THINK BEYOND

Intel International Science and Engineering Fair 2018 Program

May 13–18, 2018
Pittsburgh, Pennsylvania

Intel International Science and Engineering Fair

About the Intel ISEF

The Intel International Science and Engineering Fair (Intel ISEF), a program of Society for Science & the Public, is the world's largest international pre-college science competition. The Intel ISEF is the premier science competition in the world and provides a forum for more than 1,750 high school students from more than 80 countries, regions and territories to showcase their independent research annually. Each year, millions of students worldwide compete in local science fairs; winners go on to participate in Intel ISEF-affiliated regional, state and national fairs to earn the opportunity to attend the Intel ISEF. Uniting these top young scientific minds, the Intel ISEF provides the opportunity to finalists to display their talent on an international stage, while enabling them to submit their work for judging by doctoral-level scientists. The Intel ISEF offers awards nearly $5 million in prizes and scholarships annually.

Intel International Science and Engineering Fair 2018

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Welcome from Intel

Intel Corporation

Rosalind Hudnell
President, Intel Foundation
Vice President, Corporate Affairs Group,
Intel Corporation

Dear Intel ISEF Finalists, Educators, Families, Fair Directors, and Special Guests:

Congratulations and welcome to the 2018 Intel International Science and Engineering Fair (Intel ISEF) in Pittsburgh! We are very happy and excited to have you here. Many of you have traveled far and wide for this amazing experience, and we hope you enjoy your time at this enriching experience.

We encourage you to make new friends, ask questions during the exciting sessions, and embrace the spirit of our theme to "THINK BEYOND" in the following three ways:

BEYOND YOURSELF: When you consider the Intel ISEF finalists, judges, panelists, and Nobel Laureates, there is no greater collection of brainpower in one place than Intel ISEF! Please take advantage of this chance to listen and learn beyond your current focus areas. Let's not forget, innovation doesn't happen in a vacuum.

BEYOND DOUBT: Our world faces many challenges, and it's important to remember that the status quo defines only what hasn't been discovered yet. The ideas that the Intel ISEF community will bring into existence through hard work and collaboration will fundamentally change the world in ways that are impossible to imagine today. Think deeply about what impact your work can have on the planet, or just a single person. Believe in yourself — always!

BEYOND BARRIERS: You will meet people from many countries and cultures during this action-packed week. Take this opportunity to look beyond your differences of language or appearance and find what brings you together. Whether you're a fair director from Peru, or a finalist from Guatemala, you can build relationships and foster community that will enrich your perspective.

Also, I want to express my gratitude to you for helping to create this memorable experience, and to the many dedicated families, supporters, and volunteers who make the event possible.

This year marks the 50th Anniversary of Intel and the 30th Anniversary of the Intel Foundation, and during this anniversary year, we encourage you to "Do Wonderful" in the world. As you continue your journey to build a better world, remember the great words of Intel's co-founder, Robert Noyce, "Don't be encumbered by history. Go off and do something wonderful."

Welcome to 2018 Intel ISEF,

Rosalind Hudnell
President, Intel Foundation
Vice President, Corporate Affairs Group, Intel Corporation

Society for Science & the Public

Maya Ajmera
President & CEO
Publisher, *Science News*

Welcome from the Society for Science & the Public

Welcome to the Intel International Science and Engineering Fair 2018!

Congratulations on being selected to compete at Intel ISEF! Tens of millions of students compete in science fairs every year around the globe, with only about 1,750 students invited to join us as a finalist. You are truly among an elite group. While you are here, I encourage you to take advantage of everything that Intel ISEF has to offer, including connecting with your fellow finalists. Many Intel ISEF alumni stay in touch with one another, developing not only lifelong friendships, but also collaborating professionally later in life.

I also look forward to meeting you – the top young innovators from around the world – to hear more about your ideas and research. When I was a high school student, I too participated in science fairs – I understand the hard work and sweat equity that has gone into each and every project on display here this week.

I think it's extraordinarily exciting to think about the fact that the projects being judged here this week seek to take on and solve some of our world's greatest challenges. You are tomorrow's problem solvers, the stewards of our future. And, of course, nearly $5 million in awards is up for grabs!

Please enjoy this week and celebrate your accomplishments. I also encourage you to thank the people who helped you get here – your teachers, parents and mentors who supported you through the years. It takes a true community to develop talent like yours!

The Society for Science & the Public would like to thank Intel for their sponsorship, the many additional organizations that have provided support and awards, the volunteers from Pittsburgh and throughout the country who make this event possible, as well as the people who work so diligently to organize science fairs around the world.

I hope all of you have a wonderful time at Intel ISEF 2018!

Sincerely,

Maya Ajmera

Maya Ajmera
President & CEO
Society for Science & the Public
Publisher, *Science News*

City of Pittsburgh

William Peduto

Mayor

CITY OF PITTSBURGH

"America's Most Livable City"

Office of Mayor William Peduto

April 3, 2018

Dear Friends,

On behalf of the City of Pittsburgh, welcome! We are so pleased that the Society for Science & the Public is holding its 2018 Intel International Science and Engineering Fair in Pittsburgh.

It is fitting that Pittsburgh be the host city for this prestigious event: The Pittsburgh region has transformed itself with a balanced, innovation-driven economy based upon historic strengths in advanced manufacturing, information and communications technology, health care and life sciences, higher education and research, financial services and energy solutions. In fact, the Pittsburgh region is home to 22 outstanding universities, world-class medical facilities, a diverse economy and cutting-edge research and technology labs. You'll find that the business sectors of technology, finance and industry are infused with a vibrant cultural scene that celebrates arts from around the world. I invite you to explore our beautiful city while you're here for this important event.

Venture out into one of our 90 distinct neighborhoods. Take a ride on the historic Inclines to see the breathtaking view from Mount Washington – ranked among the most beautiful views in America. Visit our world-class museums, which offer everything from rare dinosaur bones to famous Andy Warhol paintings. See a performance in our Cultural District where spectacular shows and cutting-edge galleries can be enjoyed. Downtown, the heart of our City, offers unique dining and shopping experiences. Stroll through the historic Market Square – a newly designed, European-style plaza and then head to Point State Park, the historic site at the confluence of our three rivers.

I hope that you enjoy your stay in Pittsburgh – a city that keeps surprising people from all over the world. And, best wishes to all of you for the best Intel ISEF yet!

Sincerely,

William Peduto
Mayor of Pittsburgh

512 CITY-COUNTY BUILDING 414 GRANT STREET PITTSBURGH, PENNSYLVANIA 15219
Phone: 412-255-2626 || Fax: 412-255-8602

Welcome from the County Executive

County of Allegheny

Rich Fitzgerald

County Executive

COUNTY OF ALLEGHENY

RICH FITZGERALD
COUNTY EXECUTIVE

May 2018

Dear Friends:

On behalf of our more than 1.2 million residents, I'm proud to welcome you to Allegheny County. We are thrilled to once again host so many talented students for the Intel International Science and Engineering Fair (Intel ISEF). Thank you to the Society for Science & the Public for making this possible.

In the coming years, many of you will be looking for great places to further your education and eventually work and live, and this area might be a great fit for you. We have a diverse and thriving economy, especially in the fields of science, engineering, technology, and mathematics (STEM). The county has become known for its world-class colleges and universities and as a hub for innovation, particularly in robotics, artificial intelligence, and autonomous vehicles. That success has brought some of the top intellectual talent in the country here and also a great deal of investment. In fact, over the past decade, more than 450 area tech companies have attracted a total of $3.5 billion in investment, and tech startups here saw record levels of funding last year, nearly doubling the total from the year before. People are noticing. A new study by financial data website WalletHub ranked Pittsburgh as the nation's third-best city for STEM jobs.

During your stay, you'll also see why this region consistently ranks as one of the best places to live and visit in the country. Our vibrant and welcoming community boasts wonderful people, strong cultural institutions, beautiful terrain, entertaining attractions, an emerging food scene, successful sports teams, affordable shopping, and amazing accommodations. Whether this is your first time in Allegheny County or you've visited us before, there's always something new and exciting to enjoy.

We are delighted to have you here and to show off what makes our city, county, and region so special. Congratulations to each of the Intel ISEF participants, and we wish you the best luck in the world's largest international pre-college science competition. We look forward to seeing all of the great things you are set to accomplish, and hope you come back again soon.

Sincerely,

Rich Fitzgerald

Rich Fitzgerald

OFFICE OF THE COUNTY EXECUTIVE

Courthouse • 436 Grant Street • Pittsburgh, PA 15219 • Phone (412) 350-6500 • Fax (412) 350-6512
www.alleghenycounty.us • executive@alleghenycounty.us

Welcome from VisitPITTSBURGH

VisitPITTSBURGH

Craig T. Davis
President and CEO

May 2018

Dear Friends,

It is my great pleasure to welcome the Intel International Science and Engineering Fair to the city of Pittsburgh! We are thrilled to host this meeting and competition for high school students from all over the world.

As President and CEO of VisitPITTSBURGH, I can say with confidence that this gathering of brilliant young minds aligns perfectly with our organization's mission. Pittsburgh has become a red hot city for innovation in medicine, engineering, technology and more–and we are always looking to inspire new talent. Pittsburgh was named one of four tech hubs to watch in 2018 by VentureBeat, which cited not only our large corporations, but also our steadily growing startups. We hope to be on the radar of young adults who will surely one day be leading companies of their own.

Here in Pittsburgh, our fondness for the new and innovative is matched by our appreciation of what got us here. Our foundation is built on many different cultures, traditions and industries, brought together by our shared appreciation of this city that is so full of life and potential. Like the students converging for the Intel ISEF, we in Pittsburgh thrive on collaboration and the coming together of bright minds from all types of backgrounds to achieve something truly great.

During your time here in Pittsburgh, I am sure you will bear witness to unique attractions both old and new. Pittsburgh's culinary scene is bursting with new flavors. Our Cultural District is home to nine world-class theaters. Our 22 outstanding universities are constantly bringing new perspective and fresh ideas to the table. Our 90 neighborhoods, over a diverse landscape, embrace a vibrant culture distinctive to this city. I encourage you to discover the unique charm of Pittsburgh and kindness of its people.

Again, welcome to Pittsburgh–we are so happy to have you here. Best wishes for a wonderful Intel ISEF, and enjoy your time in the city!

Sincerely,

Craig T. Davis, CDME
President and CEO

Photo by Dllu/Wikimedia Commons(CC BY-SA 4.0)

About Pittsburgh

As authentic as it is awesome, the strength of Pittsburgh lies in the friendliness of its people and the beauty of its landscape. Add award-winning chefs, eclectic art galleries, one-of-a-kind venues and world-class attractions all conveniently located within walking distance of the David L. Lawrence Convention Center, and you'll find that Pittsburgh makes for one of the most ideal meeting destinations in the country.

It's no wonder that Condé Nast Traveler named Pittsburgh among the top three places in the world to go to in 2018. A safe, walkable downtown allows for convenient free-time options. Delegates can see a show at any of the nine Cultural District theaters, shop in unique boutiques, wander through art galleries and be amazed at The Andy Warhol Museum.

Yes, Pittsburgh is packed with possibilities – and boasts 200-plus restaurants all within easy walking distance of the Convention Center. Attendees will also appreciate the spacious public parks, and the warm, friendly feeling they'll get as visitors and residents stroll through city streets that are known for public art and incredible architecture.

Nightlife features easily walkable hot spots in Market Square, the North Shore. Jazz joints bob to the beat of world-class musicians. And, nationally acclaimed chefs are plating creative, hand-crafted dishes at award-winning restaurants.

The new Pittsburgh is "a world away from its dirty industrial past, [the city] has transformed itself into a top travel destination," reports Travel + Escape magazine.

Pittsburgh's rolling hills, shimmering rivers and stunning skyline will delight. "The Pittsburgh skyline is a scene right out of a Hollywood movie," said Travel Adventures. For an invigorating jog, walk or bike, just select any starting point along the city's 24 miles of scenic riverfront trails.

The David L. Lawrence Convention Center makes sustainable meetings a reality. It's the first – and only – Gold and Platinum LEED-certified convention center in the United States. The Convention Center is functional as well as beautiful, too. On the cutting edge of design, this innovative structure by Rafael Viñoly Architects connects the urban city to the waterfront overlooking the Allegheny River. The architecturally stunning building symbolizes this region's commitment to sustainable development and environmental awareness.

No question. Pittsburgh is an ideal place to visit. For more details, go to **visitpittsburgh.com**.

Gordon E. Moore Award

Gordon E. Moore co-founded Intel Corporation in 1968, serving as president and CEO as well as Chairman of the Board before his retirement in 1997. With degrees in chemistry and physics from University of Pennsylvania, Berkeley (B.S.) and Caltech (Ph.D.), Moore is widely known for "Moore's Law," the driving pulse of the semiconductor industry.

He and his wife, Betty Moore, have created the Gordon & Betty Moore Foundation and are among the world's most generous philanthropists. He is widely admired for his technical leadership and his role as one of the creators of today's Silicon Valley, as well as for his ongoing philanthropic role supporting environmental efforts and science education and research.

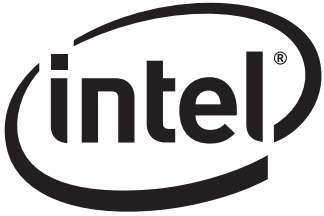
The Gordon E. Moore Award recognizes the best of the Best of Category among the outstanding students from around the world who participate in the Intel International Science and Engineering Fair. The winning project is selected on the basis of outstanding and innovative research, as well as on the work's potential in the winner's field and on the world at large.

Intel Foundation is proud to present the Gordon E. Moore Award, as well as a prize of $75,000, to the Intel International Science and Engineering Fair 2018 winner.

Society for Science & the Public acknowledges with gratitude

Intel Corporation
and
Intel Foundation

for their support of the Intel ISEF 2018.



In the last decade, Intel has invested more than $1 billion, and Intel employees have donated over four million volunteer hours, to improve education in more than 80 countries, regions and territories.

Intel is actively involved in education programs, advocacy and technology access to help tomorrow's innovators.

Intel is proud to serve as the title sponsor of the Intel International Science and Engineering Fair through 2019.

Intel ISEF 2018 Title Sponsor

As a result of their excellent performance at an Intel ISEF-affiliated fair at a local, regional or national level this year, more than 1,750 students earned finalist status at the Intel ISEF 2018 in Pittsburgh.

Finalists will compete for nearly $5 million in awards and scholarships. They will be judged on their creative ability and scientific thought, as well as the thoroughness, skill and clarity shown in their projects.

2018 GRAND AWARDS INCLUDE:

Gordon E. Moore Award

Intel and Society for Science & the Public are pleased to present an award of $75,000 to the top Best of Category project.

The Gordon E. Moore Award recognizes the Best of the Best among the outstanding students from around the world who participate in Intel ISEF. The winning project is selected on the basis of outstanding and innovative research, as well as on the potential impact of the work—in the field and on the world at large.

Intel Foundation Young Scientist Award

Intel and Society for Science & the Public will present $50,000 to two Best of Category projects. These finalists will be selected for their commitment to innovation in tackling challenging scientific questions, using authentic research practices and creating solutions to the problems of tomorrow.

Dudley R. Herschbach SIYSS Award

Three finalists will win an all-expenses paid trip to attend the Stockholm International Youth Science Seminar (SIYSS), which includes attendance at the Nobel Prize ceremonies in Stockholm, Sweden. This award is named for Dudley R. Herschbach, Harvard Professor and 1986 Nobel Laureate in Chemistry. He is Board Chairman Emeritus of Society for Science & the Public.

Intel–Indo U.S. Science & Technology Forum Scientific and Cultural Visit to India Award

In partnership with the Indo-U.S. Science and Technology Forum, Intel is pleased to award a scientific and cultural exchange visit to India. Winners will showcase their research projects at the National Fair of India–Initiative in Research and Innovation in Science (IRIS). In addition to participation at IRIS, the students will receive an opportunity to visit research institutions and universities and interact with the key scientific leadership in India.

European Union Contest for Young Scientists Award

An all-expenses-paid trip enables attendance at the European Union Contest for Young Scientists to be held in Dublin in 2018.

Intel ISEF Best of Category Award

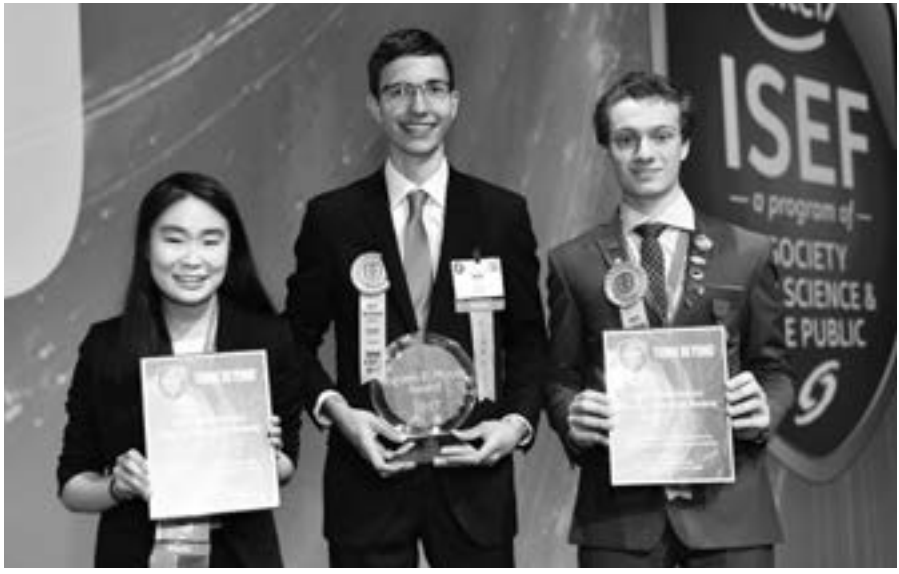
Intel will present Best of Category project winners with $5,000. Additionally, a $1,000 grant will be given to the winner's school and the Intel ISEF-affiliated fair they represent.

Intel ISEF Grand Award

Presented in each of the 22 Intel ISEF categories, Grand Awards are given for:

1st Place–$3,000 cash award
2nd Place–$1,500 cash award
3rd Place–$1,000 cash award
4th Place–$500 cash award

Monetary awards are allocated by project, not by number of finalists winning the award. For example, a three-person team project that wins first place will win $3,000, to be split evenly among the team members.



Education Outreach Day Program Sponsors

Society for Science & the Public and Intel thank the following organizations for their generous support of the Intel ISEF 2018 Education Outreach Day Program to be attended by more than 2,500 local middle and high school students and their teachers.

Bayer USA Foundation

EQT

مؤسسة الملك عبدالعزيز ورجاله للموهبة والإبداع
King Abdulaziz & his Companions Foundation for Giftedness & Creativity
موهبة

BROADCOM FOUNDATION

THE GRABLE FOUNDATION
dedicated to improving the lives of children

PPG

AAAS
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

ARCONIC FOUNDATION

The Buhl Foundation
HENRY C. FRICK EDUCATIONAL FUND

Chevron

Feng Zhang Fund for STEM Education and Outreach

DCAT
DRUG, CHEMICAL & ASSOCIATED TECHNOLOGIES ASSOCIATION

GoDaddy

KENNAMETAL

Dr. Nelson Ying

The sponsors are proud to support students and hope their participation will inspire them and their teachers, parents, scientists and others.


SOUTH
KOREA

Intel ISEF 2018 Special Award Organizations

Intel ISEF 2018 Special Award Organizations provide education scholarships, cash awards, summer internships, scientific field trips and equipment grants. Intel and Society for Science & the Public thank the following organizations for their support of the Intel ISEF.

Acoustical Society of America

Air Force Research Laboratory on behalf of the United States Air Force

American Chemical Society

American Committee for the Weizmann Institute of Science

American Geosciences Institute

American Institute of Aeronautics & Astronautics

American Mathematical Society

American Meteorological Society

American Physiological Society

American Psychological Association

American Statistical Association

Arconic Foundation

Arizona State University

Association for Computing Machinery

Association for the Advancement of Artificial Intelligence

ASU Rob and Melani Walton Sustainability Solutions Initiatives

Carnegie Mellon University Leonard Gelfand Center for Service Learning and Outreach

China Association for Science and Technology (CAST)

Coalition for Plasma Science (CPS)

Drexel University

Drug, Chemical & Associated Technologies Association (DCAT)

Florida Institute of Technology

Fondazione Bruno Kessler

GoDaddy

IEEE Foundation

Intel Foundation

International Council on Systems Engineering–INCOSE

K. Soumyanath Memorial Award

King Abdul-Aziz & his Companions Foundation for Giftedness and Creativity

Mu Alpha Theta, National High School and Two-Year College Mathematics Honor Society

National Aeronautics and Space Administration

National Anti-Vivisection Society

National Center "Junior Academy of Sciences of Ukraine"

National Institute on Drug Abuse, National Institutes of Health & the Friends of NIDA

National Security Agency Research Directorate

National Taiwan Science Education Center

Office of Naval Research on behalf of the United States Navy and Marine Corps

Oracle Academy

Patent and Trademark Office Society

Qatar Foundation, Research & Development

Ricoh USA, Inc

Samvid Education Foundation

Shanghai STEM Cloud Center

Sigma Xi, The Scientific Research Honor Society

Society for Experimental Mechanics, Inc.

Spectroscopy Society of Pittsburgh

Thermo Fisher Scientific

U.S. Agency for International Development

United States Environmental Protection Agency

University of Arizona

University of the Sciences in Philadelphia

West Virginia University

Wolfram Research, Inc.

Office Hours

All Intel ISEF 2018 events take place at the David L. Lawrence Convention Center unless otherwise noted.

Event/Group	Location	Day
Adult Mixer	Heinz Field	5/15
Innovation and Entrepreneurship Panel *Presented by Society for Science & the Public*	Hall A	5/15
Excellence in Science and Technology Panel *Presented by Intel Foundation*	Hall A	5/15
Finalists' Exhibits	Halls B and D/E	5/13–5/18
Finalist Resource Center	403/404	5/13–5/15
Grand Awards Ceremony	Hall A	5/18
Housing Information	Registration Complex	5/12–5/17
HUB (Center of Exhibit Halls)	Halls B and D/E	5/13–5/18
IB Testing	Westin Hotel, Cambria Room	5/14–5/18
Intel Quad	Second Floor Concourse	5/13–5/17
Intel ISEF Commons 2018	Spirit of Pittsburgh Ballroom B/C	5/13–5/15
International Office	309	5/11–5/18
Judges' Registration	Registration Complex	5/15–5/16
Locator Card Kiosk	Registration Complex	5/12–5/14
Lost and Found	HUB Locations	5/12–5/18
	Registration Complex	5/12–5/18
Opening Dinner	Spirit of Pittsburgh Ballroom A	5/14
Opening Ceremony	Hall A	5/14
Press Room	333	5/14–5/18
Project Exhibits	Halls B and D/E	513–5/18
Public Visitation	Halls B and D/E	5/17
Registration	Registration Complex	5/12- 5/18
Retail Store	East Lobby	5/12–5/18
Scientific Review Committee (SRC)	401/402	5/13–5/14
Special Award Ceremony	Hall A	5/17
Student Mixer	Stage AE	5/15
Student Pin Exchange *(Finalist and Student Observers Only)*	Spirit of Pittsburgh Ballrooms A/B/C	5/13
Symposia	408–411	5/14–5/17
VisitPITTSBURGH Booth	East Lobby	5/12–5/18
Volunteer Office	309	5/11–5/18

Download the Intel ISEF app at the Apple App Store or Google Play Store or visit **student.societyforscience.org/attendees** for schedule updates throughout the week.

By entering the Intel International Science and Engineering Fair 2018 (Intel ISEF), you agree that you may be filmed or photographed for use in various promotional materials.

Please do not provide handouts or other materials at Intel ISEF, unless authorized in writing by the Society.

Open Daily

Exhibit Halls and the HUB	**Halls B and D/E**
Sunday	
Project Set-up and D&S Inspections (OFP)	8:00 a.m.–9:00 p.m.
Monday	
Project Set-up and D&S Inspections (OFP)	8:00 a.m.–6:00 p.m.
Tuesday	
Finalists with Infractions only	7:30 a.m.–9:00 a.m.
Finalists/Press/PR only	9:30 a.m.–11:00 a.m.
Wednesday	
Finalists & Judges only	7:45 a.m.–11:45 a.m., 1:15 p.m.–4:00 p.m.
Thursday	
Public Visitation Day	9:00 a.m.–9:00 p.m.
Friday	
Tear Down	Close of Awards Ceremony–1:30 p.m.

Finalist Resource Center	**403/404**
Sunday–Monday	8:00 a.m.–8:00 p.m.
Tuesday	8:00 a.m.–12:00 noon

Intel Quad	**Second Floor Concourse**
Sunday	1:00 p.m.–6:00 p.m.
Monday	9:00 a.m.–6:00 p.m.
Tuesday	9:00 a.m.–1:30 p.m., 4:00 p.m.–6:00 p.m.
Wednesday	2:00 p.m.–5:00 p.m.
Thursday	10:00 a.m.–5:00 p.m.

Intel ISEF Commons 2018	**Spirit of Pittsburgh Ballroom B/C**
Sunday	5:00 p.m.–7:00 p.m.
Monday	2:30 p.m.–6:30 p.m.
Tuesday (refreshments served)	8:00 a.m.–9:30 a.m.

Judges' Registration	**Registration Complex**
Tuesday (SAO judges)	8:00 a.m.–7:00 p.m.
Tuesday (Grand Award judges)	12:00 noon.–5:00 p.m.
Wednesday (SAO judges)	7:00 a.m.–1:00 p.m.

Official Party Registration	**Registration Complex**
Saturday	3:00 p.m.–6:00 p.m.
Sunday–Monday	8:00 a.m.–9:00 p.m.
Tuesday	8:00 a.m.–7:00 p.m.
Wednesday	7:00 a.m.–7:00 p.m.
Thursday	8:00 a.m.–8:00 p.m.
Friday	8:00 a.m.–9:00 a.m.

Retail Store	**East Lobby**
Saturday	3:00 p.m.–6:00 p.m.
Sunday–Monday, Thursday	8:00 a.m.–7:00 p.m.
Tuesday–Wednesday	8:00 a.m.–6:00 p.m.
Friday	8:00 a.m.–2:00 p.m.

VisitPITTSBURGH Information Booth	**East Lobby**
Saturday	10:00 a.m.–5:00 p.m.
Sunday, Monday and Tuesday	10:00 a.m.–7:00 p.m.
Wednesday,Thursday and Friday	10:00 a.m.–5:00 p.m.

Volunteer/International Office	**309**
Friday	7:30 a.m.–5:00 p.m.
Saturday	7:30 a.m.–6:00 p.m.
Sunday, Monday and Tuesday	7:30 a.m.–9:00 p.m.
Wednesday–Thursday	6:00 a.m.–7:00 p.m.
Friday	7:00 a.m.–11:00 a.m.

Auditorium Safety

Sticks and large flags are prohibited during all ceremonies and will be confiscated at the door. Please do not bring flags or state symbols on stage during the presentation of awards. Large bags are not permitted in the Ceremony Hall. Attendees are not permitted to reserve seats or place signs to reserve seats. Any signs placed by attendees will be removed and disposed of.

Event Security

Admission to all Intel ISEF functions at the David L. Lawrence Convention Center (DLCC) is restricted to persons wearing an Intel ISEF name badge. Intel ISEF participants MUST wear their name badges to participate in fair activities and events. All Intel ISEF badges will be scanned at the entrance to all events and those without badges will be turned away at the door.

Hotel Safety

- Do not answer the door in a hotel room without verifying who it is. If a person claims to be an employee, call the front desk and ask if someone from their staff is supposed to have access to your room and for what purpose.
- Always walk in groups.
- Always use your hotel's main entrance, especially late in the evening.
- Be observant, and look around before entering parking lots.
- Close the door securely whenever you are in your hotel room, and use the locks.
- Do not needlessly display guest room keys or convention badges in public.
- Do not carry large amounts of cash or expensive jewelry. Store valuables in the hotel's safe deposit box.
- Do not offer money or food to the homeless people who may loiter near the hotels.
- Do not invite strangers to your hotel room.
- Make sure sliding glass doors and any connecting room doors are locked.
- Report any suspicious activity to management.

Hotels	Address	Phone
Cambria Suites	1320 Center Avenue	(412) 381-6687
Courtyard Pittsburgh	945 Penn Avenue	(412) 434-5551
Doubletree Hotel and Suites	One Bigelow Square	(412) 281-5800
Drury Plaza Hotel Downtown	745 Grant Street	(412) 281-2900
Embassy Suites by Hilton	535 Smithfield Street	(412) 338-2200
Fairmont Pittsburgh	510 Market Street	(412) 773-8800
Hampton Inn and Suites	1247 Smallman Street	(412) 288-4350
Hilton Garden Inn Downtown	250 Forbes Avenue	(412) 281-5557
Holiday Inn Express & Suites N Shore	228 Federal Street	(412) 323-0300
Homewood Suites Downtown	1410 Smallman Street	(412) 232-0200
Hotel Monaco	620 William Penn Place	(412) 471-1170
Hyatt Place North Shore	260 N. Shore Drive	(412) 321-3000
Omni William Penn	530 William Penn Place	(412) 281-7100
Pittsburgh Marriott City Center	112 Washington Place	(412) 471-4000
Renaissance Pittsburgh	107 6th Street	(412) 562-1200
Residence Inn North Shore	574 W. General Robinson Street	(412) 321-2099
Sheraton Station Square	300 W. Station Square Drive	(412) 261-2000
Westin Convention Center	1000 Penn Avenue	(412) 281-3700
Wyndham Grand	600 Commonwealth Place	(412) 391-4600

About David L. Lawrence Convention Center

The Convention Center is a smoke-free environment. Outside food and beverages are prohibited in the Convention Center.

THINK BEYOND

intel ISEF — a program of — SOCIETY FOR SCIENCE & THE PUBLIC

Congratulations to past winners of the Intel International Science and Engineering Fair (Intel ISEF), a program of Society for Science & the Public. Finalists have gone on to do amazing things, such as start nonprofits around the world, win awards such as the MacArthur "Genius" award, start successful companies and become professors at major universities.

Intel's commitment to education ranges from science competitions that encourage young thinkers, scientists and entrepreneurs, to collaborative programs with educational and governmental organizations.

By empowering students around the world, Intel isn't just enabling them to succeed in the global economy — we're creating the next great wave of world-changing innovators.

See what's happening at Intel ISEF: **intel.com/ISEF**

SUNDAY, MAY 13

See page 16–17 for hours and locations of daily recurring events and resources. All events take place in the David L. Lawrence Convention Center unless otherwise noted.

8:00 a.m.–5:00 p.m. (Afterwards by appt.)
Project Drop–Off — **Halls B and D/E**
Finalists transporting their own projects may unload them only if registered. Each item must be clearly marked with finalist's name, address, and fair ID number. Only Fair Officials are permitted on the floor before 8:00 a.m. Sunday.

8:00 a.m.–7:00 p.m.
Scientific Review Committee Interviews — **401/402**
Projects must be reviewed and cleared by the Scientific Review Committee (SRC) before they may be set up. An SRC project infraction list will be posted Saturday, May 12 at *student.societyforscience.org/intel-isef/attendee*.

8:00 a.m.–9:00 p.m.
Setup of Projects/ Display & Safety Inspections — **Halls B and D/E**

1:00 p.m.–6:00 p.m.
Intel Quad — **Second Floor Concourse**
Be in your element when you visit the Intel Quad, where you bring the energy and excitement of Intel ISEF to life! This year we are returning to the elemental building blocks of scientific discovery with activities to spark your creativity. Visit our VR playground to experience the latest in virtual and immersive gaming. Showcase your artistic vision at our VR draw station. Perform on a djembe or other cool instruments on the Intel Quad Stage – we might have a jam session erupt! Craft "Circuit Pins" or a moving "Tiny Dancer" figurine from simple circuits and recycled electronics. Play soccer with tablet-driven robots. Then speed away on the Quad Drag Racing Strip when you construct your own race car. Join us in the Intel Quad to connect, refresh and recharge with your fellow finalists!

5:00 p.m.–7:00 p.m.
Intel ISEF Commons — **Spirit of Pittsburgh Ballroom B**
Visit the ISEF Commons to meet representatives from leading STEM universities where you can learn about undergraduate STEM programs, research opportunities and scholarships.

7:00 p.m.–9:00 p.m.
Student Pin Exchange — **Spirit of Pittsburgh Ballroom**
This icebreaker event is only for finalists and student observers who are invited to trade pins and to meet new friends. There will be food, music, and good times for all.

MONDAY, MAY 14

8:00 a.m.–12:00 noon
Scientific Review Committee Interviews — **401/402**
Only for finalists whose projects have not been cleared.

Opening Ceremony

Monday, May 14

David L. Lawrence Convention Center
Hall A

Genevieve Bell

Director of the 3A Institute, Florence Violet McKenzie Chair and Distinguished Professor at the Australian National University, and Vice President and Senior Fellow at Intel

Bell is a cultural anthropologist, technologist and futurist best known for her work at the intersection of cultural practice and technology development. After having spent the past 18 years in Silicon Valley helping guide Intel's product development by developing the company's social science and design research capabilities, she joined Australia National University's (ANU) College of Engineering and Computer Science in February 2017.

Prof Bell now heads the newly established Autonomy, Agency and Assurance (3A) Institute, launched in September 2017 by the ANU in collaboration with CSIRO's Data61, tasked with building a new applied science around the management of artificial intelligence, data, technology and their impact on humanity.

Prof. Bell also presented the highly acclaimed ABC Boyer Lectures for 2017, in which she questioned what it means to be human, and Australian, in a digital world. Prof. Bell completed her Ph.D. in cultural anthropology at Stanford University in 1998.

8:00 a.m.–6:00 p.m. **Project Setup/ Display & Safety Inspection** — **Halls B and D/E**

Finalists transporting their own projects may unload them only if registered. Each item must be clearly marked with finalist's name, address and fair ID number.

8:45 a.m.–4:30 p.m. **Symposia** — **408–411**

See full schedule on pages 28–37.

9:00 a.m.–6:00 p.m. **Intel Quad** — **Second Floor Concourse**

2:30 p.m.–6:30 p.m. **Intel ISEF Commons** — **Spirit of Pittsburgh Ballroom B**

All Intel ISEF 2018 participants are welcomed and encouraged to visit this year's exhibits. Organizations with a science and education focus, including educational institutions, agencies, corporations and other sponsors will be on-hand.

3:30 p.m.–6:30 p.m. **Opening Ceremony Dinner** — **Spirit of Pittsburgh Ballroom A/C**

All registered attendees are welcome.

Intel ISEF name badges are required to enter.

6:30 p.m.–7:00 p.m. **Opening Ceremony Pre-Show** — **Hall A**

Doors open at 6:15 p.m.—Casual Attire

7:00 p.m.–8:30 p.m. **Opening Ceremony** — **Hall A**

Doors open at 6:00 p.m.

Sponsored by Intel Corporation

Keynote Speaker: Genevieve Bell

The Intel ISEF Opening Ceremony officially kicks off the week of events for 2018.

8:00 p.m. **Final Project Infractions List**

Posted at Registration, outside of Exhibit Halls, and on *student.societyforscience.org/intel-isef/attendee*.

TUESDAY, MAY 15

7:30 a.m.–9:00 a.m. **Project Infraction Clearance** — **Halls B and D/E**

Both the Scientific Review Committee and Display & Safety Committee will have conducted a final review of all projects by Monday afternoon. If any problems with a project are identified during review, the finalist's booth number will be posted outside the Exhibit Halls on Monday, May 14. Only those finalists with infractions will be permitted in the Exhibit Halls beginning at 7:30 a.m. A project cannot be judged unless it has been cleared by the SRC or D&S by 9:00 a.m., Tuesday, May 15.

8:00 a.m.–9:30 a.m. **Intel ISEF Commons** — **Spirit of Pittsburgh Ballroom B**

Free refreshments will be served.

Don't miss the

Intel ISEF 2018: Innovation and Entrepreneurship Panel

presented by Society for Science & the Public

May 15, 2018 | David L. Lawrence Convention Center, Hall A

Melis Anahtar

2004 Intel ISEF

Co-Founder, Day Zero Diagnostics, Inc.

Felipe Gomez del Campo

2012 Intel ISEF

Founder & CEO, FGC Plasma Solutions LLC

Anna-Katrina Shedletsky

2003–2004 Intel ISEF

Founder & CEO, Instrumental, Inc.

Sujay Tyle

2007–2009 Intel ISEF

Co-Founder and CEO, Frontier Car Group

Maya Ajmera

Panel Moderator

President & CEO, Society for Science & the Public
Publisher, *Science News*

9:00 a.m.–12:30 p.m. **Symposia** **408–411**
See full schedule on pages 28–37.

9:00 a.m.–1:30 p.m. **Intel Quad** **Second Floor Concourse**
4:00 p.m.–6:00 p.m.

9:30 a.m.–11:00 a.m. **Press/Public Relations Time with Finalists** **Halls B and D/E**
All finalists have the opportunity to come to the Exhibit Halls for scheduled press interviews, be available for impromptu visits from visiting sponsors and dignitaries and check their booth area.

1:30 p.m.–2:30 p.m. **Innovation and Entrepreneurship Panel** **Hall A**
Presented by Society for Science & the Public— Casual Attire
All attendees are invited to a conversation with Society alumni. Panelists include Melis Anahtar, Felipe Gomez del Campo, Anna-Katrina Shedletsky and Sujay Tyle. Society President & CEO, Maya Ajmera, will moderate the panel.

2:30 p.m.–4:00 p.m. **Excellence in Science and Technology Panel** **Hall A**
Presented by Intel Foundation— Casual Attire
All attendees are invited to a conversation with Nobel Laureates, MacArthur Fellows and National Medal of Science recipients. Panelists are Martin Chalfie, Elissa Hallem, H. Robert Horvitz, Cato Laurencin, W.E. Moerner and Dianne Newman. The panel will be moderated by NPR Science Correspondent and Society Trustee Joe Palca, with a welcome from Pia Wilson-Body, Executive Director, Intel Foundation, Director, Corporate Affairs Group, Intel Corporation.

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6:00 p.m.–8:00 p.m. **Intel ISEF Mixer Events**
Students only at Stage AE, Adults only at Heinz Field
All registered Official Party members are invited to this fun night of mingling, dancing and dinner. Attendees should use Light Rail, known as the "T" in Pittsburgh, to get to and from the events. The service is free from downtown stops to the North Side stop, which attendees should use on Tuesday night. "T" stops are located near block hotels. At Stage AE, finalists and observers will enjoy a DJ-hosted dance party and games. Heinz Field will host attendees who are over 21. Dinner will be served. Participants MUST wear their Intel ISEF badge to attend.

WEDNESDAY, MAY 16

7:30 a.m.–4:00 p.m. **Student Observer Program** **Carnegie Museum of Natural History**
Students officially registered as Observers will have a day of activities, including a panel discussion with researchers, and a guided tour and lunch at the Carnegie Museum of Natural History (CMNH).

Don't miss the

Intel ISEF 2018: Excellence in Science and Technology Panel

presented by the Intel Foundation

May 15, 2018 | David L. Lawrence Convention Center, Hall A

Martin Chalfie

Nobel Prize in Chemistry, 2008

Columbia University

Elissa Hallem

MacArthur Fellow, 2012

University of California, Los Angeles

H. Robert Horvitz

Nobel Prize in Physiology or Medicine, 2002

Massachusetts Institute of Technology

Cato Laurencin

National Medal of Technology and Innovation, 2016

University of Connecticut

W.E. Moerner

Nobel Prize in Chemistry, 2014

Stanford University

Dianne Newman

MacArthur Fellow, 2016

California Institute of Technology

Joe Palca

Panel Moderator

NPR Correspondent

Pia Wilson-Body

Executive Director, Intel Foundation

Director, Corporate Affairs Group, Intel Corporation

This will begin with check-in at 7:30 am at the Registration Complex. Observers will be picked up from the CMNH and dropped off at the Westin for a 2:00 pm "Project Share." Observers who are volunteering for Thursday's Education Outreach Day will then participate in a training session that will end by 4:00 pm. Please note that students will not be permitted to bring backpacks in the galleries at the museum, so pack lightly!

8:00 a.m.–11:45 a.m. **Exhibit Halls Open** **Halls B and D/E**
Finalists at Projects for Interviews
Finalists and Judges only—Professional Attire

9:15 a.m.–3:45 p.m. **Symposia** **408–411**
See full schedule on pages 28–37.

11:45 a.m.–1:00 p.m. **Lunch Break** **Second Floor Concourse**
Concession stands and additional seating will be available outside Hall C. No outside food may be brought into the Convention Center.

1:15 p.m.–4:00 p.m. **Finalists at Projects for Interviews** **Halls B and D/E**
Finalists and Judges only—Professional Attire

2:00 p.m.–5:00 p.m. **Intel Quad** **Second Floor Concourse**

6:00 p.m.–10:00 p.m. **Pittsburgh Welcome Night**
For this night, Heinz Field and the Carnegie Science Center belong to Intel ISEF. Only Official Party/registered guests will be admitted to the venues with an Intel ISEF badge. Dinner will be served at Heinz Field and dessert and beverages will be served at the Carnegie Science Center. Attendees should use Light Rail, known as the "T" in Pittsburgh, to get to and from the events. The service is free from downtown stops to the North Side stop, which attendees should use on Wednesday night. "T" stops are located near block hotels. We recommend visiting the gift store at the Carnegie Science Center first as they have an early arrival discount, and they will have a bag check to store purchases until you are ready to leave the event.

THURSDAY, MAY 17

9:00 a.m.–9:00 p.m. **Public Visitation Day** **Halls B and D/E**
Finalists' exhibits are open to the public.

9:00 a.m.–1:00 p.m. **All Finalists Required at Projects** **Halls B and D/E**
Lunch vouchers will be provided to finalists for use at concession stands located on the Second Floor Concourse and inside Halls D/E. Finalists should note their assigned lunch time printed on their voucher, which will be found at your project booth.

9:15 a.m.–3:45 p.m. **Symposia** **408–411**
See full schedule on pages 28–37.

10:00 a.m.–5:00 p.m. **Intel Quad** **Second Floor Concourse**

7:00 p.m.–10:00 p.m. **Special Awards Ceremony** **Hall A**
Doors open at 6:30 p.m. *Professional Attire*
Ceremony in which Special Award Organizations, academic institutions and government agencies give awards.

FRIDAY, MAY 18

7:00 a.m.–3:00 p.m. **Bag Storage** **Hall C**
Attendees who are leaving Pittsburgh immediately after the Awards Ceremony may store their bags/suitcases in Hall C. This service will be provided at no charge. Bags and suitcases are NOT permitted inside the Ceremony Hall nor left in open areas in the Convention Center.

9:00 a.m.–11:00 a.m. **Grand Awards Ceremony** **Hall A**
(Doors open at 8:30 a.m.) *Sponsored by Intel—Professional Attire*
All students are to be seated by 8:45 a.m.
Awards Ceremony where winners from each category as well as the top overall winners for Intel ISEF 2018 are announced.

Close of Awards Ceremony–1:30 p.m. **Exhibit Halls Open for Project Teardown** **Halls B and D/E**
Finalists take down and pack projects for return home.
Any stored packing material will be at finalists' project booths.
Finalists transporting their own projects will load them upon completion of packing. Projects being shipped via UPS or GES/heavy freight must be packed and processed for shipping by 1:30 p.m. Intel ISEF 2018 name tags required at all times during dismantling—No exceptions.

Symposia sessions are an opportunity to share information with students, parents, teachers and fair directors, and do not imply endorsement by Society for Science & the Public. No fees have been paid.

MONDAY, MAY 14

8:45 a.m. to 9:45 a.m. | Room: 408–410

Navigating Intel ISEF - What You Need to Know to Steer Your Way through the Week

Ingrid Weigand, Austin Science Education Foundation, Austin, TX

Intel ISEF week overview for the first time Fair Directors -- what to expect on each day, deadlines for certain tasks, how to prepare students for judging, events to attend and resources available.

Type: Presentation; Audience: Fair Directors, Teachers

8:45 a.m. to 9:45 a.m. | Room: 411

When Researchers Apply to College

Tim Hickey-LeClair, Massachusetts Institute of Technology, Cambridge, MA

We will discuss elements of the college search and application process as they pertain to young researchers.

Type: Presentation; Audience: Students

8:45 a.m. to 9:15 a.m. | Room: 412

RESET: Research Experiences for STEM Educators and Teachers

Phoebe Mullis Lawing, Army Education Outreach Program (AEOP),
Stuart W. Cramer High, Belmont, NC

RESET provides educators with summer research experience at participating Army laboratories. The goal of this enrichment program is to reinforce teachers' knowledge through interactions with Army and Department of Defense scientists and engineers.

Type: Panel Discussion; Audience: Fair Directors, Teachers

10:00 a.m. to 11:00 a.m. | Room: 411

Honey Bee Colony Losses: Research Efforts to Save a Key Pollinator

Jay D. Evans, U.S. Department of Agriculture, Bee Research Laboratory, Beltsville, MD

Honey bees and other pollinators are critical for agriculture and the environment. This session will highlight bee research across genetics, chemistry, behavior, and field surveys.

Type: Presentation; Audience: Fair Directors, Teachers & Students

10:30 a.m. to 11:30 a.m. | Room: 412

Bring Science to Life: Creating Simulations, VR/AR and More with Unity

Liana Holmberg, Unity Technologies, San Francisco, CA

Scientists are using Unity's real-time 3D content creation platform to not only do research, but communicate their results through powerful, immersive experiences.

Type: Presentation; Audience: Teachers, Students

Bring science to life

Do cutting-edge research

Simulate dynamic environments with physics, machine learning, and AI

Make an impact

Communicate your results with powerful, immersive 3D, VR and AR experiences

With Unity

The world's most advanced real-time content creation platform

Visit us at The Commons, Booth 116

Join us for our Symposium:
Bring Science to Life: Creating Simulations, VR/AR and More with Unity
Monday, May 14, 10:30 am - 11:30 am, Room 412

11:45 a.m. to 12:45 p.m. | Room: 412

Leveraging Your Science Fair Experience: Oh the Places You Can Go!

Maya Ajmera, President & CEO, Society for Science & the Public and Publisher, Science News, Washington, DC

Life After Science Fair! Bring your questions to a discussion with recent Intel ISEF finalists. Hear about their triumphs, college and career choices and how their science fair experience positioned them to succeed.

A panel of 4 alumni will share stories about their academic and career pathway, the impact of science fairs and how current participants can leverage the opportunities to further their own academic and professional pursuits.

Type: Panel Discussion; Audience: Fair Directors, Teachers & Students

1:00 p.m. to 2:00 p.m. | Room: 408–410

Judging at Intel ISEF

Chuck Vukotich, Judging Chair, Intel ISEF 2018, Pittsburgh, PA

Robert Yost, Intel ISEF, Judging Ombudsman

Join us to learn more about the judging process at Intel ISEF. This session will be valuable for those new to Intel ISEF and those who are veterans. Question and answer period to follow presentation.

Type: Presentation; Audience: Fair Directors, Teachers & Students

2:15 p.m. to 3:15 p.m. | Room: 411

Best Practices for Incorporating Statistics and Charts in Your Project

Christopher Malone, Winona State University, Winona, MN

This presentation will help students, parents, and teachers learn about how to best incorporate statiscal outcomes and charts into your science fair project.

Type: Workshop; Audience: Fair Directors, Teachers & Students

2:15 p.m. to 3:15 p.m. | Room: 412

Applying to Highly Selective Engineering Schools Outside of the United States

Catherine Eames, Imperial College London, United Kingdom

Stephen Johns, University of Toronto, Canada

Advice and guidance for school counselors and students from admissions representatives at two of the world's leading engineering schools in the United Kingdom and Canada.

Type: Presentation; Audience: Teachers, Students

3:00 p.m. to 4:00 p.m. | Room: 408–410

Communicating Your Science — and Doing It Well!

Janet Raloff, Science News and Society for Science & the Public, Washington, DC

Let the professionals show you how to write about and discuss your science in such a way that others will understand and care about the message you want to convey.

Type: Workshop, Presentation; Audience: Students

3:30 p.m. to 4:30 p.m. | Room: 412

Protect Your Intellectual Property: Patents, Trademarks, Copyrights and Trade Secrets

Dr. Jorge L. Valdes, U.S. Patent & Trademark Office, Alexandria, VA

Learn how intellectual property tools (patents, trademarks, copyrights, trade secrets) can help protect your science and engineering projects and help you continue on the path to innovation.

Type: Presentation; Audience: Fair Directors, Teachers & Students

POWER YOUR CHILD'S FUTURE

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This family-friendly festival, occurring throughout Southwestern Pennsylvania and West Virginia, features 270+ fun and exciting learning events designed for youth of all ages. Attend events at local schools, museums, libraries, tech companies and more. **Nearly all events are FREE!**

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3:45 p.m. to 4:15 p.m. | Room: 411

Extract Essential Oils from Plants in a Home Microwave–No Lab Needed–STEM Projects Galore!

Dr. David Hackleman, Oregon State University

Essential oils from plants, easily extracted by this 15 minute method, offer a wide variety of science and engineering project opportunities at very low cost.

Type: Presentation; Audience: Fair Directors, Teachers

TUESDAY, MAY 15

9:00 a.m. to 10:00 a.m. | Room: 408–410

Admissions 101: Pursuing Science and Engineering at Highly-Selective Universities

Jim Caldarise, Columbia University, New York, NY

An overview of college education in STEM fields, especially at highly-selective universities like Columbia University, plus insight into finding the right "fit" for you as a prospective applicant.

Type: Presentation; Audience: Teachers & Students

9:00 a.m. to 10:00 a.m. | Room: 411

Change Agents' Stories for Sustainability

Andrew Bernier, Arizona State University, Tempe, AZ

This session shows how to tell your story as a sustainability change agent while preparing your audience with the tangible knowledge and skills they need to enact change.

Type: Workshop; Audience: Fair Directors, Teachers & Students

9:00 a.m. to 10:00 a.m. | Room: 412

Teaching Current Research and Science Literacy with *Science News* in High Schools

Anna Rhymes, Society for Science & the Public, Washington, DC

The Society's *Science News* in High Schools program is offering ways to integrate current research and literacy-based learning into classroom curricula to make science more approachable and meaningful for students.

Type: Workshop; Audience: Fair Directors, Teachers

10:15 a.m. to 11:15 a.m. | Room: 408–410

Communicating Your Science — and Doing It Well!

Janet Raloff, Science News and Society for Science & the Public, Washington, DC

Let the professionals show you how to write about and discuss your science in such a way that others will understand and care about the message you want to convey.

Type: Workshop, Presentation; Audience: Students

10:15 a.m. to 11:15 a.m. | Room: 411

Using Math and Science to Innovate in the Real World

Po-Shen Loh, Carnegie Mellon University, Pittsburgh, PA

Why are math and science relevant? Join an interactive session on using a technical mindset to approach practical issues in the real world.

Type: Presentation; Audience: Fair Directors, Teachers & Students

10:15 a.m. to 11:15 a.m. | Room: 412

Responsible Conduct of Research: A Perspective

Philip DeShong, University of Maryland, College Park, MD

Responsible conduct of research (RCR) incorporates more than research misconduct. This perspective discusses the centrality of data in RCR.

Type: Presentation; Audience: Fair Directors, Teachers & Students

11:30 a.m. to 12:30 p.m. | Room: 411

Regeneron Science Talent Search: A Program of the Society for Science & the Public

Allie Stifel, Society for Science & the Public, Washington, DC

Learn about the nation's oldest and most prestigious STEM competition (and a chance to win $250,000). The 2019 application will open June 1, 2018 for rising U.S. High School seniors.

Type: Presentation; Audience: Fair Directors, Teachers & Students

11:30 a.m. to 12:30 p.m. | Room: 412

Bringing Science Communication Skills to the High School Classroom

JulieAnn Villa, Niles West High School, Glenview, IL

Can you talk, write, and present science? Learn to help students effectively present research to the public and get NGSS (Next Generation Science Standards) "sci comm" lessons for your high school classroom.

Type: Presentation; Audience: Fair Directors, Teachers

WEDNESDAY, MAY 16

9:15 a.m. to 10:15 a.m. | Room: 411

Don't Let Salmonella Ruffle Your Feathers!

Marjorie Miles Dozier, Polk County School, Bartow, FL

Participants will explore a CDC lesson with hands-on learning, a real world outbreak case of salmonellosis and data to learn the best ways to represent and analyze data. We will also address how to teach concepts of zoonotic diseases.

Type: Workshop, Presentation; Audience: Fair Directors, Teachers

9:15 a.m. to 10:15 a.m. | Room: 412

Carnegie STEM Excellence Pathway–Journey to STEM Success!

Ian Zang, Carnegie Science Center, Pittsburgh, PA

Learn about this initiative built upon the belief that schools and educators can improve their STEM education practices through a positive, collaborative approach.

Type: Presentation; Audience: Teachers

10:30 a.m. to 11:30 a.m. | Room: 408–410

SRC–2019 Rules and Guidelines

Intel ISEF 2018 Scientific Review Committee

Meet with members of the Intel ISEF Scientific Review Committee to learn of changes in the 2019 International Rules and Guidelines. Following will be a Q&A period.

Type: Presentation; Audience: Fair Directors, Teachers & SRC members

1:00 p.m. to 1:30 p.m. | Room: 412

Developing Scientific Communication Skills in High School for Student Researchers

Kim Hoehne, Minnetonka High School, Minnetonka, MN

Being able to clearly articulate ideas to a variety of audiences is essential for today's students. Learn various strategies to develop key communication skills.

Type: Presentation; Audience: Teachers

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stemecosystems.org
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1:15 p.m. to 2:15 p.m. | Room: 411

Intel ISEF Display & Safety Rules

Diane Hecht, Chair, Intel ISEF Display & Safety Committee

Come join the Display & Safety Committee to discuss infractions encountered this year as well as changes to the rules and guidelines for 2019. Bring your questions for the committee to answer.

Type: Panel Discussion; Audience: Fair Directors, Teachers

1:45 p.m. to 2:15 p.m. | Room: 412

Outreach and Equity Programs at Society for Science & the Public

Caitlin Sullivan, Society for Science & the Public, Washington, DC

Learn about the Society's Research Teachers Conference, Advocate Grant Program, STEM Action and Research Grants, and *Science News* in High Schools.

Type: Presentation; Audience: Fair Directors, Teachers

2:45 p.m. to 3:45 p.m. | Room: 411

Intel ISEF Scientific Review Committee–SRC Project Review

Intel ISEF Scientific Review Committee

Meet with members of the Intel ISEF Scientific Review Committee to discuss project review by local and regional SRC's and to review "sample" projects. English and Spanish speaking members will be in attendance. Preference will be given to those who have not previously attended.

Type: Workshop; Audience: Local & Regional SRC members

2:45 p.m. to 3:45 p.m. | Room: 412

Protect Your Intellectual Property: Patents, Trademarks, Copyrights and Trade Secrets

Dr. Jorge L. Valdes, U.S. Patent & Trademark Office, Alexandria, VA

Learn how intellectual property tools (patents, trademarks, copyrights, trade secrets) can help protect your science and engineering projects and help you continue on the path to innovation.

Type: Presentation; Audience: Fair Directors, Teachers

THURSDAY, MAY 17

9:15 a.m. to 10:15 a.m. | Room: 411

Growing Your Rural Science Fair

Stefany Burrell, Maine Mathematics and Science Alliance, Augusta, ME

Do you want to reach more rural youth? Find out how we tripled science fair participation in Maine, and learn what new challenges we're facing.

Type: Presentation; Audience: Fair Directors, Teachers

9:15 a.m. to 10:15 a.m. | Room: 412

Broadcom MASTERS: Society for Science & the Public's National Middle School Science and Engineering Competition

Raeva Ramadorai, Society for Science & the Public, Washington, DC

Learn about the Society's national middle school competition in this general information session. Former finalists will answer questions and share advice.

Type: Presentation; Audience: Fair Directors, Teachers and Students

10:45 a.m. to 11:45 a.m. | Room: 411

Smorgasbord of Technology Tips & Tricks

Kris Clements, Caddo Parish Magnet High, Shreveport, LA

Google Chrome shortcuts, apps, extensions, and some Google Drive (docs, forms, sheets) and add-ons are shared. Three other captivating (perhaps life-changing!) items will be demonstrated too!

Type: Presentation; Audience: Fair Directors, Teachers

10:45 a.m. to 11:45 a.m. | Room: 412

Building a Dye-Sensitized Solar Cell Using Blackberries

Dr. Lurea J. Doody, Beyond Benign, Waynesburg, PA

Participants will build and test a dye-sensitized solar cell. The 12 Principles of Green Chemistry will be presented and discussed in relation to the solar cell.

Type: Workshop; Audience: Teachers

1:30 p.m. to 2:30 p.m. | Room: 411

Intelligence Community STEM Careers–A Discussion

Torland J. Wingfield, Sr., (ODNI) Office, Director of National Intelligence, Washington, DC

Intelligence Agencies (IC) fall under the Office of the Director of National Intelligence, each IC Agency has its own application and hiring process. This includes student programs, internships and coop opportunities. Come join me and others from the (NSA) National Security Agency, (DIA) Defense Intelligence Agency, and (NGA) National Geospatial-Intelligence Agency.

Type: Presentation, Panel Discussion; Audience: Students;

1:30 p.m. to 2:30 p.m. | Room: 412

Climate Change, Modeling, and Supercomputers

Mark R. Petersen, Los Alamos National Laboratory, Los Alamos, NM

Climate change research relies on high-resolution computer models to understand the complex, interdependent processes that will affect the atmosphere, ocean, and land in the coming century.

Type: Presentation; Audience: Students

2:45 p.m. to 3:45 p.m. | Room: 412

From Exploration to Publication

Eman Ghanem, Sigma Xi, The Scientific Research Honor Society, Research Triangle Park, NC

Publishing scientific research is a challenging process. Learn how to convert your project into a manuscript and where to submit it for publication.

Type: Workshop; Audience: Fair Directors, Teachers & Students

3:00 p.m. to 3:30 p.m. | Room: 411

Sense-Making and Critical Thinking

Dr. William Christian, Deputy Chief, National Security Agency's Informatics Research Office, Fort Meade, MD

This presentation discusses challenges associated with answering different kinds of questions in a world overflowing with data–and the kinds of answers one might prefer.

Type: Presentation; Audience: Fair Directors, Teachers & Students

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Join us at the Intel ISEF Commons to interact and engage with industry, academic and community organizations.

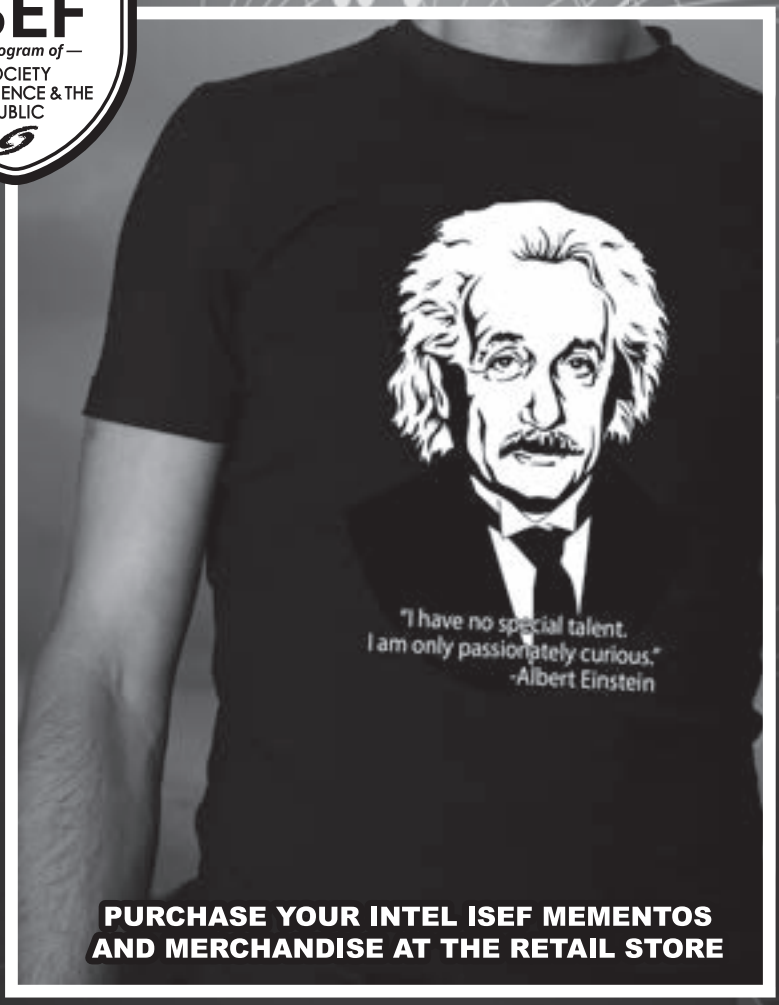
Hours are:

Sunday, May 13	5:00 p.m.–7:00 p.m.
Monday, May 14	2:30 p.m.–6:30 p.m.
Tuesday, May 15	8:00 a.m.–9:30 a.m.

Free refreshments will be served.

2018 INTEL ISEF

PITTSBURGH, PENNSYLVANIA



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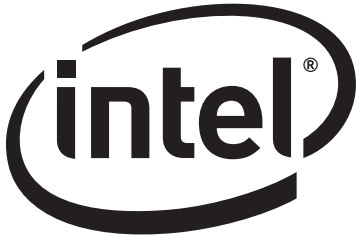

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AMERICAN SAMOA

Pago Pago, American Samoa, TEAS01, American Samoa Science Fair

EAEV079 **Reducing Total *Coliform* Bacteria in American Samoa's GUDI Wells with UV-B Treatment**
Gloria Park, 16, Junior, Pacific Horizons School, Pago Pago, American Samoa, T: Jhoanna Marie Dizon

EAEV081 **Searching for Hydrothermal Vents in the Samoan Archipelago**
Seamos Cleary, 16, Junior, Pacific Horizons School, Pago Pago, American Samoa, T: Jhoanna Marie Dizon

MCRO069 **The Stage Development Preference of *Bactrocera xanthodes* (Pacific Fruit Fly) on *Artocarpus altilis* (Breadfruit) and the Effect of Bacteria Found in *B. xanthodes* on *A. altilis***
Da ln Myung, 17, Junior, South Pacific Academy, Pago Pago, American Samoa, T: Cecilia Tuionoula

ARGENTINA

Ciudad de Buenos Aires, Argentina, ARG001, National Science Fair of Argentina

ROBO003T **Cuboide—Screenless Robot Programmable by Children**
Matias Julian Apablaza, 19, Senior, Matias Alejandro Munoz, 19, Senior, Instituto Tecnologico del Comahue, Neuquen, Argentina, T: Sebastian Prenna

AUSTRALIA

Sydney, Australia, AUS002, Young Scientist

ANIM059 **The Effect of Storage Conditions and Time on the Quality of Chicken Eggs**
Emma Millie Serisier, 16, Junior, Bishop Druitt College, North Boambee Valley, New South Wales, Australia, T: Alison Hollier

EAEV060T **Rain *vs.* Bore: Do the Best Results Come Out of the Blue or the Red?**
Felisha Rose Kaiser, 18, Senior, Elena Suzette Kaiser, 16, Junior, Danthonia Home School, Elsmore, New South Wales, Australia, T: Christian Domer

EGCH034 **Novel Use of Bio-Based Materials in Metal-Air Batteries**
Aniruddh Chennapragada, 17, Senior, James Ruse Agricultural High School, Sydney, New South Wales, Australia, T: Sandra Fernandez

ENEV063 **Recycling Waste into Biochar: A Sustainable and Economic Wastewater Filter and Fertiliser for the Agricultural Industry**
Minh Nga Nguyen, 17, Senior, Sydney Girls High School, Sydney, New South Wales, Australia, T: Elizabeth O'Connor

ENEV069T **The SAS Water Purification System: Utilizing Novel Chemical, Ionizing, Solar and Off Grid Thermal Induction Techniques for Chemical and Microbial Purification and Medical Sterilization of Water in Developing Communities**
Macinley Neve Butson, 17, Senior, Jade Taylor Moxey##, 18, Senior, The Illawarra Grammar School, Mangerton, New South Wales, Australia, Sapphire Coast Anglican College, Bega, New South Wales, Australia, T: John Kennedy, T: Beth Worthy

PHYS069 **Future Board**
Lachlan John Bolton, 19, Senior, Redeemer Baptist School, North Parramatta, New South Wales, Australia, T: Stuart Garth

THINK BEYOND

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ROBO053 **Autonomous Window Cleaning Robot for Commercial High Rise Buildings**
Oliver Grant Nicholls, 18, Senior, Barker College, Sydney, New South Wales, Australia, T: Stuart Garth

Melbourne, Australia, AUS003, BHP Billiton Foundation Science and Engineering Awards

BMED023 **Can I Eat That? An Investigation into the Effectiveness of Gluten Digestive Dietary Supplements**
Cassandra Leigh Dods, 18, Senior, Tintern Grammar, Melbourne, Victoria, Australia, T: Heather Ross

BMED047 **The Protease Inhibiting Effects of Almonds**
Caitlin Lucy Roberts, 18, Senior, The Friends' School, Hobart, Australia, T: Brenda Winning

ENBM011 **Is Honeybee Silk Antimicrobial?**
Ella Jade Cuthbert, 15, Sophomore, Lyneham High School, Canberra, Australia, T: Robin Morrell

ENBM018 **HeartMonitor: An Integrated Home-Based and Mobile Heart Attack Monitor and Alert System**
Kavinya Theumali Welikala, 16, Junior, Daramalan College, Canberra, ACT, Australia, T: Colin Price

ENEV022 **From Shrimps to a Barbie: Shrimp Shell Bioplastics: A New Solution to the World's Growing Plastic Problem**
Angelina Arora, 15, Junior, Sydney Girls High School, Sydney, NSW, Australia, T: Ian Wedlock

ENMC018 **B.M.G.: Brushless Motor Generator**
Ashley Hugh Cain, 17, Junior, Mazenod College, Mulgrave, Victoria, Australia, T: Jacinta Fox

AUSTRIA

Vienna, Austria, AUT001, Vienna International Science and Engineering Fair

EGCH018T **Storage of Electrical Energy by Converting It into Chemical Energy**
Matthias Franz Breitegger, 19, Senior, Kerstin Koller, 19, Senior, Hohere Technische Lehranstalt Weiz, Weiz, Styria, Austria, T: Helfried Tuisel

AZERBAIJAN

Baku, Azerbaijan, AZR001, Azerbaijan Science and Engineering Fair

BCHM008 **Alteration of the Metabolism of *Chlorella* in a Productive Way**
Fidan Ibrahimova, 15, Sophomore, Lyceum Named after Academician Zarifa Aliyeva, Baku, Azerbaijan, T: Ralfrid Hasanov

ENEV034 **Innovative Wind Turbines**
Mahammad Hajiyev, 16, Junior, Namiq Hemzeyev Adina 238 Sayli Tam Orta Mekteb, Baku, Azerbaijan, T: Sayali Aliyeva

PHYS017T **New Method for Changing Physical-Chemical Properties of Oil**
Aliagha Abdullayev, 16, Sophomore, Adnan Bunyatov, 15, Sophomore, Zarifa Aliyeva Lyceum, Baku, Yasamal, Azerbaijan, T: Rovshan Khalilov

SOFT023T **TreLop**
Jeyla Huseynzade, 14, Freshman, Javid Huseynzade, 16, Sophomore, Lyceum Named after Academician Zarifa Aliyeva, Baku, Azerbaijan, T: Vugar Huseynli

BELARUS

Minsk, Belarus, BLR001, BelISEF

CHEM039T **Electrochemical Preparation of Tin-Silver Alloy to Be Used as Solder**
Anhelina Hunich, 15, Sophomore, Hanna Rabenok, 16, Junior, Minsk State Regional Lyceum, Minsk, Minsk Region, Belarus, T: Svetlana Melnikova

EAEV050T **Chitosan as an Eco-Friendly Biopack**
Aliaksandra Hileuskaya, 16, Junior, Lizaveta Karpovich, 17, Junior, BSU Lyceum, Minsk, Minsk Region, Belarus, T: Hanna Chubarova

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BELGIUM

Brussels, Belgium, EUB001, European Union Contest for Young Scientists (EUCYS)

ANIM013T **On the Structure and Mechanics *in vivo* of the Ostial Cells and the Aortic Valve of the *Drosophila melanogaster* Larva Heart by Analyzing High Resolution Microscopic Images**
Juan Sanchez Mateos, 17, Junior, Claudia Rodríguez, 18, Senior, I.E.S. Maestro Gonzalo Korreas, Jaraiz de la Vera, Caceres, Spain, T: Jesus Manjon Sanchez

EBED055 **Ferrotilt–A New High Accuracy Tilt Measurement Sensor**
Aron Molnar, 19, Senior, Szechenyi Istvan Technical Secondary School of Szekesfehervar, Szekesfehervar, Hungary, T: Tibor Medvegy

MCRO019T **ShealS–Sea Heals Soil**
Gabriel Silva, 18, Senior, Eduardo Teixeira Rocha Nogueira, 18, Senior, Francisca Santos Martins, 19, Senior, Colegio Luso-Frances, Porto, Portugal, T: Rita Rocha

BRAZIL

Novo Hamburgo, Brazil, BRA001, International Fair of South America–MOSTRATEC

BCHM001 **Evaluation of the Biocatalytic Potential of Agroindustrial Residues by Employing the Orange Peel Residue as a Biocatalyst in the Asymmetric Bioreduction Reaction of the Acetophenone Substrate to 1-Phenylethanol**
Gabriel Negrao de Morais, 18, Senior, Escola Djalma Pessoa - Sesi Bahia, Salvador, Bahia, Brazil, T: Fernado Leal Moutinho

BCHM002 **Hydrolysis of the Bovine Milk Lactose from Beta-Galactosidase Enzyme Obtained by Extraction and Permeabilization of *Saccharomyces fragilis* IZ 275 Cells**
Amanda Sayuri Senoo Kakuno, 16, Junior, Colegio Interativa, Londrina, Parana, Brazil, T: Luiz Morioka

BEHA001 **Endophenotype Model in Obsessive Compulsive Disorder: Identification of Risk and Protective Factors**
Ricardo Angelin Pereira Giorgion, 17, Junior, Alef Peretz, Sao Paulo, Brazil, T: Carolina Cappi

BMED001 **Treatment of Human Melanoma: Overcoming Cell Resistance by Glutathione Depletion (Phase II)**
Juliana Martes Sternlicht, 17, Senior, Colegio Dante Alighieri, Sao Paulo, Sao Paulo, Brazil, T: Carolina Lavini

ENBM001T **Sit to Play–Floor-Level Adaptable Mobility Device for Paraplegic Children**
Matheus Bender, 18, Senior, Emerson da Costa e Silva, 18, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brazil, T: Fabio Souza

ENEV001 **Biosorventum: A Novel Approach for Textile Effluent Treatment**
Juliana Davoglio Estradioto, 17, Senior, Instituto Federal de Educacao, Ciencia e Tecnologia do Rio Grande do Sul (IFRS) - Campus Osorio, Osorio, Rio Grande do Sul, Brazil, T: Flavia Pinto

ENEV002 **Sustainable Construction of a Desalination Model with Supplementary Heating and Photovoltaic Conversion**
Caio Vinicius Lima de Souza, 16, Sophomore, Escola Estadual Gabriel de Almeida Cafe, Macapa, Amapa, Brazil, T: Aldeni Souza

MCRO001T ***In vitro* Evaluation of Cytotoxicity and Genotoxicity of an Ionic Liquid with Antifungal Activity**
Laura Cavalheiro Brizola, 18, Senior, Andrea Auler, 18, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brazil, T: Carla Ruschel

PLNT001 **Biological Activity and Phytochemical Approach of the Medicinal Plant Barbatimao (*Stryphnodendron adstringens*)**
Vanessa Aparecida Vasconcelos de Freitas, 18, Senior, Escola Estadual Domingos Justino Ribeiro, Mateus Leme, Minas Gerais, Brazil, T: Fernanda Ferreira

Sao Paulo, Brazil, BRA002, FEBRACE–Feira Brasileira de Ciencias e Engenharia

BEHA018T **Cartography of Missing Teenagers Within the Violence Triangle in the South Area of Sao Paulo City in 2016**
Clara Helena Vicentini Ferreira do Valle, 17, Senior, Ana Carolina Bueno Goncalves, 16, Senior, Beatriz de Souza Bim, 17, Senior, Escola Nova Lourenco Castanho, Sao Paulo, Sao Paulo, Brazil, T: Ednilson Quarenta

CHEM028 **Benzodiazepine Detection in Alcoholic Beverages**
Isabela Dadda dos Reis, 17, Senior, Instituto Federal de Educacao, Ciencia e Tecnologia do Rio Grande do Sul (IFRS) - Campus Osorio, Osorio, Rio Grande do Sul, Brazil, T: Flavia Santos Twardowski Pinto

EBED021 **Autonomous Liquid Dispenser**
Gabriel Gelli Checchinato, 18, Senior, Colegio Ser, Jundiai, Sao Paulo, Brazil, T: Ricardo Meca Parmezzano

ENEV042 **Polymeric Environmental Cycle: Synthesis of Crystals from Expanded Polystyrene to Solve Problems in the Petroleum Industry**
Myllena Cristyna Braz da Silva, 19, Junior, Instituto Federal De Educacao, Ciencia e Tecnologia Do Ceara, Limoeiro do Norte, CE, Brazil, T: Phylippe de Lima Santos

ENEV043T **Using *Dunaliella salina* Microalgae to Reduce Anthropic CO_2 Levels in the Atmosphere and Applying Its Biomass to Produce Surfactants**
Marcos Felipe Soares Alves Pereira, 18, Sophomore, Joao Vitor dos Santos Oliveira, 18, Sophomore, Escola SESI Djalma Pessoa - Unidade Piata, Salvador, BA, Brazil, T: Fernando Barreiros Moutinho

ENEV044T **Copper Recovery from Galvanic Industries Through Spontaneous Oxidation**
Kaique Goncalves Ferreira, 17, Senior, Elizandra Larissa da Silva, 16, Senior, Vitoria Ventura, 16, Senior, ETEC Trajano Camargo, Limeira, Sao Paulo, Brazil, T: Gislaine Barana Delbianco

PLNT031 **Agriculture Production Increase with Carbon Dioxide Seed Treatment, Phase II**
Joao Americo Macori Barboza, 17, Senior, Colegio Londrinense - Instituto Filadelfia Londrina, Londrina, PR, Brazil, T: Murillo Rodrigues

ROBO028 **Autonomous Quadcopter-Based Indoor Mapping System**
Pedro Henrique Capp Kopper, 17, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brazil, T: Marcos Zuccolotto

TMED018 **Using Bioactive Compounds to Develop an Alternative to Control *Candida spp.***
Maria Vitoria Valoto, 18, Senior, Colegio Interativa de Londrina, Londrina, PR, Brazil, T: Fabio Ferreira Bruschi

BULGARIA

Sofia, Bulgaria, BGR001, Bulgarian Science and Innovation Fair

MATH001 **Generating Functions of the Free Generators of Some Submagmas of the Free Omega Magma and Planar Trees**
Chavdar Tsvetanov Lalov, 17, Junior, Geo Milev High School of Mathematics, Pleven, Pleven, Bulgaria, T: Diana Danova

ROBO007 **Improving the Performance of Unitary Recurrent Neural Networks and Their Application in Real-Life Tasks**
Ivan Danielov Ivanov, 18, Senior, American College of Sofia, Sofia, Bulgaria, T: Elka Kondakova

SOFT001 **Predicting Digital Asset Market Based on Blockchain Activity Data**
Zvezdin Borisov Besarabov, 17, Junior, National High School of Mathematics and Natural Sciences "Acad. Luybomir Chakalov", Sofia, Bulgaria, T: Neli Georgieva

CANADA

Hamilton, Canada, CAN001, Bay Area Science and Engineering Fair

BMED062 **Quantifying Lung Macrophages to Understand Increased Susceptibility to Bacterial Pneumonia with Age**
Anika Gupta, 16, Sophomore, Westdale Secondary School, Hamilton, Ontario, Canada, T: George Geczy

EBED048 **P.I.P.S.–An Inexpensive Patient Indoor Positioning System**
Joseph Carmelo Saturnino, 15, Freshman, Bishop Ryan Catholic Secondary School, Hannon, Ontario, Canada, T: George Geczy

ENEV070T **Utilizing the Limestone Cycle to Reduce Net Atmospheric CO_2 While Simultaneously Producing Electricity**
Rishi Sai Popuri, 16, Sophomore, Kishore Jaiswal, 15, Freshman, Hillfield Strathallan College, Hamilton, Ontario, Canada, T: Laura De Lazzari

ENMC054 **EVERSE: Electric Vehicle Energy Recovery and Safety Enhancement**
Michael Wolfe, 15, Sophomore, King's Christian Collegiate, Oakville, Ontario, Canada, T: George Geczy

MCRO054 **Tardigrade Mech: A Biomimetic System for Advanced Radiation Protection in Space**
Arielle Ese Ainabe, 17, Junior, Garth Webb Secondary School, Oakville, Ontario, Canada, T: Joshua Sanderson

Canada, Canada, CAN002, Youth Science Canada–Team Canada

BMED063 **A Novel Pediatric Cancer Therapy Targeting Epigenetics and Neuroblastoma Differentiation**
Colette Erin Benko, 17, Senior, St. Mary's High School, Calgary, Alberta, Canada, T: Jacqueline Pollard

BMED069 **EEG Coherence as a Marker for Alzheimer's Dementia**
Crystal Kelly Radinski, 17, Junior, Rundle College, Calgary, AB, Canada, T: Marcella Manns

CBIO030 **Battling Superbugs: A Machine Learning Framework for Identifying Novel Antibiotic Resistance Factors**
Harkirat Bhullar, 17, Junior, Evan Hardy Collegiate Institute, Saskatoon, Saskatchewan, Canada, T: Tina Rioux

EAEV061 **Taphonomic Geochemistry of Fossil Bones from Marine and Terrestrial Fossilization Environments**
Emily Grace Cross, 18, Senior, Hammarskjold High School, Thunder Bay, Ontario, Canada, T: Douglas Davidson

EBED043 **Drip–A Precision Irrigation System for Developing Nations**
Waleed Wael Sawan, 16, Junior, Oakridge Secondary School, London, Ontario, Canada, T: Bart Irwin

ENBM055 **Recruiting Endogenous Proteins for Site-Specific Transport: A Novel Workflow for Gene Carrier Design**
Sajeev Kohli, 16, Junior, Sir John A. Macdonald Secondary School, Waterloo, Ontario, Canada, T: Tara Hurley

ENBM056 **W.I.N.I.T.S. (Wireless Interconnected Non-Invasive Triage System)**
Danish Mahmood, 14, Freshman, London Central Secondary School, London, Ontario, Canada, T: Ijaz Mahmood

ENBM057 **A Novel Computational Solution to Advance Ferromagnetic Nano Therapy to Cure Cancer**
Tasnia Nabil, 17, Senior, Vincent Massey Secondary School, Windsor, Ontario, Canada, T: Scott Westbury

Montreal, Quebec, Canada, CAN004, Montreal Regional Science and Technology Fair

BCHM030 **Cancer Is MAD(2L2); Regulation of Rev7 on Survival and Chemoresistance in Multiple Myeloma**
Jordan Levett, 16, Sophomore, Herzliah High School, Montreal, Quebec, Canada, T: Patrick Elbaz

EBED041 **Green Switch**
Athavan Thambimuthu, 16, Junior, Royal West Academy, Montreal, Quebec, Canada, T: Jessica Fogel

PHYS067 **An MRI Approach to the Quantification *in vivo* of Cerebral Blood Volume at High Resolution**
Raphael Hotter, 18, Senior, Marianopolis College, Westmount, Quebec, Canada, T: Angela Keane

CHILE

Santiago, Chile, CHL001, EXPLORA National Youth Science Conference

ANIM025T **Evaluation of the Potential of Planarians *Dugesia tigrina* as Bioindicators of the Toxicity of Waters and Sludges from Mining Tailing**
Fernando Andres Gonzalez, 17, Senior, Rene Alonso Esper, 17, Senior, Colegio Ingles Saint John, Rancagua, Cachapoal, Chile, T: Marco Araya Cubillos

PHYS088T **The Acoustics of a Room**
Ailyn Dannae Carter, 17, Senior, Rocio Tania Rojas, 18, Senior, Colegio Santa Marta de Valdivia, Valdivia, Chile, T: Paulina Cornejo

CHINA

China, CHN001, China Adolescents Science and Technology Invention Contest

ANIM011T **Who Is the Mice's King? Key Factors for Regulation of Social Hierarchy on C57BL/6 Mice**
Jingru Zhang, 17, Junior, Xieran Gu, 17, Junior, Yuhui Zhang, 17, Junior, High School Affiliated to Fudan University, Shanghai, China Shanghai Foreign Language School, Shanghai, China High School Affiliated to Shanghai Jiao Tong University, Shanghai, China, T: Chengpeng Du

BCHM022 **Exploring the Floating Mechanism of Algal Cells Responsible for Cyanobacterial Blooms**
Lixin Zhang, 15, Sophomore, Xiamen Shuangshi Middle School, Xiamen, Fujian, China, T: Yuanlin Luo

BMED022 **The Effect of Senescence on *Drosophila* Rhythmic Behavior and Possible Molecular Mechanism**
Jiaming He, 17, Junior, Beijing No. 4 High School, Beijing, Beijing, China, T: Liyan Kong

CHEM012 **The Fabrication of Flexible Transparent Electrode Based on Silver Nanowires**
Yuejia Zhu, 16, Junior, Hefei No. 8 Senior High School, Hefei, Anhui, China, T: Baman Jiang

EBED011 **Design of Blind E-Reader with Conjugate Cam Group Based on Binary Principle**
Zizhuo Wang, 17, Senior, Shanghai Experimental School, Shanghai, China, T: Ming Pei

EGCH006 **Long Life High Energy Density K+/FSI- Dual-Ion Battery with Corncob/Graphite Mixture as Cathode and Soft Carbon as Anode**
Kairui Lin, 17, Junior, QuanZhou No.5 High School, Quanzhou, Fujian, China, T: Bingan Lu

EGCH015 **Research on the Conversion of Waste Straws into High-Octane Gasoline**
Ziqi Pan, 17, Junior, Beijing No. 4 High School, Beijing, China, T: Liyan Kong

ENEV011 **One Key Recycling Intelligent Disinfection Cabinet for Waste Textbooks**
Jingke Hu, 17, Sophomore, Hangzhou Xuejun High School, Hangzhou, Zhejiang, China, T: Xiao Tian Shen

ENMC019 **Inspection 360: A Novel Spin-Climbing Robot Design Targeting at Performing Maintenance Tasks for Cable-Stayed Bridges**
Yifan Zhang, 18, Senior, Shanghai High School, Shanghai, Shanghai, China, T: Lin Cheng

ENMC020T# **Wildlife Observation System Based on Autonomous Target Recognition and Tracking**
YanYi Wang, 16, Sophomore, YuFei Li#, 16, Sophomore, Beijing No. 4 High School, Beijing, Beijing, China; The High School Affiliated to Renmin University of China, Beijing, China, T: LiYan Kong, T: Qian Xu

MATH007 **The Generalization of Finsler-Hadwiger's Inequality on General Hyperbolic Triangles and Its Applications**
Yingxin Liu, 17, Junior, Beijing No.161 High School, Beijing, China, T: Yi Liu

MATH008 **A Design of Early Warning Models for Spectator Violence at Soccer Games– A Research Based on Home Games of Shanghai Greenland Shenhua FC in China Super League 2016**
Nuo Chen, 17, Junior, No. 2 High School of East China Normal University, Shanghai, Shanghai, China, T: Chengpeng Zhang

MATH009 **What Do We Have in Mathematics 2000 Years Ago?: A Study of Arithmetic Based on the Nine Chapters on the Mathematical Art**
Yundi Hou, 17, Junior, Nanjing Foreign Language School, Nanjing, Jiangsu, China, T: Ting Wu

MATS007 **Sulfur-Doped Carbon Materials Derived from Waste-Car-Tire for High Performance Lithium-Sulfur Battery**
Yutong Wang, 16, Sophomore, The High School Affiliated to Renmin University of China, Beijing, Beijing, China, T: Keke Fan

MCRO027 **Study on Molds Prevention Effect of *Broussonetia papyrifera* Milky Sap on Putty**
Xingqiao Xu, 15, Sophomore, Beijing 101 Middle School, Beijing, Beijing, China, T: Lixia Ma

PHYS019 **The Birth Rate of La Supernovae in Nearby Universe**
Jichen Zhang, 18, Junior, United World College Changshu China, Changshu, Suzhou, Jiangsu, China, T: Xiaofeng Wang

PLNT014 **Crude Extraction of *Amana edulis* Induces Liver Cancer Apoptosis**
Yueyang Fan, 16, Junior, No. 2 High School of East China Normal University, Shanghai, Shanghai, China, T: Lv Xiuhua

ROBO014 **Changing the Ratio of an Image Intelligently According to Its Contents: An Image Processing Tool Based on Pixel Weight and Face Detection**
Han Qi, 17, Junior, Tianjin Nankai High School, Tianjin, China, T: Mingming Cheng

ROBO029 **The Dexterous Hand of Sign Language**
Ruixi Jiang, 17, Junior, Beijing No.2 Middle School, Beijing, China, T: Shan Gao

SOFT012 **Faster R-CNN over Attention: Shared Bikes Detection in Surveillance Video**
Xuelin Yang, 16, Junior, The Affiliated High School of South China Normal University, Guangzhou, Guangdong, China, T: Yang Xiao'an

SOFT013 **Seeing Clearly and Farther: Augmented Perception for Safe Driving in Adverse Weather and Reduced Visibility Conditions**
Ruihua Chou, 16, Junior, The High School Affiliated to Renmin University of China, Beijing, Beijing, China, T: Dan Wan

Chengdu, China, CHN008, Sichuan Science Fair

BMED002 **Using CRISPRi to Analyze the Role of Caveolae-Mediated Endocytosis in Tau Uptake of Central Nervous System Culture**
Helen Zhang, 17, Senior, Concordia International School Shanghai, Shanghai, Pudong, China, T: Daniel Barrientes

ENBM002 **Fish & Snips: Facilitating Wound Healing Through Tilapia Collagen Dressing**
Juyeon Baik, 17, Junior, Concordia International School Shanghai, Shanghai, Pudong, China, T: Todd Gordon

MCRO004T **The Nutmeg-ical Solution: Investigating Bactericidal Effects of *Myristica fragrans* for Treatment of *Helicobacter pylori* Infection**
Dakota Chen Ma, 17, Senior, Yoonhyun Jung, 16, Junior, Qiuhong (Anna) Wei, 16, Junior, Concordia International School Shanghai, Shanghai, Pudong, China, T: Daniel Barrientes

SOFT006T **Using Spam Filters to Detect Malware: A Machine Learning Approach to Malware Detection**
Chan Woo Kim, 17, Junior, Austin Liu, 17, Junior, Shanghai American School–Puxi Campus, Shanghai, Shanghai, China, T: Dominc Mooney, T: Alan Chan

TMED001 **Returning to Roots: A Study on the Antibacterial Properties of Herbal Extracts Found in Traditional Chinese Medicine**
Jeffrey Zheng, 17, Senior, Shanghai American School–Puxi Campus, Shanghai, Shanghai, China, T: Alan Chan

CHINA, HONG KONG SPECIAL ADMINISTRATIVE REGION

Hong Kong, China, Hong Kong Special Administrative Region, HKG001, Hong Kong S&T Invention Contest

ANIM026T **Galaxy Nest: A Study on the Nesting Behaviors of Asian Weaver Ants**
Ruo Yan Elysia Ye, 15, Sophomore, Muhua Yang, 16, Sophomore, Chinese International School, Hong Kong, China, Hong Kong Special Administrative Region; St. Joseph's College, Hong Kong, China, Hong Kong Special Administrative Region, T: Haipeng Liu

CHEM020T **Tree Plaster–Using of Polymers as a Drugs Release Media to Cure Wood Decay Fungi**
Po Ying Yip, 14, Freshman, Yuet Ting Wong, 15, Freshman, Pui Lam Queenie Choi, 15, Freshman, Shun Tak Fraternal Association Yung Yau College, Hong Kong, China, Hong Kong Special Administrative Region, T: Yuen Kee Tsui

CHEM021T **An Investigation on Starch-Stabilized Silver Nanoparticles on Detection of Proteinuria and Hyperphosphatemia**
Kam Fai Wan, 18, Senior, Chi Ho Ng, 17, Senior, King's College, Hong Kong, China, Hong Kong Special Administrative Region, T: Bob Lui

EBED014T **Universal Sign Language Translation Gloves**
Ho Fai Chung, 17, Senior, Ka Lung Chan, 17, Senior, Christian and Missionary Alliance Sun Kei Secondary School, Hong Kong, China, Hong Kong Special Administrative Region, T: Wing Hei Chow

MATS017 **A Novel Type of Nonvolatile Memory Device–RS Study on ZnO Materials**
Tsz Hei Lo, 17, Senior, St. Paul's Co-Educational College, Hong Kong, China, Hong Kong Special Administrative Region, T: Edith Lo

TMED010 **When East Meets West: Panax Notoginseng Alginate Diabetic Wound Dressing**
Natalie Cho, 17, Junior, Pui Ching Middle School, Hong Kong, China, Hong Kong Special Administrative Region, T: Wai Lok Yeung

CHINA, MACAO SPECIAL ADMINISTRATIVE REGION

Macao, China, Macao Special Administrative Region, MAC001, Macao Region Science Fair

BCHM034T **Identification, Cloning and Recombinant Expression of Novel Bioactive Peptides from Coral: Clues to Potential New Therapeutics for Human**
Chun Hei Fong, 14, Freshman, Chi Kio Chan, 18, Senior, Pui Ching Middle School, Macau, China, Macao Special Administrative Region; Pui Ching Middle School, Macao, China, Macao Special Administrative Region, T: Hio Fai Io

ENEV035T **A Multi-Functional, Deep Water Monitoring Robot for Pollution Control in Reservoirs**
Man Chon Ho, 15, Sophomore, Seong Hok Lao, 16, Sophomore, Pui Ching Middle School, Macao, China, Macao Special Administrative Region, T: Kun Wa Lao

ENEV057T **'Leave' It Back to Us: A Comprehensive & Sustainable MCD Concept Integrating the Whole Life Cycle of Consumer Goods**
Weng Io Chan, 17, Senior, Weng Ian Wong, 18, Senior, Keang Peng School - Secondary Section, Macao, China, Macao Special Administrative Region, T: Kin Keong Leong

CHINESE TAIPEI

Taipei, Chinese Taipei, TWN001, Taiwan International Science Fair

BMED024 **The Role of Carbohydrate Sulfotransferase 11 on Epithelial-to-Mesenchymal Transition in Lung Cancer Cells**
I-An Chiu, 18, Senior, Taipei First Girls High School, Taipei, Taiwan, T: Michael Hsiao

CELL009T **Impact of Chitinase-3-like-1 on M1 Macrophage Polarization and Functions**
Guan-Yi Huang, 17, Junior, Yu-Ruei Chen, 17, Junior, Taipei Municipal Jianguo High School, Taipei City, Chinese Taipei, T: Wen Fang Cheng

CHEM024T **Design New Exciplex-forming Systems for OLEDs Application**
Jie-Lan Jhang, 17, Junior, Jie-Jhu Jhang, 17, Junior, Taipei First Girls High School, Taipei City, Chinese Taipei, T: Ken-Tsung Wong

EAEV011 **Examining Directivity of the 2016 Meinong Earthquake Using Doppler Effect**
Shen-Chang Huang, 17, Senior, Taipei Municipal Jianguo High School, Taipei City, Chinese Taipei, T: Wen-Li Lee

ENEV014 **Sustainable Structural Health Monitoring after Earthquake Based on Multiscale Entropy Analysis**
Kai-En Yang, 17, Junior, National Experimental High School at Hsinchu Science Park, Hsinchu, Taiwan, T: Hsin-Pei Lee

ENMC031T **A Spherical Induction Motor with Hexahedron Stator for Attitude Control**
Shang-Jung Lee, 18, Senior, Po-Hsun Yen, 18, Junior, Concordia Middle School, Chiayi County, Taiwan Department of Education, Chiayi City, Chiayi City, Taiwan, T: Hsieh Min-Fu, T: Min-Fu Hsieh

MATH011T **"Equal Powers Turn Out" – Conics, Quadrics, and Beyond**
Kai Wang, 18, Senior, Chi-Lung Chiang, 17, Senior, The Affiliated Senior High School of National Taiwan Normal University, Taipei City, Chinese Taipei, T: Ming-Chu Chou

PHYS022T **Nanobubble Conductors – The Unexpected Hall and Temperature Characters**
Cheng-Jui Yang, 18, Senior, Yu-Chi Wang, 17, Junior, Han-Yuan Hsu, 17, Junior, National Chiayi Senior High School, Chiayi City, Taiwan, T: Wen-Tang Lee

COLOMBIA

Medellin, Colombia, COL001, Colombia Science & Engineering Fair

ENEV071 **Altitude: A Auadcopter UAV for Air Pollutants Identification and Measurement**
John Fredy Sepulveda, 17, Junior, Institucion Educativa Instituto Tecnico Industrial Pascual Bravo, Medellin, Antioquia, Colombia, T: Marta Naranjo

Bogota, Colombia, COL002, Feria Nacional de Ciencia, Tecnologia e Innovacion

EGCH037T **Biomass Energy as a Means of Electrical Production**
Angela Carolina Morales Diaz, 16, Junior, Daniel Esteban Cruz Perez, 16, Junior, Veinte de Julio, Acacias, Meta, Colombia, T: Gigliola Acosta Rubiano

COSTA RICA

San Pedro de Montes de Oca, Costa Rica, CRI001, Feria Nacional de Ciencia y Tecnologia

PLNT008 ***In vitro* Establishment and Acclimatization of Coffee (*Coffea arabica*) in Three Costa Rican Traditional Varieties and in a Promising Variety Resistant to Leaf Rust (*Hemileia vastatrix*)**
Heilyn Calvo-Vargas, 17, Junior, Colegio Tecnico Profesional de Acosta, Acosta, San Jose, Costa Rica, T: Johanna Segura-Solano

PLNT011T **Effect of Traditional Organic Technique (BAMI) in the Development of Cucumber Plants of *Cucumis sativus L.***
Yaricsa Segura-Marin, 17, Junior, Prisly Segura-Marin, 19, Junior, Luis Fernando Rios-Hidalgo, 16, Sophomore, Liceo Unesco, Perez Zeledon, San Jose, Costa Rica, T: Jeison Vargas-Sanabria

CZECH REPUBLIC

Boskovice, Czech Republic, CZE001, Students' Professional Activities (SPA)

CELL001 **Should Human Induced Pluripotent Stem Cells Regret Their Choice of DNA Repair Mechanisms?**
Adela Rotreklova, 18, Senior, Gymnazium Brno, Trida Kapitana Jarose, Prispevkova Organizace, Brno, South Moravian Region, Czech Republic, T: Iva Kubistova

SOFT002 **Optical Recognition of Cursive Handwriting**
Bretislav Hajek, 19, Senior, Gymnazium Cesky Brod, Cesky Brod, Czech Republic, T: Ivo Kocum

SOFT003 **Simplex RPG Engine**
Matej Stagl, 19, Senior, Gymnazium Ceska Lipa, Ceska Lipa, Liberecky Kraj, Czech Republic, T: Pavla Machova

Prague, Czech Republic, CZE002, AMAVET Czech Republic Science Fair

BCHM003 **Novel Replication Fork Protection Factor**
Karina Zadorozhny, 19, Senior, Prvni Ceske Gymnazium v Karlovych Varech, Karlovy Vary, Czech Republic, T: Zdenek Papez

PLNT002 **Investigating Plant Telomere Motifs Using Bioinformatics**
Martin Matl, 19, Senior, Gymnazium Brno, Trida Kapitana Jarose, Prispevkova Organizace, Brno, South Moravian Region, Czech Republic, T: Jana Sitarova

SOFT004 **CSE-Lab**
Kamil Mudrunka, 19, Senior, Gymnazium Pardubice, Dasicka 1083, Pardubice, Czech Republic, T: Sona Kristanova

DENMARK

Copenhagen, Denmark, DNK001, Unge Forskere

MATH027 **An Improvement of the Asymptotical Upper Bound for the Cardinality of Sidon Sets of Vectors with Binary Components**
Joakim Asger Faergeman, 19, Senior, Alssundgymnasiet Sonderborg, Sonderborg, Denmark, T: Michael Jensen

PHYS055 **Why Are We 3D?: Modelling the N-Dimensional Electron Orbitals**
Benjamin Muntz, 19, Senior, H.C. Orsted Gymnasiet i Lyngby, Kongens Lyngby, Denmark, T: Larisa Shestakova

EGYPT

Cairo, Egypt, EGY001, Egypt Science and Engineering fair - Cairo & Upper Egypt

CHEM031 **Extract the Insulating Fiber from the Chicken Feathers**
Amira Gamal Abdelazim, 16, Sophomore, El Menia Preparatory Secondary School for Girls in New Menia, New Minia, Egypt, T: Madeha Muhamed

CHEM048T **The Power of Nature**
Abdelaziz Emad Mohamed, 17, Senior, Mohamed Mahmoud Hegazy, 17, Senior, The Red Sea STEM High School, Hurgada, Egypt, T: Heba Abdelsalam

EAEV035 **Enhanced Biogas System for Sustainable Agriculture**
Sara Atef Ibrahim Hasan, 16, Sophomore, Hadabet El-Ahram Governmental Language School, Giza, Haram, Egypt, T: Heba Abdelsalam

EBED024T **New Vision for the World**
Nourhan Hussien ZainElabedeen, 16, Junior, Mira Medhat Moussa, 16, Junior, S.T.E.M. Luxor School, Luxor, Egypt, T: Mohamed Shahat

EBED025T **Salvum Cars**
Sama Mahmoud Hadhoud, 16, Junior, Hanin Hossam Eldaly, 16, Junior, Menofya STEM School, Sirs Eel Lian, Menofya, Egypt, T: Heba Abdelsalam

MATS038T **From Banana Peels to Bioplastic–Using Banana Peels as a Starch-Rich Material to Produce Biodegradable Plastic**
Jassin Fahd Zaki, 17, Senior, Mohammad Yahia Arafa, 18, Senior, 6 of October STEM Egypt School, Giza, Egypt, T: Heba Abdelsalam

ROBO048 **Arya-X4 Advanced Smart Drone**
Mohamed Ashraf Ahmed, 19, Senior, Martyr Osama Ahmed Ismael Language High School, Nasr City, Cairo, Egypt, T: Heba Abdelsalam

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SOFT030 **It's Possible to Improve Your Eyesight Naturally**
Mohamed Ayman Hafez, 15, Sophomore, Saint Fatima Abbassia Language School, Cairo, Egypt, T: Heba Abdelslam

Alexandria, Egypt, EGY002, Bibliotheca Alexandrina Science and Engineering Fair - Alexandria

EAEV036T **Eco-Brick**
Ahmed Abdelbaset Elshenawy, 17, Senior, Ahmed Nabil El Sheikh, 18, Senior, Kafr EL-Sheikh STEM School, Kafr EL-Sheikh, Egypt, T: Shokry Eshak

EGPH015T **Solar Musical Engine**
Fatma Adel Mahmoud, 17, Junior, Khadeja Omar Dapour, 17, Junior, STEM School of Alexandria, Alexandria, Egypt, T: Mostafa Dapour, T: Mostafa Dapour

ENBM058T **Heart Knight**
Fadwa Elshenawy Elshenawy, 17, Senior, Hadeel Hesham Adam, 18, Senior, Kafr EL-Sheikh STEM School, Kafr EL-Sheikh, Egypt, T: Shokry Henin

ROBO047T **Smart Farming**
Rowan Ashraf Qushta, 17, Junior, Yasmeen Amr Eltawil, 18, Junior, STEM School of Alexandria, Alexandria, Egypt, T: Eman Mohamed

ESTONIA

Tallinn, Estonia, EST001, Estonian Young Scientist Contest

BCHM005 **The Development of Biligand Inhibitors and Non-Radioactive Inhibition Assay for Protein Kinase Aurora B**
Mirel Mesila, 18, Senior, Tallinn Secondary School of Science, Tallinn, Harjumaa, Estonia, T: Darja Lavogina

ENEV007T **Innovative Indoor Biowaste Composting Solution: Biobox with Added Microorganisms and Heating Source**
Kevin Reisenbuk, 19, Senior, Kris-Robin Sirge, 19, Senior, Joonatan Oras, 19, Senior, Hugo Treffner Gymnasium, Tartu, Tartu County, Estonia, T: Madis Vodja

FINLAND

Helsinki, Finland, FIN001, Finland National Science & Engineering Fair

ENMC062 **Device for Measuring the Efficiency of Electromagnetic Launchers**
Petteri Haverinen, 16, Sophomore, Lahden Lyseo, Lahti, Paijat-Hame, Finland, T: Tarja Vierinen

MATH048 **Finnish Baseball's Draw of Choice (Hutunkeitto) as a Two Player Finite Game**
Olli Aapo Matias Jarviniemi, 16, Sophomore, Valkeakosken Tietotien Lukio, Valkeakoski, Pirkanmaa, Finland, T: Esa Lappi

FRANCE

Paris, France, FRA001, Olympiades de Physique

ENMC015T **Access to the Study of Rapid Chemical Kinetics by Generating and Monitoring a Drop of a Reaction Mixture**
Clarisse Baudouin, 17, Senior, Clement Traup, 18, Senior, Chloe Emma Simonnet, 17, Senior, Lycee Douanier Rousseau, Laval, France, T: Patrice Michel

GEORGIA

Tbilisi, Georgia, GEO001, Georgian Science Project Olympiad

MATH010T **The Possibility to Build a Triangle, Given Its Three Medians, Three Bisectors or Three Heights**
Sandro Janelidze, 16, Sophomore, Nodar Trapaidze, 15, Freshman, Georgian-American School, Tbilisi, Georgia, T: Natia Miminoshvili

PLNT015T **The Effect of Electromagnetic Fields on the Growth and Development of Plants**
Mariami Bukia, 16, Sophomore, Nino Machaidze, 15, Sophomore, Georgian-American School, Tbilisi, Georgia, T: Khatia Zurashvili

Tbilisi, Georgia, GEO002, Leonardo da Vinci Fair

CHEM032T **Reception of New Biologically Active Substances on the Basis of Curcumin**
Grigol Mikadze, 18, Senior, Tsotne Mikadze, 15, Sophomore, Luka Buskandze, 17, Junior, Vazha-Pshavela #87 Public School, Tbilisi, Georgia, T: Mikheil Labartkava

EBED026T **Large Format Mosaic Screens to Visualize Schlieren**
Shorena Gudzhabidze, 16, Junior, Marina Gudzhabidze, 17, Junior, Dea Ilarionova, 17, Junior, Cervantes Gymnasium AIA-GESS, Tbilisi, Georgia, T: Teimuraz Chichua

GERMANY

Erlangen, Germany, DEU001, Jugend Forscht

ANIM006 **The Effect of Environmental Factors on Tardigrade Communities**
Stefan Kemmerich, 15, Sophomore, Erzbischofliches St.-Angela Gymnasium, Wipperfurth, Germany, T: Alois Dederichs

EAEV007 **A Combined Explanation for the Sailing Stones in Death Valley, California and the Laguna del Altillo Chica, Spain**
Ronja Spanke, 18, Senior, Hans Thoma Gymnasium, Lorrach, Germany, T: Renate Spanke

EBED004 **Infrared-Laser Computer Control**
Lukas Nullmeier, 19, Senior, Salier-Gymnasium, Waiblingen, Germany, T: Daniel Nullmeier

ENBM009T **So that Load-Bearing Implants Do Not Burden: Load Analyzes for the Selection of Joint Replacements**
Paula Lankowski, 19, Senior, Bianca Kreitz, 19, Senior, Lea Kampfert, 19, Senior, Innerstadtisches Gymnasium, Rostock, Germany, T: Daniel Kluess

ENMC011 **Designing and Building a Continuously Spinning but Controllable Flying Object**
Frederik Dunschen, 19, Senior, Friedensschule Munster, Munster, Germany, T: Thomas Konnemann

ENMC012T **Orientation Gadget for Visually Impaired**
Nele Tornow, 18, Senior, Fabian Charles Miro Rimmele, 19, Senior, Alfred Nobel Schule, Geesthacht, Germany, T: Jens Muller

PHYS009 **A Novel Method for the Separation and Detection of Macroscopic Particles Using Ion-Trap Mass Spectrometry in the Presence of Atmospheric Gases**
Jannik Sonke Meyer, 16, Junior, Jacob-Grimm-Schule Kassel, Kassel, Germany, T: Klaus-Peter Haupt

PHYS010T **Galileo's Ladder Problem: Rope Ladders Falling Faster than Gravity**
Lennart Nikolai Resch, 17, Senior, Tim Noah Kubetzko, 18, Senior, Hans Thoma Gymnasium, Lorrach, Germany, T: Hermann Klein

PHYS011T **Liquid Stream Hits Rough Surfaces – Showing an Extraordinary and Stable Wave Pattern**
Matthias Paul Grutzner, 17, Junior, Julian Egbert, 17, Senior, Arne Jakob Geipel, 17, Senior, Herder-Gymnasium, Berlin, Germany, T: Christoph Urbanowski

PLNT010T **Risk Analysis: Pyrrolizidine Alkaloids in Honey and the Distribution of *Senecio jacobaea***
Jessica Kirchner, 18, Senior, Jonas Boukamp, 19, Senior, Berufskolleg Rheine, Rheine, Germany, T: Berthold Sommer

SOFT008 **Developing a Full Featured Graphic Design Software for iOS**
Mihai Vladimir Danila, 18, Senior, Lessing Berufskolleg Dusseldorf, Dusseldorf, Germany, T: Rafael Regh

GHANA

Accra, Ghana, GHA001, MISE Research Program

ROBO005T **Developing an Algorithm for Detecting Diabetic Retinopathy from Retinal Images Using Machine Learning**
Gianna Nana Ama Boadi Torpey, 16, Junior, William Thibaud Manirakiza, 16, Sophomore, SOS-Hermann Gmeiner International College, Tema, Greater Accra Region, Ghana; Liberty American School, Accra, Greater Accra Region, Ghana, T: Amy Zhang

GUAM

Mangilao, Guam, TEGU01, Guam Island-Wide Science Fair

MATS052 **Novel Graphene Nanoplatelet Embedded Pigmentless Emulsions for Low Cost Paintable Capacitive Sensors and Supercapacitors**
Daniel Zion Kang, 16, Sophomore, John F. Kennedy High School, Tamuning, Guam, T: Colette Beausoliel

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GUATEMALA

Guatemala City, Guatemala, GTM001, AASCA Science and Engineering Fair (ASEF)

EBED027T **Automatic Sustainable Low Cost Climate Control for Small Rural Buildings**
Naresh Pradeep Pillay, 16, Sophomore, Lucca Poli Fernandes Pinto, 16, Sophomore, Alexandra Leah Sherman, 16, Sophomore, International School of Panama, San Miguelito, Panama Este, Panama, T: Nicola Barratt

HUNGARY

Budapest, Hungary, HUN001, Innovation Contest for Young Scientists

EBED030 **e-Strip: The First Self-Taught, Personalized and Wearable Smart Medical Device to Control the Temperature of Body Parts**
Melinda Szegedi, 16, Sophomore, ELTE Apaczai Csere Janos High School, Budapest, Hungary, T: Agnes Bagdi

INDIA

New Delhi, India, IND001, Initiative in Research and Innovation in Science

BEHA055T **Creation of a Diagnostic Tool to Identify Spatial Abilities in Scholastically-Classified Slow-Learners**
Tanya Kaur Talwar, 15, Freshman, Akshat Gupta, 14, Sophomore, Amity International School, Pushp Vihar, New Delhi, Delhi, India, T: Radha Chauhan

BMED078T **A Novel Approach to a p53-Stabilizing Agent to Accelerate Cell Apoptosis and Initiate Cell Arrest and Curb Malignancy of Tumor Cells**
Shuvayu Dasgupta, 17, Junior, Syed Roshan Ali, 16, Junior, La Martiniere for Boys, Kolkata, Kolkata, West Bengal, India, T: Debashis Dey

EAEV073T **"FloBot": A Mobile Portable and Floating Real Time Data Acquisition Device for Lake Water Quality Monitoring and Mapping**
Pranav Nadig Shikarpur, 17, Junior, Siddharth Viswanath, 17, Junior, Bangalore International Academy (NSV), Bangalore, Karnataka, India, T: Uttam Shikarpur

ENBM066 **Non-Invasive Detection of Asymptomatic Heart Attacks Using BioElectrics Through Transcutaneous Blood Analysis**
Akash Manoj, 16, Junior, The Ashok Leyland School, Hosur, Tamil Nadu, India, T: Sharatha Shankaran

ENEV079 **Remediation of Cr(VI) Contaminated Soil and Water Using an Optimized Strain (*Anabaena cylindrica*) Immobilized in a Polymer Matrix**
Naisargik Lenka, 15, Freshman, Dav Public School, Bhubaneswar, India, T: Kishore Panigrahi

MATH049 **Solving a Mathematical Mystery: Schinzel's Conjecture**
Sacheth Sathyanarayanan, 17, Senior, National Public School, Chennai, India, T: Revathy Mukundan

MATH050 **The Analogue of Szemeredi's Theorem for Rectangles, n x n Lattice, Cuboid and n-Orthotope**
Nishant Dhankhar, 15, Sophomore, Delhi Public School, R. K. Puram, Delhi, New Delhi, India, T: Jonaki Ghosh

MCRO067 **Mind Your Language: A Host Produced AI-2 Mimic Mediated Communication to Inhibit Bacterial Pathogenesis**
Harshit Jindal, 17, Senior, Maharaja Agarsain Public School, Delhi, New Delhi, India, T: Ritu Gupta

MCRO068 **Fabrication of Highly Specific Electrochemical Genosensor for the Detection of *Escherichia coli***
Kunal Singh, 17, Senior, Maharaja Agarsain Public School, Delhi, New Delhi, India, T: Ritu Gupta

PHYS079 **Single *vs.* Multiple Planetary Systems: Insights from Analysis of Exoplanetary Data**
Antara Raaghavi Bhattacharya, 13, Freshman, G.D. Somani Memorial School, Mumbai, Maharashtra, India, T: B. Seymour

PHYS082 **Determining Space Debris Orbits for Collision Prediction Using Chaos Theory**
Aswath Suryanarayanan, 15, Junior, Devi Academy Senior Secondary School, Chennai, India, T: Santhanam M.S.

PLNT060T ***Chlorella pituita* for an Obesity Free World by Regulating Obesogen Activity**
Tanya Goyal, 17, Senior, Sharen Ganesh Mangalam Chamu, 16, Junior, Maharaja Agarsain Public School, Delhi, New Delhi, India, T: Ritu Gupta

PLNT069 **The Plant Doctor: An Artificial Intelligence Based Collaborative Platform for Plant Disease Identification, Tracking and Forecasting for Farmers**
Kaushik Kunal Singh, 15, Sophomore, Inventure Academy, Bengaluru, Karnataka, India,
T: Gousia Mohammed

ROBO061 **Phishing Website Detection Using Support Vector Machines and Nature-Inspired Optimization Algorithms**
Sagnik Anupam, 16, Sophomore, Delhi Public School, R. K. Puram, Delhi, New Delhi, India,
T: Arpan Kar

SOFT049 **Architecture Tweaking Image Analysis S/W for Automated Identification of Land Features in Satellite Images**
Param Singh Gujral, 17, Senior, La Martiniere for Boys, Kolkata, Kolkata, West Bengal, India,
T: Sachin Chaubey

SOFT059 **Childsafe Web Browser Based on Age Estimation from Fingerprints Through Discrete Wavelet Transform and Singular Value Decomposition**
Paritosh Dahiya, 16, Senior, DAV Multipurpose Public School, Sonipat, Haryana, India,
T: Geeta Dahiya

SOFT060 **A Novel Machine Learning Approach for Determining the Confounding Factors for Cancer Identification: An Integration of Neural Learning and Decision Tree**
Shinjini Ghosh, 17, Senior, South Point High School, Kolkata, West Bengal, India,
T: Partha Roy

SOFT062 **Conclusive, Unbiased Medical Diagnosis System Using a p2p Consensus Mechanism**
Parth Raghav, 18, Senior, K.R.Mangalam World School, New Delhi, Delhi, India,
T: Promila Pagore

TMED057 **digiTAC: An Automated and Inexpensive Solution for Visual Acuity Testing in Preverbal Children Using Deep Convolutional Neural Networks**
Ishita Mangla, 17, Junior, Delhi Public School, R. K. Puram, Delhi, New Delhi, India,
T: Pradeep Sharma

TMED058T **Ultralow-Cost Pre-Symptomatic Diagnostic Paper Tool for Protein-Energy Malnutrition**
#
Mohammed Suhail Chinya Salimpasha, 17, Senior, Swasthik Padma#, 16, Junior, St. Aloysius Pre-University College, Mangalore, Karnataka, India; Vivekananda Pre-University College, Dakshina Kannada, Karnataka, India, T: Parveen Salim, T: Harish B.

INDONESIA

Jakarta, Indonesia, IDN001, Youth Science Competition

ANIM041T **Conservation of Endangered, Endemic Megapode *Macrocephalon maleo S. Muller,* 1846 in Lore Lindu National Park, Indonesia: Strategy in Selecting Nesting Pit**
Herditha Asya Putri, 18, Senior, Nabila Triana, 17, Senior, Al-Azhar Mandiri Palu Senior High School, Palu, Central Celebes, Indonesia, T: Bayu Satriyawan

BEHA023T **The Upside Down in the Modern Day: The Changing Role of Father and Mother in Parenting World**
Tara Belinda, 17, Senior, Putri Azizah Malik, 17, Senior, Senior High School 2 Purbalingga, Purbalingga, Central Java, Indonesia, T: Mita Sukmasari

BEHA024T **Providing Social Support for Cancer Survivors in Rural Indonesia**
Zahira Amaalia, 17, Senior, Nur Bella Turcica Anibah, 17, Senior, SMA Negeri 2 Bengkulu Selatan, South Bengkulu, Bengkulu, Indonesia, T: Gusniarti Gusniarti

EAEV042T **Can Cicada's Song Forecast Local Weather? A Scientific Approach**
Arif Kusuma Firdaus, 17, Senior, Nadia Alfi Syarifah, 17, Senior, Madrasah Aliyah Negeri 2 Kota Malang, Malang, East Java, Indonesia, T: Fathor Rahman

EAEV051T **Development of Green Mussels Granules Coated with Actives from Oil Palm Empty Fruit Bunch Extract as a Natural Coagulant**
Christopher Prasetya Mulya, 18, Senior, Devina Grisella, 18, Senior, Santa Laurensia Senior High School, Tangerang Selatan, Banten, Indonesia, T: Margaretha Rosyati

EBED028 **Sound Wave Modulation as a Method of Color Perception for the Visually Impaired**
Jane Carolyne Hantanto, 18, Senior, Smak Penabur Gading Serpong, Kab. Tangerang, Banten, Indonesia, T: Eko Widiatmoko

ENBM045T **Detecting World's Dengue Fever with Dengue Test Strip: An Innovation of Dengue Rapid Test System**
Amelinda Mayaparamastri Agus, 18, Senior, Alifah Susatya, 18, Senior, Budi Mulia Dua International School, Sleman, Daerah Istimewa Yogyakarta, Indonesia, T: Irma Dwi Istiningsih

Jakarta, Indonesia, IDN002, Olimpiade Penelitian Siswa Indonesia

ANIM005T **Yogyakarta Beaches Mapping Based on Sea Turtle Nesting Beach Characteristics**
Aden Muflih Khaitami, 17, Senior, Fadlilah Nur Hasanah, 18, Senior, SMA Negeri 1 Yogyakarta, Yogyakarta, D.I. Yogyakarta, Indonesia, T: Rudy Narwono

EBED003T **Intel Genuino-Based Cow Estrous Detector**
Yuan Dwi Kurniawan, 17, Junior, I Dewa Gede Wicaksana Prabaswara, 18, Junior, SMA Negeri Bali Mandara, Buleleng, Bali, Indonesia; SMAN Bali Mandara, Singaraja, Bali, Indonesia, T: Kadek Artama

ENMC006T **Automatic Brake System for Motorcycle**
Ignatius Vito Wirawan Putra Hapsara, 16, Junior, Attar Husna Fathiya, 16, Junior, SMA Negeri 8 Yogyakarta, Yogyakarta, Daerah Istimewa Yogyakarta, Indonesia, T: Bambang Triwidiyatno

IRAQ

Erbil, Iraq, IRQ001, INPO (Iraq National Project Olympiad)

BMED084T **The Use of Calf Intestinal Alkaline Phosphatase and CRISPR to Change the Permeability of the BBB**
Mehmet Ihsan Kiziloglu, 15, Freshman, Muhammed Ahmed Mudheher, 17, Junior, Kirkuk Cag Boys College, Kirkuk, Girnata, Iraq, T: Ahmet Akut

EAEV085T **Save It, Repeat It and Eat It**
Dinya Nazeer Brifkani, 16, Sophomore, Rashan Jamal Mohammed, 16, Sophomore, Ronaki Duhok Ishik Girls College, Duhok, Duhok, Iraq, T: Duygu Dak

EGPH030T **Anti-Shake for Sky Scrapers**
Zhir Raouf Mohammedali, 18, Junior, Shkar Abdalla Ahmed, 18, Junior, Private Salahaddin Ayyubi College, Sulaimania, Iraq, T: Miran Ahmed

EGPH031T **Portable Thermoelectric System**
Oula Fares Qasim, 17, Junior, Manar Montasar Kadhim, 17, Junior, Baghdad Ishik Girls College, Baghdad, Iraq, T: Hulya Ozer

EGPH032T **Smart Extension Cord**
Yousif Yaseen, 17, Sophomore, Omar Maghdid Abdullah, 17, Sophomore, Mustafa Fadhil Kamal, 16, Sophomore, School: Erbil Ishik Boys College, Erbil, Iraq, T: Shivan Majeed
T: Shvan Majeed

IRELAND

Dublin, Ireland, IRL001, BT Young Scientist & Technology Exhibition

CHEM004 **An Investigation into the Removal of Microplastics from Water Using Ferrofluids**
Fionn Miguel Eckardt Ferreira, 17, Junior, Schull Community College, Schull, Co. Cork, Ireland, T: Larissa Kelly

Local, Regional and National (Dublin), Ireland, IRL002, SciFest

EBED020 **Developing a Facial Shaving Device for People with Limited Hand Dexterity**
Aaron Hannon, 19, Senior, St. Muredach's College, Co. Mayo, Connacht, Ireland, T: Kevin Boyle

ISRAEL

Jerusalem, Israel, ISR001, The Israeli Young Scientists Contest

BCHM014 **Post-Translational Modification of LaminB1 as a Regulator of Translesion DNA Synthesis (TLS)**
Dvora Rywka Sehtman, 17, Senior, Ulpenat Bnei Akiva Orot Modiin, Israel, Modiin Macabim Reut, Israel, T: Hagit Klein

CELL012 **X Chromosome Inactivation in Pluripotent Stem Cells**
Lev Roz Seaton, 17, Senior, Ort Giva'at Ram High School Jerusalem in the name of Joseph Charmatz, Jerusalem, Israel, T: Dorit Gil

ENBM019T **HDYS (How Did You Sleep): A Home-Based System for Monitoring and Treating Insomnia**
Yuval Bazak, 18, Senior, Shir Ner Gaon, 17, Senior, Omer Nulman, 18, Senior, Experimental High School - Rabin Tel Mond, Tel Mond, Israel, T: Emili Falach-Vaknin

MATH019 **Elementary Solution to Primes of the Form x^2+ny^2**
Ohad Avnery, 18, Senior, Shimon Ben Zvi High School, Givatayim, Israel, T: Tal Katz

MATS012 **Formation of Copper Nanoparticles Ink Upon Copper Complex Decomposition**
Hallel Shohat, 16, Junior, The Hebrew University Secondary School, Jerusalem, Israel, T: Anat Iosub-Amir

ITALY

Milano, Italy, ITA001, I Giovani e le Scienze

BEHA044T **Harmony: How Math Influences Our Esthetic Choices**
Gabriele Morello, 17, Senior, Elisa Seghetti, 18, Senior, Liceo Scientifico Galileo Ferraris, Torino, TO, Italy, T: Annalisa Gratteri

BEHA045T **Watch Out! Move Objects! Secure Your Furniture! Good Practices for Seismic Safety**
Annalisa Persello, 18, Senior, Martina Piemonte, 18, Senior, High School 'Magrini Marchetti', Gemona del Friuli, Udine, Italy, T: Elisa Contessi

CHEM060T **SoBlue: A Pigment from the Past with a New Future. Nanosized Halloysite Clay-Colorant Composites**
Roberto Mignacco, 16, Junior, Valentina Bo, 18, Senior, Samuele Ferrero, 18, Senior, Istituto Superiore Ascanio Sobrero, Casale Monferrato, Italy, T: Elisabetta Gaita

PLNT054 **AE Space Herbs: The Future in Aeroponics**
Marco Battisti, 19, Senior, Istituto Superiore "Enrico Fermi", Mantova, Mantova, Italy, T: Mauro Grandi

JAPAN

Tokyo, Japan, JPN001, Japan Students Science Awards

ANIM014 **Evolution of Aphid Species due to Host Plant Preference**
Kyohei Ikawa, 18, Senior, Kosei Gakuen High School, Suginami-ku, Tokyo, Japan, T: Hiroyuki Ueno

CHEM014T **Research and Application of Diethyl Ether Solution of Au(III)**
Shuhei Tsumuraya, 17, Junior, Hiroki Nagata, 17, Junior, Tomoya Yamada, 17, Junior, Miyagiken Sendai Daisan High School, Sendai-shi Miyagiken, Japan, T: Yusuke Sugawara

EGCH007 **Development and Performance Evaluation of a New Type of Mg-Air-Battery for Emergency: The Teabag Model**
Shuho Hamano, 17, Junior, Sakado High School of Saitama Prefecture, Sakado-shi, Saitama, Japan, T: Takahiro Suzuki

ENMC021 **Traditional Five-Story Pagoda: Experimental Analysis Using Home-Brew Seismic Generator**
Miyabi Nagano, 17, Junior, National Institute of Technology, Gifu College, Motosu-shi, Gifu, Japan, T: Naoki Satake

PHYS020T **Dynamics of Bubble-Ring–A Mechanism Which Realizes High Stability and Efficient Energy Transfer**
Goki Muramoto, 18, Senior, Yui Kobayashi, 18, Senior, Kouhei Yamamoto, 18, Senior, Yamaguchi Senior High School, Yamaguchi City, Yamaguchi, Japan, T: Toru Yamashita

PLNT017 **How Are the Timings of Flower Opening and Closing Controlled in *Nymphaea tetragona*?**
Masumi Suzuki, 17, Junior, Tokyo Metropolitan Nishi High School, Suginami-ku, Tokyo, Japan, T: Masaharu Watanabe

Tokyo, Japan, JPN002, Japan Science & Engineering Challenge

ANIM042T **A Method Combining Geographic Information Systems and Environmental DNA Reveals Hidden Populations of the Endangered Japanese Clouded Salamander, *Hynobius nebulosus***
Kota Tsuchida, 18, Senior, Yusuke Sakai, 17, Senior, Yuka Tsuzuku, 17, Senior, Gifu Prefectural Gifu Senior High School, Gifu-City, Gifu-Pref, Japan, T: Yuichi Yaoi

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MATH032T **Extension of Soddy's Hexlet:Number of Spheres Generated by Nested Hexlets**
Yuta Yokohama, 18, Senior, Ryusei Sakai, 17, Senior, Sota Kojima, 17, Senior, Shiga Prefectural Hikone Higashi High School, Hikone City, Shiga-Pref., Japan, T: Hidekazu Takahashi

MCRO044T **Screening of Yeasts in Azalea Nectar for Bioethanol Production**
Chihiro Ota, 18, Senior, Natsuno Shimoyama, 18, Senior, Notre Dame Seishin Gakuen Seishin Girl's High School, Kurashiki City, Okayama-Pref., Japan, T: Fukuto Tanaka

PHYS035 **Three-Dimensional Trajectories of 2016 Perseid Meteors Over West Japan Obtained Through Multi-Site Observations**
Kota Uekawa, 17, Senior, Konko Gakuen Junior & High School, Asakuchi City, Okayama-Pref., Japan, T: Yohei Toda

PHYS056T **Whether Insects See Anomalous Images Located Near a Lens or Not? Verification of Lens Equations for Anomalous Images and Application of the Simple Eye of an Insect**
Norika Narimatsu, 17, Senior, Ayaka Kosai, 17, Senior, Akiho Takata, 17, Senior, Kumamoto Prefectural Uto High School, Uto-City, Kumamoto-Pref., Japan, T: Takihiro Kajio

PLNT022 **Streaks on the Flowers of the Morning Glory, *Pharbitis nil*, Promote Water Absorption by the Flower and Play a Critical Role in Flower Blooming**
Misato Okano, 16, Junior, Saitama Prefectural Kawagoe Girls' Senior High school, Kawagoe City, Saitama-Pref., Japan, T: Minako Araki

JORDAN

Amman, Jordan, JOR001, Science Fair of The Jordanian Ministry of Education

BEHA010T **A Device that Regulates Auditory Hypersensitivity for Autistic Children Using Specialized Sounds**
Hoor Abdel Karim Al Amawi, 16, Junior, Mohammad Na'el Al Masri, 16, Junior, Jubilee School, Amman, Jordan, T: Sawsan Abu Jammaah

BEHA025 **Drawit**
Dania Rasmi Almubiden, 15, Freshman, Modern Systems School, Amman, Amman, Jordan, T: Hala Alamsha

CHEM013T **Leading the Environment with Less Heavy Metals**
Ghada Sameeh Haddad, 17, Junior, Ayah Amjad Bani Mustafa, 16, Junior, Jubilee School, Amman, Jordan, T: Sawsan Abu Jammaah

CHEM026T **Water Free of Lead and Mercury**
Marwa Nabil Al Aqtash, 15, Freshman, Dima Abdallah Alshawabkeh, 14, Freshman, Al-Hasaad Al-Tarbawi School, Amman, Amman, Jordan, T: Sahar Farwaneh

CHEM033# **Removal of Pharmaceuticals from Water by Thin Film of Nano-Composite**
Ban Ayoup Ghrair, 16, Sophomore, Pioneer Educational Schools, Amman–Khalda, Jordan, T: Sarar Khraisat

EBED017 **Indoor Blind Navigation System**
Abdul Rahman Hazem Sa'D, 16, Sophomore, Jubilee School, Amman, Jordan, T: Sawsan Abu Jammaah

ENEV012 **ECO 3D Printing**
Mohammad Basil Omari, 17, Junior, Modern Systems School, Amman, Amman, Jordan, T: Ehab Abu Nimreh

ENEV023T **Grapes Cotton**
Obada Nayef Al-leimon, 16, Sophomore, Ahmad Nayef Al-leimon, 16, Sophomore, Abdullah II for Excellence Alkarak, Alkarak, Jordan, T: Suha Shamli

PLNT016 **Remotely Controlled Hydroponic System by Solar Energy (RCHSSE)**
Shatha Salah Al Thyabat, 15, Freshman, King Abdullah II School for Excellence, Ma'an, Ma'an, Jordan, T: Rehan Al-Rfo'A

PLNT036T **Effect of Simulated Microgravity on Antioxidant Activity and Total Antioxidants Metabolite Contents of Germinated *Triticum astivum* Extract**
Raneem Mahmoud Abuelghanam, 16, Junior, Lujain Shaher Alshakhanbeh, 17, Junior, Malak Ahmad Ma'ayah, 16, Junior, King Abdullah II School for Excellence - Maddaba, Maddaba, Jordan, T: Abdel Qader Alatrash

TMED017T **Dyslipidemia Screening by Detecting Corneal Arcus Through Corneal Imaging**
Saleh Mahmoud Malkawi, 17, Junior, Saba Khaldoun Showman, 16, Junior, Jubilee School, Amman, Jordan, T: Sawsan Abu Jammaah

TMED026T **Miswak Reduces the Toxic Effect of Phenytoin**
Dima Nidal Younes, 16, Junior, Sara Bashar Alkhalidi, 17, Junior, Dur Al-Manthur School, Amman, Jordan, T: Manal Al Rashdan, T: Manal Alrashdan

KAZAKHSTAN
Astana, Kazakhstan, KAZ001, DARYN National Junior Science Projects Competition

MATH023 **On a Lower Bound for the Energy Functional on a Family of Hamiltonian Minimal Lagrangian Tori in CP2**
Aknazar Kazhymurat, 16, Junior, Nazarbayev Intellectual School of Physics and Math, Almaty, Almaty, Kazakhstan, T: Andrey Mironov

PHYS043T **Research of Some Electrolytes' Water Solutions' Electrical Characteristics**
Amir Atigayev, 17, Junior, Amina Karymsak, 16, Sophomore, #93 Gymnasium, Karagandy, Kazakhstan Republican School in Physics and Math after Zhautykov, Almaty, Karagandy, Kazakhstan, T: Olga Antipova

KENYA
Nairobi, Kenya, KEN001, Kenya Science and Engineering Fair

BMED072T **Using C#Programming Language to Create a Ready to Use Therapeutic Food (Rutf) Aimed at Addressing the Nutritional Needs of the Undernourished in Kenya**
Aleena Sara Saji, 16, Sophomore, Atiya Kadide Kuwehan, 15, Sophomore, Shree Cutchi Leva Patel Samaj School, Nairobi, Nairobi, Kenya, T: Laban Chweya

EGPH022T **A Dual Axis Solar Tracker as a Hybrid Solar Harvesting Tool as an Alternative Energy Provider for Rural Areas in Kenya**
Rohit Dhanji Rabadiya, 17, Sophomore, Kauel Rajeshkumar Brahmbhatt, 15, Sophomore, Shree Cutchi Leva Patel Samaj School, Nairobi, Kenya, T: Laban Chweya

MATH054T **Sharis Sohcahtoa**
Sharon Jerop, 16, Senior, Damaris Chepotip, 19, Senior, Stephen Kositany Girls' High School, Kaviyet, Rift Valley, Kenya, T: Nicholas Misoi, T: Sharon Jerop

SOFT050T **A Public Interactive Funds Monitoring System that Enhances Efficiency in Budgeting, Procurement and Expenditure to Reduce Misuse of Funds in Developing Countries – A Case Study of Kenya**
Priyen Devraj Pindoria, 15, Sophomore, Sanjana Rajeshkumar Pillay, 15, Sophomore, Shree Cutchi Leva Patel Samaj School, Nairobi, Kenya, T: Laban Chweya

SOFT051T **Native Language Companion: The Multilingual Platform**
Bradley Agwa, 17, Senior, Jim Aloo, 17, Senior, Kanga High School, Nairobi, Kenya, T: Peter Agwaro

KUWAIT

Kuwait, Kuwait, KWT001, Kuwait Science and Engineering Fair

CHEM061T **Flammability of Fabrics**
Estabraq Qussay Al Sanousi, 18, Senior, Lujain Ammar Sadeqi, 18, Senior, American Baccalaureate, Khaitan, Kuwait, T: Imad Darwiche

EBED053 **ENVIRO**
Fahad Osama Al Yaqout, 17, Senior, Salah Edin School, Kuwait, Kuwait, T: Dhari Hotari

EGPH027 **Thickness Variation of Optical Spacer By Using Poly (Methyl Methacrylate) (PMMA) on the Performance of a Four Terminal Mechanically-Stacked Tandem Solar Cell**
Hasan Abdulredha Ashkanani, 17, Junior, Yosef Bin Eissa, Kuwait, Kuwait, T: Hosam El Din Abd El Azeem

LATVIA

Riga, Latvia, LVA001, National Centre for Education of the Republic of Latvia

CHEM003T **Research of Wood and Oil Shale Ash Utilisation**
Martins Kaukulis, 18, Senior, Rudolfs Baumanis, 19, Senior, Valka Janis Cimze Gymnasium, Valka, Latvia, T: Juris Vaivads

EGPH002 **Solar Efficiency Cover-Up: Solar Panel Protective Cover Effects on Efficiency**
Davis Cinitis, 18, Senior, Riga's French Lyceum, Riga, Riga, Latvia, T: Virginija Vitola

LUXEMBOURG

Luxembourg, Luxembourg, LUX001, Concours Jeunes Scientifiques Luxembourg

BCHM043T **The Influence of Citric Acid on Bacterial Growth**
Noemie Ney, 15, Sophomore, Jean-Marc Raffaello Matteo Furlano, 16, Sophomore, Atert-Lycee Redange, Redange/Attert, Luxembourg, T: Isabel Diederich

MALAYSIA

Federal Territory Putrajaya, Malaysia, MYS001, National Schools Science Innovation and Engineering Competition

BMED059 **Bidara Vape (The Potential as a Mosquito Repellent)**
Muhammad Danial Afham Zailan, 16, Sophomore, Sekolah Menengah Kebangsaan Palong Timur, Batu Anam, Segamat, Malaysia, T: Muzaffar Ghazali

EAEV028T **Water Retaining Characteristics of *Pomelo albedo* to Combat Water Crisis**
Raymond Yin Hong Chow, 16, Junior, Kai Wern Wong, 16, Senior, Yew Siang Ku, 17, Senior, Heng Ee High School, Georgetown, Penang, Malaysia, T: Sze Hui Chung

MATS028T **"Med1cast" – Oil Palm Empty Fruit Bunch (EFB) and Plaster of Paris as a Novel Composite to Produce an Eco-Friendly and Cost Effective Orthopedic Cast**
Wei Wen Chiew, 17, Junior, Jing Jun Chew, 17, Junior, Chung Ling High School Penang, Georgetown, Penang, Malaysia, T: Whey Cheng Heah

ROBO044 **SMART Plate**
Amin Mohd Razak, 16, Senior, SMK Dato' Abdul Rahman Yassin, Johor Bahru, Johor, Malaysia, T: Mohd Razak Ahmad

TMED013 **Sabah Snake Grass: Nature's Solution to Superbug Reservoirs**
Isaac De Wei Chung, 18, Senior, Sekolah Menengah Kebangsaan Batu Lintang, Kuching, Sarawak, Malaysia, T: Yee Chuen Lim

TMED014T **Cytotoxic Activity of Rambutan (Nephelium lappaceum) Fruit Skin Extract on Jurkat Leukemia Cell Line**
Norman Sim, 17, Senior, Kee Khien Loo, 16, Junior, Penang Free School, Penang, Georgetown, Malaysia, T: Siti Rahimah Jusop

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Kuala Lumpur, Malaysia, MYS002, MRSM Young Scientist

CHEM059T **Eggshells as a Substituent for Lowering the Rate of Combustion**
Muhammad Shazwan Bin Sobri, 16, Senior, Nur Helmi Arwizar, 16, Senior, MRSM Transkrian, Nibong Tebabl, Malaysia, T: Mohammad Fairuz Zulkifli

EGCH039T **Vermicompose as a Source of Electricity**
Muhammad Fareeq Bin Mohamed Nasser, 16, Senior, Muhammad Amirul Naim Bin Shaiful Kamarul, 17, Senior, MRSM Tun Abdul Razak, Pekan, Pahang, Malaysia, T: Ismadey Ismail

MEXICO

Mexico City, Mexico, MEX002, Feria Nacional de Ciencias e Ingenierías – CONACYT

ANIM004T **Larvicidal Effect of Coffee (*Coffea arabica cordoba-caracolillo*) Against Mosquito (*Aedes aegypti*)**
Vanessa Salazar Balboa, 19, Senior, David Hernandez Garza, 19, Senior, Adrian Villareal Castillo, 19, Senior, Prepa UDEM Unidad San Pedro Universidad de Monterrey, San Pedro Garza Garcia, Nuevo Leon, Mexico, T: Nerla Silva Uribe

BCHM004T **Cantaloupe Seeds: An Exploitable Waste**
Samantha Serna Fernandez, 18, Senior, Susana Sosa Ballesteros, 18, Senior, Alejandra Perez-Merodio Gomez, 18, Senior, Instituto Cumbres Alpes Torreon, Torreon, Mexico, T: Andres Fernandez Pruneda

BEHA003T **Biopsychosocial Impact in Mayan Adults with Type 2 Diabetes in Yucatan**
Jesus Raymundo Ceballos Torres, 17, Junior, David Zavala Perez, 17, Junior, Escuela Preparatoria Dos, Merida, Yucatan, Mexico, T: Julia Candila Celis

CHEM005 **JONOTEC-Sustainable Bioplastic**
Yadira Guadalupe Fernandez Maximo, 17, Senior, Colegio de Bachilleres del Estado de Hidalgo Plantel Actopan, Actopan, Hidalgo, Mexico, T: Freddy Hernandez Espinosa

CHEM006 **Biopolymer from *Musa paradisiaca* Peel Waste and Nanoparticles**
Jorge Enrique Gonzalez Sevilla, 18, Senior, Colegio de Estudios Científicos y Tecnologicos del Estado de Jalisco, Guadalajara, Jalisco, Mexico, T: Everardo Fuentes

CHEM007T **Penicillium and Pleurotus Fungus-like Biocatalyst of Heavy Metals in Batteries**
Elizabeth Martinez Becerril, 17, Senior, Sarahi Sosa Mondragon, 17, Senior, Escuela Preparatoria Oficial No. 109, Acambay, Mexico, T: Gregorio Plata Hernandez

EAEV005T **Characterization of Aquatic Plants of the Coba Lagoon and Its Potential as Biofilters in Planters**
Alba Yuselmi Hau May, 17, Junior, Jose Eduardo Yam Chay, 16, Junior, EMSaD Coba, Coba, Quintana Roo, Mexico, T: Nidia Sanchez Pool

ENBM006 **A Cardio-Auxiliary Bracelet for the Monitoring of Arrhythmias**
Daniela Vianey Luna Sandoval, 16, Junior, Colegio de Estudios Cientificos y Tecnologicos del Estado de Queretaro, Queretaro, Mexico, T: Aldo Rico Martinez

MATS002T **CEBA-TIC: Bioplastic Generated with Biopolymers of *Hordeum vulgare***
Uriel Gutierrez Aguilar, 17, Senior, Alejandro Dominguez Ayala, 17, Senior, Colegio de Estudios Cientificos y Tecnologicos del Estado de Hidalgo, San Salvador, Hidalgo, Mexico, T: Blanca Olguin Galvez

PLNT005T **BIOFOMEX: Mexican Foliar Biofertilizer**
Irvin Alfredo Feliciano Siles, 18, Senior, Cruz Francisco Salazar Alvarado, 18, Senior, Colegio de Estudios Cientificos y Tecnologicos del Estado de Chihuahua No. 7 San Isidro, Juarez, Chihuahua, Mexico, T: Maria Castanon Lopez

SOFT007T **Corn Price Forecasting Using Artificial Intelligence Techniques**
Mario De Jesus Lopez Najera, 17, Senior, Jesus Miguel Lugo Yolimea, 17, Junior, Colegio de Bachilleres del Estado de Sinaloa, Mazatlan, Sinaloa, Mexico, T: Jassiny Quintero Garcia

NETHERLANDS

Amsterdam, Netherlands, NLD001, INESPO: International Environmental and Sustainability Project Olympiad

ENEV092T **The Recycling of Fiberglass in Wind Turbine Blades**
Bram Bats, 16, Junior, Myrthe van de Velde, 17, Junior, Sarah Dahoe, 16, Junior, Bonhoeffer College, Enschede, Netherlands, T: Benno Berendsen

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NIGERIA

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ROBO045T **Smart and Safe Driving Monitor**
Ayomide Emmanuel Ayoola, 14, Junior, Oluwapelumi El-Faithful Fadairo, 14, Junior, Doregos Private Academy, Lagos, West Africa, Nigeria, T: Oluseyi Lawal

ROBO046T **The Reminder... The Locator**
Ugochukwu Daniel Nnaji, 14, Junior, David Oluwagbemiga Adekoya, 15, Junior, Doregos Private Academy, Lagos, West Africa, Nigeria, T: Oluseyi Lawal

NORTHERN IRELAND

Belfast, Ulster, Northern Ireland, NFK001, Sentinus Young Innovators

PLNT004 **The Antimicrobial Potential of Tree Bark Extracts**
Niamh Ann Kelly, 18, Senior, Our Lady's College, Drogheda, Leister, Ireland, T: Frances O'Regan

NORTHERN MARIANA ISLANDS

Saipan, Northern Mariana Islands, NMI001, Northern Mariana Islands Science & Engineering Fair

ANIM031 **The Role of Purple Hermit Crabs, *Coenobita brevimanus*, as Forest Frugivores**
Alyssa Cepeda, 17, Senior, Kagman High School, Saipan, MP, Northern Mariana Islands, T: Meg Kargul

NORWAY

Oslo, Norway, NOR001, Norwegian Contest for Young Scientists

PHYS021 **Investigation of the Force Between Two Positively Charged Conducting Spheres**
Madeline Metcalf Tveite, 19, Senior, Gjovik Upper Secondary School, Gjovik, Norway, T: Maciej Pietka

PAKISTAN

Islamabad, Pakistan, PAK001, Intel Science Fair

CHEM008T **Green Synthesis of the Biodegradable Polymers**
Maryam Ijaz, 16, Sophomore, Momina Akmal, 15, Sophomore, The City School, Girls Campus, Sialkot, Punjab, Pakistan, T: Munawar Sultana

EBED002 **A Novel Gesture Decoding Sensor for the Evolution of Cost Effective Electronic Smart Gloves**

\# Arqam Ali Khan, 18, Senior, Islamabad Model College for Boys, G-10/4, Islamabad, Capital Territory, Pakistan, T: Akhtar Ali Khan

EGPH001 **In-Line Turbine Network Based Hydro-Electric Power Generation System for Residential Application**
Hasnat Ahmad, 13, Freshman, Scarsdale International School, Lahore, Punjab, Pakistan, T: Danish Mirza

PALESTINE

Ramallah, Palestine, PSE001, Palestine Science and Technology Fair

BEHA056T **Blind's Eye**
Farah F. I. Ghanim, 16, Junior, Danya S. A. Ishtaiwi, 17, Junior, Immatain Secondary Mixed School, Qalqelia, Palestine, T: Hazem Abu Shaar

BEHA062T **MJF Smart Cane**
Mays K. A. Hussein, 15, Sophomore, Jwana M. O. Ainasawi, 14, Freshman, Applied Nour Al-Huda School, Ramallah, Palestine, T: Fatima Arouri

ENBM059T **Safety Collar**
Suad I. M. Farun, 14, Freshman, Sadil N.D Ibaidi, 14, Freshman, The Orthodox School of Bethany, Bethany, Palestine, T: Riham Hilal

ENBM067 **Migraine Mind**
Doaa M. H. Sammoudi, 16, Junior, Al Yamoun Secondary Girls School, Al Yamoun, Jenin, Palestine, T: Alaa Abuobaied

ENBM068 **Re-Life Socks**
Jawa I. M. Nazzal, 16, Junior, Qabatiya Westren School for Girls, Qabatiya, Jenin, Palestine, T: Maryam Nazzal

PANAMA

Panama City, Panama, PAN001, Feria Cientifica del Ingenio Juvenil

BEHA031T **The Petroglyphs Attribute in Pre-Columbian of Caldera**
Luz Jackeline Yanguez Franco, 18, Senior, Liz Jackeline Yanguez Franco, 18, Senior, Instituto David, David, Chiriqui, Panama, T: Luis Carrera Ledezma

EAEV052 **Influence of Color Dishes on Insects Capture and Composition in the Forests of the Comarca Kuna Yala, Panama**
Edili Aurelis Paredes, 17, Junior, Instituto Cacique Olodebiliginya, Panama, Comarca Kuna Yala, Panama, T: Miguel Osorio

MCRO007 **Isolation and Characterization of *Staphylococcus aureus* with Zoonotic Potential from Domestic Pets**
David Moises Quinones, 17, Senior, Colegio Bilingue Maria Auxiliadora, Arraijan, Panama, T: Francisco Rivas

PERU

Lima, Peru, PER001, Peru Science and Engineering Fair

BEHA004T **Anthropological and Historical Study of "Tamal Chinchano" (Tamale from Chincha) Throughout Time**
Jose Ignacio Tijero Ayarza, 15, Sophomore, Fiorella Giovanna Almeyda Luis, 15, Sophomore, Simon Bolivar, Chincha, Ica, Peru, T: Tulio Renwick Solar

EBED007T **Biofeedback for the States of Anxiety and Stress Through Automated Detection Processes**
Nicolas Esleyder Caytuiro Silva, 15, Sophomore, Alfred Addison Chillitupa Quispihuanca#, 16, Sophomore, High Performance College – Arequipa, Arequipa, Peru, T: Benjamin Maraza Quispe

ENEV008T **Arsenic and Lead Decontamination Level Identification Through the Toxic Metal Biosorption Technique Using Vegetable Residues**
Ariana Fernanda Ponce Bohorquez, 15, Sophomore, Maria Jose Jaico Roman, 15, Sophomore, Santa Ana, Tacna, Peru, T: Mercedes Velarde Caceres

ROBO021T **Multitec Project**
Adriana Milagros Perez Rios, 17, Junior, Juan Gabriel Caceres Cahuana, 16, Junior, Santa Cruz, Puerto Maldonado, Tambopata, Peru, T: Rafel Torres Cruz

PHILIPPINES

Pasig City, Philippines, PHL001, Philippines Science Fair

BMED073T ***Garcinia binucao* Fruit and Leaf: Phytochemicals-Mediated Antioxidant, Alpha-Amylase and Alpha-Glucosidase Enzyme Inhibitors**
Leann Patrice Advincula Ganzon, 17, Sophomore, Anne Nicole Occena, 16, Sophomore, Iloilo National High School, Iloilo City, Philippines, T: Ronilo Aponte

EAEV077T **Biosorption of Manganese Mine Effluents Using Crude Chitin from Shell Wastes of Philippine Bivalves**
Randy Estales Molejona Jr., 19, Senior, Elaine Nicole Sally Saquin, 18, Senior, Iloilo National High School, Iloilo City, Philippines, T: Ronilo Aponte

EGPH023T **Design and Development of Solar-Tracking Arduino-Rooted PV Panels**
Joscel Kent Padayao Manzanero, 19, Senior, Keith Russel Pelagio Cadores, 18, Senior, Eugene Rualizo Rivera, 18, Senior, Camarines Sur National High School, Naga City, Camarines Sur, Philippines, T: Johnny Samino

MATS051 **Phytoreductive-Hydrothermal Synthesis of Polyethylene Glycol-coated Magnetic Iron Oxide Nanoparticles for Drug Delivery Applications**
Pete Gabriel Labayno Ledesma, 18, Senior, Iloilo National High School, Iloilo City, Philippines, T: Ronilo Aponte

ROBO062 **Propulsion Performance Evaluation of a Lego-Based Carangiform Mechanism for a Prototype Robotic Fish Unmanned Underwater Vehicle (UUV)**
Adrian Maglasang, 19, Senior, City of Bogo Science and Arts Academy, Bogo City, Cebu, Philippines, T: Irey Soon

TMED050 **Reducing Dopaminergic Neurodegeneration and Motor Dysfunction Using Crude Ethanolic Bamboo (*Bambusa vulgaris*) Leaf Extract on a Transgenic *Caenorhabditis elegans* Model of Parkinson's Disease**
Roehann Mykael Bulaclac Zabat, 16, Sophomore, Juan R. Liwag Memorial High School, Gapan City, Nueva Ecija, Philippines, T: Jerone Mejia

POLAND

Gdynia, Poland, PLD001, E(x)plory Science Fair

CHEM052 **Multifunctional, Hybrid Electrocatalityc Systems Active Towards Electroreduction of Oxygen**
Maciej Stanislaw Solnicki, 18, Junior, II Liceum Ogolnoksztalcace z Oddzialami Dwujezycznymi im. Stefana Batorego, Warsaw, Masovian Voivodeship, Poland, T: Sylwia Zoladek

EGPH019 **Medium Affecting Thermal Efficiency in the Heating Pipe System with the Simultaneous Prevention of Eutrophication Process**
Szymon Pawel Kanikowski, 19, Senior, I Liceum Ogolnoksztalcace im. Karola Marcinkowskiego, Poznan, Wielkopolska, Poland, T: Hanna Rudawska

ENMC056 **Microwave Resonant Cavity Thruster**
Jakub MikoA,aj Jedrzejewski, 19, Senior, Technikum nr 1 w Zespole SzkoA, Technicznych w Ostrowie Wielkopolskim, Ostrow Wielkopolski, Poland, T: Pawel Sobczak

PHYS073 **Dynamics of the Flows with Moving Contact Line**
Anna Malgorzata Len, 19, Senior, Lodz University of Technology High School, Lodz, Poland, T: Pawel Czyz

SOFT045 **Pearfect – A Modern Interpreted Programming Language Which Efficiently Unites Functional and Object-Oriented Programming**
Michal Paszkowski, 16, Freshman, Publiczne Gimnazjum nr 7 w Belchatowie, Belchatow, Poland, T: Piotr Stelmaszczyk

SOFT048 **AllWatch – A Software Unification Framework for Wearables**
Emil Mateusz Markiewicz, 19, Senior, Publiczne Liceum Ogolnoksztalcace Katolickiego Stowarzyszenia Wychowawcow im. Bt Natalii Tutasiewicz, Poznan, Wielkopolska, Poland, T: Marta Mickiewicz-Metelska

PORTUGAL

Porto, Portugal, PRT001, Portuguese Contest for Young Scientists

ENEV013T **Assessment of the Levels of Mercury in Students Aged 12 to 18**
Afonso Morgado Mota, 18, Senior, Bernardo Jose Soares Alves, 17, Senior, Joao Neto Afonso Dickson Leal, 18, Senior, Colegio Valsassina, Lisboa, Portugal, T: Joao Gomes

MCRO011T **Halobacteria–An Anti-Salt Bomb**
Maria Joao Oliveira Lopes, 17, Junior, Ana Catarina Cairrao Barata, 17, Junior, Raquel Costa Silva, 16, Junior, Escola Secundaria Julio Dinis, Ovar, Portugal, T: Carlos Alberto Oliveira

PHYS015T **Variations in the Evolution of Star-Forming Galaxies Through the Last 10 Gyr**
Ivo Jose Goncalves, 19, Senior, Helena Isabel Dias Pereira Marques Silva, 17, Junior, Agrupamento de Escolas D. Maria II, Braga, Braga, Portugal, T: Joao Vieira

PUERTO RICO

San Juan, Puerto Rico, TEPR01, Puerto Rico Math Fair

MATH035 **On the Validity of Composite Logical Functions**
Daniel Alejandro Santiago, 16, Sophomore, Centro Residencial de Oportunidades Educativas de Mayagüez, Mayagüez, Puerto Rico, T: Edwin Benvenutti

MATH036 **On the Convergence of the Reciprocals of Mersenne Primes**
Juan Diego Cancel, 17, Senior, CROEM HS, Mayaguez, Puerto Rico, Puerto Rico, T: Edwin Benvenutti

MATH037 **The Use of Algorithms to Analyze 3D Vectors and Component Transformations in a ROV Simulator**
Zahydee Marie Machado, 17, Senior, CROEM HS, Mayaguez, Puerto Rico, Puerto Rico, T: Elba Sepulveda

Arecibo, Puerto Rico, TEPR02, Arecibo Regional Science Fair

BMED050 **Viability of Lung Cancer Cells After Exposure to a Commercial Mixture of a Natural Compound Extracted from Seaweed and Cereals**
Serena Catalina Florez, 16, Junior, Academia Interamericana de Arecibo, Arecibo, Puerto Rico, T: Maria Barreto

Bayamon, Puerto Rico, TEPR03, Bayamon Regional Science Fair I

ENEV072 **Homemade Water Purifying System**
Jeancarlos Melendez, 17, Junior, Jose Rojas Cortes, Orocovis, Puerto Rico, T: Carol Morales

MCRO055 **The Presence of the Bacterial Growth in Cow's Milk for Human Consumption in Puerto Rico Before and After Hurricane Maria**
Raphael Gabriel Acevedo Rivera, 16, Junior, Escuela Superior Especializada Vocacional Agricola de Corozal Pablo David Burgos Marrero, Corozal, Puerto Rico, T: Enid Rodriguez Diaz

Caguas, Puerto Rico, TEPR04, Caguas Regional Science Fair

EAEV063T **Effect of the Extract of the Leaves of the *Rizophora mangle* on the Growth of *E. coli* Bacteria**
Naomi L. Santell Lebron, 17, Senior, Krystal L. Santell Lebron, 17, Senior, Specialized School of Science and Mathematics Genaro Cautino Vázquez, Guayama, Puerto Rico, T: Glorivee Guzman

PLNT055 **Progesterone Hormone Effects on *Coriandrum sativum* Growth and Development *in vitro* and Soil Seeding**
Gabriela M. Lebron, 18, Senior, Specialized School of Science and Mathematics Genaro Cautiño Vázquez, Guayama, Puerto Rico, T: Glorivee Guzman Vicente

Humacao, Puerto Rico, TEPR05, Humacao Regional Science Fair

BEHA046 **Perceptual Learning Channel Predominance Among Young Students in a Public High School of Canovanas District of Puerto Rico**
Elymar Polanco Dominguez, 17, Senior, Escuela Superior Luis Herniaz Veronne, Canovanas, Puerto Rico, T: Aquila Lebron Rivera

MATS029 **Preventing the Drought from Turning into World Hunger**
Bianca Cristina Rodriguez-Castro, 18, Senior, Centro Residencial de Oportunidades Educativas de Ceiba, Ceiba, Puerto Rico, T: Wilmayris Alvira-Concepcion

PLNT043 **The Mosquito Whisperer**
Laina Sofia Llano Jorge, 18, Senior, Centro Residencial de Oportunidades Educativas de Ceiba, Ceiba, Puerto Rico, T: Wilmayris Alvira

Ponce, Puerto Rico, TEPR06, Ponce Regional Science Fair

ANIM032 **Analysis of the Use of an Organic Pesticide Synthesized with Ursolic Acid as a Substitute for Pesticides with Neonicotinoids to Maintain Stable Sperm Production in *Apis mellifera* Drones**
Jerica Andrea Siberon, 18, Senior, Dr. Pedro Albizu Campus, Ponce, Puerto Rico, T: Kathia Rodríguez

ENEV036 ***Chlorella vulgaris* Culturing as a Method of Bioremediation for Waste Water Treatment to Control Entropic Eutrophication**
Ernesto Vazquez, 17, Junior, Dr. Pedro Albizu Campus, Ponce, Puerto Rico, T: Samirah Mercado

PHYS070 **Application of a Styrene-Butadiene Copolymer Membrane to Di-Commissioned Level A5 Aramid Fibers to Evaluate the Distribution of Impact Force and Their Resistance to Projectiles**
Lyeme Nicole Rosado, 18, Senior, Dr. Pedro Albizu Campus, Ponce, Puerto Rico, T: Carmen Noble

Mayaguez, Puerto Rico, TEPR08, Mayaguez Regional Science Fair

ANIM045 **The Significant Agrohomeopathic Effect of Natural Extracts on *Acheta domesticus***
Rodnell Busigo Torres, 16, Senior, CROEM HS, Mayaguez, Puerto Rico, T: Venus Vargas

EBED033 **Ultrasonic Glasses for the Visually Impaired**
Axel Sariel Toro Vega, 15, Sophomore, Dr. Carlos González High School, Aguada, Guaniquilla, Puerto Rico, T: Milagros Tubens

ENMC047 **New Generator Producing Energy in a Closed Circuit**
Angelysmar Feliciano-Cordero, 18, Senior, Dr. Carlos González High School, Aguada, Guaniquilla, Puerto Rico, T: Maria Mendoza Lugo

San Juan, Puerto Rico, TEPR09, San Juan Regional Science Fair

ANIM060 **Comparative Study Between *Bellis sylvestris*, *Artemisia dracunculus* and *Lantana trifolia* in the Ability to Attract *Apis mellifera***
Marco Antonio Calo, 16, Sophomore, University Gardens High School, San Juan, Puerto Rico, T: Nelson Ruiz

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CHEM053 **Keeping Water Supercool: Non-Toxic Substances that Inhibit the Crystallization of Supercooled Water**
Xavier Rafael Morales, 17, Junior, Escuela Secundaria de la Universidad de Puerto Rico (UHS), San Juan, Puerto Rico, T: Keyla Soto

San Juan, Puerto Rico, TEPR12, Puerto Rico Metropolitan Science Fair

CBIO010T **The Anti-inflammatory and Regenerative Effects of Interleukin-1 Receptor Antagonist on Ischemic Strokes**
Isabel Baez-Alicea, 16, Junior, Kamileh Alexandra Rivera-Amaral, 17, Junior, Colegio Puertorriqueno de Ninas, Guaynabo, Puerto Rico, T: Aracelis Troche

CHEM023T **Photodegradation of Ciprofloxacin Using Titanium Oxide Nanowires and Nanoparticles (P25)**
Ana Valeria Vazquez-Navas, 16, Junior, Juan Diego Rodriguez-Rivera, 17, Junior, Escuela Especializada en Ciencias, Matemáticas y Tecnología, Caguas, Puerto Rico, T: Abniel Machín

EAEV024T **Study of Mercury (Hg) Concentration Levels in Commercial Fish: A Quantitative Analysis**
Jean Paul Ambroise-Robles, 17, Senior, Isabel Irene Vega- Calderon, 17, Senior, Colegio Rosa-Bell, Guaynabo, Guaynabo, Puerto Rico, T: Yajaira Torres-De Jesus

ENBM020T **Development of a Mobile Application with a Wearable Device for the Detection and Monitoring of Heartbeat Irregularities**
Gustavo Enrique De Leon-Rivera, 17, Senior, Hector Manuel Santos-Soto, 18, Senior, Escuela Especializada en Ciencias, Matemáticas y Tecnología, Caguas, Puerto Rico, T: Fernando Alvarado

MATH021T **Mathematics of Gene Regulation: Control Theory for Ternary Monomial Dynamical Systems**
Omar Alejandro Santiago-Reyes, 18, Senior, Gustavo Xavier Santiago-Reyes, 18, Senior, Escuela Especializada en Ciencias, Matematicas y Tecnologia, Caguas, Puerto Rico, T: Omar Colon-Reyes

SOFT018 **Creation of a Mobile Application to Enhance Communication in Children with Autism**
Joshua Ricardo Santiago-Ibarra, 17, Junior, Escuela Especializada en Ciencias, Matematicas y Tecnologia, Caguas, Puerto Rico, T: Jenipher Gonzalez

QATAR

Doha, Qatar, QAT001, The National Student Research Fair

BMED074T **Use of Cardiac Stent to Restore Blocked Air Passage in Chronic Sinusitis**
Ahmed Bassel Abboushi, 16, Junior, Ali Nasser Murad, 16, Junior, Ahmad Bin Hanbal Secondary School, Doha, Qatar, T: Zakareya Hussein

EBED056 **A Smart Device to Protect Children from Heat Stroke in Confined Spaces**
Sara Ameer Abdulla AL-Baker, 17, Junior, Qatar Banking Studies & Business Adminstration School for Girls, Doha, Qatar, T: Noura Salem

EGCH040 **Leidenfrost Effect as a Reactor for Direct Methanol Fuel Cell Catalyst**
Fatima Zayed AlMaadeed, 16, Senior, AlArqam Academy for Girls, Doha, Qatar, T: Sifani Zavahir

MATS041T **The Impact of Using Nanotechnology to Improve the Silica to Make Self Cleaning Glass**
Faisal Adel Alyafei, 17, Senior, Mahmoud A Hamid Sawalha, 15, Sophomore, Ahmad Bin Hanbal Secondary School, Doha, Qatar, T: Mohamed Abouelenein, T: Mohammed Taha

MCRO061T **Cultivation Using Self-Germinating Fungus Capsules**
Sultan Saif SL AL-Misaifri, 15, Sophomore, Talal Sarhan Alsayed, 16, Junior, Jassim Hamad Independent Secondary School for Boys, Doha, Doha, Qatar, T: Sherif Elserwy

MCRO062 **Investigating Auranofin Ability to be Repurposed as a Decolonizing Drug for Vancomycin-Resistant *Enterococci***
Khalifa Elmagarmid, 16, Junior, Qatar Academy Senior School, Doha, Al-Rayyan, Qatar, T: Jason Maraku

REPUBLIC OF MOLDOVA

Chisinau, Republic of Moldova, MDA001, Moldova Science and Engineering Fair

EAEV010T **Campaign Air Pollution with the Help of Nanotechnology**
Artemie Mitioglo, 17, Junior, Vladislav Mitioglo, 17, Junior, Theoretical High School Orizont, Durlesti, Chişinău, Republic of Moldova, T: Suleyman Dasdemir

ROBO025 **A Novel Approach to Call Quality Assessment Using Deep Neural Networks**
#
Sandu Chirita, 18, Junior, B. Z. Herzl ORT Technological Lyceum, Chişinău, Republic of Moldova, T: Diana Marusic

ROMANIA

Suceava, Romania, ROM001, Romania Science and Engineering Fair

EAEV001T **Environmental Magnetism on the Black Sea Coast**
Cristiana Savuca, 16, Sophomore, Alin Mihai Rada, 17, Sophomore, Carmen Sylva High School, Eforie Sud, Constanta, Romania, T: Florin Constantin Serbu, T: Florin Serbu

EBED001T **Experimental Study of Upper Limb Movement for Creating a Natural and Universal Interface: Innovative Applications**
Paul Andrei Bricman, 17, Junior, Matei Ciprian Anghel, 17, Junior, National Bilingual High School "George Cosbuc", Bucharest, Romania; Lauder-Reut Educational Complex, Bucharest, Romania, T: Mircea Ignat

EGCH001 **Biocombustion Cells with Photosynthesizing Microorganisms**
Elena Robu, 18, Senior, Tudor Vianu National High School of Computer Science, Bucharest, Romania, T: Mircea Ignat

ENBM003T **Lipid Structures in Microelectromechanics(Mems) and Their Use in the Drug Delivery**
Andrei Cristian Ionescu, 17, Junior, Serghei Ulian, 17, Junior, Colegiul National Mihai Viteazul Ploiesti, Ploiesti, Prahova, Romania; Liceul Teoretic International de Informatica Bucuresti, Bucharest, Romania, T: Mircea Ignat

ROBO001T **Self-Learning Robotic Arthropod**
Radu-Bogdan Caprita, 18, Junior, Razvan-Gabriel Dumitru, 17, Junior, Alin Hertoiu, 18, Junior, Colegiul National "Gheorghe Lazar" Sibiu, Sibiu, Romania, T: Ioan Stoia

RUSSIAN FEDERATION

Nizhny Novgorod, Russian Federation, RUS001, ROST

CHEM002 **The Filter for Dynamic Purification of Water from Oil Products**
Alena Sergeevna Nikiforova, 18, Junior, State School #1080, Moscow, Russian Federation, T: Mikhail Astakhov

ENBM004 **Rotating Electric Spark: Innovative Medical Device**
Valeriia Lebedeva, 17, Junior, Gymnasium #5 of Korolyov, Korolyov, Moscow Region, Russian Federation, T: Vladimir Lebedev

PHYS005 **How to Improve the Quality of a Laser Beam by Homogenization**
Iuliia Dmitrievna Bulgatova, 16, Sophomore, Lyceum #40, Nizhny Novgorod, Nizhny Novgorod Region, Russian Federation, T: Andrey Afanasiev

ROBO004T **Myelofon: The Way of Expressing Thoughts for People with Speech Disorders**
Daniil Vladimirovich Kazantsev, 15, Freshman, Daniil Maksimovich Semenov, 16, Freshman, Municipal Lyceum #12, Yekaterinburg, Russian Federation, T: Irina Mankova

Moscow, Russian Federation, RUS002, Junior–I

CHEM054T **Indenyl Rhodium Complexes; New Efficient Coal Tar Catalyst**
Elizaveta Sovdagarova, 18, Junior, Vladimir Kharitonov, 18, Junior, Moscow South-Eastern School Named After V.I. Chuikov, Moscow, Russian Federation, T: Dmitry Loginov, T: Dmitry Loginov

CHEM058 **Synthesis and Antiproliferative Properties of Tryptamine Derivatives**
Irina Konstantinovna Belousova, 17, Junior, Moscow South-Eastern School Named After V.I. Chuikov, Moscow, Russian Federation, T: Rinat Salikov

MATH051 **Extreme Point in the Triangle Plane**
Egor Vladislavodich Batarin, 16, Sophomore, Lyceum 1523, Moscow, Russian Federation, T: Andrew Fedyanin

PHYS087 **The Creation of a Portable Detector for Recording Extensive Air Showers**
Roman Nikolaenko, 17, Junior, Lyceum–1511 Affiliated with MEPHI, Moscow, Russian Federation, T: Vladislav Vorobyev

PHYS089 **Universal (Alpha, Beta, Gamma, n) Geiger Detector**
Maksim Mamchur, 17, Junior, Samara Regional Centre for Intellectually Gifted Children, Samara, Russian Federation, T: Pavel Kazakevich

Moscow, Russian Federation, RUS003, Russian Youth Program "Step Into the Future"

EBED058 **Design of the Onboard Computer "CERBER"**
Ivan Shoitov, 17, Sophomore, Murmansk Polytechnic Lyceum, Murmansk, Russian Federation, T: Nikolai Pavlov

ENMC057 **The Designing of Remote Control System “Robot Snowplow”**
Evgenii Mikhailov, 16, Sophomore, Municipal Budgetary Educational Institution "The Hibinsky Gymnasium", Kirovsk, Murmansk Region, Russian Federation, T: Dmitrii Zarnitcin

MATS059 **Investigation of the Effect of Basalt Fiber on the Mechanical Properties of Asphalt Concrete Which is Operated in the Extreme North**
Ashot Shagenian, 16, Sophomore, Secondary School #2 of Nijniy Bestyakh, Nijniy Bestyakh, Republic of Sakha, Russian Federation, T: Antonina Scriabina

PLNT071 **The Study and Description of Musci Mountain Tundra of the North-East of Sakha (Yakutia)**
Ilya Andreevich Balakirev, 16, Sophomore, Municipal Budgetary Educational Institution "Ust-Nerskaya High School", Ust-Nera, Republic of Sakha (Yakutia), Russian Federation, T: Margarita Osipova

St. Petersburg, Russian Federation, RUS004, Intel Baltic Science and Engineering Fair

EAEV047T **Modeling of the Objects Drifting on the Sea Surface**
Oleg Andreevich Kirillov, 15, Freshman, Elena Alexandrovna Kovalchuk, 17, Junior, Academic Gymnasium No. 56, St. Petersburg, Russian Federation; Middle School of General Education No.25, Balakovo, Saratov Region, Russian Federation, T: Natalia Evtushenko

MATH003 **Combinatorics of Circular Codes**
Aleksandr Nikolaevich Serdiukov, 17, Junior, School 564, St. Petersburg, Russian Federation, T: Andrei Smolensky

MATH004 **New Explicit Solution to the N-Queens Problem and the Millennium Problem**
Dmitrii Mikhailovskii, 17, Junior, School 564, St. Petersburg, Russian Federation, T: Stanislav Kublanovskiy

MATH018T **On Two Letter Identities in Lie Rings**
#
Boris Borisovich Baranov, 16, Sophomore, Savelii Novikov#, 18, Junior, School 564, St. Petersburg, Russian Federation, T: Sergey Ivanov

MATS048 **Laser Micro Structurization of Titanium Surface in Liquid and Subsequent Galvanic Metal Deposition**
Aziza Khusainova, 17, Junior, Samara Regional Centre for Intellectually Gifted Children, Samara, Samara, Russian Federation, T: Pavel Kazakevith

ROBO019 **Robot Forest Pathologist: Autonomous Robotic Complex for Forest Monitoring**
Maxim Mikhaylov, 16, Sophomore, Presidential Physics and Mathematics Lyceum No 239, Saint-Peterburg, Russian Federation, T: Igor Lositskii

Chernogolovka, Russian Federation, RUS005, Avangard

CELL029 **Participation of Annexin A1 and Associated Genes in the Pathogenesis of Gliomas**
Elena Ptitsyna, 17, Junior, Advanced Educational Scientific Centre, A.N. Kolmogorov Boarding School, Moscow, Moscow, Russian Federation, T: Alina Astakhova

CHEM035T **New Approach to the Synthesis of the Functionalized Fluoroalkenes' New Perspective Types of Medicines**
Yulia Maslova, 17, Junior, Anastasiia Andrianova, 17, Junior, Moscow South-Eastern School Named After V.I. Chuikov, Moscow, Russian Federation, T: Maxim Novikov

MATH031 **On the Maximum Number of Non-Intersecting Diagonals in Unit Squares Filling an n*n Grid**
Anna Savelyeva, 16, Sophomore, Moscow State School #57, Moscow, Russian Federation, T: Fedor Selyanin

Moscow, Barnaul (Siberia Region), Russian Federation, RUS006, Scientists of the Future Fair

EGCH003T **Development of Novel Synthetic Methods for Hybrid Perovskites Using Reactive Polyiodide Melt CH_3NH_3I-I_2**
Ivan Yakimov, 18, Junior, Elizaveta Maksimovna Nemygina, 17, Junior, Universitetskaya Gimnaziya MSU im.Lomonosova, Moscow, Russian Federation, T: Natalia Shlenskaia

ENBM069T **Exerciser for Rehabilitation After a Stroke**
Georgii Barashkov, 16, Sophomore, Vladislav Sokolskiy, 17, Sophomore, Lyceum 1580, Moscow, Russian Federation; University High School Moscow State University Named after M. V. Lomonosov, Moscow, Russian Federation, T: Andrey Isachenko

PHYS004 **Viscous Fluid Mixing in an Annular Slot**
Maria Milovanova, 17, Junior, Advanced Educational Scientific Centre, A.N. Kolmogorov Boarding School, Moscow, Russian Federation, T: Evgeny Mogilevskiy

PHYS007 **Discovery and Study of a New Cataclysmic Variable Star**
Danil Panov, 17, Sophomore, Lyceum "Erudite", Rubtsovsk, Russian Federation, T: Denis Denisenko

ROBO010T **Multipurpose Platform Stabilization System (MPSS)**
Migran Sharoian, 17, Sophomore, Pavel Khakimov, 16, Sophomore, Municipal Classical Lyceum, Kemerovo, Russian Federation; Municipal Budgetary Educational Institution, Leninsk-Kuznetskiy, Kemerovo Region, Russian Federation, T: Sergey Pankov

SOFT005 **Minimal Footprint Hypervisor**
Ilia Zakharov, 17, Junior, Lyceum 1533 of Information Technologies, Moscow, Russian Federation, T: Boris Baykov

SAUDI ARABIA

Riyadh, Saudi Arabia, SAU001, Mawhiba Science & Engineering Fair

BEHA033 **Improving Communication for the Visually Impaired Through an Innovative Arabic Writing System**
Taala Fahad Aboalnaja, 14, Freshman, Third Intermediate School in Dhahran, Dhahran, Saudi Arabia, T: Fatemah AL-Mahboub

BMED049 **Using Unique Ultrashort Inhibitor Peptide as BETA-Amyloid Modulator in *C. elegans***
Abdulelah Ghazi Alharbi, 16, Senior, Alssdeq Secondary School, Hail, Saudi Arabia, T: Charlotte Hauser

CHEM036 **Predicting the Hazardous Qualities of Compounds Based on NFPA 704 Labels Using Deep Learning for QSAR/QSPR Modeling**
Hashim Mohammed Almutairi, 17, Senior, Dar Althikr Private School, Jeddah, Mecca, Saudi Arabia, T: Khalid AlNahdi

CHEM037 **A Novel Analytical Method for Quantifying Metallic Impurities in Carbon Nanotubes by Using ICP-OES**
Mohammed Jamal Hamdi, 17, Senior, AL-Falah High School, Makkah, Saudi Arabia, T: Pedro Costa

EGCH025 **Proposed Inclusive Model for the Prediction of the Derived Cetane Number (DCN) of Fuels Using Molecular Parameters**
Mohannad Ahmed Jabrah, 17, Senior, Dar AlFikr Schools, Jeddah, Makkah, Saudi Arabia, T: Mani Sarathy

EGCH027 **Improving the Water Splitting Efficiency Using Nickel-based Catalysts: A Hydrogen Production Device Driven by Photovoltaic Cell**
Nawar Tayseer Alhaddad, 17, Senior, Dhahran Ahliyya School, Dammam, Eastren Province, Saudi Arabia, T: Kazuhiro Takanabe

EGCH028 **Efficiency and Stability Improvement of Perovskite Solar Cells**
Meshail Mansour Aljalawi, 17, Senior, AlBassam Schools, Dammam, Saudi Arabia, T: Jwaher Alghamdi

EGPH011 **Catalyst Integration and Surface Protection of Water-Splitting Photoelectrochemical Cells for Hydrogen Production Applications**
Dana Turki Altoaimi, 17, Senior, Kingdom Schools, Riyadh, Saudi Arabia, T: Jr-Hau He

EGPH012 **An Innovative Design of Enhanced-Performance Solar Panels Using Heat Pipe and Thermoelectric Generator**
Norah Fahad Alamri, 16, Sophomore, Alfaisaliah Islamic Schools, AlKhobar, Saudi Arabia, T: Fahad Alamri

ENBM044 **Developing Novel Peptide Sequences to Produce Antimicrobial Hydrogels for Potential Wound Treatment**
Qusai Abdulbasit Ghabrah, 17, Senior, Dar Althikr Private School, Jeddah, Mecca, Saudi Arabia, T: Charlotte Hauser

ENEV061 **Reducing the Environmental Impact of Organic Dyes in Industrial Wastewater Using Modified Graphene-BiOBr Photocatalysts**
Razan Ahmed Almusaed, 15, Sophomore, AlBassam Schools, Dammam, Saudi Arabia, T: Tawfik Saleh

ENEV062 **Storing CO_2 in Unconventional Gas Reservoirs Through the Development of an Optimum Hydraulic Fracturing Design**
Deemah Ali Alashban, 17, Senior, Dhahran Ahliyya School, Dammam, Eastren Province, Saudi Arabia, T: Hussein Hoteit

ENMC045 **Towards Engine Downsizing: Examining the Effect of Injection Strategies and Novel AC Ion Sensor on Preignition Tendency of Spark-Ignited Engines**
Yousif Bader Alhammadi, 17, Senior, Dhahran Ahliyya School, Dammam, Eastren Province, Saudi Arabia, T: Bader Alhammadi

ENMC046 **Determining the Ignition Characteristics of GCI Blend for Gasoline Compression Ignition Engines Using Chemical Kinetics**
Hassan Ahmed Alkhunaizi, 17, Senior, Almajeediah Secondary School, Qatif, Saudi Arabia, T: Mohammed Alabbad

MATS031 **Evaluating Zinc Oxide-Doped Aluminum Oxide (AZO) as a New Dielectric Material to Develop Highly Efficient Transparent Thin Film Transistors**
Doha Ahmed Amer, 17, Senior, Dar AlFikr Schools, Jeddah, Makkah, Saudi Arabia, T: Fwzah Alshamri

PHYS063 **Quantum Gravity: The (SEPs) Symmetry of QCD Constituents Solves the Mass Gap for Quantizing EFE as the Glue-Balls**
Yazeed Turki Alharbi, 16, Junior, AL-Falah High School, Makkah, Saudi Arabia, T: Abdullah Kizhakkepura

PLNT045 **Creating Two Novel Strigolactone (SL) Analogs (C-13 and C-26) for the Benefits of Combatting Parasitic Seed Infestation**
Faisal Adel Aldossary, 18, Senior, Dhahran Ahliyya School, Dammam, Eastren Province, Saudi Arabia, T: Adel Aldossary

TMED033 **Anti-Cancer Effects of Novel Morphologies of 2,3-Dichloro-1,4-Naphthoquinone Nano-Particles in MCF7 Breast Cancer Cells**
Deemah Khalid Ghazi, 17, Senior, AlBassam Schools, Dammam, Saudi Arabia, T: Dana AlMohazey

SINGAPORE

Singapore, Singapore, SGP001, Singapore Science and Engineering Fair

BCHM031 **Cell Surface Engineering of Glycosaminoglycan Mimetics for Targeting Parkinson's Disease**
Vicky Qianqian Qu, 18, Senior, Raffles Institution, Singapore, Singapore, Singapore, T: Guoxian Tan

CHEM022 **Molecular Sensor Using Aptamers in Precision Ellipsometry**
Jin Wen Kee, 18, Senior, National Junior College, Singapore, Singapore, Singapore, T: Shan Shan Lee

CHEM049T **Use of Electrochemical Advanced Oxidation Processes for Novel Treatment of Sludge and Wastewater**
Bryan Wei Leong Lim, 18, Senior, Shawn Hai Leong Lim, 17, Senior, Dominic Wei Ting Yap#, 18, Senior, Hwa Chong Institution, Singapore, Singapore, T: Kay Siang Low

MATS013 **Rotating Magnetic Nanoparticles to Measure Microviscosity in Gels**
Wei De Koo, 17, Senior, National Junior College, Singapore, Singapore, T: Shan Shan Lee

MATS049T **Nanosurfer Flash Mobs: E-Field-Choreographed Silver Migration on Graphene Oxide**
Patria Yun Xuan Lim, 18, Senior, Yong Han Jerome Leow, 17, Senior, Dunman High School, Singapore, Singapore, T: Chin Poh Koh

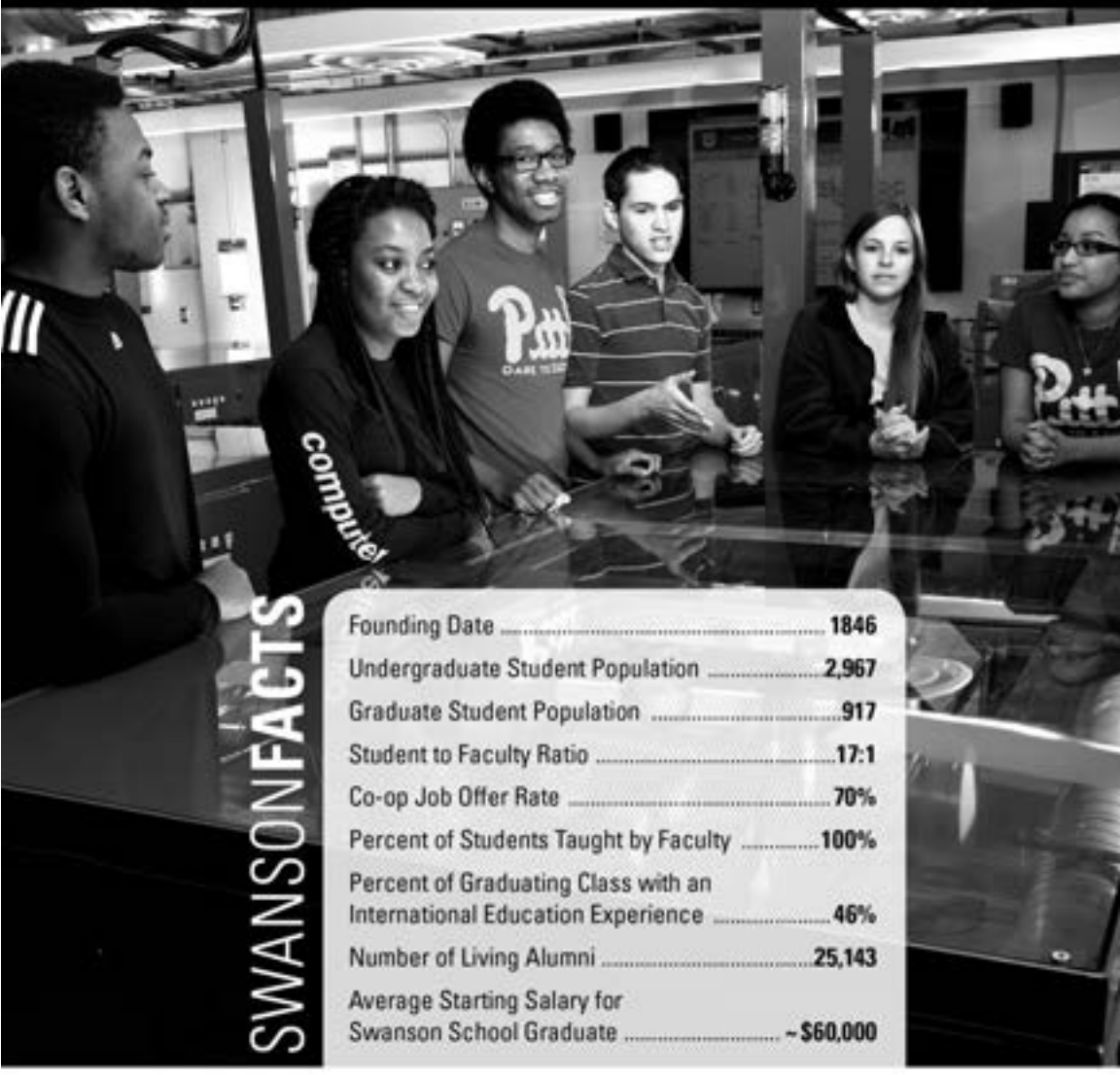
PHYS036 **Topological Analysis of Non-Symmetric Circuit Laplacians and an Experimental Verification of the Su-Schrieffer-Heeger Topological Circuit**
Russell Qi Xun Yang, 18, Senior, NUS High School of Mathematics & Science, Singapore, Singapore, T: Boon Hor Poh

SLOVAKIA

Bratislava, Slovakia, SVK002, AMAVET-Slovak Association for Youth, Science & Technology

ENBM007T ***In vitro* Cytotoxicity Testing of PEEK Biomaterials on Mesenchymal Stromal Cells**
Samuel Smoter, 18, Junior, Miriam Feretova#, 18, Junior, Saint Nicholas Grammar School, Presov, Slovakia, T: Miriam Feretova

UNIVERSITY OF PITTSBURGH | SWANSON SCHOOL OF ENGINEERING



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MATH005 **Levi-Civita Symbol in Hilbert Space L2**
Dusan Daniel, 18, Senior, Grammar School of St. Francis, Malacky, Slovakia, T: Jozef Ondrejka

SLOVENIA

Ljubljana, Slovenia, SVN001, Slovenia Science and Engineering Fair

ENEV091 **Comparative Assessment of Physical and Chemical Properties of Carrier Bags and Comparison of Its Appropriateness with Environmental Studies**
Vita Krump, 19, Senior, II.Gimnazija Maribor, Maribor, Slovenia, T: Sebastjan Hus

SOUTH AFRICA

Boksburg, Gauteng, South Africa, ZAF001, Expo for Young Scientists – South Africa

ANIM049 **Determining the Availability of Pollen Sources for Honeybees on Deciduous Fruit Farms in Summer**
Gabriele Maria Gess, 18, Senior, St. Cyprian's School, Cape Town, Western Cape, South Africa, T: Olga Peel

EBED037 **Development of an Efficient Pipe to Separate Reusable and Non-Usable Water**
Kau Winston Mohlamonyane, 17, Senior, Hoerskool Ben Viljoen, Groblersdal, Mpumalanga, South Africa, T: Sarel Snyman

EGPH017 **The Design and Testing of an Ankle Induction Coil to Charge Devices During Movement**
Chase Joel Newel, 17, Senior, Pinelands High School, Cape Town, Western Cape, South Africa, T: Nicole Masureik

ENEV064 **Using *Dimorphotheca sinuata* in the Phytoremediation of Tailing Storage Facilities Contaminated by Gold Mining**
Martha Ama Nyarko Djan, 17, Senior, The Potchefstroom High School for Girls, Potchefstroom, North West, South Africa, T: Danielle Kirchner

MATS032 **Exploring Protective Barriers for the Outer Layer of Spacesuits and Visors**
Steven Sacht-Luwes, 17, Senior, Bethlehem Voortrekker High School, Bethlehem, Free State, South Africa, T: Almarie Broekman

MCRO042 **Point-of-Care Identification and Determining the Susceptibility of Causative Organisms in Skin Infections, Using Chromogenic Principles**
Alecia Brits, 18, Senior, Diamantveld High School, Kimberley, Northern Cape, South Africa, T: Annelie Fourie

SOFT035 **Developing an Efficient Algorithm for Measuring Density in Axisymmetric Airflows Based on Background Oriented Schlieren**
Frank Sleigh Smuts, 18, Senior, Parklands College Secondary, Cape Town, Western Cape, South Africa, T: Donovan Duffield

TMED036 **Investigating an Alternative Treatment Protocol for Commonly Occurring Pathogenic Bacteria: *Escherichia coli*, Methicillin-Resistant *Staphylococcus aureus*, and *Listeria monocytogenes***
Rahil Ishan Samlal, 17, Senior, St. Dominic's Newcastle, Newcastle, KwaZulu Natal, South Africa, T: Jenita Raghoo

SOUTH KOREA

Seoul, South Korea, KOR001, Korea Olympiad in Informatics

ROBO020T **Neural Action: A Real-time and Accurate Gaze Tracking Application for a More Natural Human-Computer Interaction with User Interfaces**
Heejun Lee, 18, Junior, Jonghyeon Ham, 17, Junior, Dongan High School, Anyang-si, Gyeonggi-do, South Korea; Korea Digital Media High School, Ansan-si, South Korea, T: Sehee Kim

ROBO024 **Neural Network Generator: Technology-Neutral Design and Technology-Specific Generation**
Hyun Jin Kim, 16, Junior, North London Collegiate School Jeju, Seogwipo-si, Jeju-do, South Korea, T: Tajvir Singh

SOFT024 **One-Handed Operation UI on Smartphone**
Jihong An, 17, Senior, Yangyoung Digital High School, Seongnam-si, Gyeonggi-do, South Korea, T: Meeseon Kang

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SOFT025 **JUGI-JUGI: Chemical Education Program to Use Wearable Robot Hand**
Jangun Yeom, 16, Sophomore, Gyeongsin High School, Daegu, South Korea, T: Sang-Hun Choi

Seoul, South Korea, KOR002, YSC (National Science Research Competition)

ANIM043T **A Study on the Species Diversity in Ponds with and without Bullfrogs in Jeju Island**
Hee Do Shin, 17, Junior, Su-Sung Park, 16, Junior, Minbeom Kim, 16, Junior, Daykey High School, Jeju-si, South Korea, T: Young-Ok Koh

EGCH033T **The Efficiency Increase of Eco-Friendly DSSC Containing Visible Light Activity**
Dabin Lee, 17, Senior, Subin Lee, 16, Junior, Seo Yeon Jeong, 16, Senior, Changwon Sungmin Girls' High School, Changwon, Gyeongsangnam-do, South Korea, T: Ji Young Hong

EGPH006T **Road Wind Power Generation Using Momentary Air Pressure Difference**
Leehan Kim, 17, Senior, Jaewon Jang, 18, Senior, Jinhyeok Choi, 17, Senior, Bundang Jungang High School, Seongnam-si, South Korea, T: Eunyoung Lee

ENEV009T **Development of Self-Managed Seawater Desalination Device with Biofouling Reduction Powered by the Tidal Range**
Hyesung Jeon, 18, Senior, Yoojeong Kwon, 18, Senior, Gyeonggi Science High School for the Gifted, Suwonsi, Gyeonggido, South Korea, T: Na Jin Jeong

ENEV024T **Introduction of Styrofoam-Degrading Bacteria Derived from Mealworm into Intestine of Goldfish**
Jinhyuk Park, 18, Senior, Younghoon Lee, 18, Senior, Sebin Choi, 17, Senior, Hanmin High School, Goyang-si, South Korea, T: Youngbum Park

ENEV025T **Application of Stirling Engine to Appropriate Technology**
Junsu Kim, 17, Senior, Jaeho Seong, 18, Senior, Horyeong Chung, 17, Senior, Moksang High School, Mokpo City, Jeollanam-do, South Korea, T: Jeong Byeongjun

MATH020T **A Study on the Estimation of the Number of People Through Photographs**
Kyung Jae Lee, 16, Junior, Seunghun Jee, 16, Junior, Dongwook Cho, 17, Junior, Incheon Science High School, Incheon, Incheon, South Korea, T: Dong Jin Kim

SOFT017T **The Development of Self-Verifiable E-Voting System Using Blockchain Technology**
Dongyeong Kim, 14, Freshman, Jaehyun Bhang, 14, Freshman, Jinsoo Ok, 15, Freshman, Shinmyung Middle School, Seoul, South Korea; Mokdong Middle School, Seoul, South Korea; Dae-Shin Middle School, Seoul, South Korea, T: Dae Woun Pok

Seoul, South Korea, KOR003, Korea Science Fair

ANIM063 **Development of 3D Pollen Adsorption Models by Analyzing Pollinating Insects' Setae Structures**
Seong Won Ok, 17, Senior, Gyeongnam Science High School, Jinju-si, Gyeongsangnam-do, South Korea, T: Young Su Kim

EAEV080T **Trip to Old Astronomical Map: Development and Application of Equation to Convert from 2D to 3D**
Youngseo Du, 17, Junior, Hajun Myung, 18, Senior, Gyeonggibuk Science High School, Uijeongbu-Si, Gyeonggi-do, South Korea, T: Byunghun Oh

EGCH038T **Research of LI-S Battery with Porous Carbon from Garlic Peel**
Jihyeok Jang, 16, Sophomore, Seungjin Lee, 16, Sophomore, Changwon Science High School, Changwon-si, Gyeongsangnam-do, South Korea, T: Hungkyu Cho

EGPH009T **Increase of the Wave-Tidal Power Generator Efficiency by Copying *Litopenaeus vannameis'* Swimming**
Yuna Jung, 18, Senior, Chan Hui Kim, 17, Senior, Minseo Bang, 19, Senior, Gyeongnam Science High School, Jinju-si, Gyeongsangnam-do, South Korea, T: DaeYoung Kim

ENEV082T **Study on Prevention of Soil Acidification Using Hydrogen Bacteria**
Tae Gyun Lee, 18, Senior, Hyun Ho Bae, 18, Senior, Gyeongnam Science High School, Jinju-si, Gyeongsangnam-do, South Korea, T: Seon Gyeong An

ENEV083 **Ordered Mesoporous Alkali Metal Catalyst for Recycling Waste Glycerol from Biodiesel Manufacturing Process**
Yoonseok Yang, 18, Junior, Korean Minjok Leadership Academy, Hoengseong, Gangwon, South Korea, T: Sukbum Hong

MATS047 **Highly Induced Electrical, Morphological, and Optical Characteristics of PEDOT: PSS Film Fabricated by Hot-Casting Technique**
MinJae Kim, 16, Senior, Gwangju Science Academy for the Gifted, Gwangju, South Korea, T: Yongseok Choi

MCRO066T **Diversity and Effect of Endophytic Fungi Isolated from Conifers on Growth Inhibition of Pathogenic Micro-Organism**
Sanmaru Um, 18, Senior, Sohyun Park, 18, Senior, Kangwon Science High School, Wonju, South Korea, T: Hangseok Choi

SPAIN
Barcelona, Spain, SPN001, Exporecerca Jove

SOFT042T **Heuristic Redesign of the Hungarian Graph Algorithm for an Automated Asteroid Detection**
Ignasi Segura, 15, Sophomore, Javier Lopez-Contreras, 18, Senior, Col legi Casp - Sagrat Cor de Jesus, Barcelona, Spain; Aula Escola Europea, Barcelona, Catalunya, Spain, T: Ariadna de Casacuberta, T: Maria Calsamiglia

TMED045 **VANGUARD: An Opensource Approach to Predict Cancer Generation and Evolution by the Use of Nanoparticle SERS, Probabilistic Analysis, and Collaborative Data Processing**
Joel Romero Hernandez, 17, Senior, Institut F.X. Lluch i Rafecas, Vilanova i la Geltrú, Barcelona, Spain, T: Maria Hellin Mendez

SRI LANKA
Colombo, Sri Lanka, LKA001, Sri Lanka Science & Engineering Fair

EBED031 **Walk Enhancing Smart Device**
Liyanadura Supun Sasipriya Silva, 14, Sophomore, De Mazenod College, Kandana, Western Province, Sri Lanka, T: Kalinga Mudalige Pradeep Perera

EBED042T **Smart Walking Stick for Blind: The "Golden i"**
Gajindu Kavinda Bandara, 17, Senior, Kavindra Gimhan Wijayawardana, 17, Senior, St. Anthony's College, Kandy, Central Province, Sri Lanka, T: Dilhani Fernando

MCRO046 **Isolation of a Potential Microbial Agent for Controlling Dengue Vector Mosquitoes in Sri Lanka**
Kawudugama Ralalage Rumal Induwara, 15, Junior, Ch/Ananda National School, Chilaw, North Western Province, Sri Lanka, T: Warnakulasooriya Fernando

SWEDEN

Stockholm, Sweden, SWE001, Utstallningen Unga Forskare

CHEM062 **The Color of An Azo Dye–A Combined Experimental and DFT Investigation of Spectral Properties of 5-(4-Sulfophenylazo) Salicylic Acid**
Johanna Kristina Huhtasaari, 19, Senior, Midgardsskolan School, Umea, Sweden, T: Bertil Eliasson

ROBO067 **Dense Face Detection and Improving Temporal Convolutional Networks for Automatic Image Captioning**
Nikita Zozoulenko, 18, Senior, Katedralskolan in Linkoping, Linkoping, Sweden, T: Annika Forslund

TMED060 **Endogenous Peptide as an Alternative to Antibiotics: Investigating the Antibacterial Properties of Vicryl Sutures Coated with TCP-25**
Erik Anton Artur Hartman, 18, Senior, Katedralskolan, Lund, Sweden, T: Malin Ostvall

SWITZERLAND

Bern, Switzerland, CHE001, Swiss Youth in Science

BCHM009 **Glycosylation of the Cardiac Ion Channel Protein TRPM4 in Rat and Mouse Tissues**
Nicole Barbara Christine Hasler, 20, Senior, Neue Kantonsschule Aarau, Switzerland, T: Philipp Diener

PHYS018 **Spooky Actions at a Distance–On the Problem of Quantum Correlations**
Silvio Barandun, 19, Senior, Liceo Cantonale di Locarno, Locarno, Switzerland, T: Christian Ferrari

THAILAND

Bangkok, Thailand, THA001, SST-NSM National Science Projects Competition

ANIM046 **Behavior of Weaver Ants to Access Food when Encountering Barriers**
Suparas Yendee, 18, Senior, Princess Chulabhorn Science High School Phetchaburi, Cha-Am, Phetchaburi, Thailand, T: Nattapon Klinput

ANIM047T **A New Method to Increase Propolis Production by Activating Nest Repair Behavior in Stingless Bees**
Metawee Leeja, 17, Junior, Chonnaphat Luanghan, 17, Junior, Nattakarn Prommin, 17, Junior, Damrongratsongkroh School, Muangchiangrai, Chiangrai, Thailand, T: Kiettisak Inrajsadon

CHEM038T **The Polar Compound Measuring Tool Referred from the Frying Oils Viscosity**
Nichapat Bunlengjit, 18, Senior, Yadthip Thaithunyaphanich, 18, Senior, Satriwithaya School, Phra Nakhon, Bangkok, Thailand, T: Komane Papato

EAEV048T **Effect of Mud Conditions in Mangrove Forests on Rowing Motions of Robotic Mudskippers: A Novel Anticipation Method on Reforestation and Ecosystem Rehabilitation**
Naphat Cheenchamrat, 17, Junior, Pattharaphol Chainiwattana, 16, Sophomore, Bangkok Christian College, Bangkok, Thailand, T: Wanida Bhu-iam

EBED034 **Wireless Sensor Network for Illegal Logging and Wildfire Detection**
Yanapat Nikomrak, 18, Senior, Princess Chulabhorn Science High School Mukdahan, Thailand, T: Theerawut Chantapan

ENEV058T **Novel Approach to lmprove Local Wisdom Using Termite Mounds in Treating Agricultural Waste**
Atid Techanitisawad, 16, Sophomore, Siwakorn Chanchalotorn, 16, Sophomore, Wasin Tiarawut, 15, Freshman, Bangkok Christian College, Bangkok, Thailand, T: Chanan Keatsirisart

MATH038T **The Polar Equations of Water Distribution from Butterfly Sprinkler Heads**
Adisorn Khantong, 18, Senior, Witchaya Natemonprapa, 18, Senior, Kullanut Booranarom, 17, Senior, Princess Chulabhorn Science High School Phetchaburi, Cha-Am, Phetchaburi, Thailand, T: Saknarin Channnark

MATS030 **Development of Bio-Based PLA/NR Blends and DIY Mini-Extruder for Fabrication of 3D Printing Filaments**
Pattiya Pibulchinda, 16, Junior, Kamnoetvidya Science Academy, Rayong, Rayong, Thailand, T: Sarun Nounjeen

PLNT053 **Dehiscence of Creeping Woodsorrel's Capsule**
Nattaboon Sirisangtragul, 18, Senior, The Demonstration School of Khon Kaen University (Modindaeng), Muang Khonkaen, Khonkaen, Thailand, T: Akkarawat Srisawat

Bangkok, Thailand, THA002, Young Scientists Competition

ANIM062T **Increasing the Honey Productivity of Stingless Bees (*Tetragonula fuscobalteata*) by Creating Pseudo Honey Pots**
Wirachad Sripoori, 17, Junior, Boonyakorn Sonkhayan, 17, Junior, Jitrada Chaichaompoo, 17, Junior, Damrongratsongkroh School, Muangchiangrai, Chiangrai, Thailand, T: Sutipong Jaikaew

EAEV072T **Innovative Conservation of Wetland Resources with *Rhizophora mucronata* Nursery**
Kasidet Sukkwai, 17, Junior, Chidchanok Inkaew, 17, Junior, Pattadon Namwongnao, 17, Junior, Suratpittaya School, Muang District, Suratthani, Thailand, T: Suwaree Pongtheerawan

ENBM063 **Automatic Lung Cancer Prediction from Chest X-Ray Image Using Machine Learning Techniques**
Worawate Ausawalaithong, 16, Junior, Kamnoetvidya Science Academy, Rayong, Thailand, T: Arjaree Thirach

MATS042 **Preparation of Carboxymethyl Cellulose from Water Hyacinth for Film Formation and Encapsulations**
Yuttapong Sritrakan, 18, Senior, Anukoolnaree School, Muang Kalasin, Thailand, T: Tanasak Charearnthum

MATS043T **Improving the Elasticity of Concrete Paving-Blocks Using Natural Rubber Latex and Rice-Husk-Ash Silica**
Apinya Chotson, 18, Junior, Inthira Somsriyo, 17, Junior, Kanthicha Pholsana, 17, Junior, Princess Chulabhorn Science High School Loei, Loei, Thailand, T: Surasuk Boontima

MATS044T **The Investigation of Pectin Extracted from Melon Shells Used in Capsule Production**
Praewa Makmee, 17, Junior, Tunpitchar Singnontad, 17, Junior, Princess Chulabhorn Science High School Phitsanulok, Phitsanulok, Thailand, T: Natpassorn Laonet

SOFT047 **EEG-Based Person Authentication Method with Deep Learning Using Visual Stimulation**
Supawich Puengdang, 17, Junior, Mahidol Wittayanusorn School, Nakhon Pathom, Nakhon Pathom, Thailand, T: Boonnatee Sakboonyarat

TUNISIA

Gabes, Tunisia, TUN001, Tunisia Science and Engineering Fair

EBED005 **Read4me: Using the Internet of Things and Machine Learning to Enable Blind People to Read Paper Books**
Tarek Abdessattar Aloui, 17, Junior, Pioneer School of Gabes Tunisia, Gabes, Tunisia, T: Houssem Eddin Benjemaa

EBED006 **Multicopter Autonomous Refueling System**
Aziz Hanafi, 14, Freshman, International School of Carthage, Tunis, Carthage, Tunisia, T: Raouf Haddada

ROBO006 **Using Artificial Intelligence to Create a Self-Driving Car Compatible with Bad Infrastructure**
Nader Jemel, 17, Junior, Pioneer School of Gabes Tunisia, Gabes, Tunisia, T: Houssem Eddin Benjema

TURKEY

Ankara, Turkey, TUR002, Tubitak fair

BCHM026T **New Materials with Micron Network Membrane Morphology: The Research of Their Potential Usage in Proteomic Studies**
Roza Mercan Eskin, 15, Sophomore, Halil Ozgur, 16, Sophomore, Gaziemir Ozel Rota Fen Lisesi, Izmir, Turkey, T: Esin Kara

EAEV049T **Comparison of the Toxic and Lethal Effects of the Cleaners Containing and Non-Containing Phosphate and Petroleum Derived Agents on Biomes in Aquatic and Terrestrial Ecosystem**
Zeynep Coskun, 17, Senior, Ali Umut Guler, 19, Senior, Fethi Gemuhluoglu Fen Lisesi, Yesilyurt, Malatya, Turkey; Fahri Kayahan Kultur Temel Lisesi, Yesilyurt, Malatya, Turkey, T: Guler Karaaslan

EBED035 **RDS of Things: Using RDS Technology for Smart Cities**
Atalay Kutlay, 19, Senior, Ankara Ataturk Lisesi, Ankara, Turkey, T: Oguzhan Onder

EGCH026 **Acquisition of Low Cost Energy by Natural Dyes with Dye Sensitized Solar Cells (DSSC)**
Muhammed Melih Dogan, 18, Senior, Fethi Gemuhluoglu Fen Lisesi, Yesilyurt, Malatya, Turkey, T: Savas Guler

ENBM046T **Microfluidic Chips for Detection of Lung, Breast and Prostate Cancer**
Berna Akdeniz, 18, Senior, Leyla Al Masoud, 17, Senior, Izmir Ozel Ege Lisesi, Izmir, Bornova, Turkey, T: Onur Akpinar

ENBM047 **Ucicatrize: Practical Self-Healing Injection Kit for Allergic Reactions**
Yahya Yagiz Kemikoglu, 17, Senior, Ozel Kemerburgaz Okyanus Anadolu Lisesi, Istanbul, Turkey, T: Ayse Gul Demirel

ENMC055 **Automatized Radiation Shield for Potential Space Colonies**
Deniz Gulbaharli, 18, Senior, Ozel Cevizlibag Doga Anadolu Lisesi, Istanbul, Turkey, T: Ozlem Ozan

MATH039 **Number Patterns and Power-Difference Triangles**
Melih Sahin, 17, Junior, Ankara Fen Lisesi, Ankara, Turkey, T: Kemal Celik

MATH040 **Properties of Bicentric Quadrilaterals**
Mehmet Emin Ozturk, 17, Senior, Gazi University Foundation Private Science High School, Ankara, Turkey, T: Ender Ozdemir

TMED034T **A New System Combined with a Smart Phone Application for On-Site Doping Analysis: Mobil-Dopsens**
Semiha Doga Firat, 18, Senior, Yagmur Akyaz, 18, Senior, Takev Science High School, Azmir, Aegean, Turkey, T: Aysegul Metin, T: Aysegul Terzi

UKRAINE

Kyiv, Ukraine, UKR001, Intel-TechnoUkraine

MATH034 **A Solution of Generalized Legendre's Equation $Cz^n=Ax^2+By^2$ and Its Application to Cryptography**

\# Yuliia Suprun, 16, Junior, Municipal Institution Sumy Specialized School of I-III Levels Named After the Hero of the Soviet Union O. Butko, Sumy, Ukraine, T: Alyona Azarenkova

PHYS052 **Modeling of Phenomena in Multiple Stellar Systems**
Dmytro Dmytriiev, 16, Sophomore, Odesa Specialized School 117, Odesa, Ukraine, T: Natalia Virnina

PHYS062 **Highly Efficient Low Power Nuclear Jet Engine**
Artur Kachur, 16, Junior, Gymnasium 5, Chernivtsi, Ukraine, T: Oleg Stratiychuk

Kyiv, Ukraine, UKR002, Intel - EcoUkraine

EGPH016 **Use of Stray Currants as a Source of Renewable Energy**
Vladyslav Kazakov, 14, Freshman, Educational Complex "Alexandria Kollegium – Specialized School", Olexandriya, Ukraine, T: Svetlana Piskova

ENEV084 **Low Cost Coastal Irrigation System Spots I the Desert**
Anastasiia Venchkovska, 16, Freshman, Lviv Lyceum of Technology, Lviv, Ukraine, T: Victor Koldun

TMED059 **Neural Networking System for Detecting and Analyzing Heart Pathologies**
Solomiia Leno, 16, Junior, LEC "Primary School – Gymnasium", Lviv, Ukraine, T: Andrii Melnychyn

UNITED ARAB EMIRATES

Abu Dhabi, United Arab Emirates, ARE002, Think Science Competition

CHEM068T **Techno-Filter Glasses**
Fatma Arif Albastaki, 15, Junior, Fatima Mohammed Alneyadi, 17, Junior, Hessa Yousuf Alsayegh, 16, Junior, Dubai National School- Al Barsha, Dubai, United Arab Emirates, T: Nafissa El Jabban

CHEM069T **Temperature Insulating Solution**
Noora Salem Aldahmani, 16, Junior, Shaikha Ali Alsuwaidi Street, 16, Junior, Dubai National School- Al Barsha, Dubai, United Arab Emirates, T: Nafissa El Jabban

EBED057T **A Compact Microstrip Antenna for Ultra-Wide Band Applications**
Rashed Ali Aljasmi, 17, Senior, Omar Hassan Alhousani, 16, Junior, Humaid Bin Abdulaziz School for Boys, Ajman, United Arab Emirates T: Okba Alhasan

ENEV093T **H_2O Desalination and Purification Using CNT and Silver Nanoparticles**
Hind Tariq Alqassem Street, 17, Senior, Hamda Arif Almheiri, 17, Senior, Al Khaleej National School, Dubai, United Arab Emirates, T: Ameer Siddique

ENMC067 **Graphene Insulated Nanosatellite**
Ghaya Mohammed Ibrahim, 16, Senior, Al Khaleej National School, Dubai, United Arab Emirates, T: Ghaleb Wahbi

PHYS090 **Silent Information**
Khalid Yunis Almarzooqi, 17, Senior, Emirates Science Club, Dubai, United Arab Emirates, T: Ashraf Senbel

UNITED KINGDOM

London, United Kingdom, GBR001, The Big Bang: UK Young Science and Engineering Fair

MATS039 **Developing Cellulosic Biocomposites for Water Purification and Smartphone-based Analysis**
Krtin Kanna Nithiyanandam, 17, Senior, Sutton Grammar School, Sutton, Surrey, United Kingdom, T: Jamie Costello

ROBO060 **Low-Cost Flatpack SCARA 3D Printer**
Joshua Luke Mitchell, 18, Senior, Holmes Chapel Comprehensive School, Crewe, Cheshire, United Kingdom, T: Dave Wheeler

UNITED STATES OF AMERICA

ALABAMA

Auburn, USAL01, Greater East Alabama Regional Science and Engineering Fair

CHEM030 **Fatty Acid Methyl Ester Energy Solutions: Biodiesel as a DIY Energy Alternative**
Elizabeth Grace Melby, 18, Senior, Carroll High School, Ozark, Alabama, T: Carlton Austin

ENMC024 **The Hexagonal Weave: Using Hexagonal Engineering to Create a Better Body Armor** #
Lucas Carey Lynn, 18, Senior, Wetumpka High School, Wetumpka, Alabama, T: Virginia Vilardi

Birmingham, USAL02, Central Alabama Regional Science and Engineering Fair

BEHA011 **Peer Group Influences on High School Girls' Interest in STEM**
Percy Gresham, 18, Senior, Alabama School of Fine Arts, Birmingham, Alabama T: Hungsin Chin

BMED012 **Exosomes and Macrophage Polarization in Lung Cancer**
Alexandra Pritchard, 16, Junior, The Altamont School, Birmingham, Alabama T: Maureen Frye

EAEV013 **Carbon Dioxide Removal in Coniferous and Deciduous Trees**
Analise Elizabeth Chambers, 16, Junior, Jefferson County International Baccalaureate, Irondale, Alabama, T: Kelly Breland

MATS010 **Optical Studies of Nanostructures for Biosensing Applications**
Aniket Pant, 15, Sophomore, Jefferson County International Baccalaureate, Irondale, Alabama, T: Kelly Breland

Huntsville, USAL03, North Alabama Regional Science and Engineering Fair

BEHA029 **Assessment of Fall Risk Associated with High-Heeled Footwear Utilizing Computerized Dynamic Posturography: A Two-Phase Study**
Alexis McFeely, 16, Sophomore, St. John Paul II Catholic High School, Huntsville, Alabama, T: Brian Finzel

PLNT046 **Increasing the Lipid Density of *Chlorella* Algae with Aquatic Plants**
Phillip Matthew Arnston, 16, Sophomore, St. John Paul II Catholic High School, Huntsville, Alabama, T: Brian Finzel

TMED037 **Ultra-Sensitive Cardiac Biomarker Detection Using Gold Nanocavity Localized Plasmon Resonance for Early and Rapid Diagnosis of Myocardial Infarction**
\# Sophie Joy Guo, 17, Senior, James Clemens High School, Madison, Alabama, T: Carol Bohatch

Mobile, USAL04, Mobile Regional Science Fair

BEHA049 **Caffeine and Sugar *vs.* Focus**
Aisling Irene Finnegan, 17, Junior, Murphy High School, Mobile, Alabama, T: Julie Prerost

CELL038 **Investigating Heat Exposure on Transgenerational Inheritance in *C. elegans***
Reed Elizabeth Robinson, 17, Junior, Alabama School of Mathematics and Science, Mobile, Alabama, T: Natalie Ortell

EBED032 **Background Noise Reduction by Using Spectral Selection to Remove Unneeded Frequencies**
Kevin Xiao, 17, Junior, Alabama School of Mathematics and Science, Mobile, Alabama, T: Grey Gaillard

PHYS068 **Kepler-Keck Double Check: Confirming Exoplanet Candidates Using Keck Radial Velocity Data**
Mary Alice Fitzpatrick Jouve, 17, Junior, McGill-Toolen Catholic High School, Mobile, Alabama, T: Adrian O'Keefe

Livingston, USAL05, West Alabama Regional Science Fair

MCRO045 **Which Brand of Disinfectant Is the Most Resistant to Bacterial Growth?**
John David Lewis, 15, Sophomore, Patrician Academy, Butler, Alabama, T: Jennifer Clark

Huntsville, USAL50, Alabama Science and Engineering Fair

CBIO032 **Computational Analyses to Identify Genes Disproportionately Affected by NFKBIA Deletions and Implicated in Breast Cancer and Glioblastoma Tumorigenesis**
Amrita Lakhanpal, 17, Junior, The Altamont School, Birmingham, Alabama, T: Ryan James

ENEV076 **Development of Innovative Strategies to Protect the Aquatic Environment from Household Plastic Microfibers**
\# Noel Katherine Lange, 17, Junior, Auburn High School, Auburn, Alabama, T: Jacque Middleton

ROBO056 **Biomechanical Effect of a Novel Designed Passive Knee Exoskeleton for Human Augmentation**
Brayden Noh, 16, Freshman, Auburn High School, Auburn, Alabama, T: Jacque Middleton

SOFT061 **Developing an Efficient Solution to Personal Computer Security**
Jared Callen, 18, Senior, Wetumpka High School, Wetumpka, Alabama, T: Virginia Vilardi

ALASKA

Anchorage, USAK50, Alaska Science and Engineering Fair

EAEV053 **Evaluating Phosphorus Absorbing Materials for the Mitigation of Harmful Algal Blooms (HABs)**
Savio Le, 17, Junior, Holy Rosary Academy, Anchorage, Alaska, T: Laura Walters

MCRO047 **Investigating the Effect of Floral Source on the Antimicrobial Action of Synthetic Honey**
Will Joseph Deering, 16, Sophomore, IDEA Homeschool, Anchorage, Alaska, T: Michele Deering

ARIZONA

Sierra Vista, USAZ02, SSVEC's Youth Engineering and Science Fair

ANIM070 **Satellites and Cows**
Ashley Nicole Riggs, 15, Sophomore, Willcox High School, Willcox, Arizona, T: Ty White

ENEV073T **Plasphalt: An Engineered Application for Plastic Waste in Asphalt**
Dakota Lynn Finley, 16, Sophomore, Eduardo Lauro, 16, Sophomore, Willcox High School, Willcox, Arizona, T: Ty White

Tucson, USAZ03, Southern Arizona Research, Science and Engineering Fair

BEHA057 **Are Twenty-Four Heads Better than One? Testing the Optimal Group Size for Decision-Making in a Social Insect**
Sylvia Zarnescu, 18, Senior, Catalina Foothills High School, Tucson, Arizona, T: Theodore Manno

CBIO035 **Phylogenetic and Evolutionary Patterns of the P53 Gene in Mammals**
Yuqi Zhang, 17, Junior, BASIS Tucson North, Tucson, Arizona, T: Li Shen

EBED049 **Arduino Navigation for the Visually Impaired and Elderly**
Luis Fernando Flores Juarez, 16, Sophomore, Yuma High School, Yuma, Arizona, T: Marelis Rivera

MCRO064 **Bacteriophage MS2 Transmission Across a High School Classroom and the Effect of an Antimicrobial Intervention**
Jack Lansing Picton, 18, Senior, Canyon del Oro High School, Oro Valley, Arizona, T: Carolyn Zeiher

PLNT061 **Applying the West, Brown, and Enquist Fractal Branching Model on Palo Verde Trees**
Zoey Zhao, 17, Senior, Empire High School, Tucson, Arizona, T: Rebecca Lipson

PLNT067 **The Effect of Native Velvet Mesquite (*Prosopis velutina*) and Non-Native African Sumac (*Rhus lancea*) on Biodiversity in the Sonoran Desert**
Cassidy Sumbria Chamillard, 17, Junior, Tucson High Magnet School, Tucson, Arizona, T: Margaret Wilch

SOFT053 **Comparison Between Gradient Descent and Newton Method Optimization Algorithms Resulting in the Creation of a Unique Algorithm**
Matthew Fosdick, 16, Sophomore, Empire High School, Tucson, Arizona, T: Hillary Stacey

Phoenix, USAZ50, Arizona Science and Engineering Fair

ANIM044 **A Novel Approach to Increase Honey Bee Immune Response: The Effect of Amino Acid Supplementation on the Longevity of Nosema Infected Honeybees**
Natalia Noel Jacobson, 18, Senior, Empire High School, Tucson, Arizona, T: Michael Frank

BEHA034 **Generation Z's Motivations to Use Social Media and Susceptibility to Anxiety**
Alisha Goyal, 18, Senior, Hamilton High School, Chandler, Arizona, T: Debbie Nipar

BEHA035 **Automatically Analyzing Open-Ended Survey Responses Using Statistical and Machine Learning Methods**
Devrath Iyer, 15, Sophomore, Hamilton High School, Chandler, Arizona, T: Debbie Nipar

CBIO026 **A Novel Computational Model for Discovery of DNA Spatial Interactions: New Insights into Genomic Organization**
Joseph Galasso, 17, Senior, Galasso Homeschool, Tucson, Arizona, T: Sandra Galasso

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CBIO027 **Developing a Machine Learning Model to Identify Protein-Protein Interaction Hotspots to Facilitate Drug Discovery**
Rohit Nandakumar, 17, Senior, Basha High School, Chandler, Arizona, T: Michael McKelvy

EAEV078T **The Effect of Different Types of Fruit Peels on the Absorption of Oil: A Biodegradable Way to Clean Oil Spills**
Elda Bengu, 14, Freshman, Shreya Tripathi, 15, Freshman, Hamilton High School, Chandler, Arizona, T: Raxha Bhagdev

EGCH029 **A Novel Approach to Optimizing Algae Biofuel Production by Using Naturally Occurring Extracellular Polymeric Substances (EPS) Through Bioflocculation**
Nikita Bharati, 14, Freshman, Basha High School, Chandler, Arizona, T: Michael McKelvy

ENBM042 **A Low-Cost, Point-of-Care Ammonia Sensor for Urea Cycle Disorder Patients Utilizing Colorimetric Techniques**
Mindy Long, 17, Junior, Hamilton High School, Chandler, Arizona, T: Debbie Nipar

MATH042 **A Novel Accelerator for Machine Learning Algorithms**
Bryan Dev Gopal, 17, Junior, Brophy College Preparatory, Phoenix, Arizona, T: Patricia Mazier

MCRO048 **Exploring the Use of Bacteria in Mitigating Fungal Disease**
Hannah Skocypec, 17, Senior, Basha High School, Chandler, Arizona, T: Michael Mckelvy

PHYS061 **A Novel Layered System to Prevent High-Energy, Ionizing Radioactive Photon Transmissions and Control Particle Behavior with the Utilization of Monte Carlo Transport Modeling via SPENVIS-Based Modular Implementation**
Daniel Noon, 16, Sophomore, Brophy College Preparatory, Phoenix, Arizona, T: Patricia Mazier

PHYS064 **Wet Chemical Etching of Native Oxides on Si and GaAs Studied by Ion Beam Analysis (IBA)**
Sukesh Ram, 17, Junior, BASIS Peoria, Peoria, Arizona, T: Kim Heinzer

PLNT040 **The Effect of Organic Plant Extracts on Seed Germination and Seedling Growth**
Damian Galasso, 15, Freshman, Galasso Homeschool, Tucson, Arizona, T: Sandra Galasso

TMED039T **Cancer Screening Mobile Application: A Novel Machine Learning Based Approach Utilizing Retrospective Data**
Viraj Mehta, 15, Freshman, Roshan Ravi Pillai, 15, Freshman, BASIS Scottsdale, Scottsdale, Arizona, T: Allison Scaling

ARKANSAS

Little Rock, USAR01, Ouachita Mountains Regional Science & Engineering Fair

ENBM074 **Giving a Hand: A 3D Printed Modern Day Miracle**
Gracie Kimbrell, 17, Junior, Bryant High School, Bryant, Arkansas, T: Suzanne Johnson

Fayetteville, USAR03, Northwest Arkansas Regional Science and Engineering Fair

ANIM021 **What's All the Buzz About?**
Breanna Michelle Williams, 18, Senior, Alma High School, Alma, Arkansas, T: Zachary Thomas

EAEV014 **Banana Peel Sorption of Cations**
Trang Thi Thuy Do, 18, Senior, Fayetteville Christian School, Fayetteville, Arkansas, T: Alicia Deavens

SOFT015T **BookGazers: An Interactive Mobile Application for Reading**
Arjun Krishna, 15, Junior, Arthi Krishna, 15, Sophomore, Bentonville High School, Bentonville, Arkansas, T: Cynthia Cardwell

Jonesboro, USAR04, Northeast Arkansas Regional Science Fair

BMED013 **Sleep Deprivation: "Are You Getting Enough Sleep?"**
Corbin Osburn, 15, Sophomore, Rural Special High School, Fox, Arkansas, T: Ty Pitcock

EGPH005 **Offsetting High Rise Booster Pump Systems' Energy Consumption with the Implementation of Hydropower Turbines**
Sean Arthur Roades, 17, Junior, Valley View High School, Jonesboro, Arkansas, T: Brandi Bailey

MATH013 **Fractals**
Barrett Seth Daves, 16, Junior, Cross County High School, Cherry Valley, Arkansas, T: Molly Lacy

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Little Rock, USAR05, Central Arkansas Regional Science and Engineering Fair

CELL013 **The DNA Damage Effect of Aloe Vera Extracts**
Chengyue She, 15, Sophomore, Little Rock Central High School, Little Rock, Arkansas, T: Beth Maris

CHEM025 **Green Synthesis of Phosphorous, Nitrogen Co-Doped Carbon Materials from Renewable Resources for Supercapacitor Applications via Microwave Assisted Technique**
Meghana Chowdary Bollimpalli, 17, Junior, Little Rock Central High School, Little Rock, Arkansas, T: April Owen

ENBM013 **Superhydrophobicity of Biocompatible Titanium Dioxide Nanotubes**
Hetvi Shah, 15, Sophomore, Little Rock Central High School, Little Rock, Arkansas, T: Mary Maris

ENEV037 **Textile Dye Pollution: Can Green Chemistry Fix the Problem with a Biomimetic Iron-Complex?**
Sanjana Padala, 16, Junior, Little Rock Central High School, Little Rock, Arkansas, T: Patrick Foley

PLNT023 **The Effects of Ionizing Radiation on Glycine max (Soybean) mRNA Accumulation in Radicle Tissue**
Mohammed Abuelem, 15, Junior, Pulaski Academy, Little Rock, Arkansas, T: Kim Gammill

Monticello, USAR06, Southeast Arkansas Regional Science Fair

MCRO020 **Tiny Titans: A Comparative Study of the Antimicrobial Effects of Silver Nanoparticles and Silver Nitrate Against MRSA and MSSA**
Jeremy Turner Cotton Ward, 18, Senior, Ridgway Christian School, Pine Bluff, Arkansas, T: Diedre Young

Hot Springs, USAR07, West Central Regional Science Fair

BMED004 **Igniting Tumorigenesis: Gamma-Glutamyl-Glutamine Induced Transformation of NIH 3T3 Cells**
Sabrina Jones, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Patrycja Krakowiak

CBIO002 **Botanical Biomimicry: Using Genetic Algorithms and Plant Phyllotaxy to Determine Optimum-Efficiency Solar Arrays**
John Ostermueller, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Denise Gregory

CHEM009 **Attacking Alzheimer's: Developing New Drugs Using Computational Modeling of Beta-Amyloid Protein Binding**
Sanidhya Dutt Tripathi, 17, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Patrycja Krakowiak

Conway, USAR50, Arkansas State Science Fair

EAEV064 **Assessment of Water Quality of the Gulpha Creek Watershed, Hot Springs National Park**
Rachel Elizabeth Stall, 17, Junior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Lindsey Waddell

EAEV065T **Eradication Methods of Paulownia tomentosa in the Hot Springs National Park**
Hollie Hagler, 18, Senior, Lily Ann Easley, 17, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Lindsey Waddell

EAEV084 **Adsorption of Nitrophenols (NPhs) Using N-Doped Carbonaceous Material**
Anusha Bhattacharyya, 16, Junior, Little Rock Central High School, Little Rock, Arkansas, T: Patrick Foley

PHYS071 **Optimization of the Efficiency of Photovoltaic Cells for Laser Light: An Application to Laser Power Beaming**
Akarsh Kumar, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Brian Monson

ROBO057T **Bridging the Gap Between Robot and Human Interaction**
Ethan William McKinley, 17, Senior, Landon Medlock, 17, Junior, Alma High School, Alma, Arkansas, T: Jeana Parker

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SOFT052T **Support Material Reduction for Fused Filament Fabrication Utilizing Compound Bridging and Constrained Steiner Trees**
Wesston Reed McCollum, 18, Senior, Justin Austin, 18, Senior, Stephen Brad Greenway, 17, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Nicholas Seward

CALIFORNIA

Costa Mesa, USCA01, Orange County Science and Engineering Fair

EBED040 **iCordisX: SmartPhone-Based Personalized Cardiac Monitoring Using Computer Vision and Bluetooth Low Energy**
Patrick Liu, 17, Junior, University High School, Irvine, California, T: Tim Smay

ENBM053 **Optimizing Long-Term Gene Expression Using Chromatin Insulators in Stably Integrated Multi-Gene Constructs**
Morgan Kopecky, 16, Junior, Woodbridge High School, Irvine, California, T: Crystal Cooper

MATH044 **On the Modular Properties of Hypothetical Collatz Loops**
Jian Park, 15, Freshman, Sage Hill School, Newport Beach, California, T: Rena Dear

MATS034 **Designing a Water Repellent and Breathable Material for Wound Dressings Using Nanotechnology**
Sasha Leila Ronaghi, 15, Sophomore, Sage Hill School, Newport Coast, California, T: Anie Robinson

SOFT039 **Wireless Brainwave Classification for Alzheimer's Patients via Efficient Neural Network Computation**
Grant Sheen, 17, Junior, Sage Hill School, Newport Beach, California, T: Annalise Miyashiro

TMED043 **Plastics Destroying Your DNA: An Inquiry into the R-Loop Inducing Behaviors of Bisphenol A and Its Implications**
Amy Xin-Yi Zhong, 17, Junior, University High School, Irvine, California, T: Tim Smay

Los Angeles, USCA02, Los Angeles County Science and Engineering Fair

ANIM064 **Wnt6 in Progenitor Maintenance During Hematopoiesis: A Potential Biomarker for Acute Myeloid Leukemia (AML)**
Titash Biswas, 17, Senior, Crescenta Valley High School, La Crescenta, California, T: Orenda Tuason

MATS050 **Building a Multilayered Hydrogel Microsphere Crosslinked by Genipin for Controlled Dissolution in Drug Release**
Hyokyung An, 16, Junior, Palos Verdes Peninsula High School, Rolling Hills Estates, California, T: Melissa Klose

Fresno, USCA03, Fresno County Science Fair

ENBM032T **SmartRate: A Machine Learning Approach to Predicting Cardiac Arrest**
Sameer Sundrani, 17, Senior, Nikhil Sundrani#, 17, Junior, University High School, Fresno, California, T: Brenda Royce

ENMC032 **Project POWER: A Swift Water Warning System**
Tyler E. Robertson, 16, Junior, Clovis West, Fresno, California, T: Rebecca Avants

PHYS051 **Balloon Based Observation of Sporadic Meteors from the Stratosphere**
Natalie Celeste White, 15, Sophomore, University High School, Fresno, California, T: Brenda Royce

ROBO030 **Safecopter: Developing a Collision Avoidance and Mapping System Based on an Array of Time-of-Flight 3D Cameras**
Robert Gabriel Tacescu, 18, Senior, Clovis North High School, Fresno, California, T: Matthew Carter

Sacramento, USCA04, Sacramento Regional Science and Engineering Fair

BEHA014 **Reducing Test Anxiety to Increase Academic Performance Through Novel Breathing Techniques and Digital Visualization**
Rhitishah Yuva Raju, 15, Sophomore, Mira Loma High School, Sacramento, California, T: Colleen Kelly

PHYS044 **Determination of the Orbital Elements of Near-Earth Asteroid 1999 LO28 Using the Method of Gauss**
Gautam Govind Pradeep, 16, Junior, Mira Loma High School, Sacramento, California, T: Rochelle Jacks

ROBO026 **Early Diagnosis of Alzheimer's Disease Using Machine Learning**
Patrick Song, 17, Junior, Davis Senior High School, Davis, California, T: David Van Muyden

San Diego, USCA05, Greater San Diego Science and Engineering Fair

BMED037 **A Microbiome Approach to Treat Galactosemia, a Life-Threatening Disorder**
Philippe Ingemann Hansen-Estruch, 17, Senior, Canyon Crest Academy, San Diego, California, T: Ariel Haas

ENBM021 **Smartphone-Controlled Portable Phoropter Powered by Variable Focal Length Liquid Lens**
Ronak Roy, 16, Junior, Canyon Crest Academy, San Diego, California, T: Ariel Haas

MATH033 **Asymptotics of Character Sums**
Rachana Madhukara, 16, Sophomore, Canyon Crest Academy, San Diego, California, T: Ariel Haas

PLNT024 **Novel Strategy to Increase Fruit Production via CRISPR-Cas9 Genome Editing**
Alina Virginia Pollner, 16, Sophomore, Canyon Crest Academy, San Diego, California, T: Ariel Haas

San Francisco, USCA06, Golden Gate STEM Fair

ROBO040 **Emotion Recognition from Human Speech Using Temporal Information and Deep Learning**
John Kim, 17, Junior, Menlo School, Atherton, California, T: Rif Saurous

TMED019 **The Effects of Beta-Hydroxybutyrate on the Effects of Beta-Amyloid in *Caenorhabditis elegans***
Anwen Lin, 16, Junior, Santa Rosa High School, Santa Rosa, California, T: Lori Simerly

San Jose, USCA07, Synopsys Silicon Valley Science and Technology Championship presented by the Santa Clara Valley Science and Engineering Fair Association

BMED060 **An Affordable, Autonomous, AI-Enhanced Microscope to Enable Efficient Diagnosis of Parasitic Infection in Developing Countries**
Alice Martynova, 16, Junior, Los Gatos High School, Los Gatos, California, T: Cathy Messenger

CBIO029 **Early-Onset Schizophrenia Detection via Novel Diffusion Tensor Machine Learning of Cingulate-Orbitofrontal Tractography**
Utkarsh Tandon, 18, Senior, Cupertino High School, Cupertino, California, T: Eric Ferrante

CBIO033 **Illuminating Gene Dysregulation in Cancer: Deep Learning Identification of Disrupted Transcription Factor Binding Sites**
Bryan Hau-Ping Chiang, 17, Senior, Lynbrook High School, San Jose, California, T: Nicole Della-Santina

MATH043T **What Properties Define the Eulerian Sequence? A Computer-Inspired Analysis**
Raj Sekhar Reddy Palleti, 16, Sophomore, Suhas Prasad, 15, Sophomore, Monta Vista High School, Cupertino, California, T: Scott DeRuiter

PHYS080 **Automated Identification and Inference of Organic Molecular Structure and Relative Concentrations from Infrared Spectral Data**
Cameron Cole Jones, 16, Junior, The Harker School, San Jose, California, T: Eric Nelson

ROBO041 **Deep, Multimodal Representation Learning for Pan-Cancer Prognosis Prediction**
Anika Cheerla, 16, Junior, Monta Vista High School, Cupertino, California, T: Renee Fallon

ROBO058T **Improving Breast Cancer Detection in Fine-Needle Aspiration Biopsies Through Machine Learning**
Dhanvee Ivaturi, 16, Senior, Philip Kabranov, 16, Junior, Silver Creek High School, San Jose, California, T: Narquiz Cervantes

SOFT040T **Deep Learning Real-Time Object Detection Through Convolutional Neural Networks Using OpenCV and Optical Flow Algorithms for the Visually-Impaired**
Prachi Bhagavatha, 18, Senior, Jasmine Ngo, 18, Senior, Silver Creek High School, San Jose, California, T: Narquiz Cervantes

TMED040 **A Precision Medicine Approach to Cancer: Epigenetic Inhibitors Induce Highly-Specific Apoptosis in High Risk Acute Lymphoblastic Leukemia**
Ruhi Sayana, 17, Junior, The Harker School, San Jose, California, T: Chris Spenner

TMED046T **UCH-L1 and s100B in Saliva as Novel Biomarkers for Severe Traumatic Brain Injury**
Anjay Saklecha, 17, Junior, Krish Brij Kapadia, 17, Junior, The Harker School, San Jose, California, T: Gary Blickenstaff

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Contra Costa County, USCA08, Contra Costa County Science and Engineering Fair

EAEV031 **Microplastics, Macro Problem: A Novel Technique to Remove Microplastics from Water Using a Modified Electrostatic Filter**
Melanie Elise Quan, 15, Freshman, Las Lomas High School, Walnut Creek, California, T: Maria Laws

EAEV034 **Stop the Flame in Its Infancy! Multivariable Early-Warning System for Low-Cost Prevention of Wildfire Proliferation**
Vasily Antonovich Tremsin, 18, Senior, Campolindo High School, Moraga, California, T: Roxanna Jackman

MCRO034 **Using *Penium margaritaceum* to Investigate Cytokinesis Conservation**
Yolanda Aileen Shen, 17, Senior, Dougherty Valley High School, San Ramon, California, T: Katherine Huang

Pleasanton, USCA09, Synopsys Alameda County Science & Engineering Fair

CELL034 **Regulation of Endothelial Cell-Specific Molecule 1 (Esm-1)-Implications in Diabetes and Cancer**
Arvind Muruganantham, 16, Junior, American High School, Fremont, California, T: Joshua Baker

EBED044T **LabTrak: A Micro-Telemetry Device for Modeling Mice Behavior**
Rohan Arora, 17, Senior, Venkat Vinayak Krishnan#, 17, Senior, Anil Ravi Tolwani, 18, Senior, American High School, Fremont, California, T: Joshua Baker

MATS040 **Fabricating a Novel Ultrasensitive Flexible Biosensor with Patterned 10 nm Single Antibody Size Periodic Line Channel Created by Directed Molecular Self-Assembly to Achieve Extremely High Accuracy in the Earlier Detection of Cancer**
Erika Yang, 18, Senior, Granada High School, Livermore, California, T: Amanda Cleveland

MCRO056 **An Effective Peptide Vaccine Against the Zika Virus**
Sruthi Kalavacherla, 15, Sophomore, Amador Valley High School, Pleasanton, California, T: Renee Ogle

SOFT046T **VoiceEDx: A Novel, Voice-Based End-to-End Multi-Disease Diagnostic Platform Featuring a Highly Accurate and Expandable Artificial Intelligence Engine Integrated into a Secure Blockchain Network**
Shiladitya Dutta, 15, Sophomore, Rishik Reddy#, 15, Sophomore, Parth Saxena#, 16, Sophomore, Foothill High School, Pleasanton, California; Amador Valley High School, Pleasanton, California, T: Richard Hanson

Palos Verdes Peninsula, USCA10, Palos Verdes Peninsula Unified School District Science and Engineering Fair

ANIM010 **Mammalian Behavioral Ecology in Southern California Habitat Fragments**
Austin Leonard Nash, 18, Senior, Palos Verdes High School, Palos Verdes Estates, California, T: Julie Munoz

ENBM017 **Design and Mechanical Analysis of a Promising Hip Prosthesis Using Quaternions**
Rei Landsberger, 18, Senior, Palos Verdes Peninsula High School, Rolling Hills Estates, California, T: Melissa Klose

Santa Cruz, USCA11, Santa Cruz County Science and Engineering Fair

BEHA021 **Banding Together: Gender's Role in Collaboration on a Logic Puzzle**
Elias Balslev Gilbert, 15, Sophomore, Santa Cruz High School, Santa Cruz, California, T: Christina Latham

BEHA058 **Can a Preventative Social Media UI Break "Fake News?"**
Ryan Miles Beam, 16, Sophomore, Scotts Valley High School, Scotts Valley, California, T: Erik Wyner

Seaside, USCA12, Monterey County Science and Engineering Fair

BMED038T **The Detection of Peanut Protein on Eating Surfaces in Monterey County Public Schools and on Commercial Passenger Airliners**
Camryn Leigh More, 17, Junior, Annalisa Jane More, 14, Freshman, Salinas High School, Salinas, California, T: Daniel More

ROBO031 **Analyzing the Efficiency of Subsequent Convolutional Layers with Small-Scale Images**
Anjo Baes Pagdanganan, 14, Freshman, Salinas High School, Salinas, California, T: Dinh Nguyen

San Bernardino, USCA13, San Bernardino, Inyo, Mono, (SIM) Science and Engineering Fair

CHEM055 **TiO_2 Hollow Shell Around Gold Nanoparticles–A More Efficient Photocatalyst**
Laura Marie Noronha, 15, Sophomore, Redlands High School, Redlands, California, T: Rashed Aleisa

Riverside, USCA15, Riverside County Science and Engineering Fair

ENMC040 **Proof of Concept Modeling of Venus Atmospheric Maneuverable Platform Utilizing Earth-Bound Modeling**
Spencer Andrew Krock, 17, Junior, Norco High School, Norco, California, T: Benjamin Williams

PLNT035 **High-Resolution Genetic Profiling of Rice Pinpoints Critical Sugar Transport Genes for Engineering of Flood Resistant Crops**
Yushan Su, 17, Senior, Martin Luther King High School, Riverside, California, T: Kristine Jennings

TMED024T **Enhanced Alzheimer's Treatment via External Gamma Brain Wave Stimulation**
Krystal Rose Horton, 16, Junior, Tanner John Packham, 17, Senior, Western Center Academy, Hemet, California, T: Logan Wolny

COLORADO

Alamosa, USCO01, San Luis Valley Regional Science Fair, Inc.

EAEV074 **The Alamosa River Watershed: A Unique Proving Ground for Natural Selection**
Amber L. Michel, 17, Junior, Monte Vista High School, Monte Vista, Colorado, T: Loree Harvey

PHYS027 **Far Out! Analyzing NASA's Kepler Space Telescope Data Using the Transit-Timing Variation Method to Discover Additional Exoplanets in Planetary Systems**
Molly Megan Nehring, 17, Junior, Monte Vista High School, Monte Vista, Colorado, T: Loree Harvey

Durango, USCO02, San Juan Basin Regional Science Fair

BMED065 **Transcription Factor Preferences of Bacterial Detection Proteins**
Rollin Leavitt, 18, Senior, Animas High School, Durango, Colorado, T: Steve Smith

Brush, USCO03, Morgan-Washington Bi-County Science Fair

EGCH009T **Roots for the Road**
Emma Stone, 15, Freshman, Reiley Leake, 15, Freshman, Brush High School, Brush, Colorado, T: David Miner

PHYS028T **Analysis of Various Wing Structures for Hovering Capacity**
Drake Lee Ludgate, 17, Junior, Nathaniel David Miner#, 16, Junior, Brush High School, Brush, Colorado, T: David Miner

Colorado Springs, USCO04, Pikes Peak Regional Science Fair

CHEM016 **Geophone Phase 1: Synthesis and Characterization of a NiO ZnO P-N Type Semiconductor Junction for an Increased Electromechanical Effect**
Jenna Marie Salvat, 17, Junior, Coronado High School, Colorado Springs, Colorado, T: Lynne Williams

CHEM027 **Synthesis of Acetylene-Perfluorinatedpyridine Monomer for Click Mediated Linear Polymerization**
Katelynn Ryenne Salmon, 17, Junior, Palmer Ridge High School, Monument, Colorado, T: Tyler Dall

EAEV015T **Using 3D Drone-Based Digital Models to Investigate the Fluvial Geomorphology of an Eroding Arroyo**
Kathryn Tsi-Pak Kummel, 14, Freshman, Michelle Tsi-ying Kummel##, 17, Senior, William J. Palmer High School, Colorado Springs, Colorado, T: Geoffrey Lewis, T: Reed Carlson

Greeley, USCO06, Longs Peak Science and Engineering Fair

ENBM010 **Solar Powered Decontaminator Design and Testing**
Alyssa Keirn, 16, Sophomore, Rocky Mountain High School, Fort Collins, Colorado, T: Heidi Lovaas

La Junta, USCO07, Arkansas Valley Regional Science Fair

MATS057 **Various Crystals Responding to Environmental Sound Audio**
Adrienne Lillian Jones, 18, Senior, Trinidad High School, Trinidad, Colorado, T: Gina Festi

PHYS013 **Parallax, Part III: A Study on the Effects of Time Duration on a Stellar Parallax's Accuracy**
Antonio Martin Arant, 17, Sophomore, Trinidad High School, Trinidad, Colorado, T: Gina Festi-Gitano

Sterling, USCO08, Northeast Colorado Regional Science Fair

BMED066 **The Effect of Ketoacidosis on the Breath: A Cost-Efficient Way to Monitor Ketones**
Cody Kay Robinson, 16, Junior, Yuma High School, Yuma, Colorado, T: Amy Melby

Boulder, USCO09, Corden Pharma Colorado Regional Science Fair

BCHM011 **Developing a Novel Inhibitor for Cdc14 in the Fungus *Aspergillus niger***
Stephanie Xue Zhang, 18, Senior, Fairview High School, Boulder, Colorado, T: Paul Strode

EBED008 **Diurnal Variation and Duration of Meteors Usable for Radio Communications**
Kyra Slovacek, 18, Senior, Monarch High School, Louisville, Colorado, T: Katharine Ellis

PHYS029 **Measuring Exoplanetary Radii Using Transit Photometry**
Sarah Tang, 15, Sophomore, Fairview High School, Boulder, Colorado, T: Paul Strode

Denver, USCO10, Denver Metropolitan Regional Science and Engineering Fair

BMED070T **Novel Strategies for Detecting and Treating Podocyte Injury in Diabetic Nephropathy**
Nicole Hankovszky, 15, Sophomore, Evelyn Ariana Bodoni, 16, Sophomore, Cherry Creek High School, Greenwood Village, Colorado, T: Keith Harrison

ENMC013 **Suppression of Aeroelastic Instabilities in High Ratio Wing Structures Using Principal Component Analysis**
Krithik Ramesh, 15, Sophomore, Cherry Creek High School, Greenwood Village, Colorado, T: Keith Harrison

MCRO010 **Optimizing the Ratios of Manuka Honey to Adhesive in an Antibacterial Surgical Adhesive**
Peyton Maria Leyendecker, 15, Sophomore, Skyview Academy, Highlands Ranch, Colorado, T: Timothy Smith

Fort Collins, USCO50, Colorado Science and Engineering Fair

ANIM022 **Mealworms... A Potential Solution to the Global Plastic Problem**
\# Alyssa H. Rawinski, 17, Junior, Monte Vista High School, Monte Vista, Colorado, T: Loree Harvey

BMED075 **Computational and Experimental Methods to Find Targets of HCFC1, a Gene Linked to Neurological Disease**
Anand Manohar Chundi, 15, Sophomore, Skyview Academy, Highlands Ranch, Colorado, T: Timothy Smith

EAEV017 **A Tale of Two Fishes: An Analysis of Differentiation in Compositional Characteristics of Two Distinct Fossil Butte Member Localities**
\## Casey John Shaw, 17, Senior, Liberty High School, Joes, Colorado, T: Linda Niccoli

MATS053 **A Novel Approach for Sensing Seismic Events: Applications of Graphene Nanoflake Powder Composites, Part Two**
\# Isaac Nicholas Jordan, 17, Senior, Southwest Colorado eSchool, Durango, Colorado, T: Michael Jordan

TMED004 **Bruxism: A Novel Diagnostic Approach**
\# Edwin Christopher Bodoni, 17, Junior, Cherry Creek High School, Greenwood Village, Colorado, T: Keith Harrison

CONNECTICUT

Redding, USCT02, Connecticut STEM Fair

EAEV008 **Testing the Effectiveness of Various Shading Materials to Mitigate Effects of Climate Change on Mock Leatherback Sea Turtle Nests**
Annabelle Christine Colao, 18, Senior, Ridgefield High School, Ridgefield, Connecticut, T: Ryan Gleason

EAEV027 **Sinkhole Detection Using Wireless Sensor Networks and Structural Health Monitoring**
Sophia Joy Wang, 15, Sophomore, Amity Regional High School, Woodbridge, Connecticut, T: Deborah Day

TMED002 **Honeybee Melittin Apitherapy for Targeted Cancer Cell Suppression and Decimation**
Dante Grace Minichetti, 17, Senior, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante

Hamden, USCT50, Connecticut Science & Engineering Fair

CHEM029 **Synthesis and Separation of Chiral Compounds in the Preparation of a PET Radiotracer Targeting Synaptic Vesicle Glycoprotein 2A**
Maya N. Geradi, 17, Senior, Wilbur Cross High School, New Haven, Connecticut, T: Bernard Hulin

ENBM022 **Non-Invasive, Low-Cost Detection of Chronic Obstructive Pulmonary Disease (COPD) via Smartphone Breath Analysis**
Hiba Hussain, 15, Sophomore, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante

ENEV026 **Magnetically Induced, Visual Detection of Trace Arsenic Contaminants in Water Using Fe3O4 Photonic Crystal Structures**
Raina Jain, 15, Sophomore, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante

ENMC033 **Undulated Leading-Edge Airfoils in Low to Medium Reynolds Number Regime**
Keshav Vedula, 18, Senior, CREC Academy of Aerospace and Engineering, Windsor, Connecticut, T: Michelle Bellinger

MATS014T **Effect of Experimental Parameters on Forming Prince Rupert's Drops for Maximum Strength and Toughness**
Srikar Reddy Godilla, 16, Junior, Cristian Alexen Rodriguez, 17, Junior, CREC Academy of Aerospace and Engineering, Windsor, Connecticut, T: Michelle Bellinger

TMED015 **Controlled-Release Delivery of Ovarian Anticancer Paclitaxel via Vortex Ring, Donut-Shaped Hydrogels**
Emily C. Philippides, 17, Senior, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante

TMED020 **Detection of Early-Stage Alzheimer's Disease via Hierarchical Classification of Proteomic and Clinical Profiles**
Shobhita Saroja Sundaram, 17, Senior, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante

DISTRICT OF COLUMBIA

Washington, USDC01, District of Columbia STEM Fair

EBED054 **Using Piezoelectric Sensors to Find the Center of Gravity of an Aircraft**
Everett Reed, 17, Senior, Washington Math Science Technology PCHS, Washington, District of Columbia, T: Clyde Henderson

EGPH024 **Investigation of Novel and Unconventional Microwave Antenna Designs Using *in silico* Modeling**
Samuel Brian Lossef, 17, Junior, School Without Walls High School, Washington, District of Columbia, T: Adam Vrooman

EGPH028 **Eggtricity: The 3-D Printed Buoy that Generates Sustainable Energy Using Wave Movement**
Catalina Teresa Lemus, 17, Junior, Georgetown Visitation Preparatory School, Washington, District of Columbia, T: Quillian Haralson

FLORIDA

Avon Park, USFL01, Heartland Regional Science and Engineering Fair

ENMC007 **Is Your Smart Phone Leaking? Year Three**
Camila Rimoldi Ibanez, 15, Freshman, Sebring High School, Sebring, Florida, T: Andrea Rimoldi

PLNT013 **DNA Sequencing and Phylogenetics for the Conservation of the Florida Ridge Biodiversity**
Rohin Pankaj Patel, 15, Sophomore, Sebring High School, Sebring, Florida, T: Deena Wright

Bradenton, USFL02, Manatee STEM Competition

ENMC009 **Detecting Earthquakes Using a Two-Dimensional Pendulum**
Ephram Jonah Edelkind, 14, Freshman, Manatee High School, Bradenton, Florida, T: Patricia Zalo

Fort Myers, USFL05, Thomas Alva Edison Kiwanis Science and Engineering Fair

CHEM001 **Isolation and Identification of Quercetin from the Leaves of *Psidium guajava* by Gas Chromatography-Mass Spectrometry and Evaluation of the Extract for Anti-Cancer Activity Using the Brine Shrimp Cytotoxicity Bio-Assay**
\# Anna Kucera, 17, Senior, Canterbury School, Fort Myers, Florida, T: Mike Haughey

EAEV055 **Insights into the Effects of Tropical Disturbances Hurricane Irma and Invest 92L on the Dynamics of the Phytoplankton Community of the Estero Bay Estuary**
Mark Ethan Leone, 15, Sophomore, Canterbury School, Fort Myers, Florida, T: Michael Haughey

MCRO006 **Green Watts: Investigating Power Generation of Spartina patens Compared to *Chlorophytum comosum* by Utilizing a Mixed *Shewanella oneidensis* MR-1 Community in a Plant Microbial Fuel Cell (A Novel Fourth Year Study)**
Luke M. Long, 17, Junior, Canterbury School, Fort Myers, Florida, T: Michael Haughey

PHYS001 **Challenging Limitations: Using Deep Learning, Time Series Analysis, and Statistical Methods for Noise Reduction to Develop an Innovative Approach to Exoplanet Candidate Detection Using Earth-Based Telescopes**
\# Dahlia Dry, 17, Junior, Fort Myers High School, Fort Myers, Florida, T: Cathy Tucker

ROBO069 **Solar Powered Intelligent Irrigation System**
Jackson Wolfe Windhorst, 16, Junior, Fort Myers High School, Fort Myers, Florida, T: John Woodward

Fort Pierce, USFL06, St. Lucie County Regional Science and Engineering Fair

CBIO034 **The Role of Kinetic Parameters in Phenotypic Switches**
Sreya Banik, 15, Sophomore, Lincoln Park Academy, Fort Pierce, Florida, T: Sally VanDereedt

TMED051 **Cytotoxic Effects of Sulindac, Metformin, and TBHP on *in vitro* Lung Cancer Cells and the Effects of Glucose Level on Efficiency of the Treatment**
\# Shreya Reddy, 16, Junior, Lincoln Park Academy, Fort Pierce, Florida, T: Lisa Hevner

Fort Walton Beach, USFL07, Panhandle Regional Science and Engineering Fair

EAEV004 **Crumb Rubber for Artificial Turf: The Effects of Herbs on Environmental Runoff**
Connor N. Cleveland, 18, Senior, Fort Walton Beach High School, Fort Walton Beach, Florida, T: Devon LaMonica

ENBM005 **Single-Step Breast Cancer Detection Method Through Measurement of Gold Nanoparticle Adsorption to Lysine Amino Acid**
Liam A. Ordner, 17, Junior, Niceville High School, Niceville, Florida, T: Gina Emery

MATS006 **Reclaimed Consumer Waste and Additive Manufacturing: The Perfect Blend**
Daniel Craig Bobbitt, 18, Senior, Niceville High School, Niceville, Florida, T: Gina Emery

Gainesville, USFL08, Alachua Region Science and Engineering Fair

BMED008 **Protective Effects of Natural Products like Curcumin and *Centella asiatica* Against Amyloid Beta Induced Mitochondrial Dysfunction in Ocular Manifestations of Alzheimer's Disease**
Himanshi Verma, 16, Sophomore, Eastside High School, Gainesville, Florida, T: Adrienne Thieke

Ft Lauderdale, USFL09, Broward County Science Fair

BEHA043 **Treating Parkinsonian Neurodegeneration in Diabetic, Paraquat-Exposed *Drosophila* by Increasing Caffeine Intake**
Ephraim Oyetunji, 17, Junior, American Heritage School, Plantation, Florida, T: Leya Joykutty

BMED067T **Near Infrared Light Photobiomodulation and *C. longa* Mitigates the Neurological Effects of Mutant Amyloid Beta Precursor Protein Pathway in *D. melanogaster***
Hoang Le, 17, Junior, Laura Sarah Allen, 17, Junior, Western High School, Davie, Florida, T: Gina Cory

EGCH031 **Creating a Cost-Efficient Water Soluble Carbon Capture System for CO_2 Emitting Vehicles to Increase Biofuel Production Efficiency**
Satya Phoenix Alagarsamy, 17, Junior, American Heritage School, Plantation, Florida, T: Leya Joykutty

ENBM060 **Novel Vascularization of Mouse Heart Tissue-Engineered Vascular Scaffolds by Triggering Decidualization of Mouse Endometrial Stromal Cells for Use in Bio-Synthetic Organs**
Emily Pallack, 17, Junior, American Heritage School, Plantation, Florida, T: Leya Joykutty

ENEV074 **A Novel Approach to the Bioremediation of Concurrent 1,4-Dioxane and Chlorinated Solvent cis-DCE Contamination**
Lauren Waldman, 17, Senior, American Heritage School, Plantation, Florida, T: Leya Joykutty

Jacksonville, USFL10, Northeast Florida Regional Science and Engineering Fair

BMED003 **Discovery of Blood-Brain Barrier Disruption Regional Variability and Neuronal and Glial Uptake of Fibrinogen in Multiple System Atrophy Using a Novel Color Deconvolution Algorithm**
Devanik Biswas, 18, Senior, Stanton College Preparatory School, Jacksonville, Florida, T: Tamla Simmons

MATS001 **Tensile Testing of Additively Manufactured Joineries Complementary to Digital Engineering**
Zhaoxian Zhang, 17, Senior, Episcopal School of Jacksonville, Jacksonville, Florida, T: Marion Zeiner

PHYS006 **Using a Computer Program to Compensate for the Force Differentiation Between Two Electromagnets Simulating Earth's Gravity in Space**
MaryAlice Diana Young, 16, Sophomore, Bishop Kenny High School, Jacksonville, Florida, T: Vicki Schmitt

PLNT056 **Iodine Biofortification of *Lactuca sativa var. longifolia* in an Ebb and Flow Hydroponic System**
Julia Elizabeth Downes, 17, Junior, Episcopal School of Jacksonville, Jacksonville, Florida, T: Marion Zeiner

Lake City, USFL11, Suwannee Valley Regional Science and Engineering Fair

CBIO003 **Analysis of the HBG2-4kb DNase I Hypersensitive Site Before and After the Knockout of the HBD-1kb Region in the Beta-Globin Locus**
Alex Salvador Perez, 17, Junior, Union County High School, Lake Butler, Florida, T: Renae Allen

Bartow, USFL12, Polk Region Science and Engineering Fair

CHEM010 **Lipid Layer's Permeability of Amino Acids in Primordial Earth**
Mark C. Brigman, 18, Senior, Polk State Collegiate High School, Lakeland, Florida, T: Leah Whitehead

ENMC008 **Electromagnetic Wall Climber**
Matthew Garrett Graham, 15, Freshman, Polk Pre-Collegiate Academy, Auburndale, Florida, T: Michelle Thompson

Melbourne, USFL13, Brevard South Science and Engineering Fair

CELL005 **Can Lowering Mutant Huntingtin Limit Susceptibility to Oxidative Stress in HD Neurons?**
Ritika Jeloka, 16, Sophomore, Melbourne High School, Melbourne, Florida, T: Robin Floyd

CHEM011 **Will Fluorescent Dyes Be Able to Detect the Saccharide D-Galactose on Parasites, such as T*rypanosoma cruzi*?**
Abigail Haydee Soliven, 15, Sophomore, Melbourne High School, Melbourne, Florida, T: Kayla Carpenter

Merritt Island, USFL14, Brevard Intracoastal Regional Science and Engineering Fair

BMED006 **Effectiveness of 3D *vs.* 2D *in vitro* Well Treatments**
Lillian Nicole Zobel, 18, Senior, Satellite High School, Satellite Beach, Florida, T: Joseph Scott

PHYS012 **Using Spectral Analysis to Calculate Space/Time Distribution**
Kelli Ann Lynch, 18, Senior, Satellite High School, Satellite Beach, Florida, T: Joseph Scott

Miami, USFL15, South Florida Science and Engineering Fair

ANIM065 **The Effect of Turmeric upon the Mortality and Mobility of *Drosophila melanogasters* with Alzheimer's**
Arielle Jasmine Fedee, 17, Junior, Westminster Christian School, Palmetto Bay, Florida, T: Lisa Garrido

ANIM068 **Unintended Consequences of the Sunscreen Compound Oxybenzone on the Threatened Staghorn Coral *Acropora cervicornis***
Madison Kristin Precht, 18, Senior, Westminster Christian School, Palmetto Bay, Florida, T: Lisa Garrido

EAEV018 **Biodegradation of Polystyrene by Superworms**
Ariana Nicole Peralta, 18, Senior, Medical Academy for Science and Technology, Homestead, Florida, T: Jennifer Barreto

EAEV043 **The Abundance and Population Health of Common Reef Fish in Protected Marine Reserves Compared to Unprotected Reef Environments, Utilizing Baited Remote Underwater Video (BRUV) Surveys**
Michael Noah Odzer, 15, Freshman, Dr. Michael M. Krop Senior High School, Miami, Florida, T: David Buncher

ENEV018 **Cleaner Bottoms, Part III, Hull Materials: An Environmentally Friendly Method of Reducing Barnacle Growth and Improving the Quality of Our Waterways Using Ultrasonic Waves**
Isabela Victoria Perdomo, 15, Freshman, MAST at FIU Biscayne Bay Campus, North Miami, Florida, T: Cristina Madrigal

PHYS030 **Are We on the Dark Side of the Universe?**
Michael Bregar, 16, Sophomore, MAST at FIU Biscayne Bay Campus, North Miami, Florida, T: Cristina Madrigal

Ocala, USFL16, Big Springs Regional Science Fair

MATH002 **A Probabilistic Formulation of the Computational Analysis of Stratified Spaces**
Gianfranco Cortes-Arroyo, 16, Senior, West Port High School, Ocala, Florida, T: Janice David

PHYS016 **Energy Transformation Associated with the Creation of an Electromagnetic Field**
Haylee Adelaide Darling, 14, Freshman, St. John Lutheran School, Ocala, Florida, T: Jennifer Fontaine

Orlando, USFL17, Dr. Nelson Ying-Orange County Science Exposition

BCHM007 **The Role of Sarcolipin Protein on Energy Expenditure and Obesity Prevention**
Kadambari Vyas, 17, Junior, Lake Nona High School, Orlando, Florida, T: Valerie Ledford

BMED007 **Differential Inflammatory Genes Expression Between the Inflamed and the Unaffected Gut Tissues of Inflammatory Bowel Disease Patients**

Radhika Uday Desai, 18, Senior, Lake Highland Preparatory School, Orlando, Florida, T: Zasha Mickey

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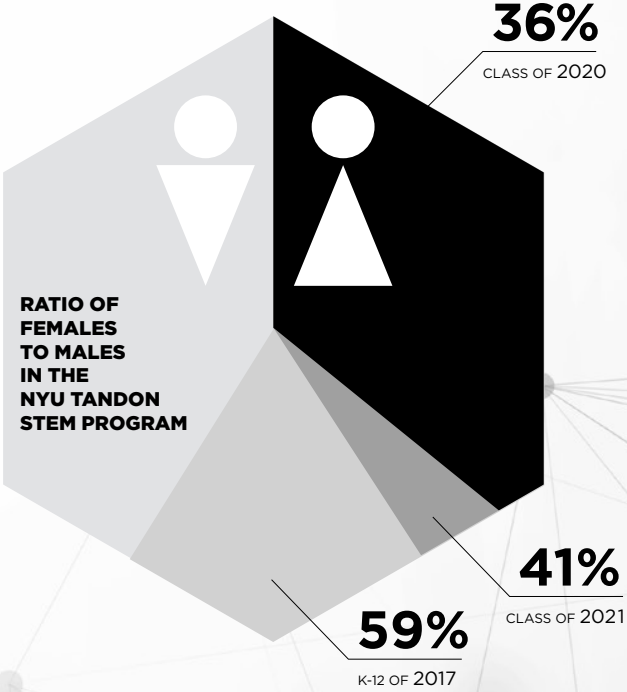

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ENEV051 **Hydrogen Generation and the OER Electrode**
Madison M. Autrey, 16, Junior, Trinity Preparatory School, Winter Park, Florida, T: Michael Arney

MATS005 **Novel Agarose Processing Techniques: Design and Characterization of a Sturdy, Porous Foam for Controlled Topical Drug Delivery**
Hamzah Faiyaaz Jhaveri, 18, Senior, Lake Highland Preparatory School, Orlando, Florida, T: Zasha Mickey

Bushnell, USFL18, Sumter County Regional Science Fair

CELL002 **Transient Expression of Flowering Locus T1 in *Arabidopsis thaliana* via Cell-Penetrating Peptides**
Antonio Hernandez, 18, Senior, South Sumter High School, Bushnell, Florida, T: Emily Keeler

EAEV002 **Aquaponics and Hydroponics; Experimentation in Real World Environments**
Makayla Bedgood, 15, Junior, South Sumter High School, Bushnell, Florida, T: Emily Keeler

MCRO002 **Do Microorganisms or Mealworms Poly-degrade Polystyrene Faster?**
Sarah Whittle, 15, Freshman, The Villages Charter High School, The Villages, Florida, T: Monica Vinas

MCRO005 **Are Bacteria Transport Properties Correlated to Hydraulic Conductivity and Geochemical Heterogeneity of the Porous Medium "Synthetic Porous"?**
Rachael Yacuzzo, 14, Freshman, South Sumter High School, Bushnell, Florida, T: Emily Keeler

PLNT003 **Propagation of Allelopathic Properties Present in *Ailanthus altissima* and *Juglans nigra* for Efforts in Circumventing Holistic Debilitation in Response to Occupational Herbicide Exposure**
Jorge Abel Guillen, 18, Senior, South Sumter High School, Bushnell, Florida, T: Emily Keeler

Panama City, USFL19, Florida Three Rivers Regional Science and Engineering Fair

SOFT054 **Do You See What I'm Saying? A Voice to Text Human-Machine Interface for the Hearing Impaired**
Alex Johnson, 16, Sophomore, Rutherford High School, Panama City, Florida, T: Beverly Barron

Pensacola, USFL20, West Panhandle Regional Science and Engineering Fair

EBED009 **Monitoring Environmental Status of a Mesocosm Using an ESP32**
Richard Alexander Pope, 16, Junior, Pensacola High School, Pensacola, Florida, T: Cherie Stephens

Saint Augustine, USFL21, St. Johns County Science Fair

ROBO011 **Edge Detection in the Line of Sight**
Aditya Singh, 15, Freshman, Allen D. Nease High School, Ponte Vedra, Florida, T: Marna Fox

TMED006 **New Potential Therapy for Ovarian Cancer: Stearoyl-CoA Desaturase-1 (SCD1) Inhibition with the Novel Compound SSI-4**
Yara Maria Chehade, 18, Senior, Allen D. Nease High School, Ponte Vedra, Florida, T: Debra Tewey

Sanford, USFL23, Seminole County Regional Science, Mathematics & Engineering Fair

BEHA002 **KeMotions: Keys to Emotional Cues, Year Two**
Sapna Karina Patel, 17, Senior, Oviedo High School, Oviedo, Florida, T: William Furiosi

ENEV088 **The Gel of the Future: The Extraction and Creation of Polyethylene Degrading Bacterial Gel**
Taeseung Um, 18, Junior, Oviedo High School, Oviedo, Florida, T: William Furiosi

PLNT006 **Microneedle-Assisted Delivery of Model Therapeutics in Plant Tissue**
Laboni Santra, 14, Freshman, Oviedo High School, Oviedo, Florida, T: William Furiosi

Stuart, USFL25, Martin County Regional Science and Engineering Fair

SOFT057 **Diagnosing Manifestations of Cardiovascular, Renal, and Liver Disease in the Fingernail Through a Convolutional Neural Network in a Smartphone Application**
Varun Annamalai Lakshmanan, 16, Junior, South Fork High School, Stuart, Florida, T: David Hill

Tallahassee, USFL26, Capital Regional Science and Engineering Fair

SOFT038 **An Algorithmic Approach with Matching Theory for Effective Prediction of Kidney Waitlist Times and Post-Transplant Survivability**
Sameer Ponnaluri, 16, Sophomore, Maclay School, Tallahassee, Florida, T: Ariel Simonton

TMED041 **Development of a Novel Organic Chemiresistor Sensor for Disease Detection Through Breath: Applied Through a Computational Model**
Akhil Kadamala Shiju, 16, Sophomore, Lawton Chiles High School, Tallahassee, Florida, T: Angela Breza-Pierce

Tampa, USFL27, Hillsborough Regional Science Fair

BMED021 **Effect of Protein Kinase Inhibitors on Tau Hyperphosphorylation as a TBI Cell-Based Model**
Milin Jiji Kurup, 18, Senior, T. R. Robinson High School, Tampa, Florida, T: Dawn Carson

CELL008 **Genome Architecture Indicates Cellular Potential in Embryonic Stem Cell Differentiation**
Sruthika Baviriseaty, 17, Senior, C. Leon King High School, Tampa, Florida, T: Dodi Cline

Merritt Island, USFL28, Brevard Mainland Regional Science and Engineering Fair

ANIM009 **Determining the Effect of a Top-Level Predator in a Simulated Aquatic Ecosystem with Organisms Used for the Mitigation of HABs**
Nathan Foo, 14, Freshman, West Shore Junior/Senior High School, Melbourne, Florida, T: Paula Ladd

MATH006 **A Fine Classification of Second Minimal Odd Orbits**
Muhammad Ugur Oglu Abdulla, 18, Senior, West Shore Junior/Senior High School, Melbourne, Florida, T: Mary Schropp

MCRO057 **Potential Gene Therapy of Human Liver Cancer with Recombinant AAV3 Flp-FRT Vectors**
Nivetha Aravind, 17, Senior, Viera High School, Viera, Florida, T: Elizabeth Youngs

West Palm Beach, USFL29, Palm Beach Regional Science and Engineering Fair

BMED048 **Tissue-Specific Requirement of Autophagy Gene Atg-18 Is Essential for Lipid Metabolism Regulated by Insulin-like Signaling in *Caenorhabditis elegans***
Ray Jia, 18, Senior, Alexander W. Dreyfoos School of the Arts, West Palm Beach, Florida, T: Stephen Anand

EAEV044 **Carbon Capture Using Solid Sorbents. Amine-tethered Polystyrene and Ppolyacrylic Polymers for CO_2 Adsorption**
Glenn Manuel Grimmett, 16, Sophomore, American Heritage School of Boca Delray, Delray Beach, Florida, T: Iris Thompson

MATS026 **Radiation Prevention: One Fiber at a Time**
Kaylee Cunningham, 18, Senior, Olympic Heights Community High School, Boca Raton, Florida, T: Lawrence Korn

MCRO041 **Utilizing Kefir Bacteria to Target NF-kB of the Bax Gene to Induce Apoptosis in Colorectal Adenocarcinoma Cells**
Tushar Sanjay Shenoy, 16, Junior, American Heritage School of Boca Delray, Delray Beach, Florida, T: Iris Thompson

SOFT033 **A Novel Cryptographic Hash Code Algorithm Based on Cellular Automata**
Rishabh Mohanka, 17, Junior, Suncoast Community High School, Riviera Beach, Florida, T: Jeffrey Laufer

New Port Richey, USFL30, Pasco Regional Science and Engineering Fair

CELL043 **The Evolution of Antibiotic Resistance Through Protein Mutations**
Adis Kukuljac, 18, Senior, James W. Mitchell High School, New Port Richey, Florida, T: Edwin Braddy

MATH053 **Deconstructing Complexity of Large Topological Models**
Roshan Warman, 17, Junior, Academy at the Lakes, Land O' Lakes, Florida, T: Colleen McCormick

PLNT068 **Using Guaiacol to Measure the Effect of a Hormone with Antioxidant Properties (N-Acetyl-5-Methpxytryptamine) on the Rate of Photosynthetic Reactions in Plants via Oxygen Production**
Chase Olivanti, 16, Sophomore, Wiregrass Ranch High School, Wesley Chapel, Florida, T: Branden Anglin

Vero Beach, USFL31, Indian River Regional Science and Engineering Fair

ROBO008 **The Creation of a Wearable Device Using Artificial Intelligence Technologies to Aid the Visually Impaired**
Omar Shareef, 16, Junior, Saint Edward's School, Vero Beach, Florida, T: Kerryane Monahan

Sarasota, USFL32, Sarasota County STEM Summit

ANIM066 **The Impact of Ocean Acidification on Lytechinus variegatus Fertilization & Development**
Logan M. Track, 18, Senior, Sarasota High School, Sarasota, Florida, T: Andrew Harshman

BMED064 **The Effect of Folic Acid on Adipose Derived Mesenchymal Stem Cells Migration and Proliferation with Gamma Secretase Inhibitor**
Kathryn L. Richards, 17, Senior, Sarasota High School, Sarasota, Florida, T: Courtney Coppola

Clermont, USFL34, Lake Regional Science & Engineering Fair

EAEV066 **Which Solar Reflector Increases Solar Efficiency the Most?**
Charles Bryce Buchanan, 15, Freshman, South Lake High School, Groveland, Florida, T: Heather Brough

Green Cove Springs, USFL35, Clay Rotary Regional Science and Engineering Fair

BMED083 **A Novel Inflammation Detection Device Through Hydrogen Peroxide Decomposition**
Michael Chen, 15, Sophomore, Ridgeview High School, Orange Park, Florida, T: Christopher Okamoto

Lakeland, USFL50, State Science and Engineering Fair of Florida - Ying Scholars

ANIM003 **Analyzing the Relationship Between Herbicide Introduction and the Development of *Gallus domesticus* Embryos**
Katelyn Nicholson, 17, Senior, Episcopal School of Jacksonville, Jacksonville, Florida, T: Marion Zeiner

BEHA047 **Combatting Familial Alzheimer's Disease by Comparing Calcium Retention of Mutated Presenilin Genes and Assessing the Restorative Potential of Parathyroid Hormone in a *Caenorhabditis elegans* Model**
Amber Bhutta, 16, Junior, American Heritage School, Plantation, Florida, T: Leya Joykutty

BMED014 **Efficiency of a Novel Nano-Cardiac Device for Atherectomy of Coronary Artery Occlusion**
Ethan Zvi Levy, 15, Sophomore, Dr. Michael M. Krop Senior High School, Miami, Florida, T: David Buncher

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BMED055 **Developing Diagnostic Tools for Vascular Disease Using RNA Markers**
\# Brindha Priya Rathinasabapathi, 16, Sophomore, Eastside High School, Gainesville, Florida, T: Adrienne Thieke

CHEM043 **Designing Sustainable Adsorbents to Remove Arsenic from Drinking Water Using Computer-Aided Molecular Design**
Rajat Kaushik Doshi, 16, Junior, Henry B. Plant High School, Tampa, Florida, T: Lindsay Tait

EAEV056 **Combating Hepatocellular Carcinoma in the Developing World: A Novel Discovery of the Fungicidal Potential of Bicarbonate Solutions Against *Aspergillus flavus***
Evan Thomas Collins, 18, Senior, Ridgeview High School, Orange Park, Florida, T: Bethany Derousie

ENEV059 **Developing a Biologically Based Artificial Leaf to Filter and Transform Carbon Dioxide Emissions into Oxygen via Photosynthesis**
Vithulan Suthakaran, 17, Junior, Florida Atlantic University High School, Boca Raton, Florida, T: Robin Barkes

MATS003 **Developing a 3D Printer Capable of Producing Hybrid Hydrogel Based Artificial Cartilage**
Anna C. Feldbush, 19, Senior, West Shore Junior/Senior High School, Melbourne, Florida, T: Paula Ladd

GEORGIA

Albany, USGA01, Darton College/Merck Regional Science Fair

EAEV003 **An Efficient Water Purification Method Using Renewable Energy**
Prerana Kumar, 18, Senior, Americus Sumter High School, Americus, Georgia, T: Pushpa Rajan

Atlanta, USGA03, Atlanta City Science & Engineering Fair

BMED015 **Nanoparticle-Mediated Sorting of Circulating Tumor Cells**
Kaiya Mitchell, 18, Senior, Benjamin E. Mays High School, Atlanta, Georgia, T: Angela Bush

EBED010 **Wearable Tech Glove Enabling Speech Through Hand Gestures**
Ethan Nathaniel Damiani, 16, Junior, Henry W. Grady High School, Atlanta, Georgia, T: Tonia Schofield

PHYS026 **The Search for Newborn Stars: Observing Bok Globules Using Infrared Archival Data**
\# Anderson Thrasher, 17, Senior, Henry W. Grady High School, Atlanta, Georgia, T: Luke Esposito

Stone Mountain, USGA04, Dekalb Science & Engineering Fair

CBIO023 **New Cell Type Detection via a Universal Single-Cell Gene Expression Algorithm**
\# Zoe Weiss, 17, Junior, Lakeside High School, Atlanta, Georgia, T: Tania Murphy

TMED031 **Novel Nanotechnology for the Detection of Circulating Tumor Cells**
Alyssa Wu, 17, Junior, Chamblee Charter High School, Chamblee, Georgia, T: Deann Peterson

McDonough, USGA06, Henry County Science and Engineering Fair

CELL006 **Prototypical Galectins and the Innate Immunity Against Molecular Mimicry**
\# Marissa Rose McDonald, 18, Senior, Union Grove High School, McDonough, Georgia, T: Keron Gwaltney

ENMC003 **Dynamo Powered Vaccine Carrier for Off-Grid Locations, Year Two**
Susanna Ruth Dorminy, 16, Junior, Sola Fide Home School, McDonough, Georgia, T: Ann Dorminy

ROBO002 **Affordable Autonomous Vehicle System**
Parkaranjot Singh, 16, Sophomore, Dutchtown High School, Hampton, Georgia, T: Yamini Mital

Milledgeville, USGA07, Georgia College & State University Regional Science and Engineering Fair

CBIO017 **Comparing Lichen Phenotypic Expression with Genomic Verification**
\# Jessica Deonna Moore, 18, Senior, Jasper County High School, Monticello, Georgia, T: Elizabeth Proctor

Griffin, USGA09, Griffin RESA Regional Science Fair

CBIO024T **Experimental External Neural Pathway for Motion in Stroke Victims**
Jacqueline Frances van Zyl, 16, Sophomore, Caitlin Patrica van Zyl, 16, Sophomore, McIntosh High School, Peachtree City, Georgia, T: Seth Bishop

SOFT010 **The Construction and Accuracy of a Glove-Based Joint Sensor**
Sam Paul Triplett, 16, Sophomore, McIntosh High School, Peachtree City, Georgia, T: Seth Bishop

Warner Robins, USGA10, Houston Regional Science and Engineering Fair

MATS004 **Green Synthesis of Antibacterial Silver Nanoparticles from Georgia Peach**
Harshvardhan Singh, 16, Junior, Houston County High School, Warner Robins, Georgia, T: Stacy McLean

MCRO008 **Metformin Inhibits Bacterial Glycerol Metabolism: Implications for Medicinal Effect**
Isha Shah, 16, Sophomore, Veterans High School, Kathleen, Georgia, T: Bethany Silver

Duluth, USGA11, Gwinnett Regional Fair

BEHA007 **A Rapid Prediction Method for Epileptic Seizures Using Machine Learning Algorithms** #
Suraj Modi, 16, Junior, Mountain View High School, Lawrenceville, Georgia, T: Billy Jones

ENMC025T **A Helping Hand for Arthritis Pain Relief & Rehabilitation**
Natalie Noel Luong, 17, Junior, Jenna White, 17, Junior, Ana Bogdanova, 16, Junior, Peachtree Ridge High School, Suwanee, Georgia, T: Gabriel Pak

MCRO028T **Microbial Analysis and Categorization of School Surfaces**
Camryn Ivette Flores, 17, Junior, Britley Sierra Jones, 17, Junior, Lanier High School, Buford, Georgia, T: Margaret Rohrbaugh

Conyers, USGA12, Rockdale Regional Science & Engineering Fair

EGPH026 **Harvesting Energy from Raindrops Using Piezoelectric Generator**
Huong Ho, 17, Junior, Rockdale Magnet School for Science and Technology, Conyers, Georgia, T: Shelley Seagraves

ENEV019 **Time of the Month: Bad for the Environment?**
Tykera Carmen Moore, 16, Junior, Rockdale Magnet School for Science and Technology, Conyers, Georgia, T: Scott Robinson

MCRO058 **Treating SSSI Using an Antibiotic Silk Fibroin Solution** #
Michelle Nguyen, 17, Senior, Rockdale Magnet School for Science and Technology, Conyers, Georgia, T: Scott Bolen

Atlanta, USGA13, Fulton County Regional Science & Engineering Fair

ENEV005 **Biodiesel Fuel Production via Mild Chemical Recycling of Thermosetting Polymers**
Emily Guo, 17, Junior, Chattahoochee High School, Johns Creek, Georgia, T: Matt Mihordea

ROBO009 **Predicting Parkinson's Disease Using AI and Machine Learning**
Shreya Ramesh, 15, Sophomore, Milton High School, Milton, Georgia, T: Varsha Sonawane

Athens, USGA50, Georgia State Science and Engineering Fair

ANIM048 **Acoustic Signatures: A Novel Tool to Detect Muscle Myopathy**
Divya Srinivasan, 17, Junior, Johns Creek High School, Johns Creek, Georgia, T: Shea Pullen

CELL030 **Expression of Arginase in Murine Colon Cells During Wound Healing Confirms the Presence of Myeloid Derived Suppressor Cells**
Joseph Zhang, 17, Junior, Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, Georgia, T: Susan Kramer

MATS027 **Casualty Care Improvised Direct Pressure Adjunct**
Marissa Claire McAfee, 17, Senior, South Forsyth High School, Cumming, Georgia, T: Melissa Smith

TMED042 **Development of a Drug-Likeness Rule for Natural Products**
Saadh Ahmed, 17, Senior, Northview High School, Johns Creek, Georgia, T: Rebecca Bingham

HAWAII

Honolulu, USHI01, Hawaii Association of Independent Schools Science and Engineering Fair

PHYS014 **Angular Reconstruction Algorithm for Galactic Cosmic Ray Shower Arrays**
Yufei Xiao, 17, Junior, Iolani School, Honolulu, Hawaii, T: Yvonne Chan

TMED003 **Synergistic Relationship of Cisplatin and Withaferin A in the Treatment of Triple-Negative Breast Cancer**
Terric Tojo Abella, 18, Senior, Kamehameha Schools Kapalama Campus, Honolulu, Hawaii, T: Gail Ishimoto

Waipahu, USHI02, Leeward District Science and Engineering Fair

EAEV019T **Effects of Different Frequencies of Electromagnetic Radiation on the Growth Rates of the Cyanobacteria *Spirulina platensis***
Alyssa Yumi Watarida, 15, Sophomore, Michelle Cho Tam, 15, Sophomore, Kapolei High School, Kapolei, Hawaii, T: Jeremy Soriano

ENMC026 **Saving Our Environment: Ash to Concrete**
Dylan Tornquist Tucker, 17, Junior, Waipahu High School, Waipahu, Hawaii, T: Lucille Imamura

ENMC044 **Evaluation of Scrubber Designs for Cleaning Ship's Hulls**
Lily Gabrielle Adcock, 16, Junior, Pearl City High School, Pearl City, Hawaii, T: Anthony Ferro

Wailuku, USHI03, Maui Schools Science and Engineering Fair

ENEV004 **Developing a Deployable pH Sensor to Monitor Ocean Acidification, Year Three**
Evelyn Amal Haase, 17, Junior, Molokai High School, Ho'olehua, Hawaii, T: Emilio Macalalad

PHYS008 **A Runaway Star Candidate Selection and Analysis, Year Two**
Celeste Maida Jongeneelen, 18, Senior, Home School– Maui, Kula, Hawaii, T: Norbertus Jongeneelen

Lihue, USHI04, Kauai Regional Science & Engineering Fair

EGCH041T **Determining the Role of n-Hexane in Multiple Phases in *Nannochloropsis sp.* and *Nitzschia sp.***
Jenna Lily Takata, 16, Junior, Charlene Tan, 16, Junior, Kauai High School, Lihue, Hawaii, T: Kevin Johnson

Hilo, USHI05, Hawaii District Science and Engineering Fair

ANIM007 **Effect of Fragmentation, Isolation, and Bleaching on Coral Reef Fish Assemblages**
Sonja Giardina, 15, Sophomore, Hilo High School, Hilo, Hawaii, T: Pascale Pinner

PLNT012 **Effect of *Ceratocystis* Species A and B Isolate Mutations on Disease Aggressiveness in *Metrosideros polymorpha***
Anne Akiko Nakamoto, 18, Senior, Waiakea High School, Hilo, Hawaii, T: Whitney Aragaki

Kaneohe, USHI06, Windward District Science and Engineering Fair

EGCH002 **The Development of New Power Storage Devices Based on Organic Heterocyclic Aromatic Compounds**
Samuel Marin Scott, 18, Senior, Kahuku High and Intermediate School, Kahuku, Hawaii, T: Daniel Scott

SOFT009 **Using SONAR, LIDAR, and Computer Vision to Assist the Visually-Impaired**
Samuel M. Cadotte, 16, Junior, Kalaheo High School, Kailua, Hawaii, T: Crystal Stafford

Honolulu, USHI07, Central Oahu District Science and Engineering Fair

EAEV020 **Small Plastics Causing a Big Problem: The Prevalence of Micro- and Macro-Plastics on Oahu Beaches**
Jasmine Mia Chase, 16, Junior, Mililani High School, Mililani, Hawaii, T: Namthip Sitachitta

Honolulu, USHI08, Honolulu District Science & Engineering Fair

CBIO001 **Dementia, Beyond Memory Loss: A Neuroimaging Study of the Hippocampus and Amygdala Utilizing OASIS and FreeSurfer**
Ryan Theodore Nguyen, 13, Freshman, Henry J. Kaiser High School, Honolulu, Hawaii, T: Garrett Hatakenaka

CELL004 **Detecting Self-Associated ORC4 in Live Murine Oocytes During Polar Body Extrusion Using FLIM of eGFP and FlAsH-EDT2 Labelling**
Brandon Alex Nguyen, 14, Sophomore, Henry J. Kaiser High School, Honolulu, Hawaii, T: Garrett Hatakenaka

Honolulu, USHI50, Hawaii State Science and Engineering Fair

BEHA048T **Improving Facial Expression Recognition in Parkinson's Disease Using Meditation**
Ben Weiss, 17, Junior, Kaitlynn Weiss, 15, Freshman, Kalaheo High School, Kailua, Hawaii, T: Crystal Stafford

CELL035 **Development of Animal Component-Free Media for the Cryopreservation of *Drosophila* S2 Cells**
Erin Yuki Kajihiro, 17, Senior, Moanalua High School, Honolulu, Hawaii, T: Lori Mizue

EAEV067T **Comparing the Difference in Plant Species Diversity, Plant Growth Forms, and Soil Characteristics Between Native and Non-Native Forests, Year II**
Marion Rose Powell, 16, Junior, Cameryn Rae Kahalewai, 16, Junior, Molokai High School, Ho'olehua, Hawaii, T: Jeannine Rossa, T: Emilio Macalad

ENEV056 **Enhancing Algal Bioremediation in Wastewater Using the Surface Plasmon Resonance of Silver Metal Nanoparticles as a Optical Nanofilter**
Min Hua Tsou, 17, Junior, Mililani High School, Mililani, Hawaii, T: Namthip Sitachitta

PHYS074 **Development of a YBCO Quantum Processor**
Elijah Keene Kaimiola Mossman, 17, Senior, Kamehameha Schools Kapalama Campus, Honolulu, Hawaii, T: Gail Ishimoto

IDAHO

Coeur d'Alene, USID01, Northern Idaho Science & Engineering Fair

PHYS031 **An Algorithm to Determine the Spectral Types of Stars**
Jieyan Wang, 15, Sophomore, Moscow High School, Moscow, Idaho, T: Pat Blount

Boise, USID02, Western Idaho Science & Engineering Fair

ENEV027 **Investigating the Water Filtration Capabilities of Carbon-Coated Oyster Shells**
Alexander Jason Howard, 17, Senior, Timberline High School, Boise, Idaho, T: Margaret Schmidt

PLNT047 **Integrating MFC-MEC Technology into Farms for More Efficient Hydrogen and Food Production**
Taylor Herndon, 17, Senior, Vision Charter School, Caldwell, Idaho, T: Jason George

Pocatello, USID03, Eastern Idaho Science & Engineering Fair

MATH014 **From Lucas Sequences to Lucas Groups**
Kayson Taka Hansen, 16, Junior, Twin Falls High School, Twin Falls, Idaho, T: Candace Wright

ILLINOIS

Chicago, USIL01, Chicago Public Schools Student Science Fair

EBED022 **Repti-Lighting: The Automated Solution to Prevent Calcium Deficiency in Reptiles**
\# Abigail Ann Arnashus, 15, Sophomore, Von Steuben Metropolitan Science Center, Chicago, Illinois, T: Carrie Kaestner

MCRO029 **Examining the Effect of Temperature on the Photosynthetic Rates of Green Algal Species: Year Three of Ongoing Study**
Abhishek Chetan Joshi, 17, Junior, Lane Technical College Prep High School, Chicago, Illinois, T: Nicholas Lang

PLNT029 **The Effects of Coronatine on Drought Stress Tolerance in *Zea mays***
Daniel O'Neill Vogwill, 18, Senior, Chicago High School for Agricultural Sciences, Chicago, Illinois, T: Daniel Martin

SOFT029 **Saving Skin: A Mobile Application for the Prevention of Skin Cancer, Using Risk Analysis**
Mercy Oladipo, 16, Junior, Whitney M. Young Magnet High School, Chicago, Illinois, T: Lynne Muhammad

Edwardsville, USIL02, STEM Science and Engineering Research Challenge

ENEV077 **Lead Ion Biosorption with *Candida albicans*, *Escherichia coli*, and *Saccharomyces cerevisiae* via Engineered Bio-Sand Filters as a Method for Pollution Remediation**
Abril Noel Hunter, 17, Junior, The Governor French Academy, Belleville, Illinois, T: Christine Stewart

Peoria, USIL03, Heart of Illinois Science and Engineering Fair

EAEV082 **The Effect of Atrazine on *Raphanus sativus* 'Champion' Seed Germination**
Austin Gene Sundell, 17, Senior, Delavan High School, Delavan, Illinois, T: Mary Kay Wonders

PLNT070 **The T/Ha Yield Potential of Simulated Herbicide Drift on *Glycine max***
Prescott Oz Jeckel, 16, Sophomore, Delavan High School, Delavan, Illinois, T: Mary Kay Wonders

Springfield, USIL04, Illinois Junior Academy of Science Region X Science Fair

ANIM037T **Effect of Yeast Diversity on Mosquito Populations**
Jadyn Lynne Henry, 15, Freshman, Kylie Erin Orris, 17, Junior, Southeastern Junior/Senior High School, Augusta, Illinois, T: Sue Henry

PLNT042 **Effect of Fungi on Arid Grasses and Commercial Crops Under Varying Environmental Conditions**
\# Jayleigh Michelle Peuster, 17, Junior, Southeastern Junior/Senior High School, Augusta, Illinois, T: Sue Henry

Skokie, USIL05, Illinois Junior Academy of Science North Suburban Region 6 Science and Engineering Fair

EAEV025 **The Effect of 4-MCHM on *Daphnia magna* Population Change**
Kate Nadja Karaman, 16, Sophomore, Niles Township West High School, Skokie, Illinois, T: Parin Patel

EGCH011 **Deconvoluting Impedance Mechanisms in Emerging Fuel Cell Material**
Alexia Popescu, 16, Junior, Niles Township West High School, Skokie, Illinois, T: Rachael Swiercz

MATH022 **The Effect of the Number of Crossing on Prime Knots on the Complexity of Their Stereographic and Inverse Stereographic Projections**
Varun Malladi, 17, Junior, Adlai E. Stevenson High School, Lincolnshire, Illinois, T: Christina Palffy

PHYS037 **Asteroid Ring Formation Through 3-Dimensional Inelastic Collisions**
Justin Lee, 17, Senior, Adlai E. Stevenson High School, Lincolnshire, Illinois, T: Christina Palffy

PLNT025 **Maximizing Growth of *Lactuca sativa* with a Polyculture in Aquaponics**
Katherine Jean Benstead, 16, Junior, Niles Township West High School, Skokie, Illinois, T: Parin Patel

INDIANA

Evansville, USIN20, Hoosier Science and Engineering Fair Region 1

CHEM051 **Novel Sustainable Process for Synthesis of Acetylsalicylic Acid: Application to Opioid Epidemic and CO_2 Emissions**

\# Akshaj Mishra, 16, Sophomore, Signature School, Evansville, Indiana, T: Lata Shukla

ENEV065 **An Improved Method for Trace Level Arsenic Quantification in Water**

\# Ankush Kundan Dhawan, 16, Sophomore, Signature School, Evansville, Indiana, T: Radhika Dhawan

Fort Wayne/Angloa, USIN21, Hoosier Science and Engineering Fair Region 2

PLNT041 **The Effects of Acetic Acid Concentrations as a Natural Herbicide**

Sydney Elaine Hefty, 15, Freshman, DeKalb High School, Waterloo, Indiana, T: Susan Zuber

Indianapolis, USIN22, Hoosier Science and Engineering Fair Region 3

EAEV075 **The Optimization of Degradation of Azo Dyes via *Saccharomyces cerevisiae***

Nicole Segaran, 16, Sophomore, Carmel High School, Carmel, Indiana, T: Ashley Wilson

PHYS065 **The Impact of Rotational Damping on the Collective Motion Exhibited by Systems of Self-Propelled Particles**

Parker Jou, 16, Junior, Carmel High School, Carmel, Indiana, T: Jennifer Drudge

Muncie, USIN23, Hoosier Science and Engineering Fair Region 4

EGCH030 **Multi-Fuel Analysis**

Jackson Carmichael Boyle, 18, Senior, Delta High School, Delta, Utah, T: Lance Brand

Indianapolis, USIN24, Hoosier Science and Engineering Fair Region 5

ENEV080T **Non-Thermal, Atmospheric Plasma: A Means of Water Purification**

Mary Eileen Sgroi, 17, Junior, Victor Karwacinski, 17, Junior, Trinity School at Greenlawn, South Bend, Indiana, T: Lynda Seasly

Greencastle, USIN25, Hoosier Science and Engineering Fair Region 6

EAEV046 **Satellite Modeling of Wildfire Susceptibility in California by Using Artificial Neural Networking**

\# Anthony David Weng, 17, Senior, Terre Haute South Vigo High School, Terre Haute, Indiana, T: Aaron Warner

ENBM075 **3D Printing Away Catheter-Associated Urinary Tract Infections**

Mitchell James Sampson, 15, Freshman, Northview High School, Brazil, Indiana, T: Halee Sluder

West Lafayette, USIN26, Hoosier Science and Engineering Fair Region 7

CELL028 **Targeted Screen of Genes Involved in *Drosophila* Neuromuscular Junction Development**

\# Bowen Jing, 18, Senior, West Lafayette Junior/Senior High School, West Lafayette, Indiana, T: Jane Schott

Valparaiso, USIN27, Hoosier Science and Engineering Fair Region 8

PLNT048 **Analyzing the Pesticidal Properties of *Trichoderma harzianum***

\# Amanda Grace Wilson, 17, Junior, Northwestern High School, Kokomo, Indiana, T: Linda Wilson

PLNT050 **The Effect of *Oscillatoria* on Flooded *Glycine max***

Jacob Liam Martin, 15, Freshman, Northwestern High School, Kokomo, Indiana, T: Linda Wilson

Indianapolis, USIN50, Hoosier Science and Engineering Fair

ROBO043 **Can Deep Reinforcement Learning Solve Misere Combinatorial Games?**

\# Abraham James Oliver, 18, Senior, Brown County High School, Nashville, Indiana, T: Joseph Grissom

IOWA

Cedar Rapids, USIA01, Eastern Iowa Science and Engineering Fair

ENEV045 **Engineered Environmental Containment: Converting *Lemna minor L.* into a Natural Fertilizer**

\# Aaron Alexander Wills, 18, Senior, Central Lee High School, Donnellson, Iowa, T: Alicia Schiller/Haynes

PLNT032 **What All the Buzz Is About: Contained Production and Increased Yield of *Glycine max* and Other Crops with the Aid of *Apis mellifera* and Natural Fertilizers (Phase II)**
Brooklyn Leann Pardall, 17, Junior, Central Lee High School, Donnellson, Iowa, T: Alicia Schiller/Haynes

Sheldon, USIA02, Western Iowa Science and Engineering Fair

CELL016 **The Functional Requirement of Aquaporin1a1 in Zebrafish Vascular Development**
Merrina Lan, 19, Senior, Ames High School, Ames, Iowa, T: De Anna Tibben

Ames, USIA50, State Science and Technology Fair of Iowa

ANIM054 **Increased Conception Rates by Regulating Temperature of Semen**
Bailey Beckman, 17, Senior, Danville Junior/Senior High School, Danville, Iowa, T: Gail Kunch

BEHA030T **Learning in the Digital Era**
Amy Nicole Cyr, 17, Junior, Sarah Arbuckle, 17, Junior, Ames High School, Ames, Iowa, T: DeAnna Tibben

ENMC048 **Utilizing Low-Cost Hybrid Technology to Decrease Emissions in Motorcycles**
Nikhil Wagher, 17, Senior, Rivermont Collegiate, Bettendorf, Iowa, T: Jenna Adams

MCRO043T **An Innovative Approach to the Detection of Ringworm**
Sara Katherine Dodge, 16, Junior, Abigail Grace Wittkamp, 16, Junior, Burlington Community High School, Burlington, Iowa, T: Elizabeth Sanning

TMED032 **Development of a Loop-Mediated Isothermal Amplification (LAMP) Assay for the Detection of Powassan Virus**
Cheryl Ann Blackmer, 16, Sophomore, Ballard Community Senior High School, Huxley, Iowa, T: Allison Maher

KANSAS

El Dorado, USKS50, Kansas State Science and Engineering Fair

CBIO036 **A Machine Learning Method for Selection of Genetic Variants and Prediction of Type 2 Diabetes Mellitus Using Next-Generation Sequencing Data**
Luann Chan Jung, 17, Senior, Manhattan High School, Manhattan, Kansas, T: Janet Stark

EAEV068 **Earthquakes ROCK: Preliminary Data from a Manipulated Model to Show the Newton Force of Different Bedrock Types and Their Relationship with Induced Earthquakes in Kansas**
Kevin Johnson, 18, Senior, Pratt High School, Pratt, Kansas, T: Luana Bitter

KENTUCKY

Louisville, USKY02, Louisville Regional Science and Engineering Fair

BMED016 **Can Yeast Help Boost the Immune Response to Cancer?**
Edward Qihao Zhong, 16, Junior, Kentucky Country Day School, Louisville, Kentucky, T: Mike Moreland

ENMC027 **Development of a Hybrid Direct Write 3D Printer: A Novel One-Step Approach to Fabricating Multi-Layer Functional Devices and Flexible Electronics Through Reactive Inkjet Printing**
Joshua Murphy Jacob, 18, Senior, Saint Xavier High School, Louisville, Kentucky, T: Greg Cambron

ENMC028 **Solar Updraft Tower-Wind Turbine Hybrid: Optimizing Power Generation in Multifarious Climatic Conditions Using Computational Fluid Dynamics Analysis**
Rachel Spaulding, 17, Junior, Eastern High School, Louisville, Kentucky, T: David Steineker

ENMC029 **Essential Features of Hyperloop Systems**
Collin Christopher Kemper, 18, Senior, Saint Xavier High School, Louisville, Kentucky, T: Gregory Cambron

Louisville, USKY03, duPont Manual High School Regional Fair

CBIO011 **Designing a Reinforcement Learning Controller for Insulin Delivery in an Artifical Pancreas**
Mark James Raj, 17, Junior, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig

CELL014 **TrkC Identifies a Putative Mechanoreceptor that Specifically Innervates Taste Papillae**
Madison Andrea Sneve, 18, Senior, duPont Manual High School, Louisville, Kentucky, T: Belinda Hafell

ENEV028 **Development of a Fully Automated 3D-Printed IoT Sensor for Arsenic Detection in Groundwater**
Anjali R. Chadha, 15, Junior, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig

MATS015 **A Kinetic Monte Carlo Study of Effects of Adatom-Adatom Repulsive Interactions on Nucleation and Growth of Nanoclusters**
Lilly Gonzalez, 15, Sophomore, duPont Manual High School, Louisville, Kentucky, T: Belinda Hafell

MCRO021 **The Effects of Sugar Substitutes and Prebiotics on the Gut Microbiome**
Elaina Rose Render, 15, Freshman, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig

Highland Heights, USKY04, Science and Engineering Fair of Northern Kentucky

CHEM017 **Direct Methanol Fuel Cell, Phase II**
Molly Anne Kleier, 16, Sophomore, Notre Dame Academy, Park Hills, Kentucky, T: Patrick Strickley

Lexington, USKY05, Central Kentucky Regional Science and Engineering Fair

ENMC030 **The Virtual Winglet: A Novel Approach to Boundary Layer Manipulation and Wingtip Vortex Suppression**
Rachel Seevers, 16, Junior, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Karen Young

MATH015 **Pythagorean Quintuples and Quaternions**
Theodore Arthur Ehrenborg, 16, Junior, Henry Clay High School, Lexington, Kentucky, T: Renee Goin

ROBO022 **Deep Learning of Mammogram Images to Enable Automatic and Accurate Breast Cancer Screening**
Erik Y. Han, 16, Junior, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Karen Young

Richmond, USKY50, Kentucky Science and Engineering Fair

BCHM025 **The Effects of Exercise on Cognitive Impairment due to Metabolic and Epigenetic Dysregulation**
Aysha Mariyam Puzhakkaraillath, 15, Sophomore, duPont Manual High School, Louisville, Kentucky, T: Belinda Hafell

CHEM044 **Can the Efficiency of Hydrogen Gas Production by Electrolysis Be Increased?**
Shirlin Janita Kingston, 15, Freshman, Ballard High School, Louisville, Kentucky, T: Ronald Simmons

EGCH024T **The Effect of Fluorination of Graphene on the Effectiveness of Primary Batteries (Li/CFx) and Supercapacitors**
Sukitha Rukshan Gunasena, 15, Sophomore, Ruchira Udara Sumanasekera, 16, Junior, duPont Manual High School, Louisville, Kentucky, T: Belinda Hafell, T: Kathy Fries

ENBM043 **3-D Printing with Modified Biocompatible Polymers for Tissue Regeneration and Drug Delivery**
Bhargav Ramesh, 16, Junior, duPont Manual High School, Louisville, Kentucky, T: Eric Purvis

ROBO042T **The Development of a Holistic Cardiovascular Disease Screening System Utilizing a Low-Cost Electrocardiogram and a Machine Learning Algorithm**
Karthik Jetty, 16, Sophomore, Pranav Senthilvel, 16, Sophomore, Shreshth Srivastava, 16, Sophomore, duPont Manual High School, Louisville, Kentucky, T: Belinda Hafell

TMED052 **Assessing Progression of Alzheimer's Disease: Predicting Cognitive Impairments and Amyloid Deposition Through PET and MRI**
David Wang Ma, 18, Senior, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Karen Young

LOUISIANA

Baton Rouge, USLA01, Louisiana Region VII–Science and Engineering Fair

CELL003 **Electronic Cigarette Aerosols Induce Adverse Health Effects in Mice of Reproductive Age and Their Offspring**
Anusha Zaman, 17, Junior, Baton Rouge Magnet High School, Baton Rouge, Louisiana, T: Tiffany Moore

MCRO003 **Efficacy of Bacteriophage P1 Therapy *vs.* 1,3-Dibromo-5,5-Dimethylhydantoin on Pathogenic Bacteria in Cow Skeletal Muscle**
Jay Iyer, 15, Freshman, Baton Rouge Magnet High School, Baton Rouge, Louisiana, T: Tiffany Moore

PHYS002 **Using Two-Mode-Squeezing for Room-Temperature Photon-Number-Resolving Detection**
Deepti Vaidyanathan, 18, Senior, Baton Rouge Magnet High School, Baton Rouge, Louisiana, T: Tiffany Moore

Bossier City, USLA02, Bossier Parish Community College Louisiana Region I Science and Engineering Fair

BMED017 **Stress Signaling Inhibitory Effects of Estrogen Cardioprotection in Myocardial Ischemia**
Lilly Anne Denis Kamberov, 17, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

CBIO008 **The Relationship Between Brain Volume and Cognitive Function in Parkinson's Disease**
Christopher Quinn Ferrier, 18, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

TMED007 **Redox in CABG: A Tale of Two Cell Types**
Sunjay Letchuman, 18, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

Houma, USLA03, Terrebonne Parish Science Fair

MATH012 **The Napkin Ring Paradox**
Evan Joseph Crispino, 16, Freshman, Terrebonne High School, Houma, Louisiana, T: Marie Parfait

MCRO009 **Orchestrated Organisms**
Bailey Marie Dupre, 17, Junior, South Terrebonne High School, Bourg, Louisiana, T: Chris Brown

Lafayette, USLA04, Louisiana Region VI Science and Engineering Fair

EAEV021 **Using Microbial Indicators to Analyze Water Quality at Cypremort Point Beach**
Ruth Adams, 17, Junior, Ovey Comeaux High School, Lafayette, Louisiana, T: Lisa Ranney

EGCH004 **Trash to Treasure: Converting Aluminum Cans into a Valuable Additive for Li-S Batteries with an Unprecedented Performance**
Sophia Patricia Zhou, 15, Sophomore, Lafayette High School, Lafayette, Louisiana, T: Lisa Ranney

MCRO016 **Antimicrobial Properties of Honey from Different Regions in North America**
Zachary R. Kurowski, 17, Junior, Ovey Comeaux High School, Lafayette, Louisiana, T: Lisa Ranney

Lake Charles, USLA05, Louisiana Region V Science and Engineering Fair

ENMC001T **Using Fluid Dynamics to Create a Submersible Aircraft**
Donald Edward Martin, 17, Junior, Jason Dong#, 17, Senior, Academics Etc., Lake Charles, Louisiana; Alfred M. Barbe High School, Lake Charles, Louisiana, T: Katherine Martin, T: Jackie Royer

New Orleans, USLA08, Greater New Orleans Science and Engineering Fair

BEHA050 **The Effects of Multilingualism on the Working Memory of Human Subjects**
Joaquin Alejo Gomez, 15, Sophomore, Benjamin Franklin High School, New Orleans, Louisiana, T: Teresa Burchette

BMED030 **Evaluating the Potential of CD264 as an Effective Biomarker for Cellular Aging in Mesenchymal Stem Cells**
Amaris Rachael Lewis, 16, Junior, Lusher Charter High School, New Orleans, Louisiana, T: Stephen Collins

EGCH019 **Sulfur-Deplete Cultivation of *C. reinhardtii:* A Novel Approach to Increasing the Cost-Efficiency of Green Hydrogen Fuel Production**
Alexander Bryce Walker, 17, Junior, Patrick F. Taylor Science & Technology Academy, Westwego, Louisiana, T: Amanda Godshaw

PLNT062 **Disruption of Circadian Rhythm: Its Effects on Glucose Production and Photosynthesis Activity**
Jewel Williams, 17, Senior, New Orleans Charter Science and Mathematics High School, New Orleans, Louisiana, T: Samuel Loftus

Baton Rouge, USLA50, Louisiana Science and Engineering Fair

BCHM016 **The Role of Autotaxin-LPA-LPP3 Axis in Ischemic Stroke**
Grace Karen Sun, 16, Sophomore, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

MATS018 **Quantification of the Effects of Fluid Shear Stress on Circulating Tumor Cells**
Rachael Noel Coates, 17, Junior, St. Joseph's Academy, Baton Rouge, Louisiana, T: Linda Messina

MCRO023 **Is Alternate Sigma Factor H (SigH) Essential for the M*ycobacterium marinum* Response to Low-Shear Modeled Microgravity (LSMMG)?**
Matthew Blaise Willis, 17, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

PHYS053 **A Novel Method for Simulating Diffracted Light**
Mary Catherine Lorio, 18, Senior, Saint Joseph's Academy, Baton Rouge, Louisiana, T: Linda Messina

PLNT030 **Ecological Restoration Zones Within the Monkey River Area (Belize) Using Community Grown Nurseries to Produce Plants for Riparian Strips**
Anna Colleen Koonce, 18, Senior, Saint Joseph's Academy, Baton Rouge, Louisiana, T: Linda Messina

SOFT026 **Contributing Factors of Louisiana Teenage Driver Injury Levels in Motor Vehicle Crashes**
Corrine Michelle Hutchinson, 17, Junior, Saint Joseph's Academy, Baton Rouge, Louisiana, T: Linda Messina

MAINE

Waterville, USME50, Maine State Science Fair

BEHA041 **Investigating the Relationship Between Polling Building Type and Voting Results: A Study in Priming**
Noah Ball Robinson, 17, Junior, Bangor High School, Bangor, Maine, T: Cary James

EBED039 **Developing a Tactile Depth Map for the Blind**
Tyler James Delargy, 16, Junior, Bangor High School, Bangor, Maine, T: Cary James

ENEV085 **Reliability and Efficiency of 3D Printed Microfluidic Devices when Used in Ocean Acidification Testing**
Ibrahim Ghassan Saleh, 16, Junior, Greely High School, Cumberland, Maine, T: Kelly Welch

MARYLAND

Glen Burnie, USMD01, Anne Arundel County Regional Science and Engineering Fair

PLNT051 **The Web of Mycorrhizal Fungi: Identifying Associations Between Orchids, Ceratobasidium Fungi, and Trees**
Simone Alma Evans, 17, Senior, South River High School, Edgewater, Maryland, T: Carlo Echiverri

ROBO050 **Concealed Weapon Detection Using Infrared Image Processing and Machine Learning**
Andrew Adel Karam, 17, Junior, Arundel High School, Gambrills, Maryland, T: Christine Houchens

SOFT043 **Survival of the Fittest: Using Biological Concepts to Maximize Efficiency**
Helen Dover, 17, Senior, South River High School, Edgewater, Maryland, T: Matthew Schrader

Frederick, USMD02, Frederick County Science and Engineering Fair

BCHM024 **Uncovering the Hidden Defense Mechanisms of Flaviviruses**
Jacqueline Liu, 17, Senior, Urbana High School, Ijamsville, Maryland, T: Gregory Hess

EBED038 **SkySend: Providing Communication During Disaster Relief**
Sanjana Subramanian, 16, Sophomore, Urbana High School, Ijamsville, Maryland, T: Elizabeth McCook

Silver Spring, USMD03, ScienceMontgomery

ANIM027 **Sheep Vocalization Analysis from Gestation to Birth**
Clara Megan Benadon, 16, Junior, Poolesville High School, Poolesville, Maryland, T: Lee Langstaff

BMED026 **What Is the Role of Wolframin in the Endoplasmic Reticulum Ca2+ Signaling Network?**
Daniel Edwin Schaffer, 16, Junior, Montgomery Blair High School, Silver Spring, Maryland, T: Angelique Bosse

CBIO012 **A Characterization of n-way Fitness Graphs that Imply n-way Epistasis**
Mengming Luo, 18, Senior, Montgomery Blair High School, Silver Spring, Maryland, T: Angelique Bosse

PHYS038T **Procedural Determination of Novel Stoichiometric Topological Superconductors Through Surface and Pressure Effects**
Carissa Wu, 18, Senior, Abhishek Nikhileswar Allamsetty, 17, Junior, Winston Churchill High School, Potomac, Maryland; Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Xuan Luo, T: John Dell

Largo, USMD05, Prince George's Area Science Fair

BMED057 **Potentiation of Glutamatergic Neurons of the Medial Amygdala Promotes Aggression**
Jada Christine Collins, 18, Senior, Oxon Hill High School, Oxon Hill, Maryland, T: Tameka Woodruff

CELL031 **Radioprotection of Normal Cells Using CD47 Morpholino Antisense Therapeutics Causes Progression of Prostate Cancer**
Teresa Anne Ozga, 17, Senior, Eleanor Roosevelt High School, Greenbelt, Maryland, T: Sean Brady

ENBM052T **Prescripted Code: A Therapeutic Smart Device Used for Rapid Rehabilitation of Ligaments, Muscles, and Tendons**
William Robert Voorhees, 18, Senior, Kyra Sue Pratley, 18, Senior, John Caleb Podsednik, 18, Junior, Dr. James A. Forrest Career and Technology Center, Leonardtown, Maryland, T: Nathan Swick

ROBO051T **Iago: A Study of Neural Networks, Othello, Difficulty, and Intelligence**
Nathan Zachary Hayes, 18, Senior, Jim Chaebum Kong, 18, Senior, William Kirby Longsworth, 18, Senior, Northern High School, Owings, Maryland, T: Erin Hitchman, T: Robin Clites

Towson, USMD06, Baltimore Science Fair

BCHM028 **Determination of Optimal Metal Conditions for Adaptation in a Type 1E CRISPR System**
Lily Kathleen DeBell, 17, Junior, Baltimore Polytechnic Institute, Baltimore, Maryland, T: Lisa Fridman

EAEV045 **Machine Learning Algorithms for Satellite Remote Sensing of Ocean Color in Coastal Waters**
Marvin Fangzhou Li, 15, Freshman, James M. Bennett High School, Salisbury, Maryland, T: Sarah Webster

ENMC066 **Improving Robustness of X-Ray Synchrotron Image Analysis Using Deep Learning and Data Augmentation**
Nicole Meister, 17, Senior, Centennial High School, Ellicott City, Maryland, T: Michelle Bagley

Baltimore, USMD07, Morgan State University Science-Mathematics-Engineering Fair

TMED053 **Effectiveness of Neratinib in Inhibiting or Reversing Hepatic Stellate Cell Activation**
Alexander Jordan Duh, 17, Junior, Gilman School, Baltimore, Maryland, T: Vincent Dinoso

MASSACHUSETTS

Bridgewater, USMA01, Massachusetts Region V Science Fair

BMED025 **Ovarian Cancer Pathogenesis Is Associated with Decreased Expression of the Zinc-Finger Transcription Factor SLUG**
Emma Theresa Kelly, 16, Junior, Newton Country Day School of the Sacred Heart, Newton, Massachusetts, T: Mary-Louise Coates

Somerville, USMA02, Massachusetts Region IV Science Fair

SOFT019 **accAAD: Efficient Append-Only Authenticated Dictionary for Transparency Logs**
Vivek Bhupatiraju, 16, Senior, Lexington High School, Lexington, Massachusetts, T: Parul Kumar

Fall River, USMA03, Massachusetts Region III Science Fair

EGPH007 **Improving the Energy Produced by a Flexible Solar Cell**
Michele Schremp, 14, Freshman, Bishop Feehan High School, Attleboro, Massachusetts, T: Eileen Correia

North Adams, USMA04, Massachusetts Region I Science Fair

ENBM029 **Neural Networks and Colon Polyp Detection**
Inthat Boonpongmanee, 17, Junior, Deerfield Academy, Deerfield, Massachusetts, T: Forest Reid

Worcester, USMA05, Massachusetts Region II State Science Fair

ANIM023 **Isolation of Novel Epigenetic Insights in Heritable Fertility Trends via NGS-Driven Analysis of DNA Damage Response and piRNA Biogenesis Pathways**
\# Evan James Mizerak, 18, Senior, Wachusett Regional High School, Holden, Massachusetts, T: Nicholas Guerin

EGCH016 **How to Feed Your Fuel: Analyzing the Effects of Nitrogen Deprivation *vs.* Increased Carbon on Lipid Production in an Algal Photobioreactor**
Christopher Daniel Dwyer, 17, Junior, Wachusett Regional High School, Holden, Massachusetts, T: Daniel Whitmore

SOFT020 **Dewey Wins: Predicting United States Presidential Elections**
Hava Susan Kantrowitz, 17, Junior, Massachusetts Academy of Math and Science at WPI, Worcester, Massachusetts, T: Siobhan Curran

Boston, USMA06, Massachusetts Region VI Science Fair

BCHM046T **Organic Arch Support**
Soukaina El Atifi, 17, Junior, Lidiya Assefa Gebru, 18, Junior, Excel High School, Boston, Massachusetts, T: Ledilla Fedillaga-Bokas

CHEM045T **Quest to the Mystery Metal**
Camila Muneton, 17, Junior, Shandira Soto, 17, Junior, Boston Latin Academy, Boston, Massachusetts, T: Paul Eaton

PLNT019T **The Effect of pH on Plant Growth**
Emily Lam, 15, Sophomore, Kimberly Chen, 15, Sophomore, Boston Latin Academy, Boston, Massachusetts, T: Thomas Hocker

Cambridge, USMA50, Massachusetts State Science & Engineering Fair

ANIM072 **Illuminating the Problem: Bioluminescence**
Chase Andrew Beausoleil, 16, Sophomore, Bishop Feehan High School, Attleboro, Massachusetts, T: Eileen Correia

BCHM012 **The Difference in the Energy Release of Lipids *vs.* Carbohydrates Based on Their Chemical Structure**
Mairead Baker, 16, Sophomore, Boston Latin Academy, Boston, Massachusetts, T: Thomas Hocker

BEHA012 **Effects of Stress on Neuroanatomical Functionality**
\# Meredith Odyl Blaise, 16, Junior, Bishop Feehan High School, Attleboro, Massachusetts, T: Eileen Correia

BMED018T **Melatonin's Effect on Learning and Memory in a Tauopathy Model of Alzheimer's Disease in *D. melanogaster***
Sada Rose Nichols-Worley, 17, Senior, Sophie Haugen, 18, Senior, Saint Mark's School, Southborough, Massachusetts, T: Lindsey Lohwater

BMED056 **Blocking Multidrug Resistance in Cancer Cells with MicroRNA Mimics**
Seo-Hyun Yoo, 17, Junior, Lexington High School, Lexington, Massachusetts, T: Janice Compton

MCRO022 **Bioprospecting for Benthic Fungi and Their Bactericidal Antibiotics**
Emma Louise Keeler, 17, Junior, Falmouth Academy, Falmouth, Massachusetts, T: Virginia Edgcomb

PHYS045T **Magnetic *vs.* Electromagnetic Helmets**
Jackson Wesley Diltz, 18, Senior, Eric John Bone, 18, Senior, Westfield High School, Westfield, Massachusetts, T: Renee Sweeney

PLNT026 **Light Sensitive Turntable: Effects on *Brassica rapa***
Cheaheon Lim, 16, Junior, Northfield Mount Hermon School, Gill, Massachusetts, T: Mary Hefner

SOFT021 **EmerSave: A Novel Crowdsourcing Emergency Response Application**
Vishnu Sai Penubarthi, 16, Junior, Massachusetts Academy of Math and Science at WPI, Worcester, Massachusetts, T: Shiobhan Curran

MICHIGAN

Detroit, USMI02, Science and Engineering Fair of Metropolitan Detroit

CELL022 ***In vitro* Characterization of HER2 Positive Breast Cancer Brain Metastases**
Allison Sarah Heath, 18, Senior, Bloomfield Hills High School, Bloomfield Hills, Michigan, T: Dennis Kwasny

ENBM033 **Efficient Incorporation of Matrix Protein M2 into Influenza Virus-like Particles (VLPs) to Improve Future Vaccine Production and Immunogenicity**
Madeleine Yang, 16, Junior, Detroit Country Day School, Beverly Hills, Michigan, T: Ross Arseneau

MATS021 **Making Scalable Inexpensive High Power and Energy Density Graphene Supercapacitors with the LightScribe Method**
Minxing "Tony" Pan, 17, Senior, University Liggett School, Grosse Pointe Woods, Michigan, T: Shernaz Minwalla

MCRO038 **Identifying the Components in Basil that Protect Lung Cells from Pneumonia**
Arundhathy Suresh, 16, Junior, Pioneer High School, Ann Arbor, Michigan, T: Stephen Armstrong

ROBO032T **Context Aware Medical Image Super Resolution Using Convolutional Neural Networks**
Matthew Dong, 14, Sophomore, Pratham Soni, 16, Sophomore, Troy High School, Troy, Michigan, T: Rebecca Brewer

ROBO034 **Using Deep Convolutional Neural Networks and Feature Matching Algorithms to Develop Smarter Autonomous Cars**
Alexander Wan, 15, Freshman, Novi High School, Novi, Michigan, T: James Didio

TMED021 **Engineering PD-L1 Specific Diabodies for PET Imaging**
Saaz Malhotra, 17, Junior, Northville High School, Northville, Michigan, T: Robert Edinger

Flint, USMI03, Flint Regional Science Fair

BCHM045T **Release of Active Pharmaceuticals Using Hyperbranched Polyesters**
Brandon Zhu, 18, Senior, Daniel Lin Zhang, 17, Senior, Herbert Henry Dow High School, Midland, Michigan, T: Patrick Smith

MCRO035 **Identifying Novel Mechanisms of Quorum Sensing Receptor Protein RpfR: Relevance to the BDSF Quorum Sensing Signaling Pathway**
Neehal Reddy Tumma, 16, Junior, Port Huron Northern High School, Port Huron, Michigan, T: Nico Fernandez

TMED029 **A Novel Approach to Early Stage Melanoma Diagnosis Using Bioconjugated Gold Nanoparticles and Molecular Optical Coherence Tomography**
Shriya Gampala Reddy, 14, Freshman, Northville High School, Northville, Michigan, T: Karin Nelson

Kalamazoo, USMI07, Southwest Michigan Science & Engineering Fair

MATS035T **Pervoskite Nanostructures as LEDs: Towards Flexible Displays**
Nathaniel Goenawan, 17, Senior, Siddhant Nandkishor Pagariya, 17, Senior, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan, T: Brandon Zeigler

PLNT044T **An Analysis Examining the Phenotype in Chloroplast RNA Editing of the orrm1xorrm6 Double Mutants in *Arabidopsis thaliana***
Zoha Aqeel, 18, Senior, Sanjna Chalasani, 17, Senior, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan, T: Brandon Zeigler

Berrien Springs, USMI08, Berrien County Regional Science Fair

BCHM042 **Heterocyclic Arylidene Chemical Compounds *vs.* Glioblastoma**
Megan Wieger, 15, Freshman, Berrien County Mathematics and Science Center, Berrien Springs, Michigan, T: Denise Smith

CELL041 **Using Urine and Saliva Solutions in a Capillary Tube Precipitation Test to Detect Dust and Dander Allergens in IgE Sensitized Individuals: A New Non-Intrusive Antigen/Antibody Reaction Test**
Audrey Jules Bakerson, 16, Sophomore, Berrien County Mathematics and Science Center, Berrien Springs, Michigan, T: Denise Smith

Flint, USMI50, Michigan Science and Engineering Fair

EGPH018 **Increasing Hydropower Flow Rate Using a Non-Linear Penstock**
Malini Mukherji, 18, Senior, Notre Dame Preparatory, Pontiac, Michigan, T: Jocelynn Yaroch

ENEV066 **Calculating Nephelometric Turbidity Units of Increased Suspended Solids in Water by Creating a Cost-effective Turbidity Buoy System Using an Attenuation Light Collection System**
Samuel Anthony Maher, 17, Senior, Arthur Hill High School, Saginaw, Michigan, T: Mark Hellebuyck

MINNESOTA

Duluth, USMN02, Northeast Minnesota Regional Science Fair

ANIM002 **Hopping Down the Bunny Trail: Spatial Distribution of *Lepus americanus* Tracks**
Lily Marie Hall, 18, Senior, South Ridge School, Culver, Minnesota, T: Blake Johnson

ENBM008 **"Anaphylactic Shocker!": The Use of a Dynamic QR Code Medical Bracelet and Connected Bluetooth Carrying Case to Locate and Administer a Practice Epinephrine Auto-Injector During a Staged Medical Emergency**
Katelyn Jo France, 18, Senior, Hinckley-Finlayson High School, Hinckley, Minnesota, T: Dennis Boxrud

ENMC004 **Measuring the Sound Intensity and Reflection Coefficients of Materials Inside an Acoustically Designed Classroom (Choir Room), Assisted by a Custom Impedance Apparatus and Modeled by Two and Three Dimensional Models**
Abigail Rose Smith, 15, Sophomore, Cloquet Senior High School, Cloquet, Minnesota, T: Cynthia Welsh

Mankato, USMN03, Southern Minnesota Regional Science and Engineering Fair

BCHM019 **Biodegradable Polymers for Protein and DNA Drug Delivery**
Ariel Jade Butler, 16, Junior, Sibley East High School, Arlington, Minnesota, T: Ann Butler

ENEV052T **No More Nitrates! A Comparison of Materials Used to Reduce Nitrate Levels in Sand Creek**
Anna Jo Prchal, 17, Junior, Julianne Pankow, 17, Junior, New Prague High School, New Prague, Minnesota, T: Jodi Prchal

St. Paul, USMN04, Twin Cities Regional Science Fair

BMED019 **Mast Cell Quantity and Localization in the Hearts, Quadriceps, and Diaphragms of a Duchenne Muscular Dystrophy Model**
Justin Vo Duffy, 17, Senior, Mounds View High School, Arden Hills, Minnesota, T: DeWayne Townsend

ENBM014 **3D Printable Prosthetic Foot**
Everett Adien Jeffrey Kroll, 17, Junior, Stillwater Area High School, Stillwater, Minnesota, T: Dennis Symalla

ENEV029 **Pulp Fiction?! Lead Remediation with Biochar Made from the *Apiacae* (Carrot) Plant Family**
Manashree Seth Padiyath, 16, Sophomore, Woodbury High School, Woodbury, Minnesota, T: Kaarin Schumacher

Crookston, USMN05, Western Minnesota Regional Science Fair

MCRO052T **UT-WHY? Effects of Household Beverages on UTI Causing Bacteria**
Audrey J. Swanson, 18, Senior, Sierra Dawn Edvall, 17, Junior, Perham High School, Perham, Minnesota, T: Shawn Stafki

Winona, USMN06, Southeast Minnesota Regional Science Fair

MCRO017 **The Potential Antimicrobial Abilities of Herb Mold**
Morgan Frances Arnold, 15, Freshman, Cotter High School, Winona, Minnesota, T: Tammy Drazkowski

Rochester, USMN07, Rochester Regional Science & Engineering Fair

SOFT011 **Implementing Deep Learning Techniques to Detect Abnormal Cells**
Gaurav Kumar Behera, 18, Senior, Century High School, Rochester, Minnesota, T: Janelle Milliken

TMED008 **The Development of a High Sensitive Home Diagnosis Kit for Group A *Streptococcus* Bacteria (GAS)**
Michelle Mai, 17, Junior, Century High School, Rochester, Minnesota, T: Janelle Milliken

Saint Cloud, USMN08, David F. Grether Central Minnesota Regional Science Fair and Research Paper Program

BMED020 **Drawing the Line Between Atypical Ductal Hyperplasia and Ductal Carcinoma *In Situ***
Joshua Matthew Proehl, 18, Senior, New London-Spicer High School, New London, Minnesota, T: Laura Molenaar

TMED009 **Screening Malignant Glioma Using an Electrical Differential Impedance Spectrometer and Artificial Neural Network**
Anna Faye Zheng, 17, Senior, Saint John's Preparatory School, Collegeville, Minnesota, T: Yi Zheng

St. Paul, USMN09, St. Paul Science Fair

PLNT020 **Exploring the Facilitative Relationship Between *Rhamnus cathartica* and *Lumbricidae***
Flannery Enneking-Norton, 18, Senior, Saint Paul Academy and Summit School, Saint Paul, Minnesota, T: Beth Seibel-Hunt

ROBO023T **CARL: A Convolutional Neural Network Powered Self-Driving Car**
Michael Raymond Hall, 18, Senior, Daniel Ellis, 18, Senior, Saint Paul Academy and Summit School, Saint Paul, Minnesota, T: Kate Lockwood

St. Paul, USMN10, Western Suburbs Science Fair

BMED027 **More than Skin Deep: Deciphering the Role of Bartonella henselae Infection in Melanoma Metastasis, Phase Two**
Cole Maxwell, 18, Senior, Breck School, Golden Valley, Minnesota, T: Princesa Hansen

ENBM023T **Holding Your Heart in Your Hand: 3D-Printing a Mechanically Accurate Aortic Valve Model**
Siyuan Ma, 17, Senior, Alexander Richard Anderson, 17, Junior, Breck School, Golden Valley, Minnesota, T: Princesa Hansen

PHYS039 **The Relationship Between the Primary Pulsation Period and the Blazhko Effect in RR Lyrae Variables**
Leonardo Clarke, 18, Senior, Minnetonka High School, Minnetonka, Minnesota, T: Caitlin McWhirter

St. Paul, USMN50, Minnesota Academy of Science State Science & Engineering Fair

BEHA051T **Unplugged: Quantifying the Effects of Technology on Adolescent Sleep and Mood**
Louise Aehyun Hostrup Kim, 16, Junior, Spencer Lee Yueh, 17, Junior, Breck School, Golden Valley, Minnesota, T: Princesa Hansen

MCRO065 **Optimizing *Escherichia coli* Energy Usage for Chemotaxis and Reproduction Through Experimental Evolution**
Camryn Franke, 17, Junior, Washington Technology Magnet, Saint Paul, Minnesota, T: Merridth Duellman-Joly

ROBO059 **Development of Autonomous Unmanned Aerial Systems for Semi-Dense Point Cloud Generation in Disaster Scenarios**
Parthiv Nandakumar Krishna, 16, Junior, Minnetonka High School, Minnetonka, Minnesota, T: Kimberly Hoehne

ROBO063T **Robotic Exoskeleton for Rehabilitation Applications**
Maxwell James Rader, 16, Junior, Christopher Richard Simmons, 17, Senior, Minnetonka High School, Minnetonka, Minnesota, T: Kimberly Hoehne

TMED054T **Vertical Flow Assay Detection for GM2-AP in Simulated Urine of Non Small Cell Lung Cancer Patients**
Alexa Reynders, 18, Senior, Benjamin Larson, 18, Senior, Benilde-St. Margaret's, St. Louis Park, Minnesota, T: Kirsten Hoogenakker

MISSISSIPPI

Biloxi, USMS01, Mississippi Region VI Science and Engineering Fair

BMED080 **The Effect of Various Sodium Hypochlorite Solutions on Porcine Dental Pulp Dissolution**
Shannon Caitlin Kirkpatrick, 18, Senior, St. Patrick Catholic High School, Biloxi, Mississippi, T: Emily Cloud

ENEV089 **Filtration of Microplastics in Aqueous Environments Using Ultrasonic Acoustics**
Gary Thanh Nguyen, 18, Senior, The Mississippi School for Mathematics and Science, Columbus, Mississippi, T: Tina Gibson

Booneville, USMS02, Mississippi Region IV Science Fair

EAEV070 **The Aquaponic Life**
Sarah Grace Trimble, 17, Junior, Kossuth High School, Corinth, Mississippi, T: Jessica Morris

Cleveland, USMS03, Mississippi Region III Science and Engineering Fair

ANIM058 **All Cracked Up Again**
Amy Bonner, 17, Sophomore, Cleveland High School, Cleveland, Mississippi, T: Amanda Bonner

ENMC058 **3... 2... 1... Blast Off**
Durga Sai Venu Omkaar Chimma, 15, Sophomore, Greenwood High School, Greenwood, Mississippi, T: Laneetra Cooper

Hattiesburg, USMS04, University of Southern Mississippi Region I Science and Engineering Fair

BEHA061 **The Effect of Noise Reduction and Pink Noise on Memory and Cognition**
Grayson Roger Gretizinger, 18, Senior, Oak Grove High School, Hattiesburg, Mississippi, T: Jamie Morrison

CHEM066 **Development of Synthesis Strategies of Quinoline for the Inhibition of HIV-Integrase**
Amy Hoang Pham, 18, Senior, Oak Grove High School, Hattiesburg, Mississippi, T: Jamie Morrison

Jackson, USMS05, Mississippi Region II Science and Engineering Fair

EAEV057T **The Effects of Increasing Temperature on Plant Development and Nutritional Content**
\# Vivian Heleana Pryor, 17, Junior, Sabrina Michelle Borg, 15, Freshman, St. Andrew's Episcopal School, Ridgeland, Mississippi, T: Claudia Bhagat

EBED046T **iSAFE (The Integrated Systems Automobile Failsafe Environment): Decreasing Infant Mortality Rates and Driver Distraction Using Microcontrollers and Embedded Circuits**
Melody Wheat, 17, Senior, Robert James Blaine, 18, Senior, Fabian Dalton Hill, 17, Junior, Jim Hill High School, Jackson, Mississippi, T: Susan Bender

PLNT049 **A Study of the Carbon Dioxide Consumption and Sequestration by *I. galbana* and *A. platensis* Under Pyrolytic Conditions**
\# Daniel Ulion Joshua, 17, Junior, Madison Central High School, Madison, Mississippi, T: Michelle Robinson

Mississippi State, USMS06, Mississippi Region V Science and Engineering Fair

CBIO004 **Classifcation of *Burkholderia species* Using Random Forest for Detection of Pathogenicity**
Michael Lu, 15, Freshman, Starkville High School, Starkville, Mississippi, T: Michael Adam

ENBM054 **Development of a Biosensor Using Sialic Acid-Bound Gold Nanoparticles for the Rapid Screening of Influenza A Virus-Positive Samples**
Hamilton Ji Wan, 16, Junior, Mississippi School for Mathematics and Science, Columbus, Mississippi, T: Tina Gibson

Oxford, USMS07, Mississippi Region VII Science and Engineering Fair

EAEV040 **Microplastics in the Terrestrial Food Chain via Earthworms (*Lumbricus terrestris*)**
Siena Catherine Cizdziel, 16, Junior, Oxford High School, Oxford, Mississippi, T: Sarah Robinson

EAEV041 **Quantifying Microplastics in the Mississippi River: A Source of Pollution in Gulf Coast Seafood**
Claire Theresa Cizdziel, 15, Freshman, Oxford High School, Oxford, Mississippi, T: Sarah Robinson

University, USMS50, Mississippi Science and Engineering State Fair

CHEM056 **LC-MS-MS Method Development and Analysis of Stimulants, Opiates, Synthetic Opiates, PCP, and Benzodiazepines in Wastewater: Preponderance of These Drugs During Football Games**
Shahbaz Waseem Gul, 18, Senior, Oxford High School, Oxford, Mississippi, T: Sarah Robinson

MCRO063 **Adopting Lactobacillus and Organic Acids as Alternative Treatments to Necrotic Enteritis**
Javad A'arabi, 17, Senior, Starkville High School, Starkville, Mississippi, T: Michael Adam

MISSOURI

Cape Girardeau, USMO01, Southeast Missouri Regional Science Fair

MCRO024 **Effects of Antimicrobial Culinary Spices on *E. coli* and *C. butyricum***
Jade Ray Samanta, 17, Senior, Saxony Lutheran High School, Jackson, Missouri, T: Brenda Etzold

PLNT027 **Environment Saving Biodegradable Plastics**
Dylan Thomas Long, 18, Senior, Dexter High School, Dexter, Missouri, T: Tiska Rodgers

Jefferson City, USMO02, Lincoln University Regional Science Fair

CELL032 **A Two Year Study to Initiate and Characterize a Cell Culture of the Native Pollinator *Bombus impatiens*: Applications in Entomology, Agriculture, and Nosema Research**
Olivia Ann Kline, 18, Senior, Camdenton High School, Camdenton, Missouri, T: Chris Reeves

EAEV069 **The Dark Side of Light: The Potential Impact of Artificial Light on *Libellulid* Feeding Behavior and Activity**
Hannah Rogers, 16, Sophomore, Camdenton High School, Camdenton, Missouri, T: Chris Reeves

Joplin, USMO03, Missouri Southern Regional Science Fair

BCHM029 **Neutralizing Free Radical Peroxynitrite Using Antioxidants**
Savannah Margaret Huff, 18, Senior, Joplin High School, Joplin, Missouri, T: Karisa Boyer

BEHA038 **The Effect of Exercise on Neuroplasticity: A Skill-Based Approach**
John Austin Schupbach, 18, Senior, Monett High School, Monett, Missouri, T: Garrett Clark

Kansas City, USMO04, Greater Kansas City Science & Engineering Fair

BEHA052 **FacePrint: A Novel, Differential Diagnostic and Monitoring Tool for Parkinson's Disease, Essential Tremor, and Atypical Parkinsonism Using Facial Behavioral Biomarkers and Dynamic Video Footage Tracking with Machine Learning**
Erin Smith, 18, Senior, Shawnee Mission West High School, Overland Park, Kansas, T: Brenda Bott

CELL044 **The Use of NKG2D Signaling in NK Cell Immunotherapy**
Rachel Brenner Silverstein, 18, Senior, Shawnee Mission West High School, Overland Park, Kansas, T: Brenda Bott

PHYS084 **The Effect of Geomagnetic Activity in the Ionosphere on GPS Signal**
Alexandria Jewel Stephenson, 17, Senior, Olathe North High School, Olathe, Kansas, T: Marsha Skoczek

Saint Charles, USMO05, Missouri Tri-County Regional Science and Engineering Fair

ROBO054 **Using a Neural Network to Detect Threats Inside of TSA Images**
Nikolos Antonio, 18, Senior, Timberland High School, Wentzville, Missouri, T: Gaddy Bergmann

Saint Joseph, USMO06, Mid-America Regional Science and Engineering Fair

SOFT058 **Dynamic Authentication Protocol to Improve Cyber Security Utilizing Near Field Communication**
Mason M. Eaton, 17, Junior, Central High School, Saint Joseph, Missouri, T: Jay Meyers

St. Louis, USMO07, Academy of Science–Greater St. Louis Science Fair

CBIO009 **Data-Analytics Modeling to Detect Peripheral Neuropathy: Augmenting Big Data with Google Trends**
Neil Ujjal Tomala, 16, Junior, Parkway West High School, Chesterfield, Missouri, T: Ellen Wilke

PHYS032 **A Geant4 Monte Carlo Simulation of a Quantum Entanglement Experiment of the Decay of Spin-Singlet State Positronium: Computer Replication and Multiple Scattering Mitigation**
Jerry Zhang, 18, Senior, Marquette High School, Chesterfield, Missouri, T: Philip Schmidt

Springfield, USMO08, Ozarks Science and Engineering Fair

EAEV062 **Silver Nanoparticles: Reducing Environmental Toxicity Through Shape Control**
Katie Lu, 17, Junior, Central High School, Springfield, Missouri, T: Rhyan Friesen

ROBO066 **Guide Bot: A Robotic Guide Dog**
Arya Eledath, 14, Freshman, Greenwood Laboratory School, Springfield, Missouri, T: Kristy Gilmore

Hillsboro, USMO09, Mastodon Art/Science Regional Fair

ANIM034 **Saving the Honey Bee from *Varroa destructor* Using RNA-Interference**
Elizabeth Paige Wamsley, 16, Sophomore, Timber Ridge Scholars Academy, Pacific, Missouri, T: Pamela Wamsley

ENBM041 **Detecting the Elusive Lyme Disease, Year Two: Creating a Novel Diagnostic Aid for the Detection of *Borrelia burgdorferi* in Ticks**
Luke Daniel Little, 18, Senior, Timber Ridge Scholars Academy, Pacific, Missouri, T: Pamela Wamsley

MONTANA

Billings, USMT01, Billings Clinic Science Expo

ENMC063 **Flying Birdie**
Hailey M. Smith, 17, Junior, Billings Senior High School, Billings, Montana, T: Patrick Kenney

Butte, USMT02, Montana Tech Regional Science and Engineering Fair

ANIM028 **Effects of Known Endocrine Disruptor Pyriproxyfen Compared to Suspected Endocrine Disruptors Bisphenol-A (BPA) and Bisphenol-S (BPS) on *Blaptica dubia* Roaches**
Casey Wyrwas, 17, Senior, Baker High School, Baker, Montana, T: Linda Rost

MCRO018 **Wolbachia Effects on the Fecundity of *Drosophila mauritiana***
Sophia Vaughn Richter, 17, Junior, Hellgate High School, Missoula, Montana, T: Rob Jensen

Havre, USMT03, Hi-Line Regional Science and Engineering Fair - MSU-Northern

EGCH012 **The Effects of Sodium Bicarbonate Concentration on the Growth Rate of *Chlorella***
Jessica Elise Roth, 18, Senior, Big Sandy High School, Big Sandy, Montana, T: Melanie Schwarzbach

EGCH013 **The Relationship Between Oil and Biodiesel Quality**
Tyler Shaud Schwarzbach, 17, Junior, Big Sandy High School, Big Sandy, Montana, T: Melaine Schwarzbach

Great Falls, USMT04, Montana Region II Science and Engineering Fair

ENEV046 **A Novel Approach to Marine Hydrocarbon Bioremediation**
Christian Andrew Bloch, 18, Senior, North Toole County High School, Sunburst, Montana, T: Amanda Nix

ENEV047T **Silver Nanoparticle Water Filtration Incorporating Ultra-Violet Sterilization**
Mackenzie Camille Wiegand, 16, Junior, Madison Clio Wiegand#, 16, Junior, Simms High School, Simms, Montana, T: Jordan Hollern

Missoula, USMT50, Montana Science Fair

CBIO028 **Accuracy Estimation of Protein Multiple Sequence Alignments Using Profile Hidden Markov Models**
Joyce Muhan Liu, 18, Senior, Sentinel High School, Missoula, Montana, T: Lindsay Manzo

EGPH013 **Aneutronic IEC Fusion Concept**
Ben James Kolar, 17, Junior, Fergus High School, Lewistown, Montana, T: Timothy Nefzger

MCRO053T **Discovery, Isolation, Purification, Amplification, and Characterization of Mycobacteriophage HSavage**
Grace Ludlow, 18, Senior, Hannah Dreesbach, 18, Senior, Capital High School, Helena, Montana, T: Sarah Urban

NEBRASKA

Curtis, USNE01, Central Nebraska Science and Engineering Fair

CHEM018 ***Manihot esculenta*: A Raw Material for Biodegradable Plastic**
Evan Scott Blank, 14, Freshman, Wilcox-Hildreth Public School, Wilcox, Nebraska, T: Marjorie Damit-Og

Nebraska City, USNE02, Greater Nebraska Science and Engineering Fair

MCRO040 **The Effects of *Bacillus cereus* as a Biological Control Agent on *Xanthomonas vasicola pathovar vasculorum***
Katie Joyce Bathke, 17, Junior, Allen Consolidated Schools, Allen, Nebraska, T: Marc Bathke

TMED030 **Antimicrobial Peptide Derivatives as Potential Drug Candidates for Ebola Virus Disease**
Amanda Kai Zhang, 17, Junior, Brownell-Talbot School, Omaha, Nebraska, T: Micki Wayman

NEVADA

Elko, USNV01, Elko County Science Fair

ANIM052 **Color Preference in Poultry Chicks**
Loulou Neff, 15, Freshman, Elko High School, Elko, Nevada, T: Kristin Birdzell

BCHM015T **Medicinal Activity of *Larrea tridentata* and *Juniperus osteosperma* Extracts**
Destiny Jonisha Max, 17, Junior, Rachel Rae Gallego, 17, Junior, Owyhee High School, Owyhee, Nevada, T: Dee Dee Dann

Las Vegas, USNV02, Southern Nevada Regional Science and Engineering Fair

ENEV031 **Development of a Highly Efficient Low-Cost Filter for Effective Dissolved Heavy-Metal and Organic Contaminant Removal**
Yatin J. Chandar, 17, Junior, The Davidson Academy of Nevada, Reno, Nevada, T: Elizabeth Walenta

SOFT028T **Integrating OCR Technology into a Business Card Wallet**
Abhishek Ravi, 17, Senior, Shiva Kittusamy, 18, Senior, Advanced Technologies Academy, Las Vegas, Nevada, T: Scott Underwood

NEW HAMPSHIRE

Concord, USNH50, New Hampshire Science & Engineering Expo

ENEV038 **An Economical Approach for Detecting Water Contamination at Homes–Preventing a Public Drinking Water Crisis**
Meghana Avvaru, 17, Junior, Nashua High School South, Nashua, New Hampshire, T: Stephen Minnigh

ENMC052T **Investigating the Effects of Propellant Mass Flow Rate and a Swirl Ring on the Efficiency of a Magnetoplasmadynamic Thruster**
Avery Parker Clowes, 16, Sophomore, William Augustus Menken, 16, Sophomore, Phillips Exeter Academy, Exeter, New Hampshire, T: David Gulick

MCRO030 **The Effect of Black Carbon on Antibiotic Resistance**
Amy Lynn Cotter, 17, Junior, Kennett High School, North Conway, New Hampshire, T: Lindsay Cole

NEW JERSEY

New Brunswick, USNJ01, Nokia Bell Labs North Jersey Regional Science Fair

ANIM029 **Accelerating Biomimetic Design Evolution Using Advanced Analytics and Rapid Prototyping: An Api-Centric Hive for Domestic *Apis mellifera***
Jade Anne Greenberg, 17, Junior, Pascack Hills High School, Montvale, New Jersey, T: Natalie Macke

BEHA013T **The Effect of Altering *Drosophila* Gut Microbiota on Mate Choice, Immunity, Memory, and Aggression**
Natalia Nicole Murillo, 18, Senior, Rebecca Volkov, 17, Senior, Pascack Hills High School, Montvale, New Jersey, T: Martin Edelberg

ENBM024 **Innovative Carbon Nanotube Based Microsensor for Early Diagnosis of Ovarian Cancer**
JooUn Lee, 16, Sophomore, Tenafly High School, Tenafly, New Jersey, T: Helen Coyle

PHYS040 **Speech Intelligibility Analysis of Sound-Modulated Laser Signal Countermeasures**
Sharmi Shah, 16, Junior, Colonia High School, Colonia, New Jersey, T: James Danch

TMED011 **Synstatin-Mediated Inhibition of Syndecan-1 in Aggressive Hodgkin Lymphoma**
Grace Yujin Lee, 17, Junior, Academies at Englewood, Englewood, New Jersey, T: Stephen Suh

TMED012 **Detection of Melanoma via Deep Learning**
Sophie Jane Andrews, 16, Junior, Chatham High School, Chatham, New Jersey, T: Yelena Naumova

Jersey City, USNJ02, Jersey City Medical Center/Barnabas Health STEM Showcase

BCHM032 **Magnetite Synthesis for Drug Delivery Purposes**
Pablo Luis Garcia, 16, Junior, Union City High School, Union City, New Jersey, T: Nadia Makar

ENEV053 **Using Stropharia Mushroom Mycelium (*S. rugosoannulata*) and Waste Treatment Residual for Filtration of Nitrate/Total Dissolved Nitrogen and Phosphate from Agricultural Runoff to Prevent Harmful Algae Blooms, Year Four**
Harshal Rajesh Agrawal, 16, Junior, Dr. Ronald E. McNair Academic High School, Jersey City, New Jersey, T: Jeremy Stanton

ENEV054 **Affordable Web-Enabled Continuous Radon Detector**
Anna Erica Prilutsky, 15, Sophomore, Dr. Ronald E. McNair Academic High School, Jersey City, New Jersey, T: Jeremy Stanton

Lawrenceville, USNJ03, Mercer Science and Engineering Fair

EAEV026 **Spray and Stick: A Novel Agent for Pesticide Adhesion**
Jacob Wu, 16, Junior, The Lawrenceville School, Lawrenceville, New Jersey, T: Elizabeth Fox

ENEV030 **PEBBLE: Preservation and Evaluation for Benthic Barcode Life Elements**
Sonja Morgan Michaluk, 15, Sophomore, Hopewell Valley Central High School, Pennington, New Jersey, T: Loreen Holstein

Hackensack, USNJ04, BCA Research Expo

BMED031 **Dihydrotanshinone: A Pan-Therapeutic Treatment for Chemoresistance in Cancer**
Varun Kumar, 16, Junior, Bergen County Academies, Hackensack, New Jersey, T: Donna Leonardi

MCRO025 **Addressing Arsenic Contamination: Creating a "Super" Bioremediator with Sub-Lethal Pretreatment**
Nikhil Lohe, 18, Senior, Bergen County Academies, Hackensack, New Jersey, T: Donna Leonardi

NEW MEXICO

Albuquerque, USAI50, National American Indian Science and Engineering Fair

BMED079 **Diabetes Biomarker Study on the Navajo Nation**
Kaylin Nicole McLiverty, 16, Sophomore, Navajo Preparatory School, Farmington, New Mexico, T: Yolanda Flores

ENBM076 **A Low Cost, Closed Loop Insulin Pump for Better Management of Types 1 and 2 Diabetes Mellitus**
Anna Quinlan, 16, Junior, Menlo-Atherton High School, Atherton, California, T: Rachel Richards

Albuquerque, USNM01, Central New Mexico Regional Science and Engineering Challenge

CELL036 **An Investigation into the Current Use of Caffeine as a Migraine Treatment and Its Effects on Spreading Depolarizations: A Second Year Study and the Introduction of a Novel Therapy**
Russell Warren Ludwigsen, 17, Junior, Early College Academy, Albuquerque, New Mexico, T: Mark Walker

MATH028 **Analyzing Patterns Within an Original Egyptian Fraction Decomposition Algorithm**
AnaMaria Perez, 16, Sophomore, Albuquerque Academy, Albuquerque, New Mexico, T: Kevin Fowler

PHYS076 **Effects of Geometry and Voltage on Ion Engine Design**
Isabela Guadalupe Ceniceros, 15, Freshman, Bernalillo High School, Bernalillo, New Mexico, T: Ivy Alefante

PLNT057 ***Mimosa pudica* as Indicator for Comparative Adverse Effects of Topical Anesthetics**
Makayla Gates, 16, Sophomore, Valencia High School, Los Lunas, New Mexico, T: Holly Ice-Gates

Farmington, USNM02, San Juan New Mexico Regional Science and Engineering Fair

ENMC042 **How to Make a More Efficient DC Motor**
Delaney Ann Hammond, 15, Freshman, Piedra Vista High School, Farmington, New Mexico, T: Jennifer Riddle

PHYS058 **Lunar Origin: Is It Really Made of Cheese?**
Sky A. Harper, 16, Sophomore, Navajo Preparatory School, Farmington, New Mexico, T: Yolanda Flores

Grants, USNM03, Four Corners Regional Science and Engineering Fair

EBED015 **EMG Controlled Bionic Hand**
Marc Miguel Mirabal, 17, Sophomore, Grants High School, Grants, New Mexico, T: Shelby Alexander

PHYS077 **Asteroid Repulsion**
Zachariah Elijah Goodrich, 17, Senior, Grants High School, Grants, New Mexico, T: Shelby Alexander

Las Cruces, USNM04, Southwestern New Mexico Regional Science and Engineering Fair

BEHA060 **An Interactive Design of an Upper Limb Therapy Method for Stroke and Spinal Cord Injury to Measure Patient's Motor Performance Quantitatively and Objectively with Tangible Robotic Companionship and Emotion Assessment**
Mustafa Muhyi, 16, Junior, Las Cruces High School, Las Cruces, New Mexico, T: Kristi Salgado

ENEV090T **Lint! A New Way to Conserve Water**
Monique Dianna Reyes, 16, Junior, Andrea Yocelin Campos, 17, Junior, Andrea Yocelin Campos, 17, Junior, Alta Vista Early College High School, Anthony, New Mexico, T: Alicia Stevens

Las Vegas, USNM05, Northeastern New Mexico Regional Science and Engineering Fair

ANIM061 **Modeling American Alligator Population Dynamics**
Karin Ruth Ebey, 14, Freshman, Los Alamos High School, Los Alamos, New Mexico, T: Katie Tauxe

PLNT058T **Hydroponic Agriculture: Commercial *vs.* Individual Growth in New Mexico**
Uriah S. Sanchez, 17, Junior, Xavier McTeigue, 17, Junior, Gabriel M. Holesinger, 17, Junior, Los Alamos High School, Los Alamos, New Mexico, T: Donald Davis, T: Eva Abeyta

Portales, USNM06, Southeastern New Mexico Regional Student Research Challenge

ROBO064 **Optical Navigation System for All-Terrain Robot**
Simon G. Armijo, 18, Senior, Carlsbad High School, Carlsbad, New Mexico, T: Deborah Haggerton

Socorro, USNM50, New Mexico Science and Engineering Fair

BMED046 **Optimization of Lipid-Coated Mesoporous Silica Nanoparticles for Cancer Immunotherapy**
Lien Tang, 18, Senior, Manzano High School, Albuquerque, New Mexico, T: Achraf Noureddine

EAEV054 **Predicting Food Shortages in Africa from Satellite Imagery**
Lillian Petersen, 15, Sophomore, Los Alamos High School, Los Alamos, New Mexico, T: Daniela Moody

ENMC037 **FEA Based Analysis of Spidron Fractal Structures in Force Absorption Applications**
Skyler Steven Hughes, 18, Senior, Albuquerque Institute for Math and Science, Albuquerque, New Mexico, T: Reginald Tyler

MCRO070 **Can Bacteriophage Be Used to Treat Bacterial Imbalances Associated with IBS and IBD?**
George Walter Santarpia, 16, Sophomore, Albuquerque Institute for Math and Science, Albuquerque, New Mexico, T: Phillip Watje

ROBO068 **Teaching an Artificial Intelligence with an Artificial Intelligence: Image Completion Using Tensorflow**
Charles Shelby Strauss, 15, Sophomore, Los Alamos High School, Los Alamos, New Mexico, T: Charlie Strauss

NEW YORK

Poughkeepsie, USNY01, Dutchess County Regional Science Fair

CHEM063 **Synthesis of a Bifunctional Metal (Fe, Ni, Co) Phthalocyanine/Tin (IV) Oxide/Carbon Nanotube Electrocatalyst for the Aqueous CO_2 Reduction to Carbon Monoxide and Formate at Different Potentials Respectively**
Jessica Cohen, 18, Senior, Spackenkill High School, Poughkeepsie, New York, T: Amy Matts

Long Island, USNY02, Long Island Science and Engineering Fair

ANIM030 **Developing a Protocol to Extract DNA from Killer Whale Mucus as a Non-Invasive Alternative to the Use of Biopsy Darts**
Luke Joseph Harris, 18, Senior, West Islip High School, West Islip, New York, T: Mary Kroll

ANIM033 **A Reverse Genetic Approach to Identify Novel Regulators of Cell Invasive Behavior**
Sydney Bracht, 18, Senior, Smithtown High School East, St. James, New York, T: Maria Zeitlin

BCHM017 **Targeting a Redox Dependency in Pancreatic Ductal Adenocarcinoma**
Julia Park, 18, Senior, Plainview-Old Bethpage John F. Kennedy High School, Plainview, New York, T: MaryLou O'Donnell

BEHA015 **The Language of Facial Expressions: A Neuroimaging Study on How a Smile Is Generated and Perceived by Another Person**
Amy Rose Shteyman, 18, Senior, John L. Miller Great Neck North High School, Great Neck, New York, T: Alan Schorn

BEHA016 **Alterations in Oligodendroglia Lineage Cells and Their Impact in Major Depressive Disorder**
Matthew Ryan Mullahy, 17, Junior, Smithtown High School East, St. James, New York, T: Maria Zeitlin

BMED032 **BIC Augments the Proliferative Effects of miR-155 in Diffuse Large B Cell Lymphoma via Downregulation of Tumor Suppressor and Anti-Apoptotic Targets**
Rinni Bhansali, 17, Junior, Half Hollow Hills High School East, Dix Hills, New York, T: Michael Lake

BMED033 **Riluzole Rescues Non-Canonical Akt Signaling and Improves Hereditary Hemorrhagic Telangiectasia Vascular Pathology**
Radhika Patel, 18, Senior, Syosset High School, Syosset, New York, T: Veronica Ade

CBIO014 **Deep Learning Identification of Autism Mutations: Using Molecular and Computational Methods to Characterize a Novel Prioritized Non-Coding Variant in FEZF1**
Vanessa J. Zhang, 17, Senior, Manhasset High School, Manhasset, New York, T: Alison Huenger

CELL017 **SOX and MALAT1: Understanding the Progression of Breast Cancer Metastasis**
Shruthi Shekar, 17, Junior, Jericho High School, Jericho, New York, T: Serena McCalla

EAEV029T **Mitigation TiO_2 Stress and Characterization of a Brassinosteroid Insensitive-1 Gene in Aquatic Bioindicator Species, *Lemna minor***
Dylan Daniel Makani, 16, Sophomore, Tong Ye, 16, Sophomore, Jacqueline Olivia Balestrieri, 16, Sophomore, North Shore Hebrew Academy High School, Great Neck, New York; Half Hollow Hills High School East, Dix Hills, New York; Saint Anthony's High School, South Huntington, New York, T: Lisa Runco, T: Michael Lake, T: Paul Paino

EAEV030 **Tracking Climate Change, Human Impact, and the Overall Oceanic and Terrestrial Health of Estuaries Along the Hudson River and Long Island Sound to Influence Policy**
Emily Alexandra Cruz, 18, Senior, Manhasset High School, Manhasset, New York, T: Alison Huenger

EBED018 **Typing without Touch: A Touchscreen Accessible Device for the Visually Impaired**
Natasha Dilamani, 17, Senior, John L. Miller Great Neck North High School, Great Neck, New York, T: Alan Schorn

EGCH017 **Paper-Based Microbial Fuel Cells for Self-Powered Sustainable Disease Diagnostics**
Kendra Zhang, 17, Senior, Jericho High School, Jericho, New York, T: Serena McCalla

ENBM027 **Subchondral Bone Engineering: Regeneration of Cartilage-Bone Interface to Replace Knee Prosthetics**
Irene Antony, 17, Senior, Half Hollow Hills High School West, Dix Hills, New York, T: Michael Lake

ENEV039 **Solar Powered Nanotech Water Filtration Device with Personal Robotic Transport System**
Smiti Shah, 17, Senior, Bethpage High School, Bethpage, New York, T: Chris Pollatos

ENMC034 **Engineering an Atomic Force Microscopy Based Nano-Stethoscope**
Fred Chu, 18, Senior, Manhasset High School, Manhasset, New York, T: Alison Huenger

MATH024 **The Frequency and Distribution of Consecutive Quadratic Residues Modulo p**
Merrick H. Cai, 16, Junior, Kings Park High School, Kings Park, New York, T: Mary Fay

MATS019 **An Investigation of a Simple, Inexpensive Apparatus for Lipid Nanoparticle Fabrication with Controllable Size and Dispersity with *in vitro* Applications**
Susan Wu, 18, Senior, Manhasset High School, Manhasset, New York, T: Alison Huenger

PHYS046 **High-Resolution Near-Field Nanoscopy Simulation Platform for Nanomaterial Characterizations**
Chiu Fan Bowen Lo, 18, Senior, Jericho High School, Jericho, New York, T: Serena McCalla

TMED016 **Development of an Innovative Drug-Delivery System for Improving the Bioavailability and Release of Curcumin Using Phosphatidylcholine and Silica-Based Nanoparticles**
Eish Maheshwari, 16, Junior, Herricks High School, New Hyde Park, New York, T: Renee Barcia

New York City, USNY03, New York City Science and Engineering Fair

ANIM055 **The Effects of Monk Parakeet Age on Sociality**
Aushna Saleem, 17, Senior, Midwood High School at Brooklyn College, Brooklyn, New York, T: Glenn Elert

BEHA039 **The Impact of Emotionally Targeted Branding on Social Behavior**
Phoebe Mae Yates, 17, Senior, Institute for Collaborative Education, New York, New York, T: Jennifer Dahlstrom

CELL033 **Exploring Posterior Growth in *D. rerio* Using a Live Cell Cycle Biosensor**
Ella Rose Feiner, 18, Senior, Horace Mann School, Bronx, New York, T: Christine Leo

CHEM047 **Cutting off Cancer: Design, Analysis, and Synthesis of Novel Vascular Disrupting Agents**
Brendon Choy, 17, Senior, Hunter College High School, New York, New York, T: Gilana Reiss

EAEV058 **A Destructive Invader: How Rising Atmospheric CO2 Is Aiding *Noctiluca scintillans* in Taking Over Tropical Oceans**
Alexandria Lauren Ang, 17, Senior, Bronx High School of Science, Bronx, New York, T: Erin O'Leary

ENEV067 **The Air We Breathe–Reducing Health Risks by Improving IAQ: An Innovative, Smart, and Responsive Ductless System Optimized by Stochastic Simulation and Machine Learning**
Eeshan Tripathii, 16, Junior, Dalton School, New York, New York, T: Brendan Matz

ENEV068 **Desalinating Water Using Electric Fields**
Ari Joseph Firester, 15, Sophomore, Hunter College High School, New York, New York, T: Gilana Reiss

MATS036 **Novel Fabrication of Organic Multifunctional Materials via Magnetic Alignment**
Vera Alexandra Zarubin, 17, Senior, The Bronx High School of Science, Bronx, New York, T: Allison Davis

PHYS066 **Stochasticity on Astronomical Scales: A Half-Life Formalism for Predicting the Disruption of Small-N Body Systems**
Timur Ibragimov, 18, Senior, Staten Island Technical High School, Staten Island, New York, T: John Davis

PHYS072T **Finding the Next Tatooine: Discovery of Giant Planets, Brown Dwarfs, and the First-Ever Circumbinary Planet Using Doppler Spectroscopy**
Brian Yikang Wu, 16, Sophomore, Bi Tian Yuan, 16, Junior, Horace Mann School, Bronx, New York; Columbia Grammar and Preparatory School, New York City, New York, T: Christine Leo, T: Ilya Yashin

ROBO052 **A Fast and Accurate Open-Source Solo Musical Instrument Classifier**
Hanna Yip, 18, Senior, The Spence School, New York, New York, T: Eric Zahler

SOFT041 **A New Method for the Exploitation of Speech Recognition Systems**
Suha Hussain, 16, Junior, Queens High School for the Sciences at York College, Jamaica, New York, T: Jose Mondestin

TMED044 **Novel Warning Mechanism for At-Risk Stroke and Epilepsy Patients Through Detection of Harmful Levels of Cortisol**
Ryan Bose-Roy, 15, Sophomore, Hunter College High School, New York, New York, T: Mrinalni Sharma

Westchester, Putnam, Sullivan Counties, USNY05, Regeneron-Westchester Science and Engineering Fair

ANIM035T **Elucidating the Influence of Habitat Fragmentation, Urbanization, and Environmental Factors on the Inhibitory Ability of Antifungal *Cutaneou* Bacteria Found on the Eastern Redback Population**
Julia Ann Piccirillo-Stosser, 16, Junior, Sabrina Grace Piccirillo-Stosser, 16, Junior, Kiara Taveras, 16, Junior, Ossining High School, Ossining, New York, T: Angelo Piccirillo

BCHM020 **Rab35: A Potential Therapeutic Target for Alzheimer's Disease**
Madiha Qureshi Zia, 18, Senior, Ossining High School, Ossining, New York, T: Angelo Piccirillo

BEHA019 **The Effects of Lithium on Insomniac *Drosophila melanogaster***
Alaina Shana Leticia Otto, 18, Senior, Sleepy Hollow High School, Sleepy Hollow, New York, T: Michele Zielinski

BEHA036T **The Effect of Metformin on Post Traumatic Brain Injury Learning and Learning Disabilities**
Emma Elizabeth Bilton, 18, Senior, Hannah Rose Bilton#, 18, Senior, Yorktown High School, Yorktown Heights, New York, T: Michael Blueglass

BEHA042 **S.O.S (Students Overcoming Stress) Gaining Insight and Addressing Student Stress: An Exploratory Study Analyzing the Different Modalities of Stress and Mindfulness on Adolescents**
Caitlin O'Donnell, 18, Senior, Yorktown High School, Yorktown Heights, New York, T: Michael Blueglass

BMED045 **Analysis of Periodontal Trends Within the United States in Comparison to Developing Countries to Further Oral Disease Prevention Understanding**
Michaela Rachel Kyer, 17, Senior, Yorktown High School, Yorktown Heights, New York, T: Michael Blueglass

BMED068 **The Role of Notch Signaling in T-Cell Acute Lymphoblastic Leukemia**
Jessica Finkler, 18, Senior, Mahopac High School, Mahopac, New York, T: Dennis Quackenbush

CBIO031 **A Scalable and Freely Accessible Machine Learning Based Application for the Early Detection of Dyslexia**
Isha Puri, 16, Junior, Horace Greeley High School, Chappaqua, New York, T: Trudy Gessler

CELL026 **Inhibiting the Effects of Fetuin-B Upregulation Using TAK-242**
Eden Sheinin, 18, Senior, Yorktown High School, Yorktown Heights, New York, T: Michael Blueglass

CELL037 **Use of a Novel Peptide-Based Assay to Determine Potential Risk of Reaction to Lupine for Peanut Allergic Patients**
Simon Jacob Peck, 17, Senior, Fox Lane High School, Bedford, New York, T: Stephanie Peborde

EGPH014 **Maximizing Energy Efficiency: Improvements in Litz Wire Designs in the Megahertz Range**
Rachel Joseph, 17, Junior, Somers High School, Lincolndale, New York, T: William Maelia

ENBM034 **Development of Decellularized Peppermint Leaf Functionalized Biomimetic Scaffolds for Cardiac Tissue Engineering: An Investigation of Physico-Chemical and Mechanical Properties**
Sarah Mae Broas, 17, Junior, Putnam Valley High School, Putnam Valley, New York, T: Jerry Zupan

ENBM035 **Multiscale Statistical Analysis of Lung Cancer Tissue Using the Backscattering of Polarized Light**
Kiera Megan Mallinson, 17, Senior, Pelham Memorial High School, Pelham, New York, T: Steven Beltecas

MATS046T **Synthesizing and Characterizing Novel Gelatin and Pluronic F127 Hybrid Hydrogels as a Barrier Membrane for Guided Bone Regeneration Following Periodontitis**
Jainil Sutaria, 18, Senior, Chelsea Wang, 17, Senior, Rachel Li, 17, Junior, Ardsley High School, Ardsley, New York; Fossil Ridge High School, Fort Collins, Colorado; Spackenkill High School, Poughkeepsie, New York, T: Diana Evangelista

PHYS057 **Exploring Lunar Impact Basin Porosity Through a Weighted Least-Squares Fit Model**
Tara Kamala Venkatadri, 17, Senior, Ardsley High School, Ardsley, New York, T: Diana Evangelista

Syracuse, USNY06, Central New York Science and Engineering Fair

BEHA040 **Effects of High Fat Diet on Metabolic Profile, Cognition, and Brain Derived Neurotrophic Factor (BDNF): Establishing a Connection Between Metabolic Dysregulation and BDNF Expression**
Rachel Elman, 16, Junior, Fayettevile-Manlius High School, Manlius, New York, T: James Morgan

CHEM042 **The Synthesis and Characterization of Novel Heteroleptic Alkaline Earth Metal Compounds**
Marina Cousins, 18, Senior, Manlius-Pebble Hill School, Dewitt, New York, T: Sue Foster

ROBO035 **Non-Invasive Detection of Sudden Infant Death Syndrome (SIDS) through Recurrent Neural Networks**
Maximilian Junqi Du, 15, Sophomore, Fayettevile-Manlius High School, Manlius, New York, T: Mary Ward

Troy, USNY07, Greater Capital Region Science and Engineering Fair, Inc.

CBIO018 **Optimization of Seizure Detection Using the Machine Learning Algorithm SVM**
Zachary Xiao Huang, 16, Junior, The Albany Academies, Albany, New York, T: Saira Chowdhry

ROBO027 **Agricultural Drones: The Development of an Unmanned Aerial System for Use in Semi-Autonomous Silo Inspection**
Samantha Boyea, 17, Senior, Greenwich Junior-Senior High School, Greenwich, New York, T: Nicole Dixson

ROBO036 **AI-Powered Multi-Spectral Intelligent Robotic System for Search and Rescue**
Aryia Dattamajumdar, 15, Sophomore, Niskayuna High School, Niskayuna, New York, T: Jill Paquette

Utica, USNY08, Utica College Regional Science Fair

CHEM041 **Comparing the Potentially Hazardous Chemical Components of Different Types of Drinking Water and the Dangers We Might Not Perceive**
Nicole Monika Grace Jeselson, 18, Senior, Rome Free Academy, Rome, New York, T: Melissa Downs

Buffalo, USNY11, Western New York Regional Science and Engineering Fair

ANIM051 **Bird Migration Patterns**
Liam-Gavin Dell, 15, Freshman, City Honors School, Buffalo, New York, T: Todd Richards

St. Bonaventure, USNY12, Twin Tiers Regional Science Fair

MATS023 **Alternative Construction 3D Printing Materials**
Christine Pagett, 17, Junior, Portville Central School, Portville, New York, T: Robert Stives

Potsdam, USNY13, Terra North East Regional Science and Engineering Fair

ANIM038 **Bovine Somatic Cell Count and Mastitis Bacterial Strains**
Kathryn Marie Bosley, 17, Senior, Franklin Academy High School, Malone, New York, T: Denise Rogers

Queens, USNY50, New York State Science and Engineering Fair

ANIM039 **The Role of NRBF2 in the Regulation of the ULK1 Kinase Complex**
Jessica Li Jiang, 17, Senior, William A. Shine Great Neck South High School, Great Neck, New York, T: Carol Hersh

ANIM050 **Acetylcholine and Nicotine Potentiate Currents in Cells Isolated from Sea Anemone *Nematostella vectensis***
Sarah Elizabeth Adamo, 18, Senior, Smithtown High School West, Smithtown, New York, T: Joanne Figueiredo

BMED034 **Establishment and Characterization of Topotecan Resistant NCI-H460/TPT10 Cells**
Kimberly W. Lu, 18, Senior, William A. Shine Great Neck South High School, Great Neck, New York, T: Carol Hersh

BMED039 **Strategic Epithelialization: Utilizing RNA Interference to Inhibit Novel Microtubule Depolymerase Fidgetin Like-2 in Human Umbilical Vein Endothelial Cells**
Ifeoluwa Tugbobo, 17, Senior, Elmont Memorial Junior-Senior High School, Elmont, New York, T: Michelle Flannory

CBIO015 **Generation of Novel Fatty Acid Binding Protein (FABP) Inhibitors with Analgesic and Anti-Cancer Properties**
Kiana Ziadkhanpour, 17, Senior, Plainview-Old Bethpage John F. Kennedy High School, Plainview, New York, T: Mary Lou O'Donnell

CELL023T **The Cilium and Centrosome Associated Protein CCDC11 Is Required for Cytokinesis via Midbody Recruitment of the ESCRT-III Membrane Scission Complex**
Jillian Emma Parker, 16, Junior, Jiachen Elizabeth Lee, 17, Junior, Arooba Ahmed, 16, Junior, Half Hollow Hills High School West, Dix Hills, New York; Half Hollow Hills High School East, Dix Hills, New York, T: Michael Lake

EBED019 **Write Anywhere: Filtering Low-Cost IMU Data for Small-Scale Motion Reproduction**
David Xu, 16, Junior, Jericho High School, Jericho, New York, T: Serena McCalla

ENEV040 **Direct Functionalization of Algal Nanocellulose to Enhance Biosorption for Lead(II) Remediation**
Michelle Xing, 17, Senior, William A. Shine Great Neck South High School, Great Neck, New York, T: Carol Hersh

MATH029 **Restoring Wild Oyster Reefs: Optimization of Population Sustainability Through Mathematical Modeling of Fertilization Dynamics**
Vincenzo Pagano, 18, Senior, Long Beach Senior High School, Lido Beach, New York, T: Cody Onufrock

MCRO031 **The Effects of Nitazoxanide on Bacterial Virulence Factor Assembly by the Chaperone/Usher Pathway**
Raphael Leon Iskra, 18, Senior, Commack High School, Commack, New York, T: Jeanette Collette

PHYS047 **Observation of the Chiral Magnetic Effect in the Quark-Gluon Plasma Produced in Au+Au Collisions at the Relativistic Heavy Ion Collider**
Cindy Wang, 17, Senior, William A. Shine Great Neck South High School, Great Neck, New York, T: Carol Hersh

PHYS048 **Single Crystal Synthesis, Structure, and Magnetic Properties of CrAl3Bi2O9, the First Cr-Al-Bi-O Compound**
Jaylyn Umana, 16, Junior, Long Beach Senior High School, Lido Beach, New York, T: Cody Onufrock

PLNT033 **Phylogenetic Analysis to Provide Insight on the Trihelix Gene Function in *Arabidopsis thaliana***
Pragati Muthukumar, 17, Junior, Commack High School, Commack, New York, T: Jeanette Collette

SOFT027 **A Novel Kalman Filter Latent State Estimator for GPS/INS Reference Point Acquisition**
Kyle Markland, 17, Senior, Rocky Point High School, Rocky Point, New York, T: Nancy Hunter

NORTH CAROLINA

Charlotte, USNC01, Charlotte-Mecklenburg Regional Science Fair

EAEV009 **The Lethal Effects of Hexafluoropropylene Oxide Dimer Acid on *Daphnia magna***
Emmily Mobley, 16, Sophomore, Stuart W. Cramer High School, Belmont, North Carolina, T: Phoebe Lawing

ROBO018T **Machine Learning Approach to Computer Assisted Diagnosis of Skin Diseases**
Daniel Joseph Haller, 18, Senior, Ashwin Kulshrestha#, 18, Senior, Jainith Jagdish Patel#, 18, Senior, Marvin Ridge High School, Waxhaw, North Carolina, T: Steve Wilson

Durham, USNC02, North Carolina Central Region III Science Fair

ENMC010 **Controlled Landing: Manipulating a Parachute to Determine the Landing Site of a Rocket**
Lorenzo Shaikewitz, 16, Junior, Charles E. Jordan Senior High School, Durham, North Carolina, T: Carson Wise

Durham, USNC03, North Carolina Science Fair Region 3B

ENEV006 **Harmful Algal Growth Suppressed by Allelopathy Regardless of Excess Phosphorus**
Elizabeth Margaret Farmer, 17, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Amy Sheck

PHYS003 **Time Domain Calculations of Scalar Self-Force and Radiation from an Orbiting Point Charge in Schwarzschild Spacetime**
Karna Ashwin Morey, 17, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Jonathan Bennett

Raleigh, USNC50, North Carolina State Science Fair

ANIM053T **Novel Method for Determining Culex quinquefasciatus Behavioral Response to Acoustic Stimuli Utilizing a Split-Tube Design**
Hunter Chase Bishop, 17, Junior, Fritz Alexander Ruppert, 15, Sophomore, Brevard Senior High School, Brevard, North Carolina, T: Jennifer Williams

BEHA037 **A Quantifiable Method to Detect and Monitor ADHD: The Use of Facial and Motion-Based Behavioral Cues Analysis Using Deep Neural Network and RGBD Data**
Ishaan Maitra, 16, Sophomore, Ardrey Kell High School, Charlotte, North Carolina, T: Stephanie Sayward

BMED054 **Role of G Protein Receptor Kinase 3 (GRK3) on Pathogenesis of Osteoarthritis**
Hyun Ho Lee, 18, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Sarah Shoemaker

CHEM046 **Development of a Mathematical Algorithm Modeling the Bioaccumulation of Styrene in the New Hanover County Materials Recovery Facility Through the Analysis of Volatiles Emitted from Recyclable Plastics**
Zane S. Dash, 16, Sophomore, Isaac Bear Early College High School, Wilmington, North Carolina, T: Bryan Bishop

EGPH010 **Fusion Reactions in Low Wattage Inertial Electrostatic Confinement Devices**
Daniel Alexander Klasing, 19, Senior, Stuart W. Cramer High School, Belmont, North Carolina, T: Phoebe Lawing

EGPH029T **Designing a Novel Self-Sustained Solar Powered Desalination Apparatus to Produce Thermoelectricity, Using a Fresnel Lens and Thermoelectric Generators**
Ibrahim Mateen Moghul, 15, Sophomore, Maryam Mateen Moghul, 16, Junior, Triangle Math and Science Academy, Cary, North Carolina, T: Thomas Ten Eyck

MATS033T **Degradation of Polyethylene and Poly (Ethyl Cyanoacrylate) via Photothermal Heating**
Tamar Ruth McMahon, 18, Senior, Matthew Ray Mims, 17, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Jonathan Bennett

MCRO039 **Antimicrobial Efficacy of Bacterially Secreted Peptide Microcins Compared to Antibiotic Nitrofurantoin**
Billy M. Ngo, 18, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Amy Sheck

MCRO050T **Antimicrobial Activity of Endophytes Isolated from Transylvania County Spray Cliff Plants**
Nicole Marisha Rideout, 17, Junior, Matthew Bailey, 17, Senior, John Van Nguyen, 17, Junior, Brevard Senior High School, Brevard, North Carolina, T: Jennifer Williams

MCRO051T **Isolation of Entomopathogenic Fungi from Mosquito Larvae and Evaluation of Potential for Mosquito Control**
Emily Clare Trusler, 16, Junior, Cullen Stuart Duval#, 17, Junior, Brevard Senior High School, Brevard, North Carolina, T: Jennifer Williams

ROBO049 **Improving Aviation Safety Using Low-Cost Low-Fidelity Sensors Augmented with Extended Kalman Filters to Develop an Accurate 3D Dynamic Sense-and-Track System**
Rohan Deshpande, 18, Senior, East Chapel Hill High School, Chapel Hill, North Carolina, T: Don Bryson

SOFT037 **AzureVoice: A Novel Approach for the Early Detection of Parkinson's Disease Using Android Apps and Artificial Intelligence**
Koushik Sridhar, 16, Sophomore, Ardrey Kell High School, Charlotte, North Carolina, T: Rachel Robinson

NORTH DAKOTA

Bismarck, USND01, Southwest Central North Dakota Regional Science and Engineering Fair

EBED047 **Does Mental Practice Make Perfect?**
Pamela Nash, 16, Sophomore, Strasburg Public School, Strasburg, North Dakota, T: Bill Malaski

ENEV087 **Bat Consumption of *Ostinia nubilalis*, European Corn Borer**
Mya Nicole Vetter, 17, Senior, Linton High School, Linton, North Dakota, T: Annette Pavlicek

Fargo, USND03, Southeast North Dakota Regional Science and Engineering Fair

MCRO059 **An Antibacterial and Antifungal Comparison of Countertop Disinfectant**
Emerson Anna Falk, 15, Freshman, Hankinson Public School, Hankinson, North Dakota, T: Patricia Kratcha

Jamestown, USND04, Southeast Central North Dakota Science and Engineering Fair

EAEV076 **Nitrogen Fixation: Biological *vs.* Synthetic Agents**
Addie James Schnabel, 18, Senior, Ashley Public School, Ashley, North Dakota, T: Lucas Moldenhauer

MCRO060 **Belly Button Bacteria**
Kathleen Marie Schmidt, 18, Senior, Ashley Public School, Ashley, North Dakota, T: Lucas Moldenhauer

Grand Forks, USND05, Northeast North Dakota Regional Science and Engineering Fair

BMED081 **What Conditions Do Planarians Regenerate Best In?**
Britney Kristen Freund, 18, Senior, Lakota High School, Lakota, North Dakota, T: Susan Bahe

Williston, USND06, Northwest North Dakota Regional Science Fair

ANIM067 **A Better Way to Wean**
Abigail Grace Larson, 17, Senior, Tioga High School, Tioga, North Dakota, T: Debra Moe

BEHA054 **Whistle While You Work It**
Mikayla Grace Wolfe, 17, Junior, Tioga High School, Tioga, North Dakota, T: Debra Moe

PLNT063 **Are Plant Growth Regulators Always Effective When Treating Wheat?**
Hannah Marie Johnson, 16, Junior, Grenora Public School, Grenora, North Dakota, T: Katelyn Jespersen

Grand Forks, USND50, North Dakota State Science and Engineering Fair

EAEV071 **Air Quality: A Quantitative Approach to Small and Large Particles**
Abigail Renae Post, 14, Freshman, Hankinson Public School, Hankinson, North Dakota, T: Patricia Kratcha

ENEV075 **Buffering the Bloom–The Effect of Nutrient Management Practices on Pond Eutrophication**
\# Alyssa Mae Kemp, 16, Junior, Cavalier Public High School, Cavalier, North Dakota, T: Chad Kemp

ENEV086 **Enhanced Biofilter Control of CAFO Green House Gas Emissions**
Juliann Kathleen Spilman, 17, Senior, Mandan High School, Mandan, North Dakota, T: Cierra Kroh

OHIO

Athens, USOH01, Southeastern Ohio Regional Science and Engineering Fair

PLNT037 **Starch Statoliths as Gravity Sensors in *Arabidopsis thaliana***
Anru Tian, 17, Junior, Athens High School, The Plains, Ohio, T: Andrea Anderson

Cleveland, USOH02, Northeastern Ohio Science and Engineering Fair

BMED035 **Development of Differentiation Therapies for NPM1 Mutated AML**
Allison Sewell, 17, Junior, Hawken School, Gates Mills, Ohio, T: Robert Shurtz

CELL018 **Examining the Effect of HIF and Notch in Endothelial Cell Migration and Sprouting**
Vishal Keshav Senthilkumar, 17, Senior, Brunswick High School, Brunswick, Ohio, T: Diana Ramirez-Bergeron

ENBM025 **Automatic Contouring Methods for Adaptive Radiotherapy in Cancer Patients Using Artificial Intelligence and a Virtual Mobile Robotic Assistant**
David Lyons, 17, Junior, Hawken School, Gates Mills, Ohio, T: Robert Shurtz

ENBM028 **Biodegradable Artificial Blood Vessels: A Breakthrough in Tissue Engineering**
Claudia Michelle Hamilton, 16, Junior, Hawken School, Gates Mills, Ohio, T: Bob Shurtz

ENMC035 **BEAM Me Up, Scotty! Mitigating the Decibel Levels on the BEAM Space Module Using a 1:10 Scale Model with Acoustic Engineering Techniques for Long Term Space Missions**
Daniel Liddell Anand, 17, Junior, Anand Homeschool Academy, Akron, Ohio, T: Vijay Anand

Dayton, USOH04, Montgomery County Science and Engineering Fair

ENBM015 **Creating a High Fidelity Portable Electrocardiogram Analysis System**
Sanjeev Melchizedek Gunawardena, 16, Junior, Centerville High School, Centerville, Ohio, T: Penny Manfredi

MATH016 **Using Lyapunov Exponents to Differentiate Between Randomness and Pseudorandomness**
Adam Michael Saunders, 17, Junior, Carroll High School, Dayton, Ohio, T: Laurie Fuhr

MCRO026T **Genetically Engineering Nonpathogenic *E. coli* to Bind to a Cellulose Matrix Using Curli Fibers and Cellulose Binding Domains**
Jonah Douglas Carter, 18, Junior, Max Anthony Herrmann, 17, Junior, Carroll High School, Dayton, Ohio, T: Christina O'Malley

Shaker Heights, USOH05, Hathaway Brown Upper School Fair

CHEM019 **Computational Predictions in the Design of Affinity-Based Drug Delivery**
Alison Wenqing Xin, 17, Junior, Hathaway Brown School, Shaker Heights, Ohio, T: Crystal Miller

ENBM016 **Sucrose Addition Improves Targeted ECO/siBeta3 Nanoparticle Stability**
Michelle Yin, 18, Senior, Hathaway Brown School, Shaker Heights, Ohio, T: Crystal Miller

MATS011 **Heteromultivalent Approaches to Clot-Targeted Nanomedicine: Combination Targeting of Drug Delivery Systems to Active Platelets and Fibrin**
\# Amaya Najma Razmi, 17, Senior, Hathaway Brown School, Shaker Heights, Ohio, T: Crystal Miller

Archbold, USOH06, Northwest Ohio Science and Engineering Fair

ANIM024 **Resurvey of Fish Species in Three Agricultural Freshwater Ecosystems in Fulton County, Ohio 2014–2017**
Jordan M. Skates, 17, Senior, Pettisville High School, Pettisville, Ohio, T: Donna Meller

EGCH010 **America's Next Generation of Green Energy: Biodigesters**
David S. Baden, 17, Junior, Patrick Henry High School, Hamler, Ohio, T: David Parry

Marion, USOH07, Marion Area Science and Engineering Fair

ENBM036 **MaculAR**
Priyanka Agochiya, 16, Sophomore, Olentangy High School, Lewis Center, Ohio, T: Benjamin Lloyd

ENMC053 **The Impact of Physical Properties on a Subsonic Projectile's Velocity**
Andre Farinazo Jr., 17, Junior, Olentangy High School, Lewis Center, Ohio, T: Benjamin Lloyd

Columbus, USOH11, Buckeye Science and Engineering Fair

EGPH025 **Electrae–An Innovative Solution for Generating Energy from Multiple Sources Including Piezoelectrics, Photovoltaic Materials and Low Flow/Head Hydropower for Application in a Multitude of Environments**
Laalitya Acharya, 14, Freshman, William Mason High School, Mason, Ohio, T: Karen Young

ENBM070 **Engineering and Evaluation of 3D Printed and Bioprinted Novel Photocuring Polymer Composite Scaffolds for Bone Tissue Regeneration**
Nipun Udara Jayatissa, 16, Junior, Maumee Valley Country Day School, Toledo, Ohio, T: Dennis Eller

ENEV081 **Is Your Water Safe to Drink? Development of a Novel Home Test Method to Quantitatively Determine the Concentration of Lead in Water, Phase Two**
Mukund Anand Seshadri, 15, Sophomore, Dublin Coffman High School, Dublin, Ohio, T: Greg Snyder

PLNT064 **Droplet Vitrification–A Viable Method of Cryopreservation for *Deeringothamnus rugelii, Deeringothamnus pulchellus,* and *Asimina tetramera***
Caroline Frances Karbowski, 18, Senior, The Summit Country Day School, Cincinnati, Ohio, T: Jessica Replogle

ROBO065T **A Generalized Machine Learning Framework for Fingerprinting Disease Based on Gene Expression Profile**
Prathik Abhay Chakravarthy, 17, Junior, Sudarshan Venkat Chakravarthy, 16, Sophomore, Beavercreek High School, Beavercreek, Ohio, T: Timothy Magill

OKLAHOMA

Alva, USOK01, Northwestern Oklahoma State University Regional Science Fair

EAEV083T **Micro Farms**
Lillian Pearl Ingraham, 18, Senior, Taylor Brianne McKinney, 18, Senior, Northwest Technology Center, Fairview, Oklahoma, Fairview High School, Fairview, Oklahoma, T: Shaun Cusack

EGCH042 **A Billion Powerplants: Could Microscopic Organisms Lead to a Future of Environmentally Friendly Electricity?**
Kylee Pameticky, 18, Senior, Fairview High School, Fairview, Oklahoma, T: Shawn Cusack

Bartlesville, USOK02, Bartlesville District Science Fair

ANIM056 **The Effects of Salinity on *Aedes aegypti* Blood Meal Selection**
Rachel Leigh Brown, 18, Senior, Bartlesville High School, Bartlesville, Oklahoma, T: Betty Henderson

ENMC051 **The Optimal Truss**
Edwin Ding, 15, Sophomore, Bartlesville High School, Bartlesville, Oklahoma, T: Gary Layman

PHYS033 **An Investigation into Efficient Wireless Power Transmission**
James Boudreaux, 16, Sophomore, Bartlesville High School, Bartlesville, Oklahoma, T: Gary Layman

Miami, USOK04, Northeastern Oklahoma A&M Science and Engineering Fair

BCHM013 **Identifying Metabolic Inhibitors to Target Aggressive Cancers with Deregulated p27kip1**
Michael Ken-Long Hwang, 16, Sophomore, Jenks High School, Jenks, Oklahoma, T: Robert Sheaff

Muskogee, USOK05, Muskogee Regional Science and Engineering Fair

ENMC038 **Optimizing Combustion Efficiency and Emissions in a Burner Design Using Spiral Mixing Technology; Year Two of an Ongoing Study**
Brendan Joseph Crotty, 16, Sophomore, Home School, Muskogee, Oklahoma, T: Jennifer Crotty

Wilburton, USOK09, Eastern Oklahoma Regional Science and Engineering Fair

ENEV020 **Designing a Novel Heavy Metal Bioremediation System Utilizing Immobilized Algae Partnered with Heavy Metal Resistant Microbial Isolates Collected from Contaminated Superfund Mine Sites and Identified with a 16S Ribosomal Subunit Analysis**
Braden Nicholas Milford, 16, Junior, Cascia Hall Preparatory School, Tulsa, Oklahoma, T: Sally Fenska

Ada, USOK50, Oklahoma State Science and Engineering Fair

CBIO038 **Developing a Novel Model for Predicting Patient Susceptibility to Contracting a Hospital Acquired Infection Utilizing Machine Learning in the Evaluation of Electronic Patient Health Records**
Erika Eleonora Ravitch, 17, Senior, Cascia Hall Preparatory School, Tulsa, Oklahoma, T: Sally Fenska

OREGON

Gresham, USOR01, Gresham–Barlow Science Expo

EAEV032 **Radiochemistry and AI: Development of a Targeted Emergency Response and Recovery System Using ML Algorithms for Use After a Nuclear Event**
Anushka M. Nair, 17, Junior, Lake Oswego High School, Lake Oswego, Oregon, T: Dave Stewart-Smith

MATH017 **Discrete Derivatives of Random Matrix Models and the Gaussian Free Field**
Gopal Krishna Goel, 14, Freshman, Krishna Homeschool, Portland, Oregon, T: Gunjan Tiwari

PLNT021 **Lichen as Bioindicators: A Study into the Relationship Between Lichen Thallus Structures and Their Sensitivity to NOx and SOx**
Isaac Taylor Quinn Klementis, 18, Senior, Gresham High School, Gresham, Oregon, T: Julie Trisel

Portland, USOR02, Portland Public Schools Science Expo

CELL015 **Oxidative Damage and Aging: Characterization of Novel Helicases DinG and YoaA and Catalases KatE/KatG, and Their Effects in Cellular Defense Against Reactive Oxygen Species**
Natalie Eajia Wang, 15, Sophomore, Lincoln High School, Portland, Oregon, T: Angie McVay

MATH025 **Musical Homotopy: A Topological Study of Voice Leading Groups and Its Application to Contrapuntal Music Genres**
Aditya Sivakumar, 18, Senior, Franklin High School, Portland, Oregon, T: Merritt Sansom

Hillsboro, USOR04, Beaverton–Hillsboro Science Expo

CELL007 **Characterization of Assembly-Activating Protein in Adeno-Associated Virus Capsid Assembly**
Lauren Hsing-Tze Li, 17, Junior, Westview High School, Portland, Oregon, T: Debbie Cooper

ENBM037 **A Fully Functional Closed- Loop System Using Ultrasound Imaging to Automatically Detect Lipohypertrophy in People with Insulin-Dependent Diabetes**
Rohan Ahluwalia, 16, Sophomore, Westview High School, Portland, Oregon, T: Debbie Cooper

ENMC017T **An Amphibious Teleoperated Vehicle Designed to Collect Water Samples in Remote and Hazardous Environments**
Ryker Bullis, 18, Senior, Nathaniel A. Fritsch, 18, Senior, Nicholas Conrad Ogden, 18, Senior, Glencoe High School, Hillsboro, Oregon, T: Christopher Steiner

ROBO012 **A Novel Approach to Recognize Emotion from Speech Using Machine Learning Algorithms to Aid Social Interaction of Kids with Autism**
Anwesha Mukherjee, 14, Sophomore, Westview High School, Portland, Oregon, T: Debbie Cooper

Portland, USOR05, Aardvark Science Exposition

BEHA008 **The Expression of Genes Correlated with ADHD and Dyslexia on the Vocal and Auditory Pathways of a Zebra Finch Model**
#` Alison Thomas, 17, Junior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley

EAEV022 **Multiple Time-Step Predictive Models for Hurricanes in the North Atlantic Basin Based on Machine Learning Algorithms**
Aneesh Gupta, 16, Junior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley

EBED013 **Development of a Multidimensional Atmospheric Sensing Platform**
Ryan Westcott, 16, Sophomore, Oregon Episcopal School, Portland, Oregon, T: Ryan Holland

ENEV021T **Implementation of *Salvinia sp.* and *Eichhornia sp.* for the Phytoremediation, Rhizofiltration, and Recycling of Heavy Metals from Contaminated Aquatic Environments**
Nastassia Goodson, 18, Senior, Bryan To, 17, Senior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley

PHYS034 **Modeling and Integrating the Orbit of Near-Earth Asteroid 2003 QB90 (242211)**
David Fang, 18, Junior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley

Wilsonville, USOR06, CREST–Jane Goodall Science Symposium

BMED053T **The Association of the KIT Gene with Colorectal Cancer**
Marlee Feltham, 17, Junior, Rishima Mukherjee, 16, Junior, West Linn High School, West Linn, Oregon, T: Nancy Monson

EBED016 **A Low-Cost, Rapid Response Communication Link During a State of Emergency Using WiFi Mesh Networks**
Pooja Jain, 17, Junior, West Linn High School, West Linn, Oregon, T: Michael George

ENEV032 **Single Chamber MFC: Role of Extracellular Phosphate in Heavy Metal Precipitation**
Nathan Michael Tidball, 16, Junior, Wilsonville High School, Wilsonville, Oregon, T: Jim O'Connell

PLNT028T **Improving Coccolithophore (*Emiliania huxleyi*) Tolerance to Ocean Acidification Through Artificial Directional Selection**
Hannah Maria Budroe, 17, Junior, Michelle Pauline Stevens, 17, Junior, Wilsonville High School, Wilsonville, Oregon, T: Jay Schauer

Eugene, USOR07, Central Western Oregon Science Expo

BCHM018 **The Effect of Ocean Acidification on Native Oyster Reproduction and Larval Development**
Anna Christine Mattson, 18, Senior, Tillamook High School, Tillamook, Oregon, T: Clair Thomas

BMED028 **Next Generation Intracellular Delivery: Optimization of Exosome Isolation and Novel Exosome-Mediated Delivery for Therapeutic Targeting of Cancer**
Megha Nitin Joshi, 16, Junior, South Salem High School, Salem, Oregon, T: John Hercher

Bend, USOR08, Central Oregon Community College Regional Science Expo

ENBM026 **The Peru-Ready Method for Optimizing Bioavailable Iron in Water to Reduce Anemia Caused by Iron Deficiency in the Highlands of Peru**
James Paul Verheyden, 17, Senior, Bend Science Station, Bend, Oregon, T: David Bermudez

Portland, USOR50, Intel Northwest Science Expo

BCHM040 **Allosteric Inhibition of the Carbonic Anhydrase IX for Anticancer Applications**
Nandini Tondamantham Naidu, 17, Senior, Valley Catholic High School, Beaverton, Oregon, T: Marty Karlin

BMED082 **Drug Testing Chemotherapies to Identify Kinase Pathways Affected by Hypertrophic Cardiomyopathy**
Himani Sood, 17, Junior, Westview High School, Portland, Oregon, T: Debbie Cooper

CELL042 **A Novel Method of Constructing Short Synthetic Promoters Using Random Transcription Factor Binding Site Combinations**
Adit Gupta, 16, Junior, Westview High School, Portland, Oregon, T: Debbie Cooper

CHEM057 **A New Route to Next-Generation Spin Based Devices for Quantum Information Processing: Optically Active Fully Organic Room Temperature Ferromagnetic Semiconductors**
Arnob Das, 18, Senior, Jesuit High School, Portland, Oregon, T: Lara Shamieh

MATS058 **Cupronickel Nanowire Networks for Future Flexible Touch Sensor Display Applications**
Musa Asim Tahir, 16, Junior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley

SOFT055 **Utilizing Blockchain to Revolutionize Privacy and Security of Medical Records**
Divya Amirtharaj, 16, Junior, Westview High School, Portland, Oregon, T: Debbie Cooper

PENNSYLVANIA

Harrisburg, USPA01, Capital Area Science and Engineering Fair

CHEM034 **Pharmaceutical Identification and Purification: Evaluating International Publications in Reference to Pharmaceutical Substance Identification**
Zoe Elizabeth Timothy, 18, Senior, Susquenita High School, Duncannon, Pennsylvania, T: Kathleen Becker

MATH030 **A Practical Cryptosystem with Provable Security: Three New Innovations in Cryptography**
Wyatt John Howe, 17, Senior, Hershey High School, Hershey, Pennsylvania, T: Jason Sibbach

PLNT038 **Optimizing Hydroponic Plant Growth and Energy Usage with LED Spectral Manipulation**
April Elizabeth Pivonka, 18, Senior, Camp Hill High School, Camp Hill, Pennsylvania, T: Amy Diehl

ROBO037 **Creating a Simulation of an Intersection of Self-Driving Cars Without Traffic Lights**
Alec Timothy Warren, 17, Junior, Harrisburg Academy, Lemoyne, Pennsylvania, T: Lakshmi Shrikantia

Lancaster, USPA02, North Museum Science and Engineering Fair

BMED061 **Tumorigenic Effect of a Cannabinoid Receptor Blocker in a Squamous Cell Carcinoma Cell Line: Implications for Treatment**
Daniel Baksh, 16, Sophomore, Lancaster Catholic High School, Lancaster, Pennsylvania, T: Anne Bleistine

EAEV059 **The Effects of Bacteria on the Biodegradation of Polymers**
Alexis Elizabeth Kellogg, 15, Sophomore, Warwick High School, Lititz, Pennsylvania, T: Diana Griffiths

Philadelphia, USPA03, Delaware Valley Science Fairs

BCHM038 **The Biochemical Interactions of Cardiac Ion-Blocking Agents and Optical Coherence Tomography *in vivo* for Cardiovascular Diseases**
Rhea Malhotra, 15, Sophomore, Moravian Academy, Bethlehem, Pennsylvania, T: Gaby Dee

BCHM041 **Targeting Apoptotic Pathways by Regulating Caspase-3 with Chemo-Preventive Agents for Cancer Therapeutics**
Tanya Mehta, 14, Freshman, Parkland High School, Allentown, Pennsylvania, T: Michael Post

EGPH021 **RPAL: A Novel Low-Cost High-Efficiency Photovoltaic System Using Tunable Plasmonic Nanostructures**
Sathya Edamadaka, 16, Junior, High Technology High School, Lincroft, New Jersey, T: Michael Roche

ENBM061 **The Use of AI Algorithms to Automatically Identify Premature Atrial Contractions from Electrocardiogram Recordings**
Ryan Zhu Luo, 17, Junior, Biotechnology High School, Freehold, New Jersey, T: Michael Chin

ENBM065 **Prostate Cancer Diagnostic Device: The Application of Multiplex Lateral Flow Immunoassay for the Detection of Prostate Specific Antigen (PSA)**
Shehbeel Arif, 18, Senior, Central High School, Philadelphia, Pennsylvania, T: Galeet Cohen

ENBM071 **Unfolding the Mysteries of vWF: Experimental *vs.* Computation Studies of vWF's A2 Domain**
Prathysha Oliveira Kothare, 15, Freshman, Parkland High School, Allentown, Pennsylvania, T: Michael Post

MATH046 **Braid Groups on Triangulated Surfaces and Singular Homology**
Karthik Yegnesh, 18, Senior, Methacon High School, Eagleville, Pennsylvania, T: Robert Helm

MATH047 **Looking at the Dynamics of Q(Z)=Z^2+C in the Space of 2X2 Real Matrices**
Pranav Garimidi, 16, Sophomore, Conestoga High School, Berwyn, Pennsylvania, T: Scott Best

PHYS081 **The Hofstadter Butterfly on a Ring Lattice: Exploring the Discrete Case & Translating to a Continuous Model with a Bichromatic Sinusoidal Potential**
Ankhitha Manjunatha, 15, Freshman, Parkland High School, Allentown, Pennsylvania, T: Michael Post

PLNT059 # **Molecular-Based Genotypic Selection for Anthocyanin in *Lactuca sativa*, Year Three**
Sophia Edith Swartz, 18, Senior, Central Bucks High School South, Warrington, Pennsylvania, T: Brian Testa

TMED048 **KetoPatch: A Novel Method for Early Detection of Diabetic KetoAcidosis**
Nehali Gupta, 16, Junior, Parkland High School, Allentown, Pennsylvania, T: Michael Post

TMED049 **How Does Poor Posture Affect the Human Body?**
Ariel Maire Baiano, 16, Sophomore, Marine Academy of Technology and Environmental Science, Manahawkin, New Jersey, T: John Wnek

TMED055T **Urine as an Alternative to Blood for Cancer Liquid Biopsy and Precision Medicine**
Adam Ming Zhang, 17, Junior, Jonathan Ruibo Cheng, 16, Junior, Methacon High School, Eagleville, Pennsylvania, T: Ying-Hsiu Su

Pittsburgh, USPA04, Covestro Pittsburgh Regional Science & Engineering Fair

BCHM023 **Developing an Optimal Fluorescent Protein Tag**
Mia Pellegrini, 16, Junior, Pittsburgh Allderdice High School, Pittsburgh, Pennsylvania, T: Janet Waldeck

CBIO021 **Gene Methylation Is a Driver of Cellular Differentiation for Intrinsic Subtype of Breast Cancer During Carcinogenesis**
Thomas Ik-Hyun Kim, 18, Senior, Vincentian Academy, Pittsburgh, Pennsylvania, T: Andrea Malm

ENBM050 **Immunology Interfaces with Nanotechnology: The Development of a Sensitive Carbon Nanotube-Based Biosensor for the Detection of Influenza A (H1N1)**
Benjamin Josiah Cummings, 17, Junior, Pittsburgh Allderdice High School, Pittsburgh, Pennsylvania, T: Janet Waldeck

ENBM051 **Development of an *in vitro* Human Liver Model for Nonalcoholic Fatty Liver Disease**
Nicole Marie Munne, 18, Senior, Peters Township High School, McMurray, Pennsylvania, T: Christopher Allen

Reading, USPA05, Reading and Berks Science and Engineering Fair

BMED036 **Wasp Venom Stings Cancer: Investigation of Dictyostelium as a Model Organism and the Potential of an Improved Treatment Delivery System**
Rini Vyomesh Kaneria, 17, Senior, Conrad Weiser High School, Robesonia, Pennsylvania, T: Adelle Schade

ENBM049 **Improving Documentation and Treatment for Patient Care Utilizing a Cell Phone Algorithm to Quantify Wounds in Three Dimensions**
Abigail Jean Browne, 17, Junior, Conrad Weiser High School, Robesonia, Pennsylvania, T: Adelle Schade

MCRO071 **Successful Inhibition of *Candida albicans* Utilizing Borate-Based Bioactive Glass: An Emerging Antifungal Material**
Madison Leigh Bright, 18, Senior, Conrad Weiser High School, Robesonia, Pennsylvania, T: Adelle Schade

York, USPA06, York County Science and Engineering Fair

BEHA009T **Using Python to Develop Twitter Personas**
Daniella Feistritzer, 15, Sophomore, Adam Joseph Rilatt, 15, Sophomore, Central York High School, York, Pennsylvania, T: Dianna Guise

MATS016 **3D Printing of Biodegradable Material**
Alex Sun, 17, Junior, Red Lion Area Senior High School, Red Lion, Pennsylvania, T: Valerie Stone

RHODE ISLAND

Warwick, USRI50, Rhode Island Science and Engineering Fair

BMED040 **From EpiPens to EpiGenetics: Understanding the Mechanisms Behind the Microbiome's Impact on Peanut Allergies**
Isabella M. Heffernan, 14, Freshman, St. Mary Academy - Bay View, Riverside, Rhode Island, T: Janell Johnson

PHYS054 **Fast-Neutron Yield of Alpha-Neutron Sources Using Varying Targets**
Joshua Almeida Guertler, 15, Freshman, Barrington High School, Barrington, Rhode Island, T: Diana Siliezar

SOUTH CAROLINA

Aiken, USSC01, Central Savannah River Area Science and Engineering Fair

BMED029 **Effect of Plasma Exosomes in Polymicrobial Sepsis on Erythrocyte Deformability**
Srikrishnan Pillai Raju, 16, Junior, Lakeside High School, Evans, Georgia, T: Charlotte Smith

Bluffton, USSC02, Sea Island Regional Science Fair

BMED041 **Inhibitor A: Targeting Therapeutically Resistant HER2+ Breast Cancer Tissues**
Alexander James Schaffer, 18, Senior, May River High School, Bluffton, South Carolina, T: Susan Dee

CHEM040 **BPA *vs.* BPS: An Analysis of Water Stored in "BPA-Free" Polycarbonate-Based Baby Bottles Using High Performance Liquid Chromatography and X-Calibur Software**
Rachel Alys Stratton, 15, Sophomore, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Janet Sullivan

ENMC061 **Engineering a Composite Ballet Pointe Shoe Shank**
Abigail Roslyn Freed, 17, Junior, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Janet Sullivan

MCRO032 **Characterization of Bacteria Living on the Teeth and Gums of Sharks, First Steps to Identify Potential Treatments in Case of Shark Bites**
Lucas Alexander Tomita, 17, Junior, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Thomas Lannen

Charleston, USSC03, Low Country Science Fair

BEHA059 **Test Tunes**
Naomi Rae Higgins, 15, Freshman, The Georgetown School of Arts and Sciences, Georgetown, South Carolina, T: Michelle Neubauer

CHEM064 **The Impact of Fullerene Additives on the Morphology of P3HT Thin Films Processed from Binary Solvent Mixtures**
Anna Smirnova, 18, Senior, Academic Magnet High School, North Charleston, South Carolina, T: Katharine Metzner-Roop

Columbia, USSC04, USC Central South Carolina Region II Science and Engineering Fair

BCHM027 **The Effect of Nonassociative Learning on Oxidative Stress in *Caenorhabditis elegans*: A Potential Application for Alzheimer's Disease Research**
Gillian Elizabeth Patton, 16, Junior, Spring Valley High School, Columbia, South Carolina, T: Michelle Spigner

EGCH035 **Optimizing the Designs of Multi-Layer Microbial Fuel Cells**
Zachary Kochert, 17, Senior, Center for Advanced Technical Studies, Chapin, South Carolina, T: Patrick Smallwood

Florence, USSC05, Sand Hills Regional Science Fair

ANIM071 **Which Egg-Laying Substrate Do Crickets Prefer?**
Katherine Traver, 15, Sophomore, Sockdolager School, Hartsville, South Carolina, T: Maya Traver

Spartanburg, USSC07, Piedmont South Carolina Region III Science Fair

MCRO049T **What Effect Does the pH of a Solution Have on the Growth of a Possible Cancer Linked Fungi *Candida albicans*?**
Ty Nelson, 15, Freshman, Nathaniel James Diehn, 15, Freshman, Vivian Clair Pellegrino, 14, Freshman, Paul M. Dorman High School, Roebuck, South Carolina, T: Karen Crossley

SOUTH DAKOTA

Aberdeen, USSD01, Northern South Dakota Science and Math Fair

BEHA026 **Recreating Ancient Art Mediums**
Hailey Ann Boekelheide, 16, Sophomore, Northwestern High School, Mellette, South Dakota, T: Denise Clemens

EGCH020 **The Production of Oxygen and Hydrogen Gases Through the Development of an On Board Electrolyzer to Improve the Mile per Gallon Efficiency of a Spark-Ignition Engine**
Daniel A. Orr, 17, Junior, Northwestern High School, Mellette, South Dakota, T: Denise Clemens

ROBO055T **Low Cost 3-D Printed Robot Arm**
Conner Joe Torrence, 18, Senior, Nathan Joseph Rook, 19, Senior, Aberdeen Central High School, Aberdeen, South Dakota, T: Charles Hermansen

Brookings, USSD02, Eastern South Dakota Science and Engineering Fair

BEHA022T **Correlation Between the Development of the Prefrontal Cortex and Reaction Time**
Jess Huber, 18, Senior, Elsie Aslesen, 18, Senior, Elk Point Jefferson High School, Elk Point, South Dakota, T: Karlene Stabe

BEHA027 **What's Feeding Your Mind?**
Shantel A. Mack, 16, Freshman, Waverly-South Shore Public School, Waverly, South Dakota, T: Nancy Adair

EGCH021 **Fuel Ethanol Potential of Barley, Phase Four**
Morgan Marcella Kohl, 18, Senior, Waverly-South Shore Public School, Waverly, South Dakota, T: Nancy Adair

Rapid City, USSD03, High Plains Regional Science and Engineering Fair

BCHM036 **Buffalo *vs.* Beef: Analyzing Lipid Content in Search of Potential Health Benefits (Phase II)**
Elsie Monique DuBray, 17, Senior, Timber Lake High School, Timber Lake, South Dakota, T: Louise Lindskov

MATS054 **Superconductivity: Planar Weight Disparity in Relation to Critical Temperature**
Grayson Nelson, 17, Senior, Sturgis Brown High School, Sturgis, South Dakota, T: Kristin Wheaton

Mitchell, USSD04, South Central South Dakota Science and Engineering Fair

EBED029 **Universal GPS Watch**
Mallory Bohr, 15, Sophomore, Plankinton High School, Plankinton, South Dakota, T: Kevin McElhinney

ENEV048 **Constructing a Solar Graphene-Based Supercapacitor, Phase II**
Madison Rose Hetland, 18, Senior, Mitchell High School, Mitchell, South Dakota, T: Julie Olson

TMED022 **The Plausibility of Using Plant Based Extracts as Acetylcholinesterase Inhibitors**
Thea Lauren Patrick, 18, Senior, Mitchell High School, Mitchell, South Dakota, T: Julie Olson

TENNESSEE

Chattanooga, USTN01, Chattanooga Regional Science and Engineering Fair

BMED042T **Total Sponge and Coral Proteins Show Promise for Slowing N2a Cancer Cell Division**
Ben Smith, 18, Senior, Grant Harrison Smith, 18, Senior, McCallie School, Chattanooga, Tennessee, T: Karah Nazor

PHYS049 **Can Parachutes Be Used to Replace Runaway Ramps?**
Benjamin Thomas Gardner, 17, Junior, Sale Creek Middle High School, Sale Creek, Tennessee, T: Thomas Gardner

Cookeville, USTN02, Cumberland Plateau Regional Science and Engineering Fair

EAEV023 **Analyzing Water Quality in Local Watersheds Through Water Chemistry and Macroinvertebrates**
Ethan Jean, 17, Junior, Cookeville High School, Cookeville, Tennessee, T: Jennifer Williams

Knoxville, USTN04, Southern Appalachian Science and Engineering Fair

SOFT056 **Software Techniques for Rendering Fractals**
Cade Brown, 17, Junior, L&N STEM Academy, Knoxville, Tennessee, T: Cindy Brown

TMED038 **Heart Smart: A Novel Deep Learning Approach to Improving Heart Disease Diagnosis**
Sofia Tomov, 14, Freshman, Homeschool, Knoxville, Tennessee, T: B. Tomov

Memphis, USTN05, Memphis-Shelby County Science and Engineering Fair

CBIO039 **Analysis of Polymer Characteristics through C++ Computational Methods**
Shridhar Athinarayanan, 17, Junior, White Station High School, Memphis, Tennessee, T: Maridee Cornell

Nashville, USTN06, Middle Tennessee Science and Engineering Fair

ENMC036 **MARS-Q: A Vertical Thrust Vehicle Capable of Planetary Reconnaissance in a Martian Atmosphere**
Aylor Jake Huneycutt, 15, Freshman, AP4, Madison, Tennessee, T: Jennifer Castro

SOFT036 **Preventing Domestic Violence Using Emotion Recognition in Speech**
Gabrielle Kaili-May Liu, 16, Junior, Ravenwood High School, Brentwood, Tennessee, T: Peter Lowen

TEXAS

Dallas, USTX01, Beal Bank Dallas Regional Science and Engineering Fair

CBIO005 **Designing a Modified HAC-PD-1 to Antagonize PD-L2 for the Improvement of Cancer Immunotherapy**
Amanda Grace Moon, 17, Junior, Plano East Senior High School, Plano, Texas, T: Julie Baker

CELL010T **Assessing the Impacts of CRISPR Editing on Protein Expression; Utilizing dCas9 as a Potential Roadblock to DNA Transcription**
Yesh Satyajit Doctor, 18, Senior, Kshitij Sachan##, 18, Senior, Plano East Senior High School, Plano, Texas, T: Julie Baker

EBED012 **Electroencephalogram (EEG) Sensor and Subsequent Analysis System Optimization for Objective and Point-of-Care Concussion Diagnosis**
Paritosh Suri, 17, Junior, Plano West Senior High School, Plano, Texas, T: Neil Milburn

EGPH003 **Untapped Static: A New Paradigm for Energy Harvesting Integrating a Cost-Effective Electrostatic-Based Generator with Supercapacitors to Optimize Energy Storage and Energy Harvesting Efficiency**
Eshan Chhabra, 17, Junior, Plano Senior High School, Plano, Texas, T: Tiffany Grimes

ENBM030 **VTE GTG: Using Near Infrared Light to Create a Vein Map to Accurately, Quickly and Safely Diagnose Venous Thromboembolism**
Rohan Khera, 16, Junior, Plano West Senior High School, Plano, Texas, T: Neil Milburn

MCRO015T **An Inside Job: The Transformation of *Escherichia coli* K-12 with aiiA Encoded Plasmids and Their Translative Effects as Quorum Sensing Inhibitors**
Jason Tanner Smith, 18, Senior, Austin Wolfgang Katzer#, 18, Senior, Plano West Senior High School, Plano, Texas, T: Neil Milburn

ROBO013 **Vehicle Action Prediction with Artificial Intelligence: An Innovative Way to Transform Advanced Driver Assistance Systems from Reactive to Proactive**
Kevin Meng, 15, Sophomore, Jasper High School, Plano, Texas, T: Patricia Kite

SOFT016 **An Electroencephalographic Brain-Computer Interface to Restore Communication to the Paralyzed**
Triston Zhang, 17, Senior, Plano Senior High School, Plano, Texas, T: Tiffany Grimes

El Paso, USTX02, Sun Country Science Fair

ANIM015 **Accelerated Planarian Regeneration Through the Manipulation of Frequency**
Xena Tame, 18, Senior, Ysleta High School, El Paso, Texas, T: Enrique Gomez

MATS008T **Jaundice: The Battle Between Blue *vs.* Yellow**
Samantha M. Perez, 15, Freshman, Dinorah A. Perez, 16, Sophomore, Loretto Academy High School, El Paso, Texas, T: Jesse Reade

ROBO015T **To Europa and Beyond**
Annai Cuvelier, 16, Junior, Alexa Hernandez, 17, Junior, Jenny Cha, 16, Junior, El Dorado High School, El Paso, Texas, T: Antonio Castruita

Fort Worth, USTX03, Fort Worth Regional Science and Engineering Fair

BCHM006 **Effective Evasion of Chemotherapeutic Resistance by Functionalized Viral Capsid QB**
Sangita Vasikaran, 16, Junior, Texas Academy of Mathematics and Science, Denton, Texas, T: Samuel Earls

BEHA020 **Diagnostic Test for Dyslexia, Year Three**
Ainsley McDonald-Boyer, 18, Senior, Azle High School, Azle, Texas, T: Kimberly Wrick

EGCH005T **A Bright Future: The Use of Organic Waste in Dye-Sensitized Cells in the Creation of Efficient Solar Energy Systems**
Grace Lee, 16, Junior, Nick Lee, 18, Senior, Colleyville Heritage High School, Colleyville, Texas, T: Sonya Loughran

ENEV015 **A New Air Pollution Filter for Effective Gas Separation and Purification: High-Performance Polymer-Blended Mixed-Matrix Membranes with Triad Compatibilizers – Small Organic Molecules, Metal Organic Frameworks, and Carbon Nanotubes**
David Yue, 17, Junior, Texas Academy of Mathematics and Science, Denton, Texas, T: Samuel Earls

PHYS023 **Design and Simulation of a Novel Concentric Cone Antihydrogen Gravity Experiment**
Sahil S. Patel, 18, Senior, Texas Academy of Mathematics and Science, Denton, Texas, T: Carlos Ordonez

TMED005 **Lipoprotein-Based Therapeutic Approach to Combat Breast Cancer**
Ruhani Kaur Ahluwalia, 14, Freshman, Harmony School of Innovation - Fort Worth, Fort Worth, Texas, T: Omer Dogan

Brownsville, USTX04, Rio Grande Valley Regional Science and Engineering Fair

ANIM008 **Worm Amnesia: The Effect of Taurine, Glucose, and Caffeine on *Dugesia dorotocephala***
David Lee Garcia, 17, Junior, IDEA College Preparatory McAllen, McAllen, Texas, T: Vanora Davila

BMED005 **Investigating Whether FOXO1 Hinders ZEB1 Gene Expression in (U87MG) Glioblastoma Cells**
Angelica Rodriguez, 17, Junior, UTRGV Mathematics and Science Academy, Edinburg, Texas, T: Megan Keniry

PHYS059 **The Response of Field Effect Transistors**
Christian Lee Ortiz, 17, Junior, Academy for Health Science Professions-STEM, La Joya, Texas, T: Daniel Plas

Houston, USTX05, Science Engineering Fair of Houston

ANIM016 **Environmentally-Friendly, Color-Infused, Structurally-Strengthened Silk Fibers from Feed-Induced *Bombyx mori***
Andrew Dong-Hyun Kim, 18, Senior, Academy of Science and Technology, The Woodlands, Texas, T: Susan Caffery

BEHA006 **Better Decision Making: Forecasting or Surrogation?**
Alyssa Knowles, 16, Sophomore, Friendswood High School, Friendswood, Texas, T: Rebecca Clark

CBIO006 **Alzheimer's Disease Prediction**
Adarsh Suresh, 16, Junior, Clear Brook High School, Friendswood, Texas, T: Alaina Garza

EGPH004T **Energy of Life: Colored Bioluminescent Concentrator for Enhanced Photovoltaic Performance**
Smiti Gandhi, 17, Senior, Andrew Liu, 17, Senior, Clear Brook High School, Friendswood, Texas, T: Alaina Garza

ENBM012 **Detection of Ear Infection Using a Smartphone Application**
Anushka Sameer Jetly, 15, Sophomore, Friendswood High School, Friendswood, Texas, T: Rebecca Clark

ENEV016T **Reducing Commercial Food Waste: Developing an Application for the Economically Viable Transportation of Food Waste from Source to Compost Facility via Private Contractors**
Michael Jonathan Gerhard, 15, Sophomore, Kabir Jolly, 16, Sophomore, Academy of Science and Technology, The Woodlands, Texas, T: Susan Caffery

ENEV049 **Organic and Synthetic: Evaluation of Environmentally Conscious Chemical Dispersant for Biological Crude Oil Remediation**
Adham Mohab Kassem, 17, Junior, Academy of Science and Technology, The Woodlands, Texas, T: Susan Caffery

ENMC022 **Development of a Smart Cervical Vertebrae Brace for Neck Pain Prevention and Rehabilitation**
Muning Fan, 17, Junior, Academy of Science and Technology, The Woodlands, Texas, T: Jennifer Davies

MATS022 **Repurposing Recycled Materials for Greener, Stronger Cement**
Jill Elizabeth Bohnet, 17, Junior, Academy of Science and Technology, The Woodlands, Texas, T: Theresa Delong

MCRO012 **Cancer Targeting and Drug Delivery by Chimeric Proteins**
Jennifer Lin, 17, Junior, Michael E. DeBakey High School for Health Professions, Houston, Texas, T: Barbara Williams

PHYS024 **Faraday's Bicycle**
Sebastian Saenz, 15, Freshman, Academy of Science and Technology, The Woodlands, Texas, T: Sara Fox

ROBO016 **A Sensor-Enhanced Digital Stethoscope (SEDS): Design and Development of an Intelligent Sensor-Enhanced Digital Stethoscope for Patient-Friendly Remote Auscultation**
Syamantak Payra, 17, Senior, Clear Brook High School, Friendswood, Texas, T: Alaina Garza

Kilgore, USTX06, East Texas Regional Science Fair

BCHM021 **Optimal Circadian Rhythms of Pyrocystis Dinoflagellate Algae for Maximizing Bioluminescence**
Carissa Margaret Bruton, 17, Junior, Winnsboro High School, Winnsboro, Texas, T: Cindy Rogers

Laredo, USTX07, United Independent School District Regional Science Fair

EAEV006 ***G. mellonella, T. molitor, Z. morio*, Larvae Waste Products from Polystyrene Biodegradation Used as Fertilizer for Tropaeolum Plant**
Lourdes Marian Marquez, 17, Junior, John B. Alexander High School, Laredo, Texas, T: Veronica Villarreal

Lubbock, USTX08, South Plains Regional Science and Engineering Fair

PLNT007 **Co-Overexpression of AVP1 and PP2A-C5 Increases Plant Tolerance to Multiple Stresses**
Phyllis Ann Zhang, 17, Junior, Lubbock High School, Lubbock, Texas, T: Paxton Payton

PLNT009 **Reducing Water Requirements in the Establishment of Bermudagrass with Polymer Coated Sand, Year Two**
Benjamin Luke Wanjura, 17, Junior, Christ the King Cathedral School, Lubbock, Texas, T: Alicea Chaloupka

Odessa, USTX09, Permian Basin Regional Science Fair

EAEV037T **FLOC AND FLOW: Using Electrocoagulation and Granular Media Filtration to Improve Water Quality**
Matthew Jeffrey Trees, 15, Sophomore, Garrett Guerrero, 16, Sophomore, Trees Family Home School, San Angelo, Texas, Guerrero Home School, San Angelo, Texas, T: Janice Trees, T: Annette Guerrero

San Antonio, USTX11, Alamo Regional Science and Engineering Fair

ANIM017 **Can A Small Bird End Malnutrition? A Comparison of Coturnix japonica and *Gallus gallus* as Potential Sustainable Protein Sources for Developing Countries and Those Seeking a Quality Sustainable Source of Protein**
Shannon Leigh Anderson, 16, Sophomore, Anderson Christian Academy, Seguin, Texas, T: Lisa Anderson

BEHA017 **What Influences Safe Medication Practices: Investigating the Relationship Between Parent's Intentions, Self-Efficacy and Knowledge**
Emily Stephany Garcia, 17, Junior, Young Women's Leadership Academy, San Antonio, Texas, T: Rachael Guillen

BMED009 **Identification of Novel Drivers of Insulin Resistance and Type 2 Diabetes in the Skeletal Muscle Tissue of Non-Obese Individuals Using a Multi-Omics Approach**
Adithya Mummidi, 17, Senior, Keystone School, San Antonio, Texas, T: Jason Nydegger

BMED010 **East Indian Sandalwood Oil (EISO) as a Therapeutic Target for Disease: A Study of TRPM7 Ion Channels (Year IV)**
Nia Myfanwy Clements, 17, Senior, Keystone School, San Antonio, Texas, T: Jason Nydegger

ENMC023 **Economizing Materials on a Pratt Truss Bridge**
Chloe Aviana Boerner-Martinez, 15, Freshman, John Jay Science and Engineering Academy, San Antonio, Texas, T: Michael Scully

PHYS025 **Designing a Practical Quantum Network Using Standard Basis Rotation and Blockchain Verification**
Evan McKenna Meade, 18, Senior, Keystone School, San Antonio, Texas, T: Jason Nydegger

PLNT018T **Stop and Smell the Flowers: The Assessment of the Effects of Aeration in Regards to Lifespan and Bacteria Presence of the *Lilium orientalis***
Ashley Nicole Walker, 17, Senior, Hannah Noelle Taylor, 17, Junior, Agriscience Magnet Program, San Antonio, Texas, T: Joshua Anderson

Waco, USTX12, Central Texas Science and Engineering Fair

EGCH008 **Genetic Engineering Yeast to Produce Lipid Based Biofuel for the Future**
Remi Olivier Labeille, 16, Sophomore, Midway High School, Waco, Texas, T: Kathy McMillan

ENMC014 **KN-Sucrose Rocket Fuels**
Caleb Wilson Chakmakjian, 15, Freshman, Live Oak Classical School, Waco, Texas, T: Katherine Pitts

Austin, USTX13, Austin Energy Regional Science Festival

ANIM018 **A Novel Approach to Substance Abuse Rehabilitation Using Transient Receptor Potential Channels and Insulin Signaling in *C. elegans***
Sindhuja Uppuluri, 16, Sophomore, Westwood High School, Austin, Texas, T: Judy Grimsley

BEHA005 **Social Skills in Adolescents Who Use Cochlear Implants**
Megan Cantwell, 16, Sophomore, Veritas Academy, Austin, Texas, T: Esteban Cantu

BMED058 **Multiple Sclerosis and Epilepsy: Insights into a Potential Therapy Through the Role of Mutation T1244C of Theiler's Murine Encephalomyelitis Virus (TMEV) in Reducing Virulence**
Xiao Zhou, 16, Junior, College Station High School, College Station, Texas, T: Casey Akin

ENEV010 **Using Solar Power in a Combined Electrocoagulation-Electroflotation Approach to Water Treatment**
Stephanie Brown, 17, Junior, College Station High School, College Station, Texas, T: Casey Akin

MATS009T **Eco-Friendly Alternatives to Polystyrene**
Varisha Masroor, 16, Sophomore, Rushmia Zaina Hoq, 16, Sophomore, Austin Peace Academy, Austin, Texas, T: Nahed Abougalala

MCRO013 **Biodegrading Acid: A Novel Approach Using Bacteria**
Raneen Aljamal, 17, Junior, Austin Peace Academy, Austin, Texas, T: Nahed Abougalala

Laredo, USTX14, Laredo Independent School District Science Fair

ANIM019 **Motion Activated Auditory Deterrents to Prevent Wildlife Vehicular Collisions Along High-Density Wildlife Crossing**
Maegan Yeary, 18, Senior, J.W. Nixon High School, Laredo, Texas, T: Itzel Hinojosa

EAEV012 **An Environmental Study: Activated Carbon as a Neutralizing Agent of a Pesticide Imidachloprid**
Isabella Lopez, 17, Senior, J.W. Nixon High School, Laredo, Texas, T: Eduardo Lopez

Corpus Christi, USTX15, Coastal Bend Regional Science Fair

ENBM062T **A U"knee"Que Solution**
Thomas Alexander Curtin, 15, Freshman, Ibrahim Samhar Al-Akash, 15, Freshman, Veterans Memorial High School, Corpus Christi, Texas, T: Porfirio Zamora

PHYS041 **Saving Lives with AFLOAT: Airbag Flotation Anti-Drowning System**
Joaquin Haces-Garcia, 15, Freshman, Santa Gertrudis Academy High School, Kingsville, Texas, T: Veronica Alfaro

San Antonio, USTX50, Texas Science and Engineering Fair

BCHM044 **Engineering a Bacterial Pathogen with an Enhanced Luminescent Reporter for High-Throughput Resistance Assays**
Isabella Quisqueya Elmore, 16, Sophomore, San Marcos High School, San Marcos, Texas, T: Ryan Randolphin

CBIO040T **Hit or Miss? Using Mathematical Computations Based on Existing Physics Theorems to Evaluate Head Impacts in the National Football League**
Smaran Velidi, 16, Sophomore, Aditya Sai Vishnubhotla, 16, Sophomore, Plano East Senior High School, Plano, Texas, T: Julie Baker

EBED050T **EyeMove: Using Electrooculography to Provide Mobility for the Disabled**
Malav H. Shah, 18, Burzin Poras Balsara##, 18, Senior, Plano Senior High School, Plano, Texas, T: Elizabeth Carson

EGCH036T **Highly Mesoporous Electrodes Derived from Polymer Blends of Polyacrylonitrile-Polystyrene and Polyacrylonitrile-Poly(Methyl-Methacrylate) Paired with a Cost-Effective Deep Eutectic Solvent for High Energy Density Supercapacitors**
Ashna Shah, 17, Junior, Ashay Shah, 17, Junior, Plano East Senior High School, Plano, Texas, T: Julie Baker

ENBM072 **An Electronic Device with an Integrated Mobile App for Early Detection of Cardiovascular Diseases: A Low-Cost, Easy-To-Use, Non-Invasive Device and Comprehensive, Multi-Parametric Smartphone App**
Shelly Goel, 17, Junior, School of Science and Engineering at Yvonne A Ewell Townview Magnet Center, Dallas, Texas, T: Keivon Spencer

MATS055 **A Novel Analytical Technique for Dendritic Microstructures Formed During Directional Solidification of Metallic Alloys and Synthesis of an Alloy Fabrication Protocol for Optimization of Physical Properties**
Arman Sharma, 15, Sophomore, Academy of Science and Technology, The Woodlands, Texas, T: Susan Caffery

PHYS085 **Flexible, Low Cost Solar Cells Using High Efficiency Gallium Arsenide Compound Semiconductors**
Kumaran Selva, 16, Sophomore, Clear Lake High School, Houston, Texas, T: Lauren Cooper

PLNT065 **A Low-Cost Technique to Combat Eutrophication and Soil Contamination in Organic Agricultural Communities**
Kavya Muralidhar, 16, Sophomore, Plano East Senior High School, Plano, Texas, T: Julie Baker

TMED056 **Methylene Blue May Mitigate Symptoms of Traumatic Brain Injury**
Beril Lara Saygin, 16, Sophomore, Keystone School, San Antonio, Texas, T: Jason Nydegger

UTAH

Layton, USUT01, North Davis Area Science and Engineering Fair

ANIM040 **The Effect of Talking on a Horse's Heart Rate When Grooming the Neck and Withers After Exercise**
Abegail Louise Faz, 17, Senior, Northridge High School, Layton, Utah, T: Colleen Bagley

BMED043 **The Effect of Different Wavelengths of Amplified Light on the Corneas of Cow Eyes**
Makenzie Paula Moore, 16, Sophomore, Syracuse High School, Syracuse, Utah, T: Amanda O'Keefe

CHEM067 **Lord Kelvin's Thunderstorm: Improving Power Generation with Ionic Solutions**
Benjamin DeVries, 16, Sophomore, Woods Cross High School, Woods Cross, Utah, T: Janette Duffin

EGCH032T **Performance of Conventional & Unconventional Hybrid Rocket Fuels**
Ryan Spencer Pearson, 15, Sophomore, Chad Harrison Brown, 16, Sophomore, Woods Cross High School, Woods Cross, Utah, T: Janette Duffin

ENMC039 **Simulation, Optimization, and Validation of a Closed Wing Airplane**
Andrew Bennett, 18, Senior, Bountiful High School, Bountiful, Utah, T: Austin Walker

MATH026 **Combinatorics on Path Connections of a Rectangular Graph**
Emil Geisler, 16, Junior, Bountiful High School, Bountiful, Utah, T: Chandler Austin

Cedar City, USUT02, Southern Utah Science and Engineering Fair

BEHA032 **Sex Perspective Rigidity and Sex Discrimination**
Troilus White, 16, Sophomore, Cedar City High School, Cedar City, Utah, T: Anna Lewin

EAEV038 **Speed and Survival Rate of *Oncorhynchus nerka* Migrating from the Pacific Ocean**
Ryan Paul Bunn, 16, Junior, Success Academy DSU, St. George, Utah, T: Charmain Brammer

ENEV060 **Comparing the Effects of Mycoremediation and Phytoremediation on Soil Pollution Levels Using *Pleurotus ostreatus* and *Brassica juncea***
Ali Talib Mustufa Saifee, 16, Junior, Success Academy DSU, St. George, Utah, T: Charmain Brammer

PHYS078T **Secondary Crater Morphology with Distance from Primary Crater**
Dante Dalton, 18, Senior, Brad Walter Taylor, 17, Junior, South Sevier High School, Monroe, Utah, T: Deborah Morgan

Ogden, USUT03, Weber Area Science and Engineering Fair

EGPH008 **The Laser's Potential: Photonic Propulsion in the Future of Transportation**
Benjamin Erik Hickenlooper, 18, Senior, Fremont High School, Plain City, Utah, T: Robert Riley

ENMC041T **Fuel Geysering in Small Motor Systems**
Mason Robert Palmer, 17, Senior, Lylee Ranee Nebeker, 18, Senior, Fremont High School, Plain City, Utah, T: Robert Riley

MCRO036 **The Role of *Apis mellifera* on the Preservation of Organic Tissue**
Piper Cai Deamer, 16, Sophomore, Fremont High School, Plain City, Utah, T: Robert Riley

PLNT034T **Corn Silage Yield and Nutritional Testing**
Jace Michael Marriott, 15, Sophomore, Cheyenne Marcheta Breeding, 17, Junior, Fremont High School, Plain City, Utah, T: Robert Riley

TMED025 **Human Oral Bacteria Strains *vs.* Xylitol (C5H7(OH)5) and Other Common Health Care Products**
Joshua Dean Mackley, 17, Junior, Weber High School, Pleasant View, Utah, T: Lareen Radle

Provo, USUT04, Central Utah STEM Fair

BCHM033 **The Agricultural Application of Phytomethylotrophy**
Frank Kaelin Mittel, 18, Senior, American Fork High School, American Fork, Utah, T: Robert Adamson

CELL040 **CRISPR and Its Use in Determining the Function of the VPS-34 Gene in *Caenorhabditis elegans***
Colin Michael Robinson, 18, Senior, Utah County Academy of Sciences, Orem, Utah, T: Angela Busath

EBED045 **Doppler Radar Flash Flood Detector**
Ammon Wallace, 14, Freshman, Salem Hills High School, Salem, Utah, T: Kellie Roberts

ENMC064T **Hexagon Housing: A More Realistic Solution to Refugee Housing Using the Isoperimetric Honeycomb Conjecture**
Samantha B. Davis, 17, Junior, Alicia Kuhlmann, 17, Junior, Bingham High School, South Jordan, Utah, T: Chris Fish

Salt Lake City, USUT05, University of Utah Science and Engineering Fair

BEHA028 **Externality Framing Effects on Cognition**
Emma Grace Sun, 15, Sophomore, The Waterford School, Sandy, Utah, T: James Harris

CBIO025T **Undetected Suicide: Classification of Undetermined Drug-Related Deaths Using Machine Learning Techniques**
Daphne Liu, 14, Freshman, Mia Yu, 17, Senior, West High School, Salt Lake City, Utah, T: Carlos Arce-Larreta

ENBM038 **Automatic Detection of Intravitreal Neovascularization in Retinal Flat Mount Images Using Deep Learning Methods**
Alexander Cheng, 17, Junior, Hillcrest High School, Midvale, Utah, T: Alexander Mettler

MCRO037 **Viruses to the Rescue: Using *D. tsuruhatensis* to Demonstrate Phage Therapy's Effectiveness Against Antibiotic Resistant Bacterial Biofilms in a Medical Setting**
Divyam Goel, 16, Junior, West High School, Salt Lake City, Utah, T: Hilary Thirwell

SOFT031 **Using Machine Learning to Optimize Key-Length Prediction for Polyalphabetically Encrypted Text**
Shriya Pingali, 17, Junior, West High School, Salt Lake City, Utah, T: Enrique Arce-Larreta

TMED027 **Mucoadhesive HA-Based Film Releasing Metronidazole to Treat Bacterial Vaginosis**
Marina Lee Gerton, 16, Junior, West High School, Salt Lake City, Utah, T: Melissa Anderson

Ogden, USUT07, Harold W. & Helen M. Ritchey Science and Engineering Fair of Utah

CBIO022 **Modeling the Emergence of Epistatic Gene Combinations as a Phenotypic Function of Evolution**
Wyatt Graham Brannon, 15, Sophomore, InTech Collegiate High School, North Logan, Utah, T: Tracy Davidson

ENBM039 **Designing a Miniature Gait Lab**
Michael James Remley, 18, Senior, Northern Utah Acadamy for Math, Engineering and Science, Layton, Utah, T: Nickole Brooks

PLNT052T **Enhancing Seed Viability for Space Travel with Silk Protein Polymers**
Yae-won Michelle Jung, 17, Junior, Andre Nguyen, 17, Junior, Gareema Dhiman, 17, Junior, Logan High School, Logan, Utah, T: Shaunda Wenger

ROBO038 **Response-Based Scaling Models the Binding Problem in Top-Down Visual Search**
Matthew Tran Radovan, 17, Senior, Ridgeline High School, Millville, Utah, T: Robert Henke

VERMONT

Northfield, USVT50, Vermont Science, Technology, Engineering and Mathematics Fair

BCHM035 **The Effects of Alkaline and Acidic Substances on Catalase Functionality and Molecular Structure**
Emily Ann Dean, 14, Freshman, Woodstock Union High School Middle School, Woodstock, Vermont, T: Vanessa Cramer

BMED051 **The Effect of Nitric Oxide Synthase Inhibition on Spiral Arteries and Venous Remodeling During Rat Pregnancy**
Anna Grace Oblak, 14, Sophomore, South Burlington High School, South Burlington, Vermont, T: Nathaniel Moore

CELL039 **Identifying Inhibitors of PDE4B2 Mutant Enzymes and Inhibitor Specificity Using *Schizosaccharomyces pombe***
Avi Jonah Cohen, 17, Senior, South Burlington High School, South Burlington, Vermont, T: Nathaniel Moore

VIRGINIA

Arlington, USVA01, Northern Virginia Science and Engineering Fair

ANIM069 **See the Bees Speak: Confined Direct Analysis in Real Time and SPME-GC-MS for *B. impatiens* and *A. mellifera* Alarm Pheromone Detection**
Skylar Mariquita Brodowski, 17, Senior, Washington-Lee High School, Arlington, Virginia, T: Jason Brodowski

EAEV039 **The Effect of Pharmaceuticals on Nitrate Concentration and Removal Rate in a Simulated Bardenpho Reactor**
James Licato, 15, Freshman, Washington-Lee High School, Arlington, Virginia, T: Kristen Johnston

Charlottesville, USVA02, Virginia Piedmont Regional Science Fair

ENEV033 **Examining Manufactured Esterification, Homemade Esterification, and Non-Corroding Coating as Viable Solutions to Fatberg Formation**
Jee-Ho Kim, 16, Junior, Albemarle High School, Charlottesville, Virginia, T: Kirsten Fuoti

SOFT022 **Revealing Unseen Motion: Eulerian Magnification Applied to Live Video**
Anders Knospe, 16, Junior, St. Anne's-Belfield School, Charlottesville, Virginia, T: Ben Cohen

Fairfax, USVA03, Fairfax County Regional Science and Engineering Fair

ANIM036 **Analyzing the Role of Intralipid and Epinephrine in the Treatment of Bupivacaine-Induced Toxicity in *Daphnia magna***
Nicholas Lin, 17, Junior, Westfield High School, Chantilly, Virginia, T: Mary Constantino

BMED044T **Identifying Alzheimer's-Associated Proteins as Substrates of a Novel Protein Quality Control Pathway**
Karthik Sai Budharaju, 18, Senior, Christopher Bi, 16, Junior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Sonia Del Cerro

CBIO019T **New Structure and Energy Cycles of Kinesin Dimers Walking on Microtubules Revealed from Molecular Simulations**
Alicia Pan, 16, Junior, Allen Pan, 15, Freshman, James Madison High School, Vienna, Virginia, T: Jyothsna Vallampati

CELL019 **Melanoma Cell Malignancy Does Not Correlate with Migratory Rates in Three Different Highly Metastatic Cell Lines**
Tyler Lee Amos, 17, Senior, Chantilly High School, Chantilly, Virginia, T: Deborah Swantek

ENEV050T **Impurivision: A High Performance Mobile Application for Identifying Water Contamination Using Deep Learning**
Palash Shah, 17, Junior, Kartik Chugh, 17, Junior, Westfield High School, Chantilly, Virginia, T: Mary Constantino

MATH052 **Monodromy Groups of Indecomposable Rational Functions**
Franklyn Hai Wang, 17, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: John Dell

PHYS050 **The Effect of Spectral Content of Acoustic and Synthesized Timbre**
Justin Wang, 17, Junior, Chantilly High School, Chantilly, Virginia, T: Rebecca Wills

SOFT014 **Optimizing Reinforcement Learning Through Dynamic Environment Manipulation**
Mihir Patel, 18, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Patrick White

TMED023 **A Novel Approach to Improving Photodynamic Therapy Through Analysis of the Effects of Induced Hypoxia and Utilization of Bioluminescence, Year Two**
Shannen Kelly Prindle, 17, Senior, Oakton High School, Vienna, Virginia, T: Grace Wang

Harrisonburg, USVA04, Shenandoah Valley Regional Science Fair

ANIM057 **Effects of Molting on Movement Patterns in *Chromatopelma cyanpubescens* (Green Bottle Blue Tarantulas)**
Francesca Teresa Circosta, 18, Senior, Massanutten Regional Governor's School, Mt. Jackson, Virginia, T: Kara Bates

MATS045 **Establishing the Method for Investigating the Impact of Healing Agent to Concrete Ratio on Water Permeability of Concrete**
Katie Lynn Sommerfield, 17, Junior, Mountain Vista Governors School, Middletown, Virginia, T: Judy Cain

Lynchburg, USVA05, Central Virginia Regional Science Fair

EGCH014 **The Effect of Sulfate Compounds on Perovskite Solar Cell Voltage Output**
Chloe Anne Seng, 17, Junior, Central Virginia Governor's School for Science and Technology, Lynchburg, Virginia, T: Michele Coghill

MCRO014 **The Temperature-Dependent Inhibition of *Pseudogymnoascus pannorum* by *Pseudomonas protegens***
Benjamin George McCarthy, 17, Junior, Central Virginia Governor's School for Science and Technology, Lynchburg, Virginia, T: Michelle Douglass

Manassas, USVA06, Prince William-Manassas Regional Science Fair

ENMC065 **The Effectiveness of Man-Made Structures in Reducing the Amount of Flooding Caused by a Tsunami**
Liam Paul Kellogg, 15, Freshman, Seton School, Manassas, Virginia, T: Aileen Foeckler

Ashburn, USVA07, Loudoun County Science and Engineering Fair

CBIO020 **MiRNet: A Novel *in silico* Network-Based Approach to miRNA Drug Target Identification for Next Generation Drug Discovery**
Marissa Sumathipala, 17, Senior, Broad Run High School, Ashburn, Virginia, T: Laura Hicks

CELL027 **Preventing Preterm Birth: Maximizing GSH Synthesis to Fight Oxidative Stress**
Lucy Arin Greenman, 17, Senior, Academy of Science, Sterling, Virginia, T: Jackie Curley

ENMC049 **Mathematically Accurate, Double-Axis Microgravity Simulator**
Gwyneth Marie Schloer, 17, Senior, Rock Ridge High School, Ashburn, Virginia, T: Mario Saavedra

SOFT032 **Development of a Computer Aided System for the Classification of Breast Lesions from Mammogram Scans**
William Christopher Peterson, 18, Senior, Loudoun County High School, Leesburg, Virginia, T: Terri Moulds

Roanoke, USVA08, Western Virginia Regional Science Fair

CHEM050 **The Effect of Natural Chitosan on the Removal of Azo Dyes from Water**
Carly Mae Smith, 17, Junior, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia, T: Stephen Smith

MCRO033 **Novel Use of Phenolic Compounds for Epstein-Barr Virus Lytic Induction**
Logan Dunkenberger, 17, Junior, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia, T: Cynthia Bohland

Norfolk, USVA09, Tidewater Science and Engineering Fair

CBIO007 **Mathematical Model of HIV: Immune System Dynamics and Treatments**
Nicole Victoria Rychagov, 17, Junior, Cape Henry Collegiate, Virginia Beach, Virginia, T: Iordanka Panayotova

CELL024 **Mechanisms of the Interplay of Tau and Alpha-Synuclein on Tubulin Polymerization Promoting Protein (TPPP/p25)**
Anjali Hetal Patel, 18, Senior, New Horizons Governor's School for Science and Technology, Hampton, Virginia, T: Margaret Mulvey

Radford, USVA10, Blue Ridge Highlands Regional Science Fair

CELL011 **Peptide Nucleic Acids as Potential Designer Antimicrobials**
Raaga Unmesha Vullikanti, 17, Junior, Blacksburg High School, Blacksburg, Virginia, T: Katharine Davis

ROBO033 **Using Deep Learning to Identify Critical Documents for Clinical Decision Support Systems**
Brandon Xu Fan, 15, Sophomore, Blacksburg High School, Blacksburg, Virginia, T: Katharine Davis

Richmond, USVA11, Metro Richmond STEM Fair

BMED071 **An In-Depth Patch Clamp Study of HCN2 Channels: Cyclic AMP- A Possible Novel Therapy for the Treatment for the Suppression of the Ih Current by Dexmedetomidine**
Perisa Satish Ashar, 15, Freshman, Maggie L. Walker Governor's School, Richmond, Virginia, T: Emily Post

ENEV078 **The Effect of Spent Coffee Grounds on the Multicyclic Adsorption of Lead**
Janine Tomas Icalla, 15, Sophomore, Mills E. Godwin High School, Henrico, Virginia, T: Dana Delano

MATH041 **Game Theory-Based Investment Strategy *vs.* Buy-And-Hold: Which Optimizes Profits?**
Lisa Qin, 16, Junior, Maggie L. Walker Governor's School, Richmond, Virginia, T: Jennifer Todd

PHYS086 **The Effect of Varied Surface Gravity on the Gravitational Radiation (Luminosity) Produced by a Binary System of Black Holes**
Medha Majety, 16, Junior, Science, Math, and Technology Center at Mills E. Godwin High School, Henrico, Virginia, T: Heather Martin

TMED035 **Inhibition of LPS-Induced Inflammation in Macrophages Through Natural Anti-Inflammatory Compounds**
Anusha Puri, 15, Sophomore, Mills E. Godwin High School, Henrico, Virginia, T: Dana Delano

Warrenton, USVA12, Fauquier County Regional Science & Engineering Fair

MATS025 **A Comparison of the Strength of Experimental Chestnut Hybrids to Functionally Extinct *Castanea dentata***
Heather Dawn Wotton, 18, Senior, Mountain Vista Governor's School, Warrenton, Virginia, T: Denise Thompson

Roanoke, USVA50, Virginia State Science and Engineering Fair

CBIO016 **GlioVision: A Platform for the Automatic Assessment of Glioblastoma Tumor Features, Molecular Identity, and Gene Methylation from Histopathological Images Using Deep Learning**
Kavya Kopparapu, 17, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Mark Hannum

CHEM065 **Augmenting Gaseous Adsorption Capabilities via Nanoporous Cyclodextrin Metal-Organic Frameworks (CD-MOF) Synthesized with Alkali Coordinating Ions**
David Jeremy Toomer, 16, Junior, Hayfield Secondary School, Alexandria, Virginia, T: Julia Riley

MCRO072T **The Effect of Nanotechnology on Purifying Water Supply in the Developing World**
Patrick Gerard Berry, 16, Junior, Matthew Kian Baharmast, 17, Junior, James Madison High School, Vienna, Virginia, T: Allison Sarfatti

PHYS060 **Finding Exoplanets by Assessing the Dynamical Packing of Kepler Three- and Four-Candidate Systems**
Ana Luisa Tio Humphrey, 17, Junior, T.C. Williams High School, Alexandria, Virginia, T: Shawn Lowe

PLNT066T **Cyanofertilization: A Comparative Analysis of Biological and Environmental Impacts**
Sarah Sajila Syed, 15, Sophomore, Miamar Gloria Burgos-Rosario, 16, Sophomore, Saijai Supanklang, 15, Sophomore, Hayfield Secondary School, Alexandria, Virginia, T: Luke Tonia

WASHINGTON

Kennewick, USWA01, Mid-Columbia Regional Science and Engineering Fair

EBED023 **Aware of Air: Measuring Local Air Quality Using Portable Arduino-Based Sensors**
Nikhil Devanathan, 16, Sophomore, Kennewick High School, Kennewick, Washington, T: Don Fankhauser

SOFT034 **Utilizing Machine Learning to Generate Efficient Quantum Algorithms**
Christopher Thomas Kang, 16, Junior, Hanford High School, Richland, Washington, T: Brian Palmer

Tacoma, USWA02, South Sound Regional Science and Engineering Fair

EBED036 **A Portable Android Based Detection System of Prevalent Chronic Respiratory Illnesses**
Sathvik Nallamalli, 14, Freshman, Olympia High School, Olympia, Washington, T: Alex Steinkamp

ENBM040 **A Novel Approach to Diagnosing Zika: The Use of Silk Fibroin and 2D Paper Networks to Create a Temperature-Independent, Affordable Paper Test Strip**
Ashlynn Anne Gallagher, 18, Senior, W.F. West High School, Chehalis, Washington, T: Wendy Neal

ENBM048 **Smart Heart: A Portable Early Diagnostics System for Myocardial Infarction Events Utilizing Generative Machine Learning Algorithms**
Abhinav Gundrala, 16, Junior, Olympia High School, Olympia, Washington, T: Alex Steinkamp

Bellevue, USWA03, Central Sound Regional Science & Engineering Fair

EAEV033 **Next Generation Morphological and Molecular Analysis of the Toxicity of Pharmaceutical-Derived Aquatic Contaminants (PPCPs)**
Ronit Jain, 16, Sophomore, Interlake High School, Bellevue, Washington, T: Cathy Laetz

ENEV041 **Transforming Agriculture to Feed the World Sustainably: A State-of-the-Art, Drone-Enabled Precision Agriculture End-to-End Solution**
Veenadhari Kollipara, 17, Senior, Interlake High School, Bellevue, Washington, T: Allen Philip

Vancouver, USWA04, Southwest Washington Science and Engineering Fair

CBIO013 **Proteomic Evolution in Hair Cell Regeneration**
Rahul Ram, 16, Junior, Camas High School, Camas, Washington, T: Kimberly Newman

ENEV017T **Understanding the Degradation of an Algae-Derived Bioplastic and Its Immediate Effects on Aquatic Environments**
Odessa Emmanuelle Thompson, 16, Sophomore, Rose Marlee Leveen, 15, Sophomore, Bailey Rhyan Segall, 16, Sophomore, Camas High School, Camas, Washington, T: Kimberly Newman

Spokane, USWA05, Eastern Washington Regional Science and Engineering Fair

BMED052 **The Effect of Green Tea on a Dementia Patient's Cognitive Ability**
Aislin Claire Gamon, 17, Senior, Mead Senior High School, Spokane, Washington, T: Carol Dever

CELL020 **Dietary Analysis of Sea Lion Consumption of Salmonid Populations Along the Pacific Northwest Coast Using qPCR and Fluorescent Species Specific Probes**
Cydni Tatem Lynn Marshall, 18, Senior, North Central High School, Spokane, Washington, T: Daniel Shay

ENBM031 **Metal Nitrate Enhanced Green Fluorescent Protein for Nano-Technology**
Lexie Kay Smith, 18, Senior, Joel E. Ferris High School, Spokane, Washington, T: Darci Hastings

PLNT039 **The Effect of Acid Rain on Wheat Grass**
Alicia Colleen Johnson, 17, Senior, Wilbur-Creston High School, Wilbur, Washington, T: Jason Maioho

Bremerton, USWA50, Washington State Science and Engineering Fair

EGCH022 **A Novel Sol-Gel Derived SPEEK/Silicon Dioxide Composite Membrane for the Vanadium Redox Flow Battery**
Dhruvik Parikh, 18, Senior, Henry M. Jackson High School, Bothell, Washington, T: Kevin Kukla

ENMC043 **Implementation of Gyroscopically Leveled Spherical Drones Optimized Through Neuro-Evolution of Augmented Topologies for Reconnaissance and Imaging of Martian Environments**
William Wang, 16, Junior, Nikola Tesla STEM High School, Redmond, Washington, T: Kate Allender

ENMC050T **Langmuir Plasma Research**
Daniel Joel Christensen, 18, Senior, Michaela Germani Fennell, 17, Junior, Northwest Nuclear Consortium, Federal Way, Washington, T: Carl Greninger

MATS024 **Thermal Transport Properties of 2-Dimensional Transition Metal Dichalcogenide Heterostructures**
Terrance Li, 17, Junior, Newport Senior High School, Bellevue, Washington, T: Bevin Huang

ROBO039 **Development of Semi-Supervised Machine Learning Models to Predict Enhancer Regions in Polygenic Developmental Diseases**
\# Savitha Srinivasan, 16, Sophomore, Interlake High School, Bellevue, Washington, T: Philip Allen

TMED028 **A Novel Point-of-Care Theranostic for Gram-Negative Sepsis: Synthesis and Application of Polymer Nanoparticles for Rapid Endotoxin Capture**
\## Sriharshita Musunuri, 18, Senior, Henry M. Jackson High School, Bothell, Washington, T: Kevin Kukla

WEST VIRGINIA

Keyser, USWV01, West Virginia Eastern Panhandle Regional High School Science Fair

MATH045 **Differentiate the Difference**
Tessla Jade Muir, 17, Junior, Musselman High School, Inwood, West Virginia, T: Brenda Waterworth

MATS020 **The Effect of Drumstick Material on Sound Produced**
Davis Michael Funk, 16, Sophomore, Spring Mills High School, Martinsburg, West Virginia, T: Jana Woofter

Fairmont, USWV50, West Virginia State Science and Engineering Fair

BMED077T **Identification of the Gene by Which Physical Exercise Protects Brain Injury Against Stroke**
Fahema Shaik, 17, Junior, Fathima Shaik, 17, Junior, Morgantown High School, Morgantown, West Virginia, T: Junaith Mohamed

CBIO037 **A Novel Approach to Classify and Detect Thoughts Using Electroencephalography**
Viraat Das, 17, Senior, Morgantown High School, Morgantown, West Virginia, T: William Gibson

EBED052 **DIMOS: A Novel Low-Power, Fast Response Logic Gate Architecture**
\# Swagat Bhattacharyya, 17, Senior, Morgantown High School, Morgantown, West Virginia, T: Daniel Price

WISCONSIN

Glendale, USWI02, Nicolet Science and Engineering Fair

SOFT044 **Using BLE (Bluetooth Low Energy) Beacons and 2D (Two Dimensional) Trilateration in a Smartphone Application as an Affordable Positioning System to Assist People Suffering from Severe Vision Loss and Blindness with Indoor Navigation and Spatial Awareness**
Louisa Wood, 14, Freshman, Nicolet High School, Glendale, Wisconsin, T: Stephanie Deering

Milwaukee, USWI03, University School of Milwaukee - Science Fair

CELL021 **Role of GATA4 in Early Gastrointestinal Tract Development**
Afiya Fatima Quryshi, 16, Sophomore, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch

CHEM015 **Computer Modeling of Protein-Protein Interactions with Hsp70 to Understand the SOD2 Import to Mitochondria for Regulation of Oxidative Stress**
Amogh Bhatnagar, 16, Sophomore, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch

Madison, USWI04, Capital Science and Engineering Fair

MATS056 **Effect of Shot-Peening on Oxidation Behavior of Nuclear Light Water Reactor Fuel Cladding Material to Improve Accident Stability**
Charles Xialong Hua, 17, Senior, West High School, Madison, Wisconsin, T: Carmen Lombard

Milwaukee, USWI50, Badger State Science and Engineering Fair

ANIM020T **Metformin as a Novel Neurogenic Method of Methylmercury Neurotoxicity Symptom Mitigation in *Danio rerio* as a Model for Human Fetuses**
Ayman Napsy Isahaku, 18, Senior, Anna Spektor, 17, Junior, Nicolet High School, Glendale, Wisconsin, T: Stephanie Deering

BMED011 **Role of Telomerase in Vascular Function and Exploration of Mitochondrial Dynamics: A Novel Approach to Treatment of Vascular Dysfunction**
\## Nabeel Jami Quryshi, 18, Senior, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch

ENBM073 **3D Printing of Bioengineered Human Cardiac Stem Cells**
Katharine Claire Schwister, 17, Junior, Brookfield Academy, Brookfield, Wisconsin, T: Aoy Mitchell

WYOMING

Greybull, USWY01, Northern Wyoming District Science Fair

ENEV003 **Potential Bioremediation of Waste Hydrocarbons: Utilization of Mycorrhizal Fungi as an Environmental Enhancement Agent**
Eduardo Burgos, 17, Senior, Greybull High School, Greybull, Wyoming, T: Joel Kuper

Laramie, USWY50, Wyoming State Science Fair

CELL025 **Engineering Bacterial Guanylate Cyclase for Optogenetic Applications**
Arundathi Sreejayan Nair, 15, Sophomore, Laramie High School, Laramie, Wyoming, T: Erin Klauk

MATS037 **Polarized Vehicle Headlights: A Novel Solution to Nighttime Snowblindness Affecting Human Drivers & Autonomous Vehicles**
Nicholas Albert-Jozef Primanis-Erickson, 16, Sophomore, Pinedale High School, Pinedale, Wyoming, T: Debra Noble

PHYS042T **The Effect of a Solar Eclipse on Muon Count Rates**
Markie Whitney, 16, Sophomore, Perry Wayne Martin, 16, Junior, Newcastle High School, Newcastle, Wyoming, T: Zach Beam

ROBO017 **Utilizing Gesture Recognition with 3D Printed Prosthetics**
Qingfeng Li, 16, Junior, Laramie High School, Laramie, Wyoming, T: Erin Klauk

UNITED STATES VIRGIN ISLANDS

St. Croix, United States Virgin Islands, TEVI02, Good Hope Country Day School Science Fair

PHYS083 **The Brachistochrone Curve**
Jack Falconer, 15, Freshman, Good Hope Country Day School, Kingshill, United States Virgin Islands, T: Jane Coles

URUGUAY

Montevideo, Uruguay, URY001, Feria Nacional de Clubes de Ciencia

ANIM001T **FishApp**
Manuel Cassarino, 18, Senior, Sofia Cabezas, 17, Junior, Liceo No. 1 Jose Maria Campos, Mercedes, Soriano, Uruguay, T: Marilina Lopez

ENMC002T **Captain Smartphone**
Ivan Andres Otero, 16, Sophomore, Santiago Gabriel Perez, 17, Sophomore, Escuela Technica Carmelo Anexo (ERCNA), Carmelo, Colonia, Uruguay, T: Pablo Debenedetti

VIET NAM

Ha Noi City, Viet Nam, VNM001, Ha Noi Science Fair

BCHM037T **Novel Bacteriophage Lysin: A Solution for Antibiotic Resistant *Staphylococcus aureus* Infection in Vietnam**
Tuyet Quynh Anh Le, 17, Senior, Thi Minh Hue Pham, 17, Junior, Tran Phu Gifted High School, Hai Phong, Viet Nam, T: Thi Hai Ly Nguyen

BEHA053T **CAC–Companions of Autistic Children**
Pham Nhat Minh Tran, 16, Sophomore, Thi Hau Nhu Nguyen, 16, Junior, Tran Phu Gifted High School, Hai Phong, Viet Nam, T: Thi Hai Ly Nguyen

BMED076T **The Study of Concentration of Urine Neurotransmitters of Dopaminergic and Serotonergic System and the Relationship to Behavioral Disorders in Patients with Online Game Addiction**
Ha Khoa Le, 16, Junior, Phuong Nam Nguyen, 16, Junior, Nguyen Hue High School, Ha Noi, Ha Noi, Viet Nam, T: Viet Van Trinh

EBED051T **NeoEyes: Smart Glasses for the Blind Based on Vietnamese Character Recognition System**
Hoang Minh Khoi Nguyen, 17, Senior, Phuong Thao Vu, 17, Senior, Le Hong Phong High School for the Gifted, Ho Chi Minh, Viet Nam, T: Ngoc Vinh Nguyen

ENBM064T **Fabrication of Fluorescein Isothiocyanate (FITC)-Doped Silica Nanoparticles and Gold-Coated Silica Nanoparticles for Locating and Killing Cancer Tumors**
Bao Vu Dang, 18, Senior, Ha Phuong Thao Nguyen, 17, Senior, Bao Loc High School for the Gifted, Bao Loc, Lam Dong, Viet Nam, T: Phuong Nguyen, T: Chau Pham Minh

ENMC059T **The Automatic Freshwater Distillation System from Seawater Operated by Water Pressure**
Anh Nhat Mai, 17, Senior, Long Van Phung, 17, Senior, Phan Boi Chau Gifted High School, Vinh, Nghe An, Viet Nam, T: Quyen Mai

ENMC060T **The Wheel for Moving on the Floor and Stair, the New Solution for Wheelchairs**
Nguyen Cong Khanh, 17, Senior, Nguyen Huu Thanh Dat, 16, Junior, Bac Ninh Specialized High School, Bac Ninh, Viet Nam, T: Ngo Van Tien

TMED047T **Fabrication of 3D-Nano-Cellulose Network (3DNC) from Green Tea Fermentation, Used for Loading and Releasing to Increase Bioavailability of Famotidine**
Thi Huyen Vy Phan, 16, Junior, Minh Thy Bui, 17, Junior, Hung Vuong Upper Secondary School for the Gifted, Pleiku, Gia Lai, Viet Nam, T: Hue Phung

ZIMBABWE

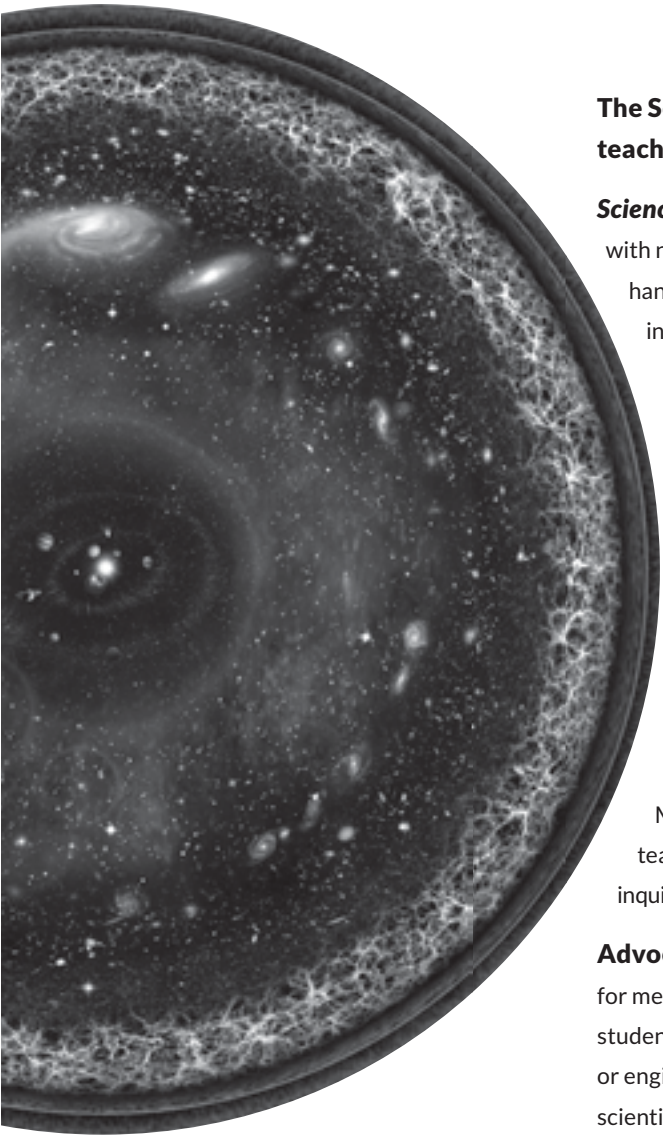
Harare, Zimbabwe, ZWE001, Zimbabwe National Science Fair

EGCH023 **Electricity from Living Water Hyacinth Plants Enhanced Biogas Production**
Macdonald Tawanda Chirara, 18, Senior, ZRP High School, Harare, Harare Metropolitan, Zimbabwe, T: Richard Ngomanyuni

EGPH020T **Electricity from the Air**
Tonyaradzwa Louisa Chivandire, 17, Senior, Tapiwanashe Kamba, 16, Junior, Queen Elizabeth Girls' High School, Harare, Zimbabwe, T: James Takaendesa

ENEV055 **Re-Use and/or Disposal of Disposable Diapers**
Memory Panashe Bvungo, 14, Freshman, Irene Christian College, Harare, Zimbabwe, T: Ronald Churu

Science Inspires



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UNIVERSAL MAP This diagram, made up of stitched together NASA imagery, is essentially a map of the observable universe. The solar system is at center. The scale changes as you move outward so that the distances depicted toward the edge of the circle are enormous.
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