



2022 Finalist Directory

Each # next to the finalist's name indicates previous ISEF participation

A T after the booth ID number indicates a Team Project

In-person indicates projects that will be also have booths
in the Finalist Exhibit Hall at the GWCC in Atlanta, GA;

Virtual indicates finalists that will be judged virtually on either May 4 or 5, 2022 in zFairs

Animal Sciences

- ANIM001 Testing Effectiveness of Surfactants on Stable Foam Involved in Primary Ruminant Tympany**
Emma Bogue, 16 Sophomore, South Sumter High School, Bushnell, FL
In-person.
<https://projectboard.world/isef/project/81197>
- ANIM002 Application of Agroindustrial Residues in the Combat of the Arbovirus-Vector Mosquito (*Aedes aegypti*), Phase II**
Joao Pedro Silvestre Armani, 18 Junior, Colegio Alfa, Toledo, Parana, Brazil
In-person.
<https://projectboard.world/isef/project/81920>
- ANIM003 Averting Human-Elephant Conflict Using Machine Learning on Elephant Vocalizations**
Chinmayi Ramasubramanian, 16 Sophomore, Sri Kumaran Children's Home - CBSE, Bangalore, Karnataka, India
Virtual.
<https://projectboard.world/isef/project/82962>
- ANIM004 Analyzing the Ease of Digestion in Dogs Through the Absorbency of Different Types of Dog Foods**
Collin Horiuchi, 17 Senior, Mililani High School, Mililani, HI
Virtual.
<https://projectboard.world/isef/project/83153>
- ANIM005T Fantastic Role of Tiny "Second Wings," or Calypteres, in Facilitating Highly Complex Flying Patterns**
Noe Furugen, 17, Junior,
Yukiha Ishibashi, 17, Junior,
Nagasaki Prefectural Nagasaki Nishi High School, Nagasaki-City, Nagasaki-Pref., Japan
Virtual.
<https://projectboard.world/isef/project/85832>
- ANIM006 Mechanisms of High-Salt Diet-Induced Learning Deficit in *Drosophila***
Yi-Shan Hung, 18 Senior, Taipei Municipal Zhongshan Girls High School, Taipei City, Chinese Taipei
In-person.
<https://projectboard.world/isef/project/85891>
- ANIM007 Year 5: Developing a Novel Multiple Linear Regression Model To Optimize Honey Bee Gut Immunity Using a Lactic Acid Bacteria Probiotic Mixture**
Varun Madan, 17 Senior, Lake Highland Preparatory School, Orlando, FL
Virtual.
<https://projectboard.world/isef/project/83071>
- ANIM008T Mosquito Surge: Global Warming and Geographical Factors**
Hyunmoon Hwang, 18, Senior,
Junwoo Kim, 18, Senior,
Youngeun Seo, 17, Senior,
Incheon Academy of Science and Arts, Incheon, Incheon, South Korea
Virtual.
<https://projectboard.world/isef/project/82981>
- ANIM009T The Effect of Herbal Extract Supplementation on Biological and Productive Character of Silkworm: A Novel Approach for Efficient Silk Sheath Production**
Panatas Chairakan, 16, Sophomore,
Porawat Dontanam, 16, Sophomore,
Sirawich Laolapha, 16, Sophomore,
Damrongratsongkroh School, Muangchiangrai, Chiangrai, Thailand
In-person.
<https://projectboard.world/isef/project/85270>
- ANIM010T Increasing Propolis Production of Stingless Bee (*Tetragonilla collina*) for Promoting Species Conservation and Sustainable Utilization**
Witsanuchai Hathakong, 16, Freshman,
Tanakon Sakhun, 14, Freshman,
Natchapon Wongsaroj, 15, Freshman,
Damrongratsongkroh School, Muangchiangrai, Chiangrai, Thailand
In-person.
<https://projectboard.world/isef/project/83175>

- ANIM011T Rearing Crickets *Teleogryllus mitratus* in Green LED Light Can Significantly Reduce Limb Autotomy and Mortality**
Marisa Arjananont, 18, Senior,
Jrasnatt Vongkampun, 18, Senior,
Princess Chulabhon Science High School
Pathumthani, Ladlumkaew, Pathumthani,
Thailand
In-person.
<https://projectboard.world/isef/project/85089>
- ANIM012 A Genetic Analysis of Solar-Powered Sea Slugs**
Sarita Thosteson, 18 Senior, Satellite High
School, Satellite Beach, FL
In-person.
<https://projectboard.world/isef/project/83000>
- ANIM013 The Characteristic of the Penetration Preference of the Field Related to Its Species Diversity by Selected Representatives of Hymenoptera, Flies, Beetles, and Butterflies for the Purpose of Revitalization Activities for Green Spaces in Cities and Farmlands**
Gabriela Szczepanik, 18 Senior, XIV Liceum
Ogolnokształcące im. Stanisława Staszica,
Warsaw, Voivodeship Mazowieckie, Poland
Virtual.
<https://projectboard.world/isef/project/86103>
- ANIM014 Hay, Hay, Which Is Better?**
Dixie Miller, 16 Junior, Warner Robins High
School, Warner Robins, GA
Virtual.
<https://projectboard.world/isef/project/85237>
- ANIM015 What You Eat, What You Are: Diet-induced Epigenetic Alteration of *Tenebrio molitor's* Pigmentation**
Minjun Shin, 17 Senior, Hankuk Academy of
Foreign Studies, Yongin, Gyeonggido, South
Korea
Virtual.
<https://projectboard.world/isef/project/83232>
- ANIM016 Mushroom Medicine for Bees: A Look Into the Benefits of the *Trametes versicolor* Extract on *Apis mellifera* Colony Health for Backyard Beekeepers**
Claire Green, 18 Senior, Arkansas School for
Mathematics, Sciences and the Arts, Hot
Springs, AR
In-person.
<https://projectboard.world/isef/project/82987>
- ANIM017 A Habitat Assessment Protocol To Determine Suitability for Southwestern Willow Flycatcher Occupancy in the Northern Rio Grande Watershed**
Marissa Martinez, 17 Junior, Monte Vista High
School, Monte Vista, CO
In-person.
<https://projectboard.world/isef/project/85755>
- ANIM018 Tough Turkeys, Year 2: What Habitat Type Do Turkeys Now Associate With in Northeast Minnesota?**
Harmony Tracy, 18 Senior, Cloquet Senior High
School, Cloquet, MN
In-person.
<https://projectboard.world/isef/project/83268>
- ANIM019 The Mechanism of Female Parasitoid Wasps, That Do Not Oviposit in the Hosts, Interrupt the Oviposition of the Other Female Wasps**
Hisaki Kawahara, 18 Junior, Mie Prefectural Ise
High School, Ise City, Mie, Japan
Virtual.
<https://projectboard.world/isef/project/82989>
- ANIM020T An Attempt To "See" the Behavior of the Japanese Lampreys in the Sandy Mud by Acoustic Analysis**
Chikako Katayama, 18, Junior,
Akira Mori, 17, Junior,
Rika Sakemoto, 17, Junior,
Tottori Nishi High School, Tottori city, Tottori,
Japan
Virtual.
<https://projectboard.world/isef/project/83078>
- ANIM021 The Effect of Rider Ability and Movement on the Stress/Discomfort Indicating Behaviors of Hippotherapy Equines**
Hannah Mullis, 18 Senior, East Gaston High
School, Mt. Holly, NC
In-person.
<https://projectboard.world/isef/project/83063>
- ANIM022 Impact of Prednisone on the Body Length, InR, and ILP2 Expression in *Drosophila melanogaster***
Jenna Cecrle, 17 Junior, Adams Central Jr.-Sr.
High School, Hastings, NE
In-person.
<https://projectboard.world/isef/project/82688>

- ANIM023 Investigation of the Movements of Western Painted Turtles Into Brumation**
Gabriella Caskey, 18 Senior, Ogallala High School, Ogallala, NE
In-person.
<https://projectboard.world/isef/project/82998>
- ANIM024 Seventeen Minutes: The Time of Host Blood Protein Remaining in *Anopheles* Mosquitoes**
Liyuan Zhu, 17 Junior, Shanghai Foreign Language School Affiliated to SISU, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/83227>
- ANIM025 Analysis of Magnetoreception and the Foraging Behavior of *Pogonomyrmex* Using an Altered Magnetic Field**
Ana Kothandram, 17 Senior, Notre Dame Academy, Park Hills, KY
In-person.
<https://projectboard.world/isef/project/85144>
- ANIM026T Protect the Rhinoceros Beetle of Okinawa Island**
Kirari Arimura, 19, Senior,
Kaho Shigenobu, 17, Junior,
Maria Tomita, 17, Junior,
Kagoshima Prefectural Kokubu High School, Kirishima City, Kagoshima, Japan
Virtual.
<https://projectboard.world/isef/project/83019>
- ANIM027 Dozing Off With *Drosophila*: The Effect of Disrupted Circadian Rhythms and Disturbed Sleep on Mortality, Mood, and Addiction**
Rania Lateef, 15 Freshman, Charles J. Colgan Sr. High School, Manassas, VA
In-person.
<https://projectboard.world/isef/project/82866>
- ANIM028 Genetic Analysis of Brown Trout To Understand Population Declines in Southwestern Montana**
Pilar Seielstad, 18 Senior, Big Sky High School, Missoula, MT
In-person.
<https://projectboard.world/isef/project/83012>
- ANIM029 Loss of NMDA Receptor Signaling Results in Excess Proliferation of CNS and Neural Crest-Derived Cells**
Sarah Schubel, 18 Senior, Smithtown High School East, St. James, NY
In-person.
<https://projectboard.world/isef/project/83020>
- ANIM030 Exploring Sexual Dimorphism and Sex Hormone Receptor Expression in the Bed Nucleus of the Stria Terminalis (BNST) in the Monogamous Prairie Vole**
Soyoun Moon, 18 Senior, Commack High School, Commack, NY
In-person.
<https://projectboard.world/isef/project/83036>
- ANIM031T Year III: Optimizing the Bioavailability of Curcumin in *Dugesia tigrina* as a Model To Mitigate the Negative Effects of Radiotherapy**
Rotem Ris, 16, Junior,
Zaina Siddiqi, 16, Junior,
College Park High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/82906>
- ANIM032 Characterizing the Feeding Behavior of Western Screech Owls**
Emmaline McKinnon, 17 Senior, Hanford High School, Richland, WA
Virtual.
<https://projectboard.world/isef/project/83003>
- ANIM033 Investigating Differences in Regeneration Across Species of Planarian Flatworms**
Irving Morris, 17 Senior, Paul Laurence Dunbar High School, Lexington, KY
In-person.
<https://projectboard.world/isef/project/82827>
- ANIM034 Auto-Dissemination: Analyzing the Function of a Novel Tool in Mosquito Control**
Sarah Stutsman, 16 Junior, Corona High School, Corona, CA
Virtual.
<https://projectboard.world/isef/project/82860>
- ANIM035 Parkinson's Disease: Assessing the Effect of a Polyphenolic Compound on Alpha-Synuclein Aggregation in Lab Afflicted *Drosophila melanogaster***
Jaspreet Sahota, 14 Freshman, Sanger High School, Sanger, CA
In-person.
<https://projectboard.world/isef/project/85106>

- ANIM036T Effect of a Multi-Strain Probiotic (Visbiome®) on Intestinal Microbiome Diversity in Two-Breeds of Canines**
Jacob Gannon, 18, Senior,
Alexis Schallock, 18, Senior,
North Central High School, Spokane, WA
Virtual.
<https://projectboard.world/isef/project/85817>
- ANIM037 Sensory Input Underlying Natural Behaviors in *Sepsis punctum* (Diptera: Sepsidae)**
Sasha Turner, 17 Junior, Hawken School, Gates Mills, OH
In-person.
<https://projectboard.world/isef/project/85858>
- ANIM038 Spot the Predator**
Ian Lentz, 15 Freshman, Camp Hill High School, Camp Hill, PA
In-person.
<https://projectboard.world/isef/project/85263>
- ANIM039T Do Relatives in Families Have Similar Fingerprints?**
Emma Lilly, 15, Freshman,
Sophia White, 15, Freshman,
North Atlanta High School, Atlanta, GA
In-person.
<https://projectboard.world/isef/project/85878>
- ANIM040 Secret Sounds of Bees: Analysis of Honey Bee Vibroacoustics Using Hidden Markov Models**
Amara Orth, 18 Senior, Lewis Central High School, Council Bluffs, IA
In-person.
<https://projectboard.world/isef/project/85221>
- ANIM041T Analysis of Coupled Nonlinear Dynamic Phenomena Using Sensors To Detect Abnormal Motion in Quadrupeds**
Sabine Close, 16, Sophomore,
Natalia Morrow, 15, Sophomore,
Sequoia High School, Redwood City, CA
Notre Dame High School Belmont, Belmont, CA
In-person.
<https://projectboard.world/isef/project/85661>
- ANIM042 Examining the Effects of Sodium Propionate on Heart Rate Using *Daphnia magna* as a Model Organism**
Jonmejoy Dhar, 17 Junior, St. Andrew's Episcopal School, Ridgeland, MS
In-person.
<https://projectboard.world/isef/project/85888>
- ANIM043 Creation of a 3D Design for Hermit Crab Shells**
Isabella Rodriguez Ramos, 14 Freshman, The Palmas Academy, Humacao, PR
In-person.
<https://projectboard.world/isef/project/85061>
- ANIM044 Real-Time Motion Tracking and Data Analytics for Live Insects Using Three-Wheeled Servosphere Robot**
Nicholas Lee, 16 Junior, Hopkins School, New Haven, CT
In-person.
<https://projectboard.world/isef/project/85162>
- ANIM045 Can Jellyfish Smell? *Aurelia aurita* Exhibit a Pulse Response to Food Stimuli**
William Boyd, 16 Sophomore, Flintridge Preparatory School, La Cañada Flintridge, CA
In-person.
<https://projectboard.world/isef/project/85884>
- ANIM046 A Caterpillar That Can Eat Polyethylene: *Galleria mellonella***
Sabrina Di Bello, 17 Junior, Woods Cross High School, Woods Cross, UT
In-person.
<https://projectboard.world/isef/project/85646>
- ANIM047 The Effects of Clothianidin, Propiconazole, and Amitraz on *Apis mellifera* Behavior**
Lauren Sitzman, 18 Senior, Omaha North High Magnet School, Omaha, NE
In-person.
<https://projectboard.world/isef/project/85568>
- ANIM048 Robotic Microinjection of Embryos for Producing Transgenic Mosquitoes**
Grant Gallagher, 17 Junior, Sage Hill School, Newport Beach, CA
Virtual.
<https://projectboard.world/isef/project/85561>
- ANIM049 Exploring E-Cigarette Condensate Toxicity of Menthol and Nicotine in PCLS**
Jeffrey Ho, 18 Senior, Millburn High School, Millburn, NJ
Virtual.
<https://projectboard.world/isef/project/85634>

- ANIM050 Uncovering the Origin and Evolution of the Firefly Bioluminescence Storage Protein**
Lauren Van, 17 Junior, Portola High School, Irvine, CA
In-person.
<https://projectboard.world/isef/project/85663>
- ANIM051T Potential Use of Synthetic and Natural Aromatic Mixtures in Prevention from Cockroaches of *Shelfordella lateralis* Genus**
Serhii Kolomiichuk, 17, Junior,
Dmytriy Omelyanov, 17, Junior,
Dnipro Financial and Economic Lyceum,
Dnipro, Ukraine
Virtual.
<https://projectboard.world/isef/project/85933>
- ANIM052 Collective Behavior and Coastal Health: How Individual Personality Influences Population Mortality in a Marsh Ecosystem Predator-Prey Interaction**
Regan Williams, 17 Junior, John T Hoggard High School, Wilmington, NC
Virtual.
<https://projectboard.world/isef/project/85945>
- ANIM053 The Effects of Pulsed Electro-Magnetic Fields on Bovine Semen Collection Rates**
Avery Miles, 16 Junior, Doland High School, Doland, SD
Virtual.
<https://projectboard.world/isef/project/85963>
- ANIM054 Using Cnidarian Nerve Nets To Visualize the Excitotoxic Effects of BMAA**
Tyler Nagosky, 17 Senior, Smithtown High School West, Smithtown, NY
In-person.
<https://projectboard.world/isef/project/85970>
- ANIM055 Col-IV: An Indicator of Vascular Formation and Pericyte Recruitment**
Abhinav Karri, 17 Senior, Roanoke Valley Governor's School for Science and Technology, Roanoke, VA
In-person.
<https://projectboard.world/isef/project/86204>
- ANIM056 Population Status and Monitoring of the Red-Crowned Parrot (*Amazona viridgenalis*) on O'ahu, Hawai'i**
Kellen Apuna, 17 Senior, Kamehameha Schools Kapalama Campus, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/86230>
- ANIM057 Vitamin D Impacts on Chicken Eggs**
Taylor Schmitt, 15 Freshman, Northwestern High School, Kokomo, IN
Virtual.
<https://projectboard.world/isef/project/86240>
- ANIM058 The Role of Dietary Inulin in Mitigating Brain Injury**
McKenna Sun, 17 Senior, Paul Laurence Dunbar High School, Lexington, KY
In-person.
<https://projectboard.world/isef/project/86261>
- ANIM059 Testing the Sinistral Bias of *Pheidole megacephala*, *Tapinoma melanocephalum*, and *Paratrechina longicornis***
Kelly Liang, 15 Freshman, Pacific Horizons School, Pago Pago, American Samoa
Virtual.
<https://projectboard.world/isef/project/86370>
- ANIM060 Estimating the LC50 of 1-Naphthyl-N-methylcarbamate in an Insecticide Using Different Percentages of Concentration on *Apis mellifera***
Justine Xu, 16 Junior, St. John's School, Upper Tumon, Guam
In-person.
<https://projectboard.world/isef/project/86372>
- ANIM061 The Effect of Anthropogenic Noise on Bumblebee Foraging Patterns**
Lila Sverdrup, 17 Junior, Wentzville Holt High School, Wentzville, MO
In-person.
<https://projectboard.world/isef/project/86392>
- ANIM062 A Non-Invasive Approach to the Treatment of Equine White Line Disease Using Poly-Wrap and Manuka Honey Topical**
Emma Markowitz, 17 Junior, Maine Homeschool, Trevett, ME
In-person.
<https://projectboard.world/isef/project/86397>
- ANIM063 The Epigenetic Effects of Climate Change on *Aiptasia***
Shelby Wray, 18 Senior, North Carolina School of Science and Mathematics, Durham, NC
Virtual.
<https://projectboard.world/isef/project/86656>

- ANIM064 Effectiveness of Cattle Dewormers**
Lindsey Vachal, 18 Senior, Tioga High School, Tioga, ND
Virtual.
<https://projectboard.world/isef/project/86657>
- ANIM065 Breakthroughs in Honey Bee Health: Continuous-Release Mist Diffusion of Thymol-Based Essential Oils in Varroa Control, Part II: The Field Study**
Kaitlyn Culbert, 16 Sophomore, Toms River High School North, Toms River, NJ
In-person.
<https://projectboard.world/isef/project/86694>
- ANIM066 Harms and Benefits of Oral Sucrose To Reduce Adverse Events, Pain and Distress During Veterinary Needle Prick Procedures in Domestic Rabbits: Random Control Trial**
Caleb Smith, 17 Junior, Southwest Metro High School, Chaska, MN
Virtual.
<https://projectboard.world/isef/project/86711>
- ANIM067 Early Gonadectomy as a Factor that Predisposes Canines to Cranial Cruciate Ligament Injury: An Evaluation With Reference to the Tibial Plateau and Femoral Anteversion Angles**
Raina Bandekar, 17 Junior, Germantown Academy, Fort Washington, PA
In-person.
<https://projectboard.world/isef/project/86776>
- ANIM068 Enhancing Human Embryonic Kidney Cell Regeneration Through Transducing Exogenous Ambystoma Mexicanum Pax-7 DNA**
Matthew Brownrigg, 18 Senior, Central Bucks High School East, Doylestown, PA
In-person.
<https://projectboard.world/isef/project/86781>
- ANIM069 The Effect of Substrate Type on Black Soldier Fly Larvae Mass**
Colin Surabian, 15 Sophomore, South Lakes High School, Reston, VA
In-person.
<https://projectboard.world/isef/project/86826>
- ANIM070 Strengthening Eggshells Using a Natural Calcium Supplement**
Kaleb Johnson, 15 Freshman, Marian High School, Mishawaka, IN
In-person.
<https://projectboard.world/isef/project/86836>
- ANIM071 The Role of Developmental Plasticity in Adaptation to High Altitude in Highland and Lowland Deer Mice**
Natalya de la Plaza, 17 Junior, Hellgate High School, Missoula, MT
In-person.
<https://projectboard.world/isef/project/86847>
- ANIM072 Monitoring Honeybee Hive Health With Computer Vision**
Reagan Chambers, 17 Senior, Woodhaven Academy, Fargo, ND
In-person.
<https://projectboard.world/isef/project/86849>
- ANIM073 Efficacy of Copper Oxide Wire Particles and Albendazole Against Gastrointestinal Nematodes in Goats**
Jack Mongan, 18 Senior, Burnt Hills-Ballston Lake High School, Burnt Hills, NY
In-person.
<https://projectboard.world/isef/project/86950>
- ANIM074T Bruce vs. Climate Change**
Abby Nelson, 18, Senior,
Brooklyn Portell, 17, Senior,
Crystal City High School, Crystal City, MO
Virtual.
<https://projectboard.world/isef/project/87033>
- ANIM075 Caste Plasticity in the *H. saltator* Ant - Social Context Influences Dominance and Reproduction Related Gene Expression**
Luke Jow, 17 Senior, Bronx High School of Science, Bronx, NY
In-person.
<https://projectboard.world/isef/project/87061>

Biochemistry

BCHM001 Phase VII: Inhibiting Cancer Metastasis by Using EGCG To Target the 67 kDa Laminin Receptor

Stephen Litt, 17 Senior, Kennesaw Mountain High School Academy of Mathematics, Science and Technology, Kennesaw, GA
In-person.
<https://projectboard.world/isef/project/83016>

BCHM002T Lactate! Lactate! Lactate!

Johanna Heijkoop, 16, Sophomore,
Ty Kadur, 16, Sophomore,
South Sumter High School, Bushnell, FL
Virtual.
<https://projectboard.world/isef/project/83218>

BCHM003 Biotechnological Potential Analysis of Four Oleaginous Species From the Brazilian Cerrado Biome To Be Applied in the Regional Economic Context

Marcela Romao, 17 Senior, Escola Santa Teresinha, Imperatriz, Maranhao, Brazil
In-person.
<https://projectboard.world/isef/project/83163>

BCHM004 Tucum Mirim Oil (*Astrocaryum acaule*): Evaluation of Its Potential as Repellent Conveyed to an Experimental Model *in vitro*

Gustavo Serra, 16 Senior, Escola Santa Teresinha, Imperatriz, Maranhao, Brazil
In-person.
<https://projectboard.world/isef/project/86106>

BCHM005 A Novel Study of the Bio-Insecticidal Properties of *Annona reticulata* L.

Sarvesh Prabhu, 16 Junior, FIITJEE Junior College, Hyderabad, Telangana, India
In-person.
<https://projectboard.world/isef/project/83209>

BCHM006 Scientific Web Tool for the Analysis and Visualization of the Packing of Biological Macromolecules

Nikola Ristic, 19 Senior, Wilhelm-Ostwald-Schule, Leipzig, Sachsen, Germany
In-person.
<https://projectboard.world/isef/project/86104>

BCHM007 BoxProtect: Identification of 2-Methoxy-1,4-Naphthoquinone From *I. glandulifera* and Exploration of Its Potential in Insect Pest Control

Helen Hauck, 19 Senior, Nellenburg Gymnasium, Stockach, Baden-Wuerttemberg, Germany
In-person.
<https://projectboard.world/isef/project/86094>

BCHM008T New Cultivation Technology of Plants at Hydroponic System with Applying Inductors (Phytohormones)

Ozlem Ahmedli, 16, Sophomore,
Erhan Ibrahimli, 15, Sophomore,
Ganja FRITL, Ganja, Kapaz, Azerbaijan
Young Talents Lyceum, Baku, Azerbaijan
In-person.
<https://projectboard.world/isef/project/82856>

BCHM009T An Experimental Study of the Effects of Increased CO₂(g) on the Production and Concentration of Biomacromolecules of Plants

Dyllan Lozano-Lomeli, 17, Junior,
Ashley Nunez, 17, Junior,
Kathia Palacios, 18, Senior,
James Pace High School, Brownsville, TX
In-person.
<https://projectboard.world/isef/project/85292>

BCHM010 Reversible Inhibition of Retinoic Acid Synthesizing Enzyme ALDH1A2 With WIN18,446 Derivatives in Male Contraception

Mingya Wang, 19 Senior, Oregon Episcopal School, Portland, OR
In-person.
<https://projectboard.world/isef/project/83009>

BCHM011 Comparing the Polymerization of Casein Protein Using Homogenized Bovine Milk Types

Jose Avila, 16 Junior, Joseph W. Nixon High School, Laredo, TX
In-person.
<https://projectboard.world/isef/project/85285>

- BCHM012** LuxI/LuxR-Type Quorum Sensing System in K61, *Dickeya* Species Novel: Growth and AHL Production in MgSO₄-Rich Brine
Jingjing Wang, 18 Senior, Iolani School, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/85091>
- BCHM013** *In silico* Analysis of Small Molecules With Possible SARS-CoV-2 RNA-Dependent RNA Polymerase Inhibiting Properties and Their Therapeutic Potential
Michael Yang, 16 Junior, A&M Consolidated High School, College Station, TX
In-person.
<https://projectboard.world/isef/project/82990>
- BCHM014** Single Amino Acid Polymorphism at Position 1709 Alters Integrin Beta 4 Function in BT-549 Breast Cancer Cell Growth
Saadhavi Maskey, 17 Senior, Paul Laurence Dunbar High School, Lexington, KY
In-person.
<https://projectboard.world/isef/project/82816>
- BCHM015** The Effect of Amino Acid Mutagenesis on the Binding Affinity of SARS-CoV-2 Monoclonal Antibodies
Kartik Joshi, 15 Freshman, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/82787>
- BCHM016T** Exploring Ecofriendly Way To Recycle Wasted Part of *Flammulina velutipes*: Through Proving Bioactivity of Its Subcritical Water Extract
Donghyeon Gwak, 17, Junior,
MyeongJin Kang, 16, Junior,
Seungmin Lee, 17, Senior,
Changwon Science High School, Changwon-si, Gyeongsangnam-do, South Korea
Virtual.
<https://projectboard.world/isef/project/82805>
- BCHM017** Determining at What Stage Bananas (*Musa acuminata*) and Pineapples (*Ananas comosus*) Contain the Highest Amylolytic and Proteolytic Activity
Princess Jazzelle Viesca, 16 Sophomore, Fa'asao Marist High School, Pago Pago, American Samoa
Virtual.
<https://projectboard.world/isef/project/85724>
- BCHM018** Application and Comparison of Deep Learning Methods in the Prediction of RNA Sequence Degradation and Stability
Ankit Singhal, 18 Senior, International School of Basel, Reinach, Baselland, Switzerland
Virtual.
<https://projectboard.world/isef/project/85586>
- BCHM019** Novel Inhibitors for Conserved Regions of RecA To Slow Bacterial Antibiotic Resistance
Matthew Noto, 17 Junior, Canyon Crest Academy, San Diego, CA
In-person.
<https://projectboard.world/isef/project/85303>
- BCHM020** So Liá®! Designing a Novel Approach for Rapid Lithium Detection: Investigating Enzymatic Coupling to Produce Hydrogen Peroxide for the Development of Colorimetric and Fluorescent Sensors and Testing the Efficacy of Horseradish Peroxidase, 3,3',5,5' Tetramethylbenzidine, and Amplex Red
Katie Sun, 16 Sophomore, Crystal Springs Uplands School, Hillsborough, CA
Virtual.
<https://projectboard.world/isef/project/85232>
- BCHM021** Using *Micrococcus luteus*, *Lactococcus lactis*, and *Bacillus cereus* Bacteria and the Breaking Down of Microplastics
Kaden Luker, 16 Junior, Jackson Senior High School, Jackson, MO
In-person.
<https://projectboard.world/isef/project/85848>
- BCHM022T** An Integrative Approach of Utilizing Antipsychotic Supplements Designated for Schizophrenia and Endogenous Firing Rate Differential Equation Models To Induce Neuronal Synaptic Activity in PINK-1 Gene Mutated *C. elegans* With Parkinson's Disease
Rajvi Babaria, 16, Junior,
Halley Compuesto, 17, Junior,
Mehak Gaba, 16, Junior,
Vista Ridge High School, Cedar Park, TX
In-person.
<https://projectboard.world/isef/project/85786>

BCHMO23T Microbial Desalination Cells (MDCs) for Sea Water Desalination, Simultaneous Wastewater Treatment, and Electricity Production

Sama Farrag, 16, Junior,
Mayar Ibrahim, 16, Junior,
The Red Sea STEM High School, Hurghada, Red Sea, Egypt
In-person.

<https://projectboard.world/isef/project/85657>

BCHMO24T Green Flour

Menna Allah Ahmed, 14, Freshman,
Shahd Mohamed, 17, Senior,
El Adadia El Thanawia For Girls, New Menia, New Menia, Egypt
In-person.

<https://projectboard.world/isef/project/85804>

BCHMO25 To What Extent Do Silver Nanoparticles Affect the Growth of Hornwort Plants?

Lucas Hayes, 17 Senior, Alma High School, Alma, AR
In-person.

<https://projectboard.world/isef/project/85935>

BCHMO26 Investigating the Therapeutic Potential of Epigallocatechin Gallate and Theaflavin-3, 3'-digallate on Inhibiting ACE2-Spike Protein Binding and Mitigating Induced-Cellular Death by SARS-CoV-2

Chloe Chang, 17 Senior, Herricks High School, New Hyde Park, NY
In-person.

<https://projectboard.world/isef/project/85981>

BCHMO27 Synthesizing Ethanol From Recycled Cardboard Sludge Using a Cellulase Enzyme Blend and Yeast

Josiah Butler, 15 Sophomore, Chaska High School, Chaska, MN
In-person.

<https://projectboard.world/isef/project/86060>

BCHMO28 Investigation Into the Feasibility of *Maclura pomifera* as a Commercial Source of Pectin

Aaron Kurtz, 16 Junior, Thomas Edison High School, Alexandria, VA
Virtual.

<https://projectboard.world/isef/project/86071>

BCHMO29T Computational Design, Docking, and Analysis of Novel Aryl Sulfone Compounds as Potential NNRTIs

Rohan Adwankar, 17, Junior,
Aarya Morgaonkar, 16, Junior,
Andy Zhang, 16, Junior,
Irvington High School, Fremont, CA
Virtual.

<https://projectboard.world/isef/project/86224>

BCHMO30 Spin Doctor: Determining the Capacity for a Circulatory Supplement To Mitigate the Negative Effects of Placing an Unexpected Rotational G-Force Upon *Vanessa cardui* Larvae During Metamorphosis

Lexy Foust, 16 Junior, Frankfort High School, Frankfort, IN
In-person.

<https://projectboard.world/isef/project/86231>

BCHMO31 *Pyrocystis fusiformis* vs. the Circadian Rhythm: How Does Light Exposure Affect the Bioluminescence of *Pyrocystis fusiformis*?

Ella Brown, 17 Junior, Columbia Central High School, Columbia, TN
In-person.

<https://projectboard.world/isef/project/86266>

BCHMO32 Effects of Brewing Temperatures on the Antioxidant Capacity of Common Native Herbal Plants: *Thelesperma megapotamicum* and *Pectis angustifolia*

Tyneeshia Shortman, 18 Senior, South Sevier High School, Monroe, UT
In-person.

<https://projectboard.world/isef/project/86269>

BCHMO33 Enzyme Inhibition: Combating Cardiovascular Diseases, Diabetes, and Obesity Using Phytochemicals Found in Indian Spices

Sneha Gokaraju, 16 Sophomore, Monterey High School, Monterey, CA
Virtual.

<https://projectboard.world/isef/project/86387>

BCHMO34 Accelerated Bio-Chemical Depolymerization of Plastics From Surgical Face Masks: A Proactive Solution to the Impending Environmental Pandemic

Rohan Bhosale, 15 Freshman, Carmel High School, Carmel, IN
In-person.

<https://projectboard.world/isef/project/86389>

BCHMO35 Computational and Experimental Design of a Novel Acetylcholinesterase Inhibitor: Silanediols for Alzheimer's Disease Treatment
Archita Khaire, 16 Junior, North Carolina School of Science and Mathematics, Durham, NC
Virtual.
<https://projectboard.world/isef/project/86423>

BCHMO41 Developing Potential Phosphoprotein Biomarkers for Kidney Cancer From Urinary Extracellular Vesicles
Zheng-Chi Lee, 16 Sophomore, West Lafayette Junior/Senior High School, West Lafayette, IN
In-person.
<https://projectboard.world/isef/project/86842>

BCHMO36T EnoMed: The Power of Antioxidants From Grapes: A Green Perspective for Anti-Tumor Treatments
Luca Figazzolo, 16, Junior,
Letizia Mutti, 19, Senior,
Istituto Superiore Ascanio Sobrero, Casale Monferrato, Italy
In-person.
<https://projectboard.world/isef/project/86530>

BCHMO37TNatural Termite Control: A Novel Biomolecular Approach
Andre Glukhovskiy, 16, Junior,
Alex Kroumov, 17, Junior,
Nikita Sobolev, 17, Junior,
Arizona College Preparatory- Erie, Chandler, AZ
Arizona College Prep High School, Chandler, AZ
In-person.
<https://projectboard.world/isef/project/86603>

BCHMO38 Biochemical Interactions of siRNA-Based Gene Silencing To Augment Elastogenesis in Abdominal Aortic Aneurysms
Rayna Malhotra, 15 Sophomore, Moravian Academy, Bethlehem, PA
In-person.
<https://projectboard.world/isef/project/86778>

BCHMO39 Novel Plant-Derived Scaffolds Influence Cellular Mechanotransduction and Differentiation
Maya Butani, 17 Senior, Moorestown High School, Moorestown, NJ
In-person.
<https://projectboard.world/isef/project/86780>

BCHMO40 Biotin Consumption in Baker's Yeast *Saccharomyces cerevisiae* Strains Auxotrophic for Biotin
Markuss Kenins, 18 Senior, Riga State Gymnasium No. 1, Riga, Latvia
In-person.
<https://projectboard.world/isef/project/86829>

Behavioral and Social Sciences

- BEHA001 FollowMe: AI To Revolutionize Cortical Visual Impairment**
Asmi Kumar, 18 Senior, Milton High School, Milton, GA
In-person.
<https://projectboard.world/isef/project/82734>
- BEHA002 Spark Care+: Personalized Music Therapy Device Utilizing Artificial Intelligence Model**
Sarah Park, 14 Freshman, The Bolles School, Jacksonville, FL
In-person.
<https://projectboard.world/isef/project/81691>
- BEHA003 iPonder: A Multimodal and Anonymous Approach to Remote Teen Mental Health Diagnosis and Peer-Based Conversational Therapy via Deep Transfer Learning and Computer Vision**
Vivek Kogilathota, 17 Senior, Rick Reedy High School, Frisco, TX
In-person.
<https://projectboard.world/isef/project/82988>
- BEHA004 Eco-Socius: A Novel Approach Using Multivariate Analysis To Understand Youth Behavior in Circular Economy**
Victorya Silva, 18 Senior, Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul (IFRS) - Campus Osório, Osorio, Rio Grande do Sul, Brazil
In-person.
<https://projectboard.world/isef/project/82863>
- BEHA005 Enhancing the Educational Experience: How Does Digital Anatomy Compare to Physical Anatomy**
Elishah Jean-Francois, 15 Sophomore, West Port High School, Ocala, FL
In-person.
<https://projectboard.world/isef/project/85798>
- BEHA006 UDAN: Unobtrusive Sentiment Alert Using Natural Language Processing**
Anagha Sampathkumar, 15 Freshman, National Public School, Indiranagar, Bangalore, Karnataka, India
In-person.
<https://projectboard.world/isef/project/82992>
- BEHA007 Perspective vs. Emotional Intelligence**
Susanna Chiruguru, 14 Freshman, LaGrange Senior High School, Lake Charles, LA
In-person.
<https://projectboard.world/isef/project/83158>
- BEHA008 Personality and Learning in the Classroom: How Personality Traits and Learning Styles Relate to High School GPA**
Victoria Soranno, 17 Senior, Cascia Hall Preparatory School, Tulsa, OK
In-person.
<https://projectboard.world/isef/project/83055>
- BEHA009 Understanding and Creating an Equation on the Impact of Celebrity Endorsements and Their Numerous Factors on the Growth of Alt-Coins**
Rushil Shah, 16 Sophomore, West Shore Junior/Senior High School, Melbourne, FL
In-person.
<https://projectboard.world/isef/project/83041>
- BEHA010 Is a Pandemic Academic?**
Claire Seger, 15 Freshman, Monte Vista High School, Monte Vista, CO
In-person.
<https://projectboard.world/isef/project/83211>
- BEHA011 In the Footsteps of Manuela Ttito Condori -- Memory and Forgetting: Participation of the Canchina Woman During the First Independence Movement in Peru**
Yorch Quispe Condori, 16 Senior, Julio Alberto Ponce Antunez De Mayolo, Canchis, Cusco, Peru
Virtual.
<https://projectboard.world/isef/project/82794>
- BEHA012 Investigating Psychological Determinants of Efficient Behavioral Changes by Community Members To Pursue a Common Interest Using the *Drosophila* Model**
Seungmin Han, 19 Senior, Shattuck-St. Mary's School, Faribault, MN
Virtual.
<https://projectboard.world/isef/project/83123>

- BEHA013 The Competition Behavior of Bike-Sharing Companies and Industry Price Evolution: A Game Theory Approach**
Tianshu Xu, 17 Junior, Shanghai Foreign Language School Affiliated to SISU, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82845>
- BEHA014 The Local and Global Factors of the Generalized Poggendorff Illusions**
Trisha Bheemanathini, 17 Senior, Alabama School of Fine Arts, Birmingham, AL
In-person.
<https://projectboard.world/isef/project/83196>
- BEHA015 Polarization in Social Networks: Investigating Opinion Dynamics Through Human Experiments and Agent-Based Simulation**
Henry Westfall, 17 Junior, Fairview High School, Boulder, CO
In-person.
<https://projectboard.world/isef/project/82758>
- BEHA016 Now You See, Now You Don't...**
Suchita Tipirneni, 16 Sophomore, Ballard High School, Louisville, KY
In-person.
<https://projectboard.world/isef/project/83086>
- BEHA017 A Novel Application of Three-Dimensional Printing in Personalizing Drug Dosage**
Mawaddah Ali, 17 Senior, Umm Salamah, Makkah, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85268>
- BEHA018 How Neighbors Affect Self-Identification: Evidence From Chinese Character Reading**
Jia-Ying Lian, 15 Freshman, Zheng De Junior High School, New Taipei City, New Taiwan City, Taiwan
In-person.
<https://projectboard.world/isef/project/85893>
- BEHA019 Why We Vote: How Positive Descriptive Norms and Holding a Minority Political Viewpoint Increase Citizens' Intention and Responsibility to Vote**
Han Byur Youn, 17 Senior, Roslyn High School, Roslyn Heights, NY
In-person.
<https://projectboard.world/isef/project/83208>
- BEHA020 Music and Emotion: The Intervallic Fallacy of the Major-Minor Dichotomy**
Jacob Leshnowar, 16 Junior, Half Hollow Hills High School East, Dix Hills, NY
In-person.
<https://projectboard.world/isef/project/83117>
- BEHA021 SuiSensor: A Novel, Low-Cost Machine Learning System for Real-Time Suicide Risk Identification and Treatment Optimization via Computational Linguistics**
Siddhanth Pachipala, 17 Junior, College Park High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/83262>
- BEHA022 Facial Recognition: The Impact on Identifying People When Features Around the Face Are Altered**
Abigail Snider, 15 Freshman, Hedgesville High School, Hedgesville, WV
In-person.
<https://projectboard.world/isef/project/83223>
- BEHA023 A Behavioral Study of Public Health Messaging: Community, Self-interest, Vulnerability and Racial Bias**
Sierra Sun, 15 Freshman, The Waterford School, Sandy, UT
In-person.
<https://projectboard.world/isef/project/83061>
- BEHA024 American Dream or American Myth? A Linear Regression Analysis of American Attitudes as a Factor of Race and Ideology**
Kyle Kavully, 18 Senior, Plainedge High School, N Massapequa, NY
In-person.
<https://projectboard.world/isef/project/82893>
- BEHA025 Screening for Autism Spectrum Disorder by Detecting a Pattern in the Eye Movement of Autistic Children by Using an Eye Tracking System**
Salma Al-Shaghnoobi, 14 Freshman, Jubilee School, Amman, Jordan
In-person.
<https://projectboard.world/isef/project/85098>

- BEHA026T The Effectiveness of Autonomous Sensory Meridian Response (ASMR) Video To Alleviate Stress (Case Study: SMAN 81 Jakarta-Indonesia High School Students)**
Michelle Gurning, 18, Senior,
Michelle Suharly, 17, Senior,
SMA Negeri 81 Jakarta, Jakarta Timur, DKI Jakarta, Indonesia
Virtual.
<https://projectboard.world/isef/project/82771>
- BEHA027T Ecofeminism Movement as a Mangrove Forest Saving Strategy in the Coastal Area of Demak Regency- Central Java Indonesia**
Adinda Islami, 18, Senior,
Fauziyyah Wisnuwardhani, 18, Senior,
SMA Negeri 2 Semarang, Semarang City, Central Java, Indonesia
Virtual.
<https://projectboard.world/isef/project/85871>
- BEHA028 A Detailed Statistical Analysis of Chest Muscle Recruitment Patterns During Activities of Daily Life**
Neha Kommareddy, 15 Junior, Central Valley High School, Spokane Valley, WA
Virtual.
<https://projectboard.world/isef/project/85059>
- BEHA029T The Effectiveness of Audible Subliminal Messaging**
Madi Dickinson, 14, Freshman,
Shayleen Moeini, 15, Freshman,
St. Patrick Catholic High School, Biloxi, MS
In-person.
<https://projectboard.world/isef/project/85177>
- BEHA030 The Studying Habits of Twelfth Grade Student of a School in the Southeast of Puerto Rico**
Jorlyann Campos Ortiz, 17 Senior, Specialized School of Science and Mathematics Genaro Cautiño Vázquez, Guayama, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/85230>
- BEHA031 Psychological Effects of Absent Fathers**
Katie Fish, 16 Sophomore, Salem High School, Salem, AR
In-person.
<https://projectboard.world/isef/project/85141>
- BEHA032T Is There a Correlation Between Higher Scores on an Autism Spectrum Test and the Ability To Taste PTC Paper?**
Saree Hillstead, 15, Freshman,
Danica Knapp, 15, Freshman,
Hagerman Junior-Senior High School, Hagerman, ID
In-person.
<https://projectboard.world/isef/project/85258>
- BEHA033 A Quantitative Graphic Study and Wilcoxon Signed Rank Analysis To Determine If There is a Significant Gender Difference in Summer Olympic Uniforms**
Olivia Wagner, 14 Freshman, H.H. Dow High School, Midland, MI
In-person.
<https://projectboard.world/isef/project/85278>
- BEHA034 Assessing the Distribution of Excessive Noise Exposure and the Risk of Tinnitus Onset in Opera, Orchestra, and High School Musicians**
Orlando Osgood, 18 Senior, Ossining High School, Ossining, NY
In-person.
<https://projectboard.world/isef/project/85759>
- BEHA035 Decoding the Underlying Neural Activity of Neurodegeneration in Traumatic Brain Injury**

Haolin Li, 17 Junior, Crescent School, Toronto, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/85758>
- BEHA036 Do You Want To Know the Best Way To Study? We Can Help You!**
Hyunji Ryu, 17 Junior, Yatap High School, Seong-Nam, Gyeonggi-do, South Korea
Virtual.
<https://projectboard.world/isef/project/85760>
- BEHA037T Anti-Skeptical: Clusterization of the Hofstede Cultural Matrix via Machine Learning Methods Applied to the Analysis of Anti-Vax Behavior in Brazil**
Pietro Quinzani, 16, Sophomore,
Joao Sassi Sandre, 15, Sophomore,
Colégio Visconde de Porto Seguro, São Paulo, Brazil
In-person.
<https://projectboard.world/isef/project/85849>

- BEHA038 BREATH Analysis: Improving Community Readiness Outcomes for Native Hawaiian Students in K-12 Education**
Carolyn Clebsch, 17 Senior, Kealakehe High School, Kailua-Kona, HI
Virtual.
<https://projectboard.world/isef/project/85591>
- BEHA039T Animated Legends: Recovering the Imaginary From the Amazonian Region City of Igarape-Miri Through Audiovisual Productions Based on Oral Narratives**
Oscar Paraguassu, 14, Freshman,
Eloize Quintal Ferreira, 14, Freshman,
Escola Municipal de Ensino Fundamental Aristóteles Emiliano de Castro, Igarapé-Miri, Pará, Brazil
In-person.
<https://projectboard.world/isef/project/85654>
- BEHA040 Quantifying Linguistic Polarization for Congressional Representatives Facing Primary Challengers: A Random Effects Logit Regression Approach**
Jack Kelly, 18 Senior, Harrison High School, Harrison, NY
In-person.
<https://projectboard.world/isef/project/85582>
- BEHA041 Tell Me a Story: The Effects of Storytelling vs. Story-Reading on the Executive Functions of Fourth Graders**
Edith Bachmann, 18 Senior, Byram Hills High School, Armonk, NY
In-person.
<https://projectboard.world/isef/project/85621>
- BEHA042 The Effect of Virtual Learning on Student Long-Term Self-Esteem**
Sarah Garfield, 18 Senior, Palm Beach Central High School, Wellington, FL
In-person.
<https://projectboard.world/isef/project/85915>
- BEHA043 Analysis of Smiling Back**
Elizabeth Sherbrooke, 18 Senior, Hankinson Public School, Hankinson, ND
In-person.
<https://projectboard.world/isef/project/85950>
- BEHA044 The Serial Position Effect and Recency Effect**
Meagan Berger, 17 Junior, Hilton Head Island High School, Hilton Head Island, SC
In-person.
<https://projectboard.world/isef/project/85961>
- BEHA045 How Personal Biases Influence Our Voting Habits**
Lindley Richards, 17 Junior, Fremont High School, Plain City, UT
In-person.
<https://projectboard.world/isef/project/85965>
- BEHA046 A Novel Evaluation of Current Psychiatric Treatment Paradigms Involving Polypharmacy via Resting-State Functional Magnetic Resonance Imaging (fMRI) in a Sample of Patients With Bipolar I Disorder**
Dara Neumann, 17 Senior, Plainview-Old Bethpage John F. Kennedy High School, Plainview, NY
In-person.
<https://projectboard.world/isef/project/85968>
- BEHA047 Neurocognitive Tasks: Novel Markers To Predict and Prevent Adolescent Suicidal Behavior**
Natasha Kulviwat, 15 Sophomore, Jericho High School, Jericho, NY
In-person.
<https://projectboard.world/isef/project/85980>
- BEHA048 The Trends in Music and Technology: Prospectives and Approaches for Early Childhood Development**
Sneha Vashistha, 17 Junior, Carmel High School, Carmel, IN
In-person.
<https://projectboard.world/isef/project/86245>
- BEHA049T The Disproportionate Effect of the Labor Force Exodus on Rural Communities**
William Hummel, 18, Senior,
Aditya Tummala, 17, Senior,
Brookings High School, Brookings, SD
In-person.
<https://projectboard.world/isef/project/86263>
- BEHA050 Do People Prefer Online or Physical Libraries?**
Bethany Ball, 17 Junior, Northern Utah Academy for Math, Engineering and Science, Layton, UT
Virtual.
<https://projectboard.world/isef/project/86271>
- BEHA051T Type Independently**
Tala Damery, 16, Junior,
Mira Dhelieh, 16, Junior,
Tulkarem Industrial School, Tulkarem, Palestine
In-person.
<https://projectboard.world/isef/project/86277>

- BEHA052T I See You**
 Rahaf Abuzaid, 16, Junior,
 Mira Soradi, 16, Junior,
 Nablus Secondary Vocational School, Nablus,
 Palestine
 In-person.
<https://projectboard.world/isef/project/86280>
- BEHA053T Mechatronics in a Zimbabwean Girl's World: Cultivating Interest in STEM Among Female Students in Zimbabwe by Using Mechatronics**
 Tadiswa-Chloe Mafara, 18, Senior,
 Tanatswa Matonda, 17, Senior,
 Peterhouse Girls School, Marondera,
 Mashonaland East, Zimbabwe
 In-person.
<https://projectboard.world/isef/project/86361>
- BEHA054 "Keep Your Eye on the Ball": A Comparative Study of the Visual Tracking Accuracy of Baseball Batters and Non-Athletes During Knuckleball Tracking**
 Jack Blackmar, 18 Senior, Byram Hills High School, Armonk, NY
 In-person.
<https://projectboard.world/isef/project/86414>
- BEHA055 Detecting, Dismantling, and Defeating Environmental Racism Through the Lens of Urban Flooding**
 Skye Lam, 17 Senior, Bronx High School of Science, Bronx, NY
 In-person.
<https://projectboard.world/isef/project/86417>
- BEHA056 Putting Music Theory to the Test: Emotional Effects of Scales and Intervals**
 Jakub Hel, 15 Sophomore, Hoover High School, Hoover, AL
 In-person.
<https://projectboard.world/isef/project/86574>
- BEHA057T COVID-19's Effect on States' Economies**
 Spencer Lile, 17, Senior,
 Paul Massey, 18, Senior,
 Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, AR
 In-person.
<https://projectboard.world/isef/project/86592>
- BEHA059 Assessing Racial Determinants of Wellbeing**
 #
 Raeed Kabir, 18 Senior, The Mississippi School for Mathematics and Science, Columbus, MS
 In-person.
<https://projectboard.world/isef/project/86651>
- BEHA060 An Analysis of the Impact of Food Insecurity and Education on the Economy**
 Dia Kher, 16 Junior, The Mississippi School for Mathematics and Science, Columbus, MS
 In-person.
<https://projectboard.world/isef/project/86653>
- BEHA061T What Do You See?**
 Amelia Kazlo, 14, Freshman,
 Emily Pinheiro, 14, Freshman,
 Moriah Central School, Port Henry, NY
 In-person.
<https://projectboard.world/isef/project/86687>
- BEHA062 Cognitive Profiling and Personalized Therapy Recommendation for Dementia Through a Language-Aware Multi-Model Artificially Intelligent System**
 #
 Kosha Upadhyay, 15 Sophomore, Bellevue Senior High School, Bellevue, WA
 In-person.
<https://projectboard.world/isef/project/86703>
- BEHA063T Environmentally Responsible Consumption Behavior of Youth**
 Huy Pham, 17, Senior,
 Bao Pham, 15, Sophomore,
 Phan Huy Chu High School, Hà Nội, Viet Nam
 Virtual.
<https://projectboard.world/isef/project/86705>
- BEHA064 The Transgenerational Effects of the Synergy of Nicotine, Atomoxetine, and Bupirone on Egg Laying Habits, Gene Expression, and Oxidative Stress Levels in *C. elegans***
 Malcolm Owusu, 16 Sophomore, American Heritage School, Plantation, FL
 Virtual.
<https://projectboard.world/isef/project/86720>
- BEHA065 In the Fields of Mansas: The Unofficial Urban Names and Chronological Layers of the Toponyms in the Region of Maunula**
 Tarmo Sorsa, 17 Junior, Maunulan Yhteiskoulu ja Helsingin Matematiikkalukio, Helsinki, Uusimaa, Finland
 In-person.
<https://projectboard.world/isef/project/86727>

BEHA066 A Pharmacological Approach for Studying Alcohol Use Disorder: Using Calcium Imaging on hiPSC Derived Glutamatergic Neurons to Dissect the Glutamate Response in the Context of Chronic Ethanol Treatment
Arthur Liang, 17 Senior, Stuyvesant High School, New York, NY
In-person.
<https://projectboard.world/isef/project/86868>

BEHA067T Adolescent Perspectives on Stereotypes of Girls in Math
Alivia Hennessey, 15, Freshman,
Ellie Schlichtmann, 15, Freshman,
Newton Country Day School of the Sacred Heart, Newton, MA
Virtual.
<https://projectboard.world/isef/project/86886>

BEHA068 The Modification of Jury Instructions To Improve Juror Verdicts and Confession Recognitions in a Criminal Trial
Meghan Pasala, 17 Junior, Spring Valley High School, Columbia, SC
In-person.
<https://projectboard.world/isef/project/86928>

BEHA069T Flies on the Fly: A Novel Research on Thiamine as a Preventative Measure to Traumatic-Brain-Injury-Induced Locomotive Ability Loss
Claire Chang, 17, Junior,
Olivia Chang, 18, Senior,
New Horizons Governor's School for Science and Technology, Hampton, VA
Virtual.
<https://projectboard.world/isef/project/86931>

BEHA070 Addressing Barriers to Classroom Communication by Automating Student to Educator Feedback Loops Through a Novel Software-Based Approach
Junwei Tan, 18 Senior, Lee Virtual Instruction Program, Fort Myers, FL
In-person.
<https://projectboard.world/isef/project/86973>

BEHA071 Social Confidence
Brayden Sutherland, 14 Freshman, Lisbon High School, Lisbon, ND
In-person.
<https://projectboard.world/isef/project/86974>

BEHA072T Mental Health Risk Detection With Artificial Intelligence
Alexander Lim, 16, Junior,
Irene Lim, 16, Junior,
International School of Beaverton,
Beaverton, OR
In-person.
<https://projectboard.world/isef/project/87029>

BEHA073 Bringing Truth Into Fake News: The Diffusion of Fact-Checked Fake Stories on Twitter
Colin Berry, 17 Senior, Yorktown High School, Arlington, VA
In-person.
<https://projectboard.world/isef/project/87060>

Biomedical and Health Sciences

- BMED001 Nanoparticle-Mediated Drug Delivery as a Therapeutic for Aortic Aneurysms**
Misha Patel, 16 Sophomore, Wheeler High School, Marietta, GA
In-person.
<https://projectboard.world/isef/project/82956>
- BMED002 Associations of Genetic SNPs With AD, Neuropathology, and Gene Expression Offers Novel Insight Into AD**

Kristi Biswas, 17 Junior, Paxon School for Advanced Studies, Jacksonville, FL
In-person.
<https://projectboard.world/isef/project/82789>
- BMED003 Exploring Ethanol Tolerance in Honey Bees**
Noah Trstenjak, 19 Senior, UTRGV Mathematics and Science Academy, Edinburg, TX
In-person.
<https://projectboard.world/isef/project/83234>
- BMED004 Does Genetically Modified Produce When Compared to Organic and School Produce Differ in Calorie Intake?**
Karla Rocha, 16 Junior, United High School, Laredo, TX
In-person.
<https://projectboard.world/isef/project/83256>
- BMED005 Comparing Neural Network Strategies to Label Tricuspid Valve on MRI Images**
Belise Swartwood, 16 Sophomore, Mililani High School, Mililani, HI
Virtual.
<https://projectboard.world/isef/project/82824>
- BMED006 Serological Characterization of *Drosophila* S2 Cells-Expressed SARS-CoV-2 Spike Proteins**
Hinano Tsuchiya, 18 Senior, Kalani High School, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/82867>
- BMED007 Determining the Effects of Insulin on Serotonin Levels With and Without Vitamin D3 Using *Drosophila melanogaster* as a Model Organism**
Labrini Panagopoulos, 17 Senior, Cascia Hall Preparatory School, Tulsa, OK
In-person.
<https://projectboard.world/isef/project/85164>
- BMED008 The Effect of Saffron on Reproductive Health**
Nilgun Mammadli, 16 Junior, School Lyceum Complex, Baku, Baku, Azerbaijan
In-person.
<https://projectboard.world/isef/project/82822>
- BMED009 Developing CLL-1 and MSLN Immunogens for Dual CAR-T Cell Therapy for AML**
Andrew Liu, 17 Junior, Ponte Vedra High School, Ponte Vedra, FL
In-person.
<https://projectboard.world/isef/project/83202>
- BMED011 The Effect of Varying Concentrations of Artemisinin, Berberine, and Sulforaphane Upon Ocular Tumor Formation in *Drosophila melanogaster***
Annalise Garrido, 16 Junior, Westminster Christian School, Palmetto Bay, FL
In-person.
<https://projectboard.world/isef/project/82835>
- BMED012 Production of Antibodies in Patients Infected With SARS-CoV-2**
Eva Biteznik, 19 Junior, Gimnazija Kranj, Kranj, Slovenia
In-person.
<https://projectboard.world/isef/project/82977>
- BMED013 Functional Comparison of LV19.20 Bispecific CAR T-Cells Manufactured Under Distinct Cytokine Priming Conditions**

Jordan Thomas, 16 Junior, University School of Milwaukee, Milwaukee, WI
In-person.
<https://projectboard.world/isef/project/82921>

- BMED014 Disinfectant Properties of *Nuphar advena*: An Ethnopharmaceutical Approach**
 Johanna Bernu, 15 Freshman, Cloquet Senior High School, Cloquet, MN
 In-person.
<https://projectboard.world/isef/project/85762>
- BMED015 The Electromyographic Evaluation of the Bilateral Muscle Asymmetry of the Latissimus Dorsi in Martial Arts and the Effect of Real-Time Biofeedback on Technique Improvement**
 Karen Nakamura, 17 Junior, Math and Science Academy, Woodbury, MN
 In-person.
<https://projectboard.world/isef/project/83111>
- BMED016 Comparison of Skin Moisturizers and Antibiotic Ointments in the Ability To Inhibit Bacteria**
 Kelly Wyse, 17 Junior, Pettisville High School, Pettisville, OH
 Virtual.
<https://projectboard.world/isef/project/82854>
- BMED017 Altering Metabolic Pathways To Override Drug Resistance in Cancer**
 Emma Chirila, 18 Senior, Ponte Vedra High School, Ponte Vedra, FL
 In-person.
<https://projectboard.world/isef/project/82919>
- BMED018 Evolution of Oncogenic Signatures Within Glioblastoma Along a Spatiotemporal Axis**
 # Mayu Nakano, 17 Junior, Indian Springs School, Indian Springs, AL
 In-person.
<https://projectboard.world/isef/project/82733>
- BMED019 The Effect of Metabolite Glucose 6-Phosphate on Apoptosis of Breast Cancer Cells**
 Emily Shaw, 17 Junior, Ladue Horton Watkins High School, St. Louis, MO
 Virtual.
<https://projectboard.world/isef/project/83144>
- BMED020 The Effects of Inflammatory Neutrophils on Endothelial Cell Integrity**
 Jacqueline Hou, 17 Senior, Blacksburg High School, Blacksburg, VA
 In-person.
<https://projectboard.world/isef/project/82971>
- BMED021T The Effects of E-Cigarettes on *Drosophila melanogaster***
 Hannah Gengenbach, 16, Sophomore, Irelyn Samuelson, 16, Sophomore, Adams Central Jr.-Sr. High School, Hastings, NE
 In-person.
<https://projectboard.world/isef/project/83058>
- BMED022 C19orf12 Ablation-Caused Iron Accumulation, Mitochondrial Dysfunction, and Susceptibility to Ferroptosis**
 Julia Zhu, 15 Sophomore, Hathaway Brown School, Shaker Heights, OH
 In-person.
<https://projectboard.world/isef/project/82786>
- BMED023 Ganoderma Spore Oil Induces the Apoptosis of Mammary Adenocarcinoma Cell by Regulating Apoptotic Genes**
 Chenge Gao, 16 Junior, The High School Affiliated to Beijing Normal University, Beijing, Beijing, China
 Virtual.
<https://projectboard.world/isef/project/82936>
- BMED024 The Roles of Activin-A and Its Antagonists in Early and Late Stages of Colon Cancer: *In vitro* Study**
 Layan Sharalahi, 17 Senior, Umm Salamah, Makkah, Makkah, Saudi Arabia
 Virtual.
<https://projectboard.world/isef/project/85252>
- BMED025 Assessment of Knowledge About Chronic Kidney Disease in the Panamanian Population**
 Missel Camano, 14 Freshman, Centro Educativo Jose Santos Puga, Santiago, Veraguas, Panama
 Virtual.
<https://projectboard.world/isef/project/85282>
- BMED026 Repressed Autophagy in Aging Is Associated With Heightened Blood-Brain-Barrier Permeability and Altered Functional Hyperemia**
 Megan Tandar, 15 Junior, West High School, Salt Lake City, UT
 In-person.
<https://projectboard.world/isef/project/85156>

- BMED027 Analyzing Relationships Among Features of Diabetes-Induced Cerebral Microvascular Disease Using Causal Inference Methods**
Lauren Shen, 16 Sophomore, Morgantown High School, Morgantown, WV
In-person.
<https://projectboard.world/isef/project/82843>
- BMED029 Medicinal Properties of *Lomatium dissectum* and *Sambucus caerulea***
Tziavi Melendez, 17 Junior, Owyhee High School, Owyhee, NV
In-person.
<https://projectboard.world/isef/project/83077>
- BMED030 The Effect of *Bacillus cereus* on the Central Nervous System of *Dugesia tigrina***
Justin Kim, 17 Junior, Central Virginia Governor's School for Science and Technology, Lynchburg, VA
Virtual.
<https://projectboard.world/isef/project/83184>
- BMED031 Repurposed Cephalexin Causes Multifaceted Pro-Cancer Effects by Way of Wnt Signaling Pathway**
Griffin Hon, 16 Sophomore, Syosset High School, Syosset, NY
In-person.
<https://projectboard.world/isef/project/83156>
- BMED032 Multiple Sclerosis and the Retina: A Study on Neurodegeneration**
Nidhi Shenoy, 17 Junior, Lakeside High School, Evans, GA
In-person.
<https://projectboard.world/isef/project/85140>
- BMED033 Quantitative Methods To Analyze the Synergism of Digestive Enzymes for Gluten Breakdown: A Step Closer to Making Glu-Relief Pills**
Aditi Avinash, 15 Sophomore, Rock Canyon High School, Littleton, CO
In-person.
<https://projectboard.world/isef/project/82960>
- BMED034 Glutamine Transporter ASCT2's Novel Antioxidant Role in Parkinson's Disease**
Rohit Mantena, 18 Senior, Bergen County Academies, Hackensack, NJ
In-person.
<https://projectboard.world/isef/project/85212>
- BMED035 Defining the Mechanism of Fibroblast Death in Pulmonary Emphysema To Target Novel Therapies for COPD**
Jonathan Crawford, 17 Junior, University School of Milwaukee, Milwaukee, WI
In-person.
<https://projectboard.world/isef/project/85073>
- BMED036 Finding a Correlation Between Physical and Mental Health**
Natalie Gross, 17 Junior, Timber Lake High School, Timber Lake, SD
In-person.
<https://projectboard.world/isef/project/85266>
- BMED037 A Novel Glioblastoma Prognostic Assay Using Droplet Digital Polymerase Chain Reaction**
Caroline Grant, 18 Senior, Roanoke Valley Governor's School for Science and Technology, Roanoke, VA
In-person.
<https://projectboard.world/isef/project/85070>
- BMED038 Investigation of CD47 Dependent miRNAs as Early Cancer Detection Biomarker Using Liquid Biopsy Database**
Morelle Meegane Konchou, 17 Senior, Eleanor Roosevelt High School, Greenbelt, MD
Virtual.
<https://projectboard.world/isef/project/85214>
- BMED039 Fisetin in an *in vitro* Model of the Diabetic Eye**
Neha Vazarkar, 17 Senior, Bergen County Academies, Hackensack, NJ
In-person.
<https://projectboard.world/isef/project/85283>
- BMED040 Cure of Breast Cancer - Year 5: A Novel Approach to Treating Hormonal Breast Cancer Using Diabetic Medication Through Clinical Database and 3D *ex vivo* Model**
Christine Song, 17 Junior, Mayo High School, Rochester, MN
In-person.
<https://projectboard.world/isef/project/85227>
- BMED041 Pediatric BMSC Exosome Treatment Requires Interaction With Bone Tissue Defect Environment To Improve Bone Repair**
Katelyn Wasilenko, 18 Senior, Ossining High School, Ossining, NY
In-person.
<https://projectboard.world/isef/project/85253>

- BMEDO42 Dietary Impact on Memory T Cells**
Annabelle Ye, 16 Junior, Huron High School,
Ann Arbor, MI
In-person.
<https://projectboard.world/isef/project/85179>
- BMEDO43T Evaluating the Migration of Glioblastoma Stem Cells *in vitro* Towards a Chemoattractant Gradient**
Helen Copple, 17, Junior,
Shaswat Singh, 17, Junior,
Barrington High School, Barrington, RI
In-person.
<https://projectboard.world/isef/project/85784>
- BMEDO44 *In silico* Transcriptomic Analysis of Microglial Cells: Towards a Global Understanding of Immune Activation in Alzheimer's Disease**
Andres Muedano Sosa, 18 Junior, Colegio Suizo de México, Mexico City, Benito Juárez, Mexico
In-person.
<https://projectboard.world/isef/project/85153>
- BMEDO45T The Anticancer Activity of Greenly Synthesized Silver Nanoparticles Using *Ephedra aphylla* Ethanolic Extract**
Nagham AlHourani, 18, Senior,
Farah AlZaatreh, 18, Senior,
King Abdullah II School for Excellence -
Maddaba, Maddaba, Jordan
In-person.
<https://projectboard.world/isef/project/85301>
- BMEDO46 Design of a Novel, Dual-Functioning, Tissue Plasminogen Activator and Anticoagulant Therapeutic for Rapid Ischemic Stroke Treatment**
Ambika Grover, 16 Junior, Greenwich High School, Greenwich, CT
In-person.
<https://projectboard.world/isef/project/85229>
- BMEDO47 Development of RNA Vaccines Targeting Alzheimer's Disease Using Single-Cell RNA Sequencing and Proteomic Analysis**
Chloe Yan, 16 Sophomore, Episcopal High School, Alexandria, VA
Virtual.
<https://projectboard.world/isef/project/85806>
- BMEDO48 The Introduction of Excess Calcium in Cancer Cells**
Denali Isaacs-Perman, 15 Freshman, West Point Junior High School, West Point, UT
In-person.
<https://projectboard.world/isef/project/85584>
- BMEDO49 Complex Combination of Diabetes and COVID-19: Role of Glycolytic Inhibitors in the Treatment**
Keerthin Karthikeyan, 16 Junior, Oxford High School, Oxford, MS
In-person.
<https://projectboard.world/isef/project/85649>
- BMEDO50 Post-SARS-CoV-2 Symptoms and Conditions in Patients Aged 18 and Older**
Blake Rappaport, 16 Junior, Ardsley High School, Ardsley, NY
In-person.
<https://projectboard.world/isef/project/85850>
- BMEDO51 Investigating Epigenetic Modifications in Chromosome Structure in Cardiomyocyte Differentiation Mechanisms for Heart Disease Treatment**
Nicholas Wei, 17 Junior, The Harker School, San Jose, CA
In-person.
<https://projectboard.world/isef/project/85614>
- BMEDO52 Variant Effect Prediction Using Deep Neural Networks for Alzheimer's Disease**
Alexander Lan, 17 Junior, The Harker School, San Jose, CA
In-person.
<https://projectboard.world/isef/project/85730>
- BMEDO53 The Effect of Using Spidroin Protein and Spider Silk Web on Wound Healing Period Reduction**
Zain El Abdeen Kalaf, 15 Freshman, Assiut Governmental Distinguished Language School, Assiut, Assiut, Egypt
In-person.
<https://projectboard.world/isef/project/85722>
- BMEDO54 Performer: A Novel PPG to ECG Reconstruction Transformer for a Digital Biomarker of Cardiovascular Disease Detection**
Ella Lan, 15 Sophomore, The Harker School, San Jose, CA
Virtual.
<https://projectboard.world/isef/project/85764>

- BMED055 Assessing the Role of Constitutive JAK/STAT Signaling in Jak2V617F-p53 Post-MPN Leukemia Using a Novel Knock-in/Knock-out Mouse Model of Jak2V617F**
Benjamin Wang, 17 Senior, Horace Greeley High School, Chappaqua, NY
In-person.
<https://projectboard.world/isef/project/85585>
- BMED056 Altered Homer1b/c Volumes and mGluR1/5-Homer1b/c Colocalization in Parkinson's Disease-Linked LRRK2 G2019S Mice**
Emily Dodd, 18 Senior, Somers High School, Lincolnale, NY
In-person.
<https://projectboard.world/isef/project/85660>
- BMED057 Testing the Effects of Anti-DLL4 Monoclonal Antibody in Conjunction With Tamoxifen Hormone Therapy Treated Ovarian Cancer**
Tara Muthuswamy, 17 Junior, American Heritage School of Boca Delray, Delray Beach, FL
In-person.
<https://projectboard.world/isef/project/85920>
- BMED058 The Effects of Different pH levels of Chlorine on the Tooth Enamel**
Madelyn Abraham, 18 Senior, St. Andrew's Episcopal School, Ridgeland, MS
In-person.
<https://projectboard.world/isef/project/85944>
- BMED059 Implementation of Land Cover Data in a Neural Network To Forecast West Nile Virus Around the Gulf Coast**
Noah Nager, 17 Junior, Hackley School, Tarrytown, NY
In-person.
<https://projectboard.world/isef/project/85977>
- BMED060 Role of Quaternary Ammonium Compounds on Inducing Cancer Progression Using a Melanoma Cell-line**
Gokul Achaththekoot, 17 Junior, duPont Manual High School, Louisville, KY
In-person.
<https://projectboard.world/isef/project/86048>
- BMED061 Why Can't Grandma See? It's Probably AMD: The Effects of A2E and Zeaxanthin on Age-Related Macular Degeneration**
Elizabeth (Snow) Cameron, 15 Sophomore, Upland High School, Upland, CA
In-person.
<https://projectboard.world/isef/project/86056>
- BMED062 Automatic Classification of Peripheral Neutrophils on Digital Images Analyzed by Artificial Intelligence**
Jeffrey Wang, 16 Junior, Mayo High School, Rochester, MN
In-person.
<https://projectboard.world/isef/project/86061>
- BMED063 Bus Music Volume and Human Hearing**
Matavai Auapaa, 17 Senior, Tafuna High School, Pago Pago, American Samoa
Virtual.
<https://projectboard.world/isef/project/86068>
- BMED064 Construction of Oxygen Permeable Veins From Biogel**
Katherine Shoulla, 16 Sophomore, Academy for Technology and the Classics, Santa Fe, NM
In-person.
<https://projectboard.world/isef/project/86119>
- BMED065 The Effect of Sleeve Gastrectomy on Progression of Alzheimer's Disease**
Tamar Attali, 18 Senior, Israel Arts and Science Academy, Jerusalem, Israel
In-person.
<https://projectboard.world/isef/project/86218>
- BMED066 Role of TMEM-143 in Glucose Homeostasis- Implications in the Pathogenesis of Type-2 Diabetes**
Alyaa Al-Tamimi, 18 Senior, Al Bayan Secondary High School for Girls, Doha, Qatar
Virtual.
<https://projectboard.world/isef/project/86234>
- BMED067 Effects of STAT3 on Pathological Retinal Angiogenesis**
Sarah Lee, 16 Sophomore, Timpview High School, Provo, UT
In-person.
<https://projectboard.world/isef/project/86270>
- BMED068 Exploring the Use of Face Masks for Social Pathogen Detection and Personal Medical Diagnosis**
Harene Kim, 16 Junior, Northfield Mount Hermon School, Gill, MA
Virtual.
<https://projectboard.world/isef/project/86396>

- BMED069 Immune System Innovation: Ushering in a New Era of Immunology Research by Characterizing Cell Populations Most Impacted by Normal Microbial Exposure for Preclinical Research and Healthcare Treatment Development Success**
Adhvaith Sridhar, 17 Senior, Wayzata High School, Plymouth, MN
In-person.
<https://projectboard.world/isef/project/86398>
- BMED070T Microplastics in the Air as a Public Health Hazard: Development of a Digital Design of a Biodegradable Nose Filter**
Samira Abdullah, 17, Senior,
Maria Morales-Quezada, 18, Senior,
The School of San Juan, San Juan, PR
In-person.
<https://projectboard.world/isef/project/86529>
- BMED071T Sawasdee-AMP: Highly Efficient, Portable and Low-Cost Point of Care Test Kit for Future Emerging RNA/DNA Diseases Diagnosis**
Kulpatch Chananam, 18, Junior,
Kunat Khongtong, 17, Junior,
Pakitta Kriangasame, 17, Junior,
Mahidol Wittayanusorn School, Nakhon Pathom, Nakhon Pathom, Thailand
In-person.
<https://projectboard.world/isef/project/86570>
- BMED072T Alternative for Formaldehyde-Based Embalming**
Surbhi Chandak, 15, Freshman,
McKinley Pasiakos, 15, Freshman,
Paradise Valley High School, Phoenix, AZ
In-person.
<https://projectboard.world/isef/project/86601>
- BMED073 Establishing Macrophage-Neuron Co-Culture Systems To Assess Neuronal Dynamics**
Maxx Martinez, 17 Senior, Delta High School, Muncie, IN
In-person.
<https://projectboard.world/isef/project/86640>
- BMED074 An Analysis of the Effects of Nicotine on Characteristics of *Drosophila melanogaster***
Madison Echols, 17 Junior, Mississippi School for Mathematics and Science, Columbus, MS
In-person.
<https://projectboard.world/isef/project/86652>
- BMED075 The Effect of Heat Shock Proteins on *Drosophila* With Malignant Tumors**
Saachi Mody, 17 Junior, Florida Atlantic University High School, Boca Raton, FL
In-person.
<https://projectboard.world/isef/project/86670>
- BMED076 Differentiating LATE from Alzheimer's Disease in the Era of Anti-Amyloid Monoclonal Antibody Treatment: A Novel Machine-Learning Approach**
Jun Kai Yeong, 17 Senior, NUS High School of Mathematics & Science, Singapore, Singapore
Virtual.
<https://projectboard.world/isef/project/86723>
- BMED077T Evaluation of Gastric Cancer Stem Cell Targeting Ability of Saponin Extract and Preparation of Tea Product from *Ardisia gigantifolia* Stapf. Leaves**
Minh Dao, 16, Junior,
Cuong Nguyen, 17, Junior,
Thai Nguyen Specialized High School, Thai Nguyen, Thai Nguyen, Viet Nam
Virtual.
<https://projectboard.world/isef/project/86782>
- BMED078 The Effect of Antepartum Maternal Position Changes on Labor and Delivery Outcomes**
Grace Weaver, 18 Senior, Marian High School, Mishawaka, IN
In-person.
<https://projectboard.world/isef/project/86840>
- BMED079 What Is the Role of PRPF39 in Cisplatin Treated Cancer Cells?**
May Weston, 16 Junior, Marian High School, Mishawaka, IN
In-person.
<https://projectboard.world/isef/project/86844>
- BMED080 The Physical Effects of Sound: The Unconscious Impact of Sound Waves on Adolescent Heart Rates**

Sudiksha Singhal, 17 Junior, Red River High School, Grand Forks, ND
In-person.
<https://projectboard.world/isef/project/86850>

- BMED081 Autism From Mars?: Decoding the Genetic Underpinning of Sex Bias in Autism Through Big Data Analysis**
Junu Lee, 16 Sophomore, Lexington High School, Lexington, MA
Virtual.
<https://projectboard.world/isef/project/86858>
- BMED082 Reusable Screening Method for Malaria Infections From Thin Blood Smear Images Using Convolutional Neural Network**
Aaron George, 15 Freshman, Saint Dominic Savio Catholic High School, Austin, TX
In-person.
<https://projectboard.world/isef/project/86893>
- BMED083T Staying Ahead of the Hit: Concussion Recovery in Youth Optimized Using a Comprehensive App-Based Program (CRYO CAP)**
Tony Bright, 16, Junior,
Hamza Lateef, 16, Junior,
Gabriel Ralston, 16, Junior,
Governor's School at Innovation Park,
Manassas, VA
In-person.
<https://projectboard.world/isef/project/86970>
- BMED084 Natural Is Not Neutral: Dangers of Natural Compounds Found in Produce and Dietary Supplements and Therapeutic Mechanisms of Flavone Luteolin on Neuroblastoma and Lymphoma**
Jessie Dong, 17 Junior, Roslyn High School, Roslyn Heights, NY
In-person.
<https://projectboard.world/isef/project/87028>
- BMED085 An Exploration of the Effects of Diet on Liver Cancer and Angiogenesis**
Skye Beck, 17 Senior, International School of Luxembourg, Luxembourg, Luxembourg
Virtual.
<https://projectboard.world/isef/project/87133>

Computational Biology and Bioinformatics

- CBIO001 Genes Negatively Regulated by FOXO1 and Their Association With Breast Cancer**
Bipul Soti, 16 Junior, Science Academy of South Texas, Mercedes, TX
In-person.
<https://projectboard.world/isef/project/82983>
- CBIO002 Experimental Characterization of Inhibitors of the MSUT-2 Protein for the Treatment of Neurodegenerative Diseases (Year 2)**

Rithvik Ganesh, 18 Senior, Plano West Senior High School, Plano, TX
In-person.
<https://projectboard.world/isef/project/83238>
- CBIO003 COVID-19 Detection on Chest X-Ray Using an Enhanced Neural Network Model: Impact of Network Architecture Complexity, Data Augmentation, and Transfer Learning on Model**
Himal Bamzai-Wokhlu, 16 Junior, F. W. Buchholz High School, Gainesville, FL
In-person.
<https://projectboard.world/isef/project/85171>
- CBIO004 Predicting Future Mutations of COVID-19 Using Machine Learning**
Keith Torpey, 18 Senior, East Airport International School, Accra, Greater Accra, Ghana
Virtual.
<https://projectboard.world/isef/project/82847>
- CBIO005 Diagnosing COVID-19 and Prioritizing Treatment via Fuzzy Parameterized Fuzzy Soft Matrices**
Zeynep Parmaksiz, 16 Junior, Besiktas Bilim Ve Sanat Merkezi, Besiktas, Istanbul, Turkey
In-person.
<https://projectboard.world/isef/project/85795>
- CBIO006 Using Artificial Intelligence Graph Neural Networks To Repurpose Pre-Existing Drugs and Analyze Drug Relationships: Year 2**

Krithik Seela, 16 Junior, Lake Highland Preparatory School, Orlando, FL
Virtual.
<https://projectboard.world/isef/project/82842>
- CBIO007 Identifying Breast Cancer Cell Surfaceome Mutations as Potential B-Cell Targets**
Margaret Hu, 17 Senior, Century High School, Rochester, MN
In-person.
<https://projectboard.world/isef/project/82957>
- CBIO008 Novel-DTI: A Machine Learning Pipeline To Predict Drug-Target Interactions for Large-Scale Drug Repurposing and Drug Discovery Using Multiplex, Heterogeneous Networks**
Shreya Amalapurapu, 17 Junior, Texas Academy of Mathematics and Science, Denton, TX
Virtual.
<https://projectboard.world/isef/project/83142>
- CBIO009 Decoding Genetics of Aging: A Neural Network Interpretation on Age-Associated Biomarker Data and Diseases**

Hannah Guan, 16 Junior, BASIS San Antonio Shavano Campus, San Antonio, TX
Virtual.
<https://projectboard.world/isef/project/82776>
- CBIO010 Epidemiology of Pineoblastoma in the United States, 2000-2017**

Kaitlyn Greppin, 18 Senior, Hathaway Brown School, Shaker Heights, OH
In-person.
<https://projectboard.world/isef/project/82818>
- CBIO011 Pharmacodynamic Prediction Model Using Physicochemical Properties of Antidepressant**
Guhyun Chung, 17 Junior, Saint Paul Preparatory Seoul, Seocho, Seoul, South Korea
Virtual.
<https://projectboard.world/isef/project/83137>
- CBIO012 Exploring Machine Learning Interpretability by Analyzing Tumor Suppressor Genetic Sequence Data**

Hristo Todorov, 19 Senior, High School of Mathematics and Natural Sciences "Professor Emanuil Ivanov", Kyustendil, Bulgaria
In-person.
<https://projectboard.world/isef/project/82938>

- CBIO013 ERVK3-1 as a Prognostic Marker for Invasive Ductal Carcinoma**
Vasundara Govindarajan, 18 Senior, TERRA Environmental Research Institute, Miami, FL
Virtual.
<https://projectboard.world/isef/project/83178>
- CBIO014 Identification of Target IVF Preimplantation Screening Regions via Developmental Pathway and RNA-Seq Expression Analysis**
Emily Phanphongsa, 18 Senior, Waipahu High School, Waipahu, HI
Virtual.
<https://projectboard.world/isef/project/83193>
- CBIO015 Statistical Analysis of Infant Mortality and Social Contributions**
Camille Kleinpeter, 17 Junior, St. Joseph's Academy, Baton Rouge, LA
In-person.
<https://projectboard.world/isef/project/82878>
- CBIO016 NeuroXNet: A Novel Hierarchical Based, Blood Biomarker Driven, Deep Learning Model With miRNA Drug Discovery Pipeline for Neurological Disease Diagnosis and Treatment Using *in silico* Modeling, MRI Imaging and Genomic Data**
Vaibhav Mishra, 17 Senior, West Laurens High School, Dexter, GA
Virtual.
<https://projectboard.world/isef/project/82912>
- CBIO017 Leveraging Singular Value Decomposition(SVD) to Detect SARS-CoV-2 Variants**
Aidan Wang, 16 Sophomore, University School of Milwaukee, Milwaukee, WI
In-person.
<https://projectboard.world/isef/project/83161>
- CBIO018 Tumor Targeting: Utilizing Spatial Data Science Techniques To Decode the Enigmatic Immune Response With the Goal of Informing Further Efforts To Develop Immunotherapies for Tumor Treatment**
Srinath Hariharan, 17 Junior, Woodbury High School, Woodbury, MN
Virtual.
<https://projectboard.world/isef/project/82868>
- CBIO019 Evaluation of Patient-Derived Xenograft Model Accuracy Using Differential Gene Expression Analysis for Cancer Modeling Optimization**
Leo Shen, 16 Junior, Auburn High School, Auburn, AL
In-person.
<https://projectboard.world/isef/project/82841>
- CBIO020 Assessing the Effect of Traveling on COVID at the County Level Using Machine Learning**
Andrew Yu, 18 Senior, The Mississippi School for Mathematics and Science, Columbus, MS
In-person.
<https://projectboard.world/isef/project/82946>
- CBIO021 A Novel Computational Modeling Framework To Analyze Synovial-Tissue Based Drug Targets and Diagnostic Biomarkers in Rheumatoid Arthritis**
Paridhi Latawa, 17 Senior, Liberal Arts and Science Academy, Austin, TX
In-person.
<https://projectboard.world/isef/project/82817>
- CBIO022 Bioinformatics Applied to the Y-DNA Haplogroup Q-M242: Male Navajo Genetic Marker**
Jordyn Begay, 15 Sophomore, Navajo Preparatory School, Farmington, NM
Virtual.
<https://projectboard.world/isef/project/82773>
- CBIO023 Estimating Particulate Matter Exposure Across Populations in Alabama**
Elizabeth Lancaster, 18 Senior, Alabama School of Fine Arts, Birmingham, AL
In-person.
<https://projectboard.world/isef/project/82975>
- CBIO024T Predicting Mycobacteriophage Gene Start Sites Using Artificial Intelligence**
Sarisha Lohano, 18, Senior,
Bella Norman, 17, Senior,
The Carol Martin Gatton Academy of Mathematics and Science in Kentucky, Bowling Green, KY
Virtual.
<https://projectboard.world/isef/project/85295>

- CBIO025 Drug-Target Interactions Prediction Using Network Based Method and Machine Learning**
Lara Monagel, 18 Senior, Dar Jana International School, Jeddah, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85185>
- CBIO026 Comparing the Genomic and Functional Properties of Phage BangNhom and Other Phages To Test Medical Capabilities for Tuberculosis**
Laiba Farooq, 17 Senior, Annapolis High School, Annapolis, MD
In-person.
<https://projectboard.world/isef/project/83219>
- CBIO027 Recurrent Repeat Contractions: Investigating a Novel Genomic Factor of Polymorphism in 10 Human Cancers**
Kevin Zhu, 17 Junior, Jericho High School, Jericho, NY
In-person.
<https://projectboard.world/isef/project/83146>
- CBIO028 Prediction of Genetic Predisposition to Isoniazid-Induced Hepatic Steatosis via Computational Analysis of Genetic Biomarkers**
Shikha Kathrani, 16 Junior, Dougherty Valley High School, San Ramon, CA
In-person.
<https://projectboard.world/isef/project/85243>
- CBIO029 RiboBayes: Assessing the Transcriptome-Wide Expression of Ribosome Pause Sites in Ribosome Profiling Data With Bayesian Wavelet Thresholding**
Amber Luo, 18 Senior, Ward Melville High School, East Setauket, NY
In-person.
<https://projectboard.world/isef/project/82882>
- CBIO030 A Novel Visualization Tool: Application to RNA-Sequence Classification**
Ebru Ayyorgun, 17 Junior, Battlefield High School, Haymarket, VA
In-person.
<https://projectboard.world/isef/project/83070>
- CBIO031 A Novel Approach to Analyzing Alzheimer's Disease in MRI Scans Using a Convolutional Neural Network**
Rudra Patel, 15 Freshman, Middleton High School, Tampa, FL
In-person.
<https://projectboard.world/isef/project/82747>
- CBIO032 Developing an Algorithm To Analyze Structural Characteristics of Alzheimer's Disease in Different Stages of Mild Cognitive Impairment and Validate White Matter Atrophy as an Early Predictor of Mild Cognitive Impairment (A Novel Second Year Study)**
Maya Chandar, 18 Senior, Canterbury School, Fort Myers, FL
In-person.
<https://projectboard.world/isef/project/85618>
- CBIO033 Computational Analysis of SARS-CoV-2 Variants' Binding With Vertebrate ACE2**
Adithya Puninchittaya, 16 Sophomore, Bedford High School, Bedford, NH
In-person.
<https://projectboard.world/isef/project/83244>
- CBIO034 Modeling Genetic and Neurological Changes With Alcohol Use Disorder**
Zoya Khan, 15 Sophomore, Cheyenne Central High School, Cheyenne, WY
In-person.
<https://projectboard.world/isef/project/85802>
- CBIO035 DIANE: A Novel Multi-Omics Data Integration Framework Using Attributed Network Embedding Paired With Machine Learning for More Accurate Biomedical Classification**
Amogh Chaturvedi, 16 Junior, Canyon Crest Academy, San Diego, CA
In-person.
<https://projectboard.world/isef/project/85245>
- CBIO036 Deep Learning-Aided Diagnosis of Autoimmune Blistering Diseases**
Daniel Cai, 18 Senior, Torrey Pines High School, San Diego, CA
In-person.
<https://projectboard.world/isef/project/85809>

- CBIO037 Single-Cell Transcriptomic Analysis Reveals Genetic Drivers of Fast/Slow Motor Neuron Identity**
 Luke Zhao, 17 Senior, Lynbrook High School, San Jose, CA
 In-person.
<https://projectboard.world/isef/project/85872>
- CBIO038 A Machine Learning Approach to Identifying Blood-Based Biomarkers for Differential Diagnosis of Alzheimer's Disease**
 Anjali Sreenivas, 17 Junior, Nikola Tesla STEM High School, Redmond, WA
 In-person.
<https://projectboard.world/isef/project/85101>
- CBIO039 Identification of Potential Inhibitors of Severe Acute Respiratory Syndrome Coronavirus 2 Envelope Protein Ion Channel Activity Using Machine Learning Techniques**
 # Wency Suo, 17 Junior, Boise High School, Boise, ID
 In-person.
<https://projectboard.world/isef/project/85864>
- CBIO040 An Application of Machine Learning on Predicting the Presence of Retinopathy Among Diabetic Patients**
 Spandana Pavuluri, 16 Junior, duPont Manual High School, Louisville, KY
 In-person.
<https://projectboard.world/isef/project/85273>
- CBIO041 Artificial Intelligence Solution for Effective Treatment Planning for Brain Tumor Patients**
 Vikram Goddla, 16 Sophomore, Detroit Country Day School, Beverly Hills, MI
 In-person.
<https://projectboard.world/isef/project/85275>
- CBIO042 Identifying Genetic Biomarkers for Essential Tremor Using Bioinformatics and Machine Learning**
 Nicholas Djedjos, 18 Senior, Mississippi School for Mathematics and Science, Columbus, MS
 In-person.
<https://projectboard.world/isef/project/85074>
- CBIO043 Exploring the Effects of Supervised Contrastive Learning on Alzheimer's Disease Classification With the F-18 AV45 PET Modality**
 Edward Jung, 17 Junior, University High School, Irvine, CA
 In-person.
<https://projectboard.world/isef/project/85725>
- CBIO044 Mutformer-Deciphering the Language of Genetic Variants: Using a Transformer-Based Language Model To Identify Pathogenic Missense Mutations Associated With Human Inherited Diseases and Cancer**
 Theodore Jiang, 18 Senior, Palisades Charter High School, Pacific Palisades, CA
 In-person.
<https://projectboard.world/isef/project/85658>
- CBIO045 Elucidating the Mechanisms of Drug-Induced Hearing Loss: Characterization of Interferon Gamma Signaling as a Regulator of Hair Cell Regeneration and Inflammation in Zebrafish**
 Rohak Jain, 15 Sophomore, Interlake High School, Bellevue, WA
 In-person.
<https://projectboard.world/isef/project/85800>
- CBIO046 Novel 3D Convolutional Neural Network for Age-At-Death Estimation From Cranial CT Scans**
 # Maya Joshi, 17 Junior, Walter Payton College Preparatory High School, Chicago, IL
 Virtual.
<https://projectboard.world/isef/project/85655>
- CBIO047 A Novel Multi-Task Learning Model To Predict Pan-Cancer Drug Response With Integrated Multi-Omics Data**
 Shaurya Agrawal, 16 Sophomore, Adlai E. Stevenson High School, Lincolnshire, IL
 In-person.
<https://projectboard.world/isef/project/85644>
- CBIO048T A Novel Machine Learning Method for Tuberculosis Drug Discovery**
 Gaurish Lakhanpal, 16, Junior,
 Aditya Tiwari, 16, Junior,
 Adlai E. Stevenson High School, Lincolnshire, IL
 In-person.
<https://projectboard.world/isef/project/85847>

- CBIO049** **ARIEL: Adversarial Neural Evolution for Unified Variant Forecasting and Proactive Therapeutic Design**
Ryan Park, 17 Senior, Millburn High School, Millburn, NJ
Virtual.
<https://projectboard.world/isef/project/85647>
- CBIO050** **RARE: Machine Learning Approach for Binning Rare Variant Features To Detect Association With Disease**
Satvik Dasariraju, 16 Junior, The Lawrenceville School, Lawrenceville, NJ
Virtual.
<https://projectboard.world/isef/project/85636>
- CBIO051T** **A Novel Computational Pipeline To Identify Target Genes That Define Cancer Subtypes To Improve Cancer Detection and Therapy**
Ekansh Mittal, 15, Sophomore,
Vatsal Parikh, 17, Junior,
Westview High School, Portland, OR
Sunset High School, Portland, OR
In-person.
<https://projectboard.world/isef/project/85731>
- CBIO052** **COVID-19 Mortality Drivers in Brazil: Prioritizing Patients With COVID Symptoms To Reduce Mortality**
Zara Hommez, 15 Sophomore, Portola High School, Irvine, CA
Virtual.
<https://projectboard.world/isef/project/85742>
- CBIO053** ***De novo* Nanobody Design With Neural Networks, AlphaFold, and Docking Algorithms**
Anirudh Venkatraman, 16 Junior, Homestead High School, Cupertino, CA
Virtual.
<https://projectboard.world/isef/project/85615>
- CBIO054** **Identifying Small Molecule Inhibitors of Programmed Cell Death 1 for Cancer Immunotherapy Using Pharmacophore-Based Virtual Screening**
Nicole Liang, 17 Junior, River Hill High School, Clarksville, MD
In-person.
<https://projectboard.world/isef/project/85576>
- CBIO055** **CIRCA - CircularRNA for Cancer Active Immunotherapy: A Machine Learning Model To Predict Liver Cancer and Top Genes for Cancer Vaccine**
Aditya Koushik, 15 Sophomore, La Cueva High School, Albuquerque, NM
In-person.
<https://projectboard.world/isef/project/85953>
- CBIO056** **Improved Visualization of Dimensionality Reduction Plots With Controlled Downsampling**
Ashley Hsu, 17 Senior, Commack High School, Commack, NY
In-person.
<https://projectboard.world/isef/project/85979>
- CBIO057** **Predicting Virus-Human Interactions To Facilitate the Design of Anti-Coronavirus Vaccines and Therapeutics**
Angela Zhan, 14 Freshman, Logan High School, Logan, UT
In-person.
<https://projectboard.world/isef/project/85985>
- CBIO058T** **Identification of X-Linked Candidate Disease Genes Through Trio Family Analysis of Family Pedigree**
Bolong Huang, 16, Sophomore,
James Yang, 16, Junior,
Carmel High School, Carmel, IN
In-person.
<https://projectboard.world/isef/project/86102>
- CBIO059** **Creation of a Novel Machine Learning Model To Predict MGMT Promoter Methylation Status Using Multimodal MRI Images**
Ananya Anand, 16 Sophomore, Mission San Jose High School, Fremont, CA
In-person.
<https://projectboard.world/isef/project/86220>
- CBIO060** **Synthesis and Motif Discovery of Novel Antibacterial Molecules and Orally Active Drugs via Sequence-Based Machine Learning**
Tony Wang, 16 Junior, Amador Valley High School, Pleasanton, CA
Virtual.
<https://projectboard.world/isef/project/86222>

- CBIO061 Machine Learning-Based Identification of Cognitive Engagement States in EEG Data Driven by Visual Stimulation**
Sean Borneman, 13 Freshman, Bloomington High School South, Bloomington, IN
In-person.
<https://projectboard.world/isef/project/86232>
- CBIO062 Identification of Pancreatic Cancer Driver Genes With a Novel Machine Learning Approach**
Minnie Liang, 17 Junior, West Lafayette Junior/Senior High School, West Lafayette, IN
In-person.
<https://projectboard.world/isef/project/86243>
- CBIO063 Computational Method of Analyzing Genetic and Epigenetic Information for Predicting Mutations in Colorectal and Pancreatic Ductal Adenocarcinoma Cancers**
Hannah Long, 17 Junior, Magoffin County High School, Salyersville, KY
Virtual.
<https://projectboard.world/isef/project/86390>
- CBIO064T A Two-Part Approach and Implementation of Early-Stage Skin Cancer Diagnosis Using a Novel Dense Convolutional Neural Network (CNN) Architecture and Affordable Computing Hardware**
Mohit Agarwal, 17, Junior,
Aedin Yu, 16, Junior,
Eden Prairie High School, Eden Prairie, MN
In-person.
<https://projectboard.world/isef/project/86400>
- CBIO065 CROTON: An Automated and Variant-Aware Deep Learning Framework for Predicting CRISPR/Cas9 Genome Editing Outcomes**
Victoria Li, 17 Senior, Hunter College High School, New York, NY
In-person.
<https://projectboard.world/isef/project/86419>
- CBIO066 Chaos in Cancer: Analyzing Network Morphology To Predict Tumor Angiogenesis Using Chaos Theory**
Caroline Huang, 17 Junior, Abbey Park High School, Oakville, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/86462>
- CBIO067T Bioinformatics Analysis To Identify Potential Transcription Factors That Enhance Reprogramming of Somatic Cells Into Induced Pluripotent Stem Cells**
Saud Al-Jaidi, 18, Senior,
Khalifa Aljanahi, 16, Junior,
Hassan Ibn Thabit Secondary School for Boys, Doha, Qatar
Virtual.
<https://projectboard.world/isef/project/86531>
- CBIO068T PLCAI: Systematic Pipeline for Protein-Ligand Binding Prediction via Multi-Scale Convolution Neural Network With Applications in Interpretable Drug Design Process**
Pongpak Manoret, 18, Senior,
Koravit Poysungnoen, 18, Senior,
Triam Udom Suksa, Pathumwan, Bangkok, Thailand
In-person.
<https://projectboard.world/isef/project/86542>
- CBIO069T CANDraGAT: A Hybrid Fragment-Based Graph Attention Network To Improve Cancer Drug Response Prediction**
Wutthipong Chongchareansanti, 18, Senior,
Pawit Kaewnuratchadasorn, 17, Senior,
Nattawin Yamprasert, 17, Senior,
Mahidol Wittayanusorn School, Nakhon Pathom, Nakhon Pathom, Thailand
In-person.
<https://projectboard.world/isef/project/86556>
- CBIO070 Two Novel Single-Cell Algorithms Elucidate the Therapeutic Potential of Clinically-Relevant Small-Molecule Inhibitors for Targeting Cancer Metastasis**
Akshay Shivdasani, 17 Senior, Columbia Grammar and Preparatory School, New York City, NY
In-person.
<https://projectboard.world/isef/project/86667>
- CBIO071T Predicting Nucleolin Interactions in DNA Repair: An *in silico* Approach**
Laura Fan, 17, Senior,
Sukaina Shivji, 17, Senior,
Staten Island Technical High School, Staten Island, NY
In-person.
<https://projectboard.world/isef/project/86668>

- CBIO072 Discovering Biomarkers for Breast Cancer Subtypes With Gene Expression Data Using Machine Learning**
Daniel Lin, 16 Junior, Fairview High School,
Boulder, CO
In-person.
<https://projectboard.world/isef/project/86731>
- CBIO073T NucleoDepot: A Novel Approach to Genetic Depositories for the Novice Researcher**
Raunak Dani, 15, Sophomore,
Aaron Slamovich, 19, Senior,
West Lafayette Junior/Senior High School, West
Lafayette, IN
In-person.
<https://projectboard.world/isef/project/86843>
- CBIO074 Novel Reinforcement Learning Framework for Synthesizable Drug Optimization**
Aaron Tian, 17 Junior, Massachusetts Academy
of Math and Science at WPI, Worcester, MA
Virtual.
<https://projectboard.world/isef/project/86887>
- CBIO075 Quantum Support Vector Machines (QSVMs) for Breast Cancer Detection on IBM's Hardware**
Alice Liu, 18 Senior, Boston Latin School,
Boston, MA
Virtual.
<https://projectboard.world/isef/project/86972>
- CBIO076 Machine Learning To Detect Fusarium Wilt of Banana**
Khushi Parikh, 17 Senior, Gilbert Classical
Academy, Gilbert, AZ
In-person.
<https://projectboard.world/isef/project/86975>

Cellular and Molecular Biology

- CELL001 Analyzing the CD44-Targeting Capabilities of Chitosan-Coated Iron Oxide Nanoparticles in Glioblastoma Multiforme**
Thomas Commander, 17 Junior, Episcopal School of Jacksonville, Jacksonville, FL
In-person.
<https://projectboard.world/isef/project/83270>
- CELL002 The Mechanism of Methylmercury Permeation Through the Blood-Brain Barrier Using *C. elegans***
Zehra Jaffery, 16 Sophomore, Jasper High School, Plano, TX
In-person.
<https://projectboard.world/isef/project/82941>
- CELL003 Characterization of Lung Cancer Mechanosensation**
Shiv Patel, 15 Sophomore, Maclay School, Tallahassee, FL
In-person.
<https://projectboard.world/isef/project/83042>
- CELL004 BMP4 Prevents Thrombin Induced Inflammation and Vascular Damage in Endothelial Cells**
Cemre Kayisli, 17 Senior, Wiregrass Ranch High School, Wesley Chapel, FL
In-person.
<https://projectboard.world/isef/project/83258>
- CELL005 Customized Cancer Cell Weapons: Using CRISPR Cas9 Genetic Engineering and Human Adipose-Derived Mesenchymal Stem Cells To Overcome Platinum-Based Chemotherapy Resistance in OVCAR-3 Human Ovarian Cancer Cells, Year 4**
Neil Reddy, 18 Senior, Satellite High School, Satellite Beach, FL
In-person.
<https://projectboard.world/isef/project/82979>
- CELL006 Immunomodulatory Properties of Mesenchymal Stem Cells for Knee Osteoarthritis Prevention and Treatment**
Lara Gastelumendi, 17 Senior, Medical Academy for Science and Technology, Homestead, FL
Virtual.
<https://projectboard.world/isef/project/83138>
- CELL007 The Role of Ribosomal RNA Modifications in Ribosome Biogenesis**
Jean Yu, 17 Junior, Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, GA
In-person.
<https://projectboard.world/isef/project/83217>
- CELL008 Evaluating the Effects of Resveratrol on the Lysis of Skin Melanoma Cells**
Kayla Holland, 15 Sophomore, Rockdale Magnet School for Science and Technology, Conyers, GA
In-person.
<https://projectboard.world/isef/project/83210>
- CELL009 A Novel Approach to Bone Implant Infection Therapeutics Leveraging Proteins Derived From *Lactobacillus acidophilus* and Modulating Anti-Inflammatory Gene Expression**
Anouska Seal, 16 Sophomore, Paul J. Hagerty High School, Oviedo, FL
In-person.
<https://projectboard.world/isef/project/83254>
- CELL010 Attenuation of Adipocyte Hypertrophy in a Palmitic Acid-Induced 3T3 Cell Model Through Lupeol Treatment**
Shivani Babu, 16 Junior, Auburn High School, Auburn, AL
In-person.
<https://projectboard.world/isef/project/82826>
- CELL011 Sex Chromosomal Differences and Increased Leukemia Rates in Males**
Sireesha Gutti, 17 Junior, Paul Laurence Dunbar High School, Lexington, KY
In-person.
<https://projectboard.world/isef/project/83241>
- CELL012 Study on the Mechanism Underlying CENP-E Mediated Mitochondrial Movement in Mitosis**
Tianqi Lu, 16 Junior, Hefei No. 8 Senior High School, Hefei, Anhui, China
Virtual.
<https://projectboard.world/isef/project/82890>

- CELL013 Effect of Mammary Adenocarcinoma Supernatant on Hepatic Fibroblast Differentiation**
Enze Wang, 17 Junior, Beijing No. 4 High School, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/83248>
- CELL014 Using Cellular Techniques To Assess Bioindicator Plants' Response to Environmental Pollutants**
Miriam Carl, 15 Freshman, Live Oak Classical School, Waco, TX
In-person.
<https://projectboard.world/isef/project/83170>
- CELL015 Optimized Expression Condition of SARS-CoV-2 Polymerase Nsp12**
YiFei Liu, 15 Sophomore, The Experimental High School Attached to Beijing Normal University, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/85118>
- CELL016 Rare Immune Cells Significantly Associated With Severe COVID-19 Cases**
Karah Mayer, 18 Senior, Tanque Verde High School, Tucson, AZ
In-person.
<https://projectboard.world/isef/project/83098>
- CELL017 *Fusobacterium nucleatum* as a Marker for Epithelial to Mesenchymal Transition in Colorectal Cancer**
Angela Huang, 16 Junior, Sebring High School, Sebring, FL
In-person.
<https://projectboard.world/isef/project/82885>
- CELL018 Reducing the Screening Time Required for Therapeutic Exon Skips in Duchenne Muscular Dystrophy Using *ab initio* Modeling**
Dana Khafagi, 17 Senior, Al IbdAA Private Girl's Schools, Jeddah, Makkah, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85774>
- CELL019 The Sensory Potential of Synaptopodin: An Analysis of Synaptopodin Within the Dorsal Root Ganglion**
Veenasravani Pendyala, 18 Senior, North Oldham High School, Goshen, KY
Virtual.
<https://projectboard.world/isef/project/83191>
- CELL020 The Effect of Covalent Cross Links on the Secondary Structure of the Tetracycline Aptamer**
Anand Patel, 18 Senior, Dallastown Area High School, Dallastown, PA
Virtual.
<https://projectboard.world/isef/project/82850>
- CELL021 *In vitro* Evaluation of the Antioxidant Potential and Differential Effects of Punicalagin in Normal and Breast Cancer Cells**
Bhavana Sridharan, 16 Sophomore, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/82833>
- CELL022 LncRNAs Influence on NK Cells: Potential Therapeutic Target for Neuroblastoma**
Miah Margiano, 17 Junior, Saint Anthony's High School, Melville, NY
In-person.
<https://projectboard.world/isef/project/83260>
- CELL023 Coordination of Myosin Va Motors Within a Team During Cargo Transport**
Hiba Ali, 18 Senior, South Burlington High School, South Burlington, VT
In-person.
<https://projectboard.world/isef/project/85619>
- CELL024 A Novel RNAi-Based Drug for the Treatment of Hepatocellular Carcinoma**
Ritvik Viniak, 16 Junior, Walter Payton College Preparatory High School, Chicago, IL
Virtual.
<https://projectboard.world/isef/project/85827>
- CELL025 CD160 in Cytotoxic T Cell Exhaustion and Its Effect on PD-1 Blockade Cancer Immunotherapy**
Maya Ben Shalom, 17 Senior, Gymnasia HaRealit, Rishon Lezion, Israel
In-person.
<https://projectboard.world/isef/project/85222>
- CELL026 The Use of Prime Editing To Induce and Correct the CFTR-F508del Mutation in Induced Pluripotent Stem Cells**
Benjamin Persily, 16 Junior, King School, Stamford, CT
In-person.
<https://projectboard.world/isef/project/85272>

- CELL027** **Effect of Mimosa Plant Phytochemicals on the Stress Response Pathways of *Caenorhabditis elegans***
Anna Voia, 19 Senior, College Jean-de-Brebeuf, Montreal, Quebec, Canada
Virtual.
<https://projectboard.world/isef/project/85650>
- CELL028** **A Novel Investigation of the Effects of EphA4 on Axon Regeneration in the Spinal Cord**
Christina Kelly, 17 Junior, Westlake High School, Thornwood, NY
In-person.
<https://projectboard.world/isef/project/85664>
- CELL029** **Investigating the Unexplored Genome: Evaluating the Role of the Long Non-Coding RNA (lncRNA) Morrbid in the Development of Inflammatory Bowel Disease (IBD)**
Gabriella Colabello, 17 Senior, Byram Hills High School, Armonk, NY
In-person.
<https://projectboard.world/isef/project/85894>
- CELL030** **JNK Signaling as a Mediator for Gene Differentiation in Human Umbilical Vein Endothelial Cells Exposed to High Glucose**
Jaclyn Zatsiorsky, 19 Senior, Saint Mark's School, Southborough, MA
Virtual.
<https://projectboard.world/isef/project/85912>
- CELL031** **A Novel Autophagy-Related Gene Regulates Autophagy Through Endolysosomal Pathway**
Michael Gao, 17 Junior, North Hills High School, Pittsburgh, PA
In-person.
<https://projectboard.world/isef/project/85958>
- CELL032** **The Extraction of Apple Juice From Applesauce Using Cellulase Enzyme**
Ethan Calvasina, 16 Sophomore, SUCCESS Academy - SUU, Cedar City, UT
In-person.
<https://projectboard.world/isef/project/85964>
- CELL033** **Hedgehog Signaling Mediates the Dysregulation of Adrenocorticotropin Hormone Secretion and Somatostatin Receptor Expression in Cushing's Disease**
Saptarshi Mallick, 17 Senior, University High School, Tucson, AZ
In-person.
<https://projectboard.world/isef/project/86238>
- CELL034** **The Effect of N-methyl D-aspartate Receptor Shutdown on Neural Stem Cell Proliferation in Zebrafish Larvae**
Charlotte Rubin, 17 Senior, Hastings High School, Hastings-on-Hudson, NY
In-person.
<https://projectboard.world/isef/project/86411>
- CELL035** **Neurotoxicity of GenX, a Perfluoroalkyl Substance Found in Drinking Water**
Yunjia Quan, 15 Sophomore, Charlotte Country Day School, Charlotte, NC
Virtual.
<https://projectboard.world/isef/project/86424>
- CELL036** **Cytoskeletal Remodelation in Brain Tissue Exposed to Lead Nanoparticles**
Adriana Jedlickova, 18 Junior, Gymnazium Brno, Trida Kapitana Jarose, Prispevkova Organizace, Brno, South Moravian Region, Czech Republic
In-person.
<https://projectboard.world/isef/project/86458>
- CELL037** **ST6GAL 1 May Play a Role in Preventing Death by Irradiation After Chemotherapy**
Amelia Colder, 16 Junior, City Honors School, Buffalo, NY
In-person.
<https://projectboard.world/isef/project/86674>
- CELL038** **BG34-200 Engagement With Integrin CD11b for Modulating Tumor-Associated Myeloid Cells in Pancreatic Cancer**
Kaitlyn Ernst, 16 Sophomore, Laurel School, Shaker Heights, OH
In-person.
<https://projectboard.world/isef/project/86676>
- CELL039** **Assessing the Influence of TOMM40-523' Enhancer Length on APOE ε3 Expression in Alzheimer's Disease**
Leah Ellison, 17 Senior, Pine Crest School, Fort Lauderdale, FL
Virtual.
<https://projectboard.world/isef/project/86719>
- CELL040T** **Turning the TCA Cycle Backwards To Repair Damaged DNA**
Anselmo Klement Chua, 16, Sophomore, Branden Zhao, 15, Sophomore, Clementi Town Secondary School, Singapore, Singapore
Virtual.
<https://projectboard.world/isef/project/86724>

**CELLO41 Homologous Histone Acetyltransferases
KAT2A (GCN5) and KAT2B (PCAF) Roles in the
Intestinal Epithelium**

Sean Woo, 16 Junior, Millburn High School,
Millburn, NJ

Virtual.

<https://projectboard.world/isef/project/87062>

Chemistry

- CHEM002 A Green Method of Removing Immiscible Pollutants From Waterways Using Vitamin E and a Magnetic Suspension**
Amy Pham, 16 Junior, Elite Scholars Academy, Jonesboro, GA
In-person.
<https://projectboard.world/isef/project/82769>
- CHEM003 An Investigation Into the Concentration of Bisphenol A in Receipts From Major Australian Supermarkets and Its Potential Dermal Transfer**
Phoebe Adam, 16 Junior, Presbyterian Ladies' College, Sydney, Sydney, NSW, Australia
Virtual.
<https://projectboard.world/isef/project/85805>
- CHEM004 The Perfect Crystal Is the Imperfect One: A Novel Approach for Utilizing Surface Oxygen Vacancies on Crystalline Cerium (IV) Oxide To Promote Catalytic Ozonation for the Removal of BPA in Wastewater**
Kush Dewan, 17 Senior, Redeemer Baptist School, North Parramatta, NSW, Australia
Virtual.
<https://projectboard.world/isef/project/83076>
- CHEM005 The Effect of Pectin Levels on Fruit-Based Superabsorbent Polymers**
Annalise Thompson, 17 Senior, Niceville High School, Niceville, FL
In-person.
<https://projectboard.world/isef/project/83195>
- CHEM006 Effectiveness of Using Worms To Biodegrade Plastic**
Jordan Riche, 18 Senior, Wildwood High School, Wildwood, FL
In-person.
<https://projectboard.world/isef/project/83194>
- CHEM007 Graphene Oxide-Based Nanoformulations: A Novel Solution To Manage *Aedes aegypti***
Devaj Gupta, 17 Senior, DPS International, New Delhi, Delhi, India
In-person.
<https://projectboard.world/isef/project/82948>
- CHEM009 Rearrangements of N-Aryl Hydroxamic Acid Methanesulfonates: Towards Novel and Valuable Organic Substances**
Veronika Martinkova, 18 Junior, Gymnazium Frantiska Palackeho Valasske Mezirici, Valasske Mezirici, Zlinsky Kraj, Czech Republic
Virtual.
<https://projectboard.world/isef/project/85081>
- CHEM010 Modification of Silica Surface With Supercritical Water as a Tool Indicating New Possibilities of Existing Separation Methods**
Pavel Karasek, 18 Senior, Gymnazium Brno, Trida Kapitana Jarose, Prispkevova Organizace, Brno, South Moravian Region, Czech Republic
Virtual.
<https://projectboard.world/isef/project/82967>
- CHEM011 Breaking Chemical Bonds by Force: A Computational Investigation of Metal-C-H Interaction Under High Pressure**
Carly Yang, 17 Senior, Texas Academy of Mathematics and Science, Denton, TX
Virtual.
<https://projectboard.world/isef/project/83267>
- CHEM012 The Effects of Dissolving Polystyrene With D-Limonene on the pH of Seawater: A Fifth Year Study**
Anna Velten, 17 Senior, Okeechobee High School, Okeechobee, FL
In-person.
<https://projectboard.world/isef/project/85778>
- CHEM013 Face Mask Protection Against Particulate Matter**
Crt Saksida, 18 Senior, Gimnazija Nova Gorica, Nova Gorica, Slovenia
In-person.
<https://projectboard.world/isef/project/83121>
- CHEM014 The Effect of Powdered Orange Peels on the Removal of Textile Dye**
Dua Bashir, 16 Sophomore, Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, GA
In-person.
<https://projectboard.world/isef/project/82900>

- CHEM015 The Mechanisms of Amber Color Formation in Aged Umeshu (Japanese Plum Liqueur)**
Ryoko Matsui, 17 Junior, Tamagawa Academy, Machida, Tokyo, Japan
Virtual.
<https://projectboard.world/isef/project/82978>
- CHEM016 The Effectiveness of Porous Photothermal Sepiida Ink Nanoparticles for Osteosarcoma Treatment**
Laya Damaraju, 17 Junior, West Shore Junior/Senior High School, Melbourne, FL
In-person.
<https://projectboard.world/isef/project/83273>
- CHEM017T Cassava Peel Powder: A Novel, Cost-Effective and Eco-Friendly Pharmaceutical Biosorbent**
Alden Kai Ray Goh, 16, Junior,
Ze Wei Liew, 16, Junior,
Chun Rui Tan, 16, Junior,
Chung Ling High School Penang, Georgetown, Penang, Malaysia
In-person.
<https://projectboard.world/isef/project/82768>
- CHEM018 Innovation of "Copper to Silver to Gold - The Alchemist's Dream" Using Aluminum Foil and Anionic Surfactant**
Yuka Kishi, 16 Sophomore, Otsumaranzan High School, Hiki-gun, Saitama, Japan
Virtual.
<https://projectboard.world/isef/project/85702>
- CHEM019 An Environmentally Friendly Method for Preparation of Transparent Wood**
Tomohiro Kato, 17 Junior, Miyazaki Nishi High School, Miyazaki, Miyazaki, Japan
Virtual.
<https://projectboard.world/isef/project/82692>
- CHEM020 Isolation, Extraction, and Identification of Fluorescent Unknown in Friedel-Crafts Acylation of Biphenyl**
Nicholai Hagemann, 18 Senior, Sand Creek High School, Colorado Springs, CO
In-person.
<https://projectboard.world/isef/project/83091>
- CHEM021 High Concentration Silver-Carrying Materials With Controlled Silver Dissolution and Efficiently Long-Acting Sterilization**
Lingyue Wang, 17 Junior, No. 2 High School of East China Normal University, Shanghai, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/83090>
- CHEM022 An Innovative Method for Determination of Nitrite Content in Salted or Overnight Food by Paper-Based Microfluidic Device**
Yancheng Tao, 17 Junior, Hangzhou Foreign Languages School, Hangzhou, Zhejiang, China
Virtual.
<https://projectboard.world/isef/project/82965>
- CHEM023 Immobilization of C@TiO₂ in Calcium Alginate Hydrogel for Photodegradation of Organic Pollutants**
Xiyang You, 16 Junior, The Experimental High School Attached to Beijing Normal University, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/82917>
- CHEM024 Applicability of Textile Industry's Classification of Silk in the Engineering of Silk Protein Material**
Jintong Ding, 16 Junior, Shanghai East Foreign Language School, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82985>
- CHEM025 Research on the Microscopic Mechanism of CO₂ Capture Using TBAB Semi-Clathrate Hydrate Formation**
Guoxiang Lu, 16 Junior, Chongqing No 1 International Studies School, Chongqing, Sichuan, China
Virtual.
<https://projectboard.world/isef/project/82479>
- CHEM026 Energy Creation by Low-Voltage Electrolysis of Water Using Aqueous Solutions With Different pH Levels**
Akane Iwasa, 18 Senior, National Institute of Technology - Gunma College, Maebashi, Guma, Japan
Virtual.
<https://projectboard.world/isef/project/82810>

- CHEM027 Development of a Novel, Hybrid Compound as a Single-Source Precursor for Nanocrystalline Manganese Oxide and Sulfide**
Areej Bajawi, 17 Senior, Smart Learning Schools, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85822>
- CHEM028 Enhancing the Photoelectrocatalytic Performance of WO₃ Decorated With CoO Using Electrodeposition for Water Splitting**
Maria Al Ghamdi, 16 Junior, Al Shams National Schools, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85206>
- CHEM029 Novel Biodegradable Fluorescent Polymers for Anti-Counterfeiting Applications**
Leen Al Mulhim, 15 Sophomore, KFUPM Schools, Dhahran, Eastern Province, Saudi Arabia
Virtual.
<https://projectboard.world/isef/project/85828>
- CHEM030T Degradation of rPLA With the Non-Metal Catalyst (PLADEG) and Its Application in Vitrimer Synthesis**
Ti-An Hsu, 17, Junior,
Lu-An Lin, 16, Junior,
Taipei First Girls High School, Taipei City, Chinese Taipei
In-person.
<https://projectboard.world/isef/project/85080>
- CHEM031 Computational Assessment of Macrocyclic Host-Guest Ion-Dipole Interactions With Negative Pores**
Alex Wang, 17 Junior, Syosset High School, Syosset, NY
In-person.
<https://projectboard.world/isef/project/83180>
- CHEM032 Reducing the Toxicity of Heavy Metals**
Muhammad Shafique Shah, 15 Sophomore, Punjab Daanish School for Boys, Mianwali, Punjab, Pakistan
Virtual.
<https://projectboard.world/isef/project/85284>
- CHEM033 Improving Rice Nutrition**
Vivian Peng, 15 Sophomore, Starkville High School, Starkville, MS
In-person.
<https://projectboard.world/isef/project/82834>
- CHEM034T Engineering an Inexpensive and Sustainable Cellulose Battery Cell**
Shivani Mundra, 16, Sophomore,
Madelyn Puza, 16, Sophomore,
College Park High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/82937>
- CHEM035TNovel Protein Quantification With Metal-Organic Framework (MOF)-Coated Quartz Crystal Microbalance (QCM)**
Tae hoon Kim, 18, Senior,
Joonsung Lee, 17, Senior,
Woojin Park, 18, Senior,
Korea Science Academy of KAIST, Busan, Busan, South Korea
Virtual.
<https://projectboard.world/isef/project/85102>
- CHEM036 Phytochemical Research of *Peganum harmala***
Ayaulym Amangeldieva, 17 Junior, School-gymnasium No. 4 named after Zhambyl Zhabayev, Nur-Sultan, Nur-Sultan, Kazakhstan
Virtual.
<https://projectboard.world/isef/project/85147>
- CHEM037 Electrolysis of 3D Polylactic Acid (PLA) for Custom Fabrication of Sustainable Electromagnets**
Ryan McGinnis, 18 Senior, West Geauga High School, Chesterland, OH
In-person.
<https://projectboard.world/isef/project/85768>
- CHEM038 Biofuel: Testing Oils for Energy Efficacy**
Kelly Takorbisong, 15 Freshman, Keokuk High School, Keokuk, IA
In-person.
<https://projectboard.world/isef/project/85172>
- CHEM040 Extracting Humic Acid From Banana Peels To Reduce the Risks of Salinization**
Ruvarashe Mutama, 18 Senior, Queen Elizabeth Girls' High School, Harare, Zimbabwe
In-person.
<https://projectboard.world/isef/project/85751>

- CHEM041 Towards the Total Synthesis of the TRAIL-Resistance-Overcoming Pannokin D for the Development of a Pharmaceutically Significant Diprenylated Chromone-Derived Flavonoid Synthesis**
Hiren Parekh, 18 Senior, Saxony Lutheran High School, Jackson, MO
Virtual.
<https://projectboard.world/isef/project/85834>
- CHEM042 To What Extent Do Different Sodium Silicate (Na₂SiO₃) to Sodium Hydroxide (NaOH) Ratios in Alkaline Solutions Influence the Durability of Fly Ash Based Geopolymer Concrete Measured Through a Sorptivity Test?**
Matthieu Bou, 19 Senior, International School of Stavanger, Stavanger, Rogaland, Norway
In-person.
<https://projectboard.world/isef/project/85078>
- CHEM043 Selective Dehydrogenation of Formic Acid Using an Efficient Cost-Effective Ruthenium-Based Catalyst for Generating Power in Automobiles**
Dana Al Aithan, 17 Senior, Al-Anjal Private School, Al Hofuf, Eastern, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85204>
- CHEM044 Characterization of Enzymes, Chalcone Synthase, Chalcone Isomerase, and Dihydroflavonol 4-Reductase, by X-Ray Crystallography To Improve the Efficacy of Crops *Panicum virgatum* and *Sorghum bicolor* as Potential USDA Biofuel Sources**
Rishi Hazra, 17 Junior, Skyline High School, Sammamish, WA
In-person.
<https://projectboard.world/isef/project/85187>
- CHEM045 Techno-Economic Assessment of a Cost and Quality-Based Algal Biodiesel Production Process**
Steven Liu, 18 Senior, Shady Side Academy, Pittsburgh, PA
In-person.
<https://projectboard.world/isef/project/85257>
- CHEM046 Synthesis of Layered Double Hydroxides, Intercalated by Anionic Forms of Active Chlorine as a New Type of Antibiotic-Free Solid Disinfectant With Prolonged Activity for Wound Dressings and Other Application**
Sofia Timofieieva, 16 Sophomore, Chemical Ecological Lyceum, Dnipro, Dnipropetrovsk Region, Ukraine
Virtual.
<https://projectboard.world/isef/project/85741>
- CHEM047 Improving the Ductility and Overall Usability of Casein Plastic Through the Addition of a Plasticizer**
Sana Rajesh, 16 Sophomore, Gretchen Whitney High School, Cerritos, CA
In-person.
<https://projectboard.world/isef/project/85622>
- CHEM048 Creation of a Predictive MOF Performance Indication System Utilizing Synthesis Criteria and Machine Learning**
Zahra Nathani, 17 Junior, Niles Township West High School, Skokie, IL
Virtual.
<https://projectboard.world/isef/project/85831>
- CHEM049 From Leavened Products to Proteins Through Flours**
Caterina Amichetti, 19 Senior, Istituto Istruzione Superiore Galileo Galilei, Jesi, Italy
In-person.
<https://projectboard.world/isef/project/85886>
- CHEM050 Identification of Chemical Contaminants in Spiked Beverages With the Use of Infrared Spectroscopy Through Development of Inexpensive and Inconspicuous Device To Identify Date-Rape Drugs**
Mai Blaustein, 18 Senior, Harrison High School, Harrison, NY
In-person.
<https://projectboard.world/isef/project/85596>
- CHEM051 Green Mechanochemical One-Pot Isoxazoline Synthesis With TPGS-750-M Micelle**
Alor Sahoo, 18 Senior, Stockdale High School, Bakersfield, CA
In-person.
<https://projectboard.world/isef/project/85744>

- CHEM052T Carbon Capturing**
Mason Headrick, 17, Junior,
Love Patel, 16, Junior,
McMinn County High School, Athens, TN
In-person.
<https://projectboard.world/isef/project/85733>
- CHEM053 Study on Ultraviolet Protection in Cotton Fabric Dyed With Vegetable-Based Colorants**
Ana Clara Silva, 18 Senior, Centro Federal Tecnológico CEFET-MG Divinópolis, Divinópolis, Minas Gerais, Brazil
In-person.
<https://projectboard.world/isef/project/85573>
- CHEM054TEffectiveness Test of a Low-Cost and High-Efficiency Jordanian Micro Bentonite Filter To Remove Oily Pollutants From Water**
Mays Al-Kasassbeh, 16, Junior,
May Al-Manasra, 16, Junior,
Al-Hasaad Al-Tarbawi School, Amman, Amman, Jordan
In-person.
<https://projectboard.world/isef/project/85625>
- CHEM055 Synthesis of Optically Active Dimethylphosphinoyl Analogues of Fotemustine**
Sofia Smovzh, 17 Junior, Kyiv-Pechersk Lyceum No. 171 Leader, Kyiv, Kyiv, Ukraine
Virtual.
<https://projectboard.world/isef/project/85747>
- CHEM056 Glowing Gumballs: Can Gumballs Be Used as an Additive to Reduce Paint's Flammability?**
Julian Vilardi, 18 Senior, Wetumpka High School, Wetumpka, AL
In-person.
<https://projectboard.world/isef/project/86069>
- CHEM057 Pulverizing PFOA: Analyzing Molecular Dynamics Simulations Between Perfluorooctanoic Acid and a Fluoroacetate Dehalogenase Enzyme**
Srigouri Oruganty, 18 Senior, Muhlenberg High School, Reading, PA
In-person.
<https://projectboard.world/isef/project/86091>
- CHEM058 A Sustainable Alternative to Textile Dyes: Synthesizing and Applying PMMA Nanoparticles To Create Structural Coloration**
Yumi Mizobuchi, 17 Junior, Iolani School, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/86122>
- CHEM059 Evaluation of Natural Products in Mamaki Tea Using Untargeted Metabolomics**

Alanna Sun, 16 Junior, Waiakea High School, Hilo, HI
Virtual.
<https://projectboard.world/isef/project/86124>
- CHEM060 The Effect of Carbon Quantum Dots Derived From *Yucca filamentosa* on the Photosensitivity of a Dye-Sensitized Solar Cell**
Aditi Kiran, 14 Freshman, BASIS Independent Fremont, Fremont, CA
Virtual.
<https://projectboard.world/isef/project/86223>
- CHEM061 A Novel Approach for Wastewater Treatment Utilizing Adsorbent Enhanced Biosand Filtration**
Sanjana Bhatt, 16 Junior, Cypress Bay High School, Weston, FL
Virtual.
<https://projectboard.world/isef/project/86226>
- CHEM062TEvaluation of Chlorinated Paraffin Presence in Disposable Face Masks**
Liga Lapsina, 17, Junior,
Sarlotte Odzina, 17, Junior,
Cesis State Gymnasium, Cesis, Cesis, Latvia
In-person.
<https://projectboard.world/isef/project/86275>
- CHEM063 Synthesis of Cinnamic Acid for Use as a Natural Pesticide**
Samuel Cedeno, 17 Junior, Centro Residencial de Oportunidades Educativas de Villalba, Villalba, PR
Virtual.
<https://projectboard.world/isef/project/86451>
- CHEM064 FRET-Based Combination Drug With Enhanced Photothermal Therapy**

Amna Khan, 18 Senior, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/86593>

- CHEM065 Comparison of Struvite and *Chlorella vulgaris* Solution to Phosphorus Water Pollution**
Savannah Botello, 17 Junior, Cibola High School, Yuma, AZ
In-person.
<https://projectboard.world/isef/project/86604>
- CHEM066 Effects of Different Combinations of Halogen Additions to Anti-B18H22 Molecule on Absorption and Emission Wavelength**
Melody Yeh, 18 Senior, La Cueva High School, Albuquerque, NM
Virtual.
<https://projectboard.world/isef/project/86660>
- CHEM067 Polyethyleneimine Impregnated Adsorbents for a Community-Based Carbon Capture and Sequestration Approach**
Nishant Lahiri, 17 Junior, Corning-Painted Post High School, Corning, NY
In-person.
<https://projectboard.world/isef/project/86673>
- CHEM068 Identification of Microplastics in Soil Using Fluorescence**
Cecilia Sweeney, 18 Senior, Saint Johnsbury Academy, St. Johnsbury, VT
Virtual.
<https://projectboard.world/isef/project/86702>
- CHEM069T A Creative Approach to Designing and Synthesizing an Effective Plasmonic Photocatalyst Based on g-C3N4**
Quan Do, 15, Sophomore,
Luong Nguyen, 15, Sophomore,
Hanoi Amsterdam High School for the Gifted,
Hanoi, Viet Nam
Virtual.
<https://projectboard.world/isef/project/86709>
- CHEM070 Go Mini or Go Home! Fabrication and Evaluation of Miniature Solid-State Ion-Selective Electrodes for pH Measurement**
Annika Liu, 17 Senior, Raffles Institution, Singapore, Singapore
Virtual.
<https://projectboard.world/isef/project/86728>
- CHEM071 Novel Synthesis and Characterization of Manganese Nanoparticles: A Third Year Study**

Taytum Stratton, 17 Junior, SUCCESS Academy - SUU, Cedar City, UT
In-person.
<https://projectboard.world/isef/project/86828>
- CHEM072 An "Artificial Leaf" That Can Generate Oxygen and Electricity**
Sheng-Chun Chang, 16 Junior, Northfield Mount Hermon School, Gill, MA
Virtual.
<https://projectboard.world/isef/project/86866>
- CHEM073 Study of Magnesium Based Migraine Therapeutics**
Meghana Konda, 16 Sophomore, Lake Highland Preparatory School, Orlando, FL
Virtual.
<https://projectboard.world/isef/project/86946>
- CHEM074 Investigating the Binding Interactions of Small-Molecule Inhibitors to PLKs Using Molecular Dynamics Simulations**
Seymour Haque, 17 Senior, Florida Atlantic University High School, Boca Raton, FL
In-person.
<https://projectboard.world/isef/project/86949>
- CHEM075 Analysis of Microplastic Removal Efficiency of Synthesized Ferrofluids and the Development of an Automated Prototype for Aquatic Environments**
Kyra Henriques, 17 Junior, Oviedo High School, Oviedo, FL
In-person.
<https://projectboard.world/isef/project/86977>
- CHEM076 Mobile Carbon Capture - Phase 3**
Maya Sushkin, 14 Freshman, South High Community School, Worcester, MA
Virtual.
<https://projectboard.world/isef/project/87032>

Earth and Environmental Sciences

- EAEV001 Project Titan-Phyto: The Effects of Titanium Dioxide Nanoparticles on Marine Phytoplankton**
Ai Phan, 15 Sophomore, Atlanta Girls' School, Atlanta, GA
In-person.
<https://projectboard.world/isef/project/81873>
- EAEV002 Darwin Mangrove Ecosystem Field Study**
Reka Nemeth, 17 Senior, Darwin High School, Darwin City, NT, Australia
Virtual.
<https://projectboard.world/isef/project/82986>
- EAEV003T ChaCO-Ban: The Revolutionary Eco-Charcoal**
Nur Ain Dafina Muhamad Shukor, 17, Junior, Awatif Qistina Suhaimi, 16, Junior, Muhammad Fitri Hatim Zainuddin, 16, Junior, Sekolah Menengah Sains Sultan Mohamad Jiwa, Sungai Petani, Kedah, Malaysia
In-person.
<https://projectboard.world/isef/project/83047>
- EAEV004 Qube Network: A Low-Cost, High-Sensitivity Consumer Seismic Network for Earthquake Early Warning**
Vivien He, 18 Senior, Palos Verdes Peninsula High School, Rolling Hills Estates, CA
In-person.
<https://projectboard.world/isef/project/82790>
- EAEV005 The Effects of Increasing Iron Concentration on the Biomass and Fluorescence of *Chlorella* sp.**
Carmela Fetherlin, 17 Senior, Haines City IB East, Lake Wales, FL
In-person.
<https://projectboard.world/isef/project/83037>
- EAEV006 Designing of Nitrogen Doped Melamine Foam-Graphene-CNT-Metal Oxide Heterostructure Photocatalyst for Industrial Waste Management**
Rishita Ghosh, 16 Junior, Learning Paths School, Mohali, Punjab, India
In-person.
<https://projectboard.world/isef/project/82788>
- EAEV007 Developing a Machine Model To Predict Wildfire Risk and Identify Key Wildfire Drivers in California**
Angela Chen, 16 Junior, North Carolina School of Science and Mathematics, Durham, NC
In-person.
<https://projectboard.world/isef/project/82741>
- EAEV008 Study on the Effects of Polyvinyl Chloride (PVC) Water Contamination on the Oxygen Production Levels of *Elodea densa* (Aquatic Elodea Plant)**
Katelynn Paciorek, 17 Senior, Wiregrass Ranch High School, Wesley Chapel, FL
In-person.
<https://projectboard.world/isef/project/82907>
- EAEV009T A Comparison Between Two Rocky Shore Ecosystems on Two Different Coastlines**
Sarah Hackland, 15, Sophomore, Audrey Hunn, 16, Sophomore, Protea Heights Academy, Cape Town, Western Province, South Africa
In-person.
<https://projectboard.world/isef/project/82968>
- EAEV010 The Spread of the Woolly Mammoth Over Time and Determining Its Habitat**
Rhea Koivutalu, 19 Senior, Tallinn Secondary School of Science, Tallinn, Harjumaa, Estonia
In-person.
- EAEV011T Accelerated Reconstruction of the Ecosystem of Karabakh Region Through Innovative Technologies**
Samed Alizade, 15, Freshman, Ayaz Omarli, 15, Sophomore, Baku European Lyceum, Baku, Absheron, Azerbaijan
Young Talents High School, Baku, Azerbaijan
In-person.
<https://projectboard.world/isef/project/86109>
- EAEV012 The Effect of Climate Change on Carbon Sequestration in *Pinus ponderosa***
Cameron Gabrielson, 16 Sophomore, Oregon Episcopal School, Portland, OR
Virtual.
<https://projectboard.world/isef/project/83200>

- EAEV013 Replicability of Light Pollution Effects on Timing of Butterfly Metamorphosis**
Josephine Schultz, 14 Freshman, Winston Churchill High School, San Antonio, TX
In-person.
<https://projectboard.world/isef/project/83088>
- EAEV014T Please Embedding Roundabout on the City!: Roundabout Planning Program for Reducing Air Pollution in the Urban Planning Stage**
Gaon Han, 15, Sophomore,
Jiho Hwang, 15, Sophomore,
Hui Gwan Yang, 15, Sophomore,
Haemil High School, Sejong-si, Heamil, South Korea
Virtual.
<https://projectboard.world/isef/project/83079>
- EAEV015 Performance of Machine Learning Algorithms for Predicting Air Pollution Parameters**
Brianna Stan, 16 Junior, Lauder-Reut Educational Complex, Bucharest, Romania
Virtual.
<https://projectboard.world/isef/project/83043>
- EAEV016 Predicting Future Tropical Cyclone Intensity Using a Convolutional Neural Network**
Sunny You, 15 Sophomore, Miami Palmetto Senior High School, Pinecrest, FL
Virtual.
<https://projectboard.world/isef/project/82881>
- EAEV017 Superabsorbent Hydrogels for Water Conservation and Plant Growth**
Jaabili Gosukonda, 15 Sophomore, Houston County High School, Warner Robins, GA
In-person.
<https://projectboard.world/isef/project/85763>
- EAEV018 Effects of the Line 3 Oil Pipeline on Gray Wolves (*Canis lupus*) on the Fond du Lac Reservation**
Grace Lavan, 15 Sophomore, Cloquet Senior High School, Cloquet, MN
In-person.
<https://projectboard.world/isef/project/82690>
- EAEV019 The Effect of Artificial Light at Night on Anabaena and Microcystis Growth**
Carsyn Hagans, 18 Senior, Archbold High School, Archbold, OH
In-person.
<https://projectboard.world/isef/project/83056>
- EAEV020 Orange Is the New Green; From Waste to Water Absorbent BioPolymer: How Can Orange Peels Help Plants Resist Drought?**
Mehdi Achour, 15 Sophomore, Bartlesville High School, Bartlesville, OK
In-person.
<https://projectboard.world/isef/project/82757>
- EAEV021 LD50 Investigation With Brine Shrimp: Comparing the Effects of COVID Disinfectants With Water Dilution and Brine Shrimp**
Benjamin Wells, 14 Freshman, Weldon Valley High School, Weldona, CO
In-person.
<https://projectboard.world/isef/project/82958>
- EAEV022 A Novel Method for Automated Identification and Prediction of Invasive Species Growth Using Deep Learning**
Nathan Elias, 16 Junior, Liberal Arts and Science Academy, Austin, TX
In-person.
<https://projectboard.world/isef/project/82995>
- EAEV023 Development of a Portable Sensor Using Soil Fluorescence as an Indicator of Fertility in Rice Paddies**
Jun Kondo, 18 Sophomore, Kyoto Tachibana High School, Kyoto, Japan
Virtual.
<https://projectboard.world/isef/project/83038>
- EAEV024 Nouveau-AI-Plastic-Degen: A Novel Approach Using AI-Based Enzyme Engineering To Design New and Highly Efficient Marine Plastic Degrading Enzymes**
Arjun Gupta, 17 Junior, Quest for Education and Arts, Tucson, AZ
In-person.
<https://projectboard.world/isef/project/82883>
- EAEV025T Contemporary and Projected Climate Change Across the Southwestern United States Relative to the Last 24,000 Years**
Nathaniel van der Leeuw, 17, Junior,
Lily Wood, 16, Junior,
University High School, Tucson, AZ
In-person.
<https://projectboard.world/isef/project/83257>

- EAEV026T What Are the Effects of Cyanobacteria Blooms on the Taxa *Diatoma*?**
Uma Grover, 16, Junior,
Melinda Lin, 16, Junior,
West Linn High School, West Linn, OR
In-person.
<https://projectboard.world/isef/project/83010>
- EAEV027 Estimating the Capillary Pressure of Reservoir Rocks Using Nuclear Magnetic Resonance (NMR) Logging**
Lamar Alkaka, 17 Senior, Dhahran Ahliyya School, Dammam, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85881>
- EAEV028 Enhanced CO₂ Capture via Carbon Mineralization**
Emmy Li, 16 Junior, Clear Lake High School, Houston, TX
In-person.
<https://projectboard.world/isef/project/83172>
- EAEV029 The Surveillance of SARS-CoV-2 in Wastewaters**
Olya Tryndyak, 14 Freshman, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/83105>
- EAEV030 Tides, Pollution, and Human Health: Exploring the Relationship Between Tidal Phases and Water Contamination in a Coastal Inlet**
Emily Ernst, 17 Junior, Broadneck High School, Annapolis, MD
In-person.
<https://projectboard.world/isef/project/82886>
- EAEV031 Assessing Microplastic Pervasiveness in Bark #**
Claire Bucklin, 15 Sophomore, North Toole County High School, Sunburst, MT
In-person.
<https://projectboard.world/isef/project/83059>
- EAEV032T Plant Growth With At-Home Soil Treatments Planted in Riverside Soil**
Jade De La Garza, 18, Senior,
Brisa Rocha, 18, Senior,
Nacogdoches High School, Nacogdoches, TX
In-person.
<https://projectboard.world/isef/project/83134>
- EAEV033 The Effect of Casein Polymers on the Filtration of Heavy Metals and Contaminants in Well Water**
Desmen Boykin, 17 Junior, Governor's School at Innovation Park, Manassas, VA
In-person.
<https://projectboard.world/isef/project/85696>
- EAEV034 Reconstruction Modeling Using Tectonics and Climate of Western North America**
Rebecca Cho, 17 Senior, Jericho High School, Jericho, NY
In-person.
<https://projectboard.world/isef/project/83245>
- EAEV035 Assessing the Efficacy of the U.S. Endangered Species Act Through the Novel Quantification of Species Charisma and Respective Population Trends**
Tarunika Sasikumar, 17 Senior, Plainview-Old Bethpage John F. Kennedy High School, Plainview, NY
In-person.
<https://projectboard.world/isef/project/82945>
- EAEV036 A Novel Solution To Combat Brewery Waste Utilizing *Hermetia illucens***
Sreya Das, 17 Senior, Liberty High School, Frisco, TX
In-person.
<https://projectboard.world/isef/project/83023>
- EAEV037 How Do Sound Waves Affect Plant Root Physiology and Photosynthesis?**
Ruth Wise-Maldonado, 16 Sophomore, Sunnyside Senior High School, Sunnyside, WA
Virtual.
<https://projectboard.world/isef/project/85130>
- EAEV038T How Does the RUSLE Equation Determine the Soil Erosion in Watershed? A Case Study at Serayu Watershed, Banjarnegara, Indonesia**
Juzaili Alam, 18, Senior,
Erma Istiqomah, 18, Senior,
SMA Negeri 1 Bawang, Banjarnegara, Jawa Tengah, Indonesia
Bawang Public High School 1, Banjarnegara, Central Java, Indonesia
Virtual.
<https://projectboard.world/isef/project/85249>

- EAEV039 Microplastics in the Beaches of Western Puerto Rico**
Edmarie Ramos Burgos, 18 Senior, Escuela Superior Juana Colón, Comerio, PR
Virtual.
<https://projectboard.world/isef/project/85076>
- EAEV040 A Novel Approach for Coral Rehabilitation: Growth Enhancement With Electrochemical Deposition of CaCO₃**
Dev Rishi Udata, 18 Senior, Jesuit High School, Portland, OR
In-person.
<https://projectboard.world/isef/project/85077>
- EAEV041T Is True Glacier Water Really More Pure?**
Brecken Allegood, 15, Sophomore,
Nathan Elison, 16, Junior,
Hillcrest High School, Ammon, ID
In-person.
<https://projectboard.world/isef/project/85062>
- EAEV042 Assessing Genotoxicity and Coliform Contamination of Rivers and Lakes in the Saginaw Watershed Area**
Anthony Daoud, 15 Sophomore, Saginaw Arts and Sciences Academy, Saginaw, MI
In-person.
<https://projectboard.world/isef/project/85108>
- EAEV043 The Effect of Fracking on Thermal Conductivity and Seismic Wave Transmission**
Jett Miller, 16 Sophomore, Saginaw Arts and Sciences Academy, Saginaw, MI
In-person.
<https://projectboard.world/isef/project/85885>
- EAEV044 The Effect of Replacing Surfactants With Fossil Fuel Free Alternatives on the Toxicity of *Ceriodaphnia dubia***
Emma Shields, 18 Senior, Jackson Senior High School, Jackson, MO
In-person.
<https://projectboard.world/isef/project/85194>
- EAEV045 The Silence of Global Oceans: Acoustic Impact of the COVID-19 Lockdown**
Artash Nath, 15 Sophomore, Bloor Collegiate Institute, Toronto, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/85830>
- EAEV046 The Effects of Increased Sea Temperature on Phytoplankton Community Composition by Cell Size**
Julie Sieg, 17 Senior, Earl Haig Secondary School, North York, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/85111>
- EAEV047 The Effects of Natural and Artificial Dyes on Water Quality**
Grace Moeller, 18 Senior, Lake Crystal Wellcome Memorial, Lake Crystal, MN
Virtual.
<https://projectboard.world/isef/project/85889>
- EAEV048 Arsenic Metabolism in the Mushroom *Agaricus bisporus***
Owen Dong, 16 Junior, Rochester Adams High School, Rochester Hills, MI
In-person.
<https://projectboard.world/isef/project/85083>
- EAEV050 *Daphnia magna* in Surface Runoffs**
Kiera Washington, 16 Junior, Davis Aerospace, Detroit, MI
Virtual.
<https://projectboard.world/isef/project/85213>
- EAEV051 Influence of Organic Liquid Fertilizer on Crops**
Hiba Noor, 16 Junior, Aga Khan Higher Secondary School, Karachi, Sindh, Pakistan
In-person.
<https://projectboard.world/isef/project/85271>
- EAEV052T It's Flaming Out: Using Artificial Intelligence To Emulate Critical Aspects of Wildfire Growth**
Druhin Bhowal, 16, Junior,
Arihant Singh, 17, Junior,
Nikola Tesla STEM High School, Redmond, WA
In-person.
<https://projectboard.world/isef/project/85129>
- EAEV053 Fluid Filtration**
Jorge Romero, 16 Junior, Muskogee High School, Muskogee, OK
In-person.
<https://projectboard.world/isef/project/85142>

- EAEV054T Polar Vortex Influence on Broadscale Cold Extremes Associated With Arctic Oscillation**
Lu-Heng Wang, 18, Senior,
Po-Kai Yang, 17, Senior,
Kaohsiung Municipal Kaohsiung Senior High School, Kaohsiung, Taiwan
Virtual.
<https://projectboard.world/isef/project/85819>
- EAEV055 Dissolved-Solid Filtering Efficacy of Varied Landfill Liners**
Marta Pambukhchyan, 16 Junior, Crescenta Valley High School, La Crescenta, CA
In-person.
<https://projectboard.world/isef/project/85788>
- EAEV056 A 1-g Earthquake Simulation Model Evaluating the Impact of P-waves and S-waves on the Occurrence of Liquefaction-Induced Lateral Spread**
Rosemary Yahne, 18 Senior, Northern Utah Academy for Math, Engineering and Science, Layton, UT
In-person.
<https://projectboard.world/isef/project/85776>
- EAEV057 Comparative Analysis of the Effectiveness of Polyethylene, Cetyl Alcohol (Hexadecan-1-ol) and Shade Balls in Preventing Evaporation of Water and Its Effect on Water Quality**
Alyse Radle, 16 Sophomore, Weber High School, Pleasant View, UT
In-person.
<https://projectboard.world/isef/project/85645>
- EAEV058 How Humans Have an Impact on Our Watersheds Today: A Microbial Study on the Jordan River**
Thanaphone Shields, 16 Sophomore, Syracuse High School, Syracuse, UT
In-person.
<https://projectboard.world/isef/project/85571>
- EAEV059 The Effect of *Hordeum vulgare* l. Extract and *Phragmites australis* Extract on the Growth of Algae in a Freshwater Environment**
Maxwel Lee, 18 Senior, Hackley School, Tarrytown, NY
In-person.
<https://projectboard.world/isef/project/85882>
- EAEV060 Interactions of Various Algae Species and Phosphate**
William Allen, 15 Freshman, Buckeye Valley High School, Delaware, OH
Virtual.
<https://projectboard.world/isef/project/85833>
- EAEV061 Big Data Analysis of Climate Change: Extreme Temperature, Rainfall, Snowfall**
Jason Wang, 16 Junior, Oklahoma School of Science and Mathematics, Oklahoma City, OK
In-person.
<https://projectboard.world/isef/project/85583>
- EAEV062T The Effects of Varying Nitrogen: Phosphorus: Potassium (NPK) Ratios on Algal Growth in Wetland Water**
Makena Bailey, 15, Sophomore,
Kyra Phaychanpheng, 16, Sophomore,
Chino Hills High School, Chino Hills, CA
In-person.
<https://projectboard.world/isef/project/85865>
- EAEV063 Projecting Disappearance of the Dana Glacier Using Observed Melt Rate and 3D Modeling**
Ellery McQuilkin, 17 Senior, Lee Vining High School, Lee Vining, CA
In-person.
<https://projectboard.world/isef/project/85611>
- EAEV064 Evaluating the Efficacy of Organic Management Methods on Japanese Stiltgrass (*Microstegium vimineum*)**
Michael Clarke, 17 Junior, Westlake High School, Thornwood, NY
In-person.
<https://projectboard.world/isef/project/85737>
- EAEV065 Modeling Sea Level Rise Driven Coastal Forest Loss and the Aboveground Carbon Impacts With Remote Sensing and Machine Learning**
Felicia Yan, 17 Junior, William G. Enloe High School, Raleigh, NC
Virtual.
<https://projectboard.world/isef/project/85946>
- EAEV066 EISa: A Novel Real-Time Wildlife Poacher Detection Solution Leveraging Machine Learning-Driven Spatio-Temporal Analysis of Nighttime UAV Thermal Infrared Videos**
Anika Puri, 17 Senior, Horace Greeley High School, Chappaqua, NY
In-person.
<https://projectboard.world/isef/project/85971>

- EAEV067 Biologically Inspired Material Design for Selective Removal of Estradiol Water Contaminants**
Kayla Sohn, 17 Senior, Herricks High School, New Hyde Park, NY
In-person.
<https://projectboard.world/isef/project/85974>
- EAEV068 A Direct Comparison of the Acute Toxicity of Zinc Oxide Nanoparticles and Avobenzone to *Daphnia magna***
Emma Cavaneau, 17 Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, AR
In-person.
<https://projectboard.world/isef/project/86054>
- EAEV069 Planning Equitable Accessibility to Dialysis Care: A Case Study of Hurricane Ida**
Eyrin Kim, 16 Junior, Farragut High School, Knoxville, TN
In-person.
<https://projectboard.world/isef/project/86264>
- EAEV070T Preparation of a Waterproofing Based on Nopal Mucilage (*Opuntia ficus-indica*), Alum and Liquid Soap**
Jose Jesus Carretero Mendez, 17, Sophomore, Roxana Reyes Ramos, 16, Freshman, Colegio de Estudios Cientificos y Tecnologicos del Estado de Puebla Plantel Cholula, Cholula, Estado, Mexico
In-person.
<https://projectboard.world/isef/project/86273>
- EAEV071T Biodegradable Container Made From Coconut Shells and Cane Husks**
Hany Esteban Perez, 16, Freshman, Wendy Maldonado Franco, 16, Sophomore, Diana Mejia Arellano, 17, Senior, Colegio de Estudios Cientificos y Tecnologicos del Estado de Puebla Plantel Cholula, Cholula, Estado, Mexico
In-person.
<https://projectboard.world/isef/project/86276>
- EAEV072 The Implicative Comparisons of 90th Percentile Lead and Copper Compliance Calculations on Historic NYC Public Water System Data**
Alvin Chen, 17 Junior, Stuyvesant High School, New York, NY
In-person.
<https://projectboard.world/isef/project/86292>
- EAEV073 Skyglow in American Samoa**
Georgia Cox, 17 Senior, Pacific Horizons School, Pago Pago, American Samoa
Virtual.
<https://projectboard.world/isef/project/86450>
- EAEV074 Effects of Changes in Precipitation on Marine Ecosystems Due to Overstraining of Wastewater Treatment Plants**
Lovis Bergstrand, 18 Senior, Uddevalla gymnasieskola, Uddevalla, Vastra Gotalandsregionen, Sweden
In-person.
<https://projectboard.world/isef/project/86452>
- EAEV075 Multiple Factor Regression Analysis of Vegetation Changes and Land Degradation in Drylands**
Maria Chzhen, 16 Junior, Westdale Secondary School, Hamilton, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/86461>
- EAEV076T A Novel Floatable Planting Material for Inner Mangrove Forest Inspired by *Barringtonia asiatica***
Thitipong Larndate, 17, Junior, Jirapon Sengnongban, 17, Junior, Princess Chulabhorn Science High School Pathumthani, Ladlumkaew, Pathumthani, Thailand
In-person.
<https://projectboard.world/isef/project/86539>
- EAEV077 Engineering a Biomimetic System That Maximizes Surface Area Exposure to Water Flow Thus Increasing the Rate of Bioremediation in an *in vitro* Hypereutrophic System (A Novel Fourth Year Study)**
Morgan Barnes, 17 Junior, Canterbury School, Fort Myers, FL
In-person.
<https://projectboard.world/isef/project/86606>
- EAEV078 Effectiveness of a Fire-Fighting Foam as an Eco-Friendly Replacement**
Ethan Abraham, 16 Sophomore, Kamehameha Schools Kapalama Campus, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/86635>

- EAEV079 The Effect of Ocean Acidification on Carbon Sequestration by *Nannochloropsis***
Kenna Anderson, 16 Junior, Flathead High School, Kalispell, MT
In-person.
<https://projectboard.world/isef/project/86686>
- EAEV080T Effectiveness of Grass Clippings as a Fuel Alternative**
Oakley Marriott, 17, Junior, Keiley Mitchell, 17, Junior, Fremont High School, Plain City, UT
In-person.
<https://projectboard.world/isef/project/86695>
- EAEV081 The Effect of Consuming Polyethylene on the Function and Consumption Rate of the *Zophobas atratus* Superworm**
Anja Schwarzbauer, 16 Junior, Sarasota High School, Sarasota, FL
Virtual.
<https://projectboard.world/isef/project/86717>
- EAEV082T How Do Different Concentrations of Glyphosate Affect Phytoplankton Populations and How Effective Will a Granular Activated Carbon (GAC) Absorption Filtration Test Be at Removing Glyphosate From an Herbicide To Protect Phytoplankton Populations?**
Nicholas Cox, 16, Junior, Rylee Mulhollen, 17, Junior, Sarasota High School, Sarasota, FL
Virtual.
<https://projectboard.world/isef/project/86718>
- EAEV083 Evaluating Ultraviolet Rays as a Method To Increase the Efficiency of Methods Used To Clean Up Oil Spills**
Brenton Gbadebo-Goyea, 16 Junior, The Governor French Academy, Belleville, IL
Virtual.
<https://projectboard.world/isef/project/86770>
- EAEV084 Boundary Detection of Debris-Covered Glaciers Using Fractal Analysis and Normalized Differencing of Thermal and Infrared Bands in Remote-Sensed Landsat Datasets**
Mithra Karamchedu, 18 Senior, Jesuit High School, Portland, OR
In-person.
<https://projectboard.world/isef/project/86779>
- EAEV085 Urban Ozone Forecasting and Policy Recommendations Through Photochemical Modeling and Machine Learning**
Eliana Juarez, 17 Junior, V. Sue Cleveland High School, Rio Rancho, NM
In-person.
<https://projectboard.world/isef/project/86853>
- EAEV086 Quantification of Environmental Drivers Underlying the Changes in Urban Vegetation Across the United States**
Ridhima Singh, 16 Junior, Farragut High School, Knoxville, TN
In-person.
<https://projectboard.world/isef/project/86855>
- EAEV087 Finding an Accessible, Environmentally Friendly Solution to Water Purification: Testing the Effectiveness of *Aloidendron barberae* and *Bambusa dolichomerithalla* as Natural Coagulants on Copper Ion Concentration Using UV-vis Spectrophotometry**
Katherine Lee, 16 Sophomore, Jasper High School, Plano, TX
In-person.
<https://projectboard.world/isef/project/86857>
- EAEV088 An Innovative Approach To Manage the Environmental Impact of Agricultural Drainage Water**
Gavin Kratcha, 16 Sophomore, Hankinson Public School, Hankinson, ND
In-person.
<https://projectboard.world/isef/project/86861>
- EAEV089 Effects of Copper Sulfate Exposure on the Nervous System of the *Hirudo verbana* Leech**
Cameron Dunn, 16 Sophomore, Boston College High School, Boston, MA
Virtual.
<https://projectboard.world/isef/project/86888>
- EAEV090 Zooplankton Studies in Lentic Ecosystems - Phase VI: Vertical Migration**
Ashton Ryan, 17 Senior, Rochester High School, Rochester, IL
Virtual.
<https://projectboard.world/isef/project/86926>

EAEV091 Tar Print: Novel Convolutional Remote Sensing Techniques To Quantify Urbanization and Study Water Quality
Suraj Vaddi, 17 Junior, Thomas Jefferson High School for Science and Technology, Alexandria, VA
In-person.
<https://projectboard.world/isef/project/86958>

EAEV092 To What Extent Is There a Relationship Between Phosphorus and Nitrogen Concentrations and Excessive Cyanobacteria Growth in Simulated Upper Sure Lake Conditions?
Glenn Partsch, 17 Senior, International School of Luxembourg, Luxembourg, Luxembourg
Virtual.
<https://projectboard.world/isef/project/87132>

Embedded Systems

EBED001T COVID Prevention: More Precise Contact Tracing

Nathaly Rangel-Gonzalez, 15, Freshman,
Jesna Thomas, 15, Freshman,
Fayette County High School, Fayetteville, GA
In-person.
<https://projectboard.world/isef/project/82765>

EBED002 Novel Application of Lock-In Amplifiers With 2-bit FSK

Jonathan Dorminy, 15 Freshman, Sola Fide
Home School, McDonough, GA
In-person.
<https://projectboard.world/isef/project/82857>

EBED003T Simulating Astronautic Information Transfer Through the Implementation of Optical Laser Technology

Emma Lee, 15, Freshman,
Eric Lee, 17, Senior,
Stanton College Preparatory School,
Jacksonville, FL
In-person.
<https://projectboard.world/isef/project/83006>

EBED004 IVY - Intelligent Vision System for the Visually Impaired

Sarang Goel, 16 Sophomore, Coppell High
School, Coppell, TX
In-person.
<https://projectboard.world/isef/project/82928>

EBED006 Remote Detection System for Penetrative Bodily Injury Using an Innovative Electrical Engineering Enhancement of Wearable Fabric

Vivek Sandrapaty, 17 Junior, West Port High
School, Ocala, FL
In-person.
<https://projectboard.world/isef/project/83132>

EBED007 Smart Sole: A Technological Approach to Accessible Gait Analysis

Danielle Luyet, 18 Senior, Arkansas School for
Mathematics, Sciences and the Arts, Hot
Springs, AR
In-person.
<https://projectboard.world/isef/project/83013>

EBED008 PenAlone: Development of a Writing and Drawing Tool Compatible With Arbitrary Surface

Janos Rado, 16 Junior, Berzsenyi Daniel High
School, Budapest, Hungary
In-person.
<https://projectboard.world/isef/project/85068>

EBED009 Automated Energy-Saving Cleaning Systems for Central Heating and Ventilation: Healthy Air for Hospitals and Offices

Michael Shepstone, 16 Junior, Somerset
College, Cape Town, Western Cape,
South Africa
In-person.
<https://projectboard.world/isef/project/83095>

EBED010 Automated Sorting Device Using Sensors and Motor Control

Nickolas Zander, 18 Senior, New Life Academy,
Woodbury, MN
In-person.
<https://projectboard.world/isef/project/82756>

EBED011 Finding Perfect Watermelons: Non-Destructive Ripeness Detection via Photoacoustics - A Pilot Study

Eric Zou, 16 Sophomore, BASIS San Antonio
Shavano Campus, San Antonio, TX
Virtual.
<https://projectboard.world/isef/project/82931>

EBED012 Optimizing Micro-Computer Architecture in the Arithmetic Logic Unit

Emily Troutman, 17 Junior, Texas Academy of
Mathematics and Science, Denton, TX
Virtual.
<https://projectboard.world/isef/project/83087>

EBED013 Landfill SCADA System: A Next-Gen Prescriptive IoT Solution Engineered To Detect, Transmit, and Mitigate Fugitive Methane Emissions via a Long-Range Supervisory Control and Data Acquisition System (Year 4)

Lavanya Natarajan, 16 Junior, Viera High School,
Viera, FL
In-person.
<https://projectboard.world/isef/project/83277>

- EBED014 Addressing Medicine Adherence in Older Adults Through User-Friendly Medicine Dispensers**
Maya Ruiz, 15 Freshman, Americas High School, El Paso, TX
In-person.
<https://projectboard.world/isef/project/82889>
- EBED015 Wi-C.A.R.E.: Wifi Computer-Assisted Remote Eldercare (Year 3)**
Shreshth Shrivastava, 15 Sophomore, Eden Prairie High School, Eden Prairie, MN
In-person.
<https://projectboard.world/isef/project/85100>
- EBED016 Instrumental Sound Separation Using Compressed Machine Learning Models**
Ryo Muramatsu, 18 Senior, Tokyo Tech High School of Science and Technology, Minato-ku, Tokyo, Japan
Virtual.
<https://projectboard.world/isef/project/83188>
- EBED017 Invisible Blues (Novel Device for Detection and Measurement of Nitrogen Traces in a Sample)**
Aditi Bhaskar, 17 Junior, Wilsonville High School, Wilsonville, OR
In-person.
<https://projectboard.world/isef/project/83275>
- EBED018 Automatic Monitoring System Based on Arduino**
Ziqian Liu, 16 Junior, Yongzhou No.4 Senior High School, YongZhou, Hunan, China
Virtual.
<https://projectboard.world/isef/project/83239>
- EBED019 Digital Upgrade of Analog Communication Systems Using Software-Defined Radio Techniques**
Yousef Khojah, 17 Senior, Al-Faisalia Secondary School, Jeddah, Makkah, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85113>
- EBED020 A Novel, Fluorescent Nano-Based Sensor for Mercury in Seawater With High Sensitivity and Selectivity**
Ahmad Alrabiah, 18 Senior, Dhahran Ahliyya School, Dammam, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85193>
- EBED021 Project Vision: Virtual Environment Through Artificial Intelligence Recognition**
James Nagler, 15 Sophomore, Garden City High School, Garden City, NY
In-person.
<https://projectboard.world/isef/project/83072>
- EBED022 Creation of a Portable Device for Environmental Measurements Using a 3D Printing Design**
Alondra Hernandez Martinez, 14 Freshman, Escuela Especializada en Ciencias, Matemáticas y Tecnología, Caguas, Puerto Rico
In-person.
<https://projectboard.world/isef/project/85261>
- EBED023T Virtual Human Health and Safety Integration System**
Muhammad Ibrahim, 15, Sophomore, Muhammad Talha Waqar, 15, Freshman, Beaconhouse School System Valencia Town Campus, Lahore, Punjab, Pakistan
In-person.
<https://projectboard.world/isef/project/85807>
- EBED024T Water Pollution Detection Using Autonomous Drone Hardware and Software**
Nishu Anekere, 17, Junior, Harrison Gover, 17, Senior, Sahil Krishnani, 17, Senior, The Carol Martin Gatton Academy of Mathematics and Science in Kentucky, Bowling Green, KY
Virtual.
<https://projectboard.world/isef/project/85138>
- EBED025T Hypocapnia and Pediatric Vehicular Heatstroke: Prevention and Rescue**
Areen Alashmawi, 15, Sophomore, Ayah Alkatib, 17, Junior, Sara Altarawneh, 15, Sophomore, Jubilee School, Amman, Jordan
King Abdullah II School For Excellent, Aqaba, Aqaba, Jordan
In-person.
<https://projectboard.world/isef/project/85782>

- EBED026T RECOVER-V (Remotely Controlled Observer Vehicle) as Aquatic Ecosystems Monitoring Device**
Zaki Akbar, 18, Senior,
Atya Masantika, 17, Senior,
SMAN 3 Malang, Malang, East Java, Indonesia
Virtual.
<https://projectboard.world/isef/project/82731>
- EBED027 An Economical Approach To Detect Vaping, Preventing a Vaping Epidemic Among Adolescents**
Abhinav Avvaru, 15 Sophomore, Nashua High School South, Nashua, NH
In-person.
<https://projectboard.world/isef/project/85218>
- EBED028T CURE (Smart Check-In Service Using Palm Vein Authentication)**
Seongbin Byun, 15, Sophomore,
Youngtae Cho, 15, Sophomore,
Seokho Lee, 16, Sophomore,
Kyeongbuk High School
Daegu Joong-Ang High School
Daegu Software High School, Dalseong-gun,
Daegu, South Korea
Virtual.
<https://projectboard.world/isef/project/85306>
- EBED029 Novel Prototype To Identify Sound Direction Using Vibrations**
Isis Reveron, 16 Junior, University Gardens High School, San Juan, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/85067>
- EBED030T A Dangerous Occasion Monitoring and Management System**
Yike Chen, 18, Junior,
Dawen Cheng, 17, Junior,
Yiming Xiong, 15, Sophomore,
Barrington High School, Barrington, RI
In-person.
<https://projectboard.world/isef/project/85299>
- EBED031 A Wearable Device To Measure and Correct Unhealthy Back Posture**
Amy Chen, 16 Sophomore, duPont Manual High School, Louisville, KY
In-person.
<https://projectboard.world/isef/project/85783>
- EBED032 OR in Focus: An Automatic Focusing Overhead Operating Room Light**
Kayla Salasidis, 15 Sophomore, Herzlich High School, Montreal, Quebec, Canada
Virtual.
<https://projectboard.world/isef/project/86051>
- EBED033 Blind Companion**
Joud Eldeeb, 15 Sophomore, Haitham Samy Hamad, Itay Elbaroud, Egypt
In-person.
<https://projectboard.world/isef/project/86210>
- EBED034 Clamor Electric Reckon**
Dina Ali, 18 Senior, STEM School of Alexandria, Alexandria, Egypt
In-person.
<https://projectboard.world/isef/project/86213>
- EBED035T Using Machine Learning To Dynamically Filter Nanopore DNA Sequencing Data**
Aaron Philip, 18, Senior,
Leonid Svyatsky, 17, Junior,
Los Alamos High School, Los Alamos, NM
In-person.
<https://projectboard.world/isef/project/86257>
- EBED036T Smart Heights**
Aalaa Al Afi, 15, Sophomore,
Saja Al Balushi, 16, Junior,
Al Amal School, Muscat, Oman
In-person.
<https://projectboard.world/isef/project/86272>
- EBED037 The Brain and an Impact: Real-Time Detection of Concussions Among Athletes in Contact Sports Using Sensor Fusion and Convolutional Neural Networks**

Amogh Kashyap, 17 Junior, Urbana High School, Ijamsville, MD
Virtual.
<https://projectboard.world/isef/project/86649>
- EBED038 Designing a Low-Cost Wayfinder for the Visually Impaired Using Bluetooth Angle-of-Arrival Feature**
Brandon Cai, 14 Freshman, Parkland High School, Allentown, PA
In-person.
<https://projectboard.world/isef/project/86693>

- EBED039 Portable and Modular Spectral System for Material Characterization**
Ashwin Prabhakar, 16 Junior, Bob Jones High School, Madison, AL
In-person.
<https://projectboard.world/isef/project/86729>
- EBED040T HMS-Health Monitoring System for Home-Quarantined COVID-19 Patients**
Hoang Nguyen, 17, Senior,
Tu Nguyen, 15, Sophomore,
Hung Yen Specialized High School, Hung Yen, Hung Yen, Viet Nam
Virtual.
<https://projectboard.world/isef/project/86784>
- EBED041 A Novel Optical Approach: Developing a Generic Nanophotonic Processor (GNP) for Classical and Quantum Computing Applications**
Mihai Crisan, 18 Senior, Upper Arlington High School, Upper Arlington, OH
In-person.
<https://projectboard.world/isef/project/86869>
- EBED042 Geolocation of Wireless and Radio Emitters in Real Time**
Peter Radic, 16 Junior, Canyon Crest Academy, San Diego, CA
Virtual.
<https://projectboard.world/isef/project/87118>

Energy: Sustainable Materials and Design

EGSD001 The Energy Generation Efficiency and Storage Capability of a Novel Dye-Sensitized Solar Cell

Claire Huang, 17 Junior, Episcopal School of Jacksonville, Jacksonville, FL

In-person.

<https://projectboard.world/isef/project/82744>

EGSD002T What Genre of Music Creates the Most Energy?

Alan Joju, 16, Junior,
Tashan Kirubakaran, 16, Junior,
Willetton Senior High School, Willetton, WA,
Australia
Virtual.

<https://projectboard.world/isef/project/83212>

EGSD003 Underwater Turbine Innovations

Alan Garcia, 16 Sophomore, Veterans Memorial Early College High School, Brownsville, TX
In-person.

<https://projectboard.world/isef/project/83067>

EGSD004 Seebeck-Watch: Development of a Nano and Microtechnological Method for Constructing Wristwatch Systems Through Temperature Difference

Vinicius Ribeiro de Moraes, 19 Senior, Matriz Educacao, Rio de Janeiro, RJ, Brazil
In-person.

<https://projectboard.world/isef/project/82844>

EGSD005T Ammonia Production From Seawater and Air by a New Method That Utilizes Renewable and Waste Energy

Yuka Ando, 16, Sophomore,
Nene Kizu, 17, Junior,
Hinata Yamamoto, 17, Junior,
Shizuoka Kita High School, Shizuoka-City,
Shizuoka-Pref., Japan
Virtual.

<https://projectboard.world/isef/project/83092>

EGSD006T Novel Organic Electrode Material for LIBs

Ka Hei Chan, 17, Senior,
Janelle Camille Chen, 19, Senior,
San Chong Ng, 17, Senior,
Escola Choi Nong Chi Tai, Macao, China, Macao Special Administrative Region
Virtual.

<https://projectboard.world/isef/project/82802>

EGSD007 *Typhi capensis* (Reed) Biofuel

Memory Bvungo, 18 Senior, Dominican Convent High School Harare, Harare, Zimbabwe
In-person.

<https://projectboard.world/isef/project/85167>

EGSD008 Prototyping an Algae-Based Martian *in situ* Oxygen Generation System

Kara Gaiser, 18 Senior, Oregon Episcopal School, Portland, OR
In-person.

<https://projectboard.world/isef/project/82823>

EGSD009 Solar-Wind Charger

Camila Moreno, 15 Sophomore, Rockdale Magnet School for Science and Technology, Conyers, GA
Virtual.

<https://projectboard.world/isef/project/82729>

EGSD010 Generating Energy From Wheel Motion by Designing a Hybrid 3D Printed Triboelectric Nanogenerator

Naeim Mahjouri, 17 Junior, Auburn High School, Auburn, AL
In-person.

<https://projectboard.world/isef/project/82859>

EGSD011 A Plant With Promise: Using Engineering Principles To Create an Eco-Friendly Manufacturing Process for a Biodegradable Piezoelectric Transducer

Maggie Banks, 16 Sophomore, Mounds Park Academy, St. Paul, MN
In-person.

<https://projectboard.world/isef/project/85787>

- EGSD012 Novel Model of an Adaptive Wave Energy Converter With Spectral Analysis-Based Sea State Classification**
Gwyneth Liu, 17 Junior, Mills E. Godwin High School, Henrico, VA
In-person.
<https://projectboard.world/isef/project/83220>
- EGSD013T High Capacity, High Stability and Low Corrosive Al-Treated Ionic Liquid Electrolyte With Al-Deposited Carbon Cloth Anode Used in Aluminum-Ion Battery**
Oi Wa Cheang, 16, Junior,
Chong Hin Tam, 17, Senior,
Pui Ching Middle School, Macau, China, Macao Special Administrative Region
Virtual.
<https://projectboard.world/isef/project/83206>
- EGSD014 Utilizing Soft Robotic Concepts To Achieve Passive Solar Tracking To Increase Efficiency of a Solar Panel**
Ricardo Victorio, 15 Sophomore, College Park High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/85176>
- EGSD015 Peru 2.0: Electrical Energy Generator From Plant Photosynthesis and Water Generator From Air**
Jheriko Gomez Quilca, 17 Senior, Politecnico Regional Del Centro, Huancayo, Junin, Peru
Virtual.
<https://projectboard.world/isef/project/83051>
- EGSD016 Uniform Cu-Doped Carbon Inherited From Plant Growth for Electrocatalytic CO₂ Reduction to CH₄**
Qingyuan Zhu, 17 Junior, Shanghai Foreign Language School Affiliated to SISU, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/83229>
- EGSD017 Exogenous Niacin and Zeaxanthin Treatment To Increase the Stress Tolerance and Light Absorbance Capacity of Microalgae *Chlorella vulgaris* Under an Engineered Martian Environment**
Christopher Miranda, 15 Sophomore, Harvest Preparatory Academy, Yuma, AZ
In-person.
<https://projectboard.world/isef/project/83049>
- EGSD018 Engineering a Bifunctional Metal: Organic Framework for Efficient and Cost-Effective Hydrogen Production and Storage**
Abdullah Al-Ghamdi, 17 Senior, Al-Hussan High School, Dammam, Eastern, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85189>
- EGSD019 Co-Ferrite Modified Hematite Films for All-Day Active Photo-Electrocatalyst Electrode in Water Splitting**
Abdullah Al Hamadat, 17 Senior, AL Bassam-IGCSE, Dammam, Eastern, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85234>
- EGSD020 Enabling High Performance Supercapattery Through Uniquely Designed Multilayer Oxides Electrode Material**
Tala Al-Qahtani, 17 Senior, KFUPM Schools, Dhahran, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85131>
- EGSD021 Network-Based Piezoelectric System for Self Defense Shoe Mechanism**
Muhammad Ayan Asim, 16 Sophomore, Scarsdale International School, Lahore, Punjab, Pakistan
In-person.
<https://projectboard.world/isef/project/85609>
- EGSD022 Improving the Performance of Solar Cells Using Thermal Cooling**
Megan Yeager, 15 Freshman, Chesapeake Science Point Public Charter School, Hanover, MD
In-person.
<https://projectboard.world/isef/project/83118>
- EGSD023 Synthesizing Biomorphic Batteries Using Porous Plant Stems Using Zinc (Zn) and Copper (Cu) Electroplating Technique**
Lia Wilford, 18 Senior, Navajo Preparatory School, Farmington, NM
Virtual.
<https://projectboard.world/isef/project/82785>
- EGSD024 The Effect of Hydrophobic Coatings on the Efficiency of Solar Panels**
Burke Bankston, 17 Junior, Central Virginia Governor's School for Science and Technology, Lynchburg, VA
Virtual.
<https://projectboard.world/isef/project/82942>

- EGSD025 Electrify Your Step: Converting Foot Traffic Into Renewable Energy Using Piezoelectric Transducers**
Shrey Rohilla, 15 Freshman, The Classical Academy, Colorado Springs, CO
In-person.
<https://projectboard.world/isef/project/82837>
- EGSD026 Investigating the Impacts of Dye Color on Energy Production of Luminescent Solar Concentrators**
Teaghan Knox, 18 Senior, Summit High School, Bend, OR
Virtual.
<https://projectboard.world/isef/project/83274>
- EGSD027 Development of an All-Solid-State Self-Charging Supercapacitor Energized by a Safe, Biodegradable Gel Electrolyte**
Latifa Alghannam, 15 Sophomore, KFUPM Schools, Dhahran, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85148>
- EGSD028 Analyzing Non-Chemical Storage Solutions for the Grid-Scale Energy Problem**
Wilson Moyer, 17 Junior, Lakewood High School, Lakewood, CO
In-person.
<https://projectboard.world/isef/project/83104>
- EGSD029 Electric Energy Generation To Charge a Smartphone With the Bicycle Wheel Movement**
Alondra Ortiz Melendez, 18 Senior, Specialized School of Science and Mathematics Genaro Cautiño Vázquez, Guayama, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/85155>
- EGSD030 *Sargassum fluitans* as an Energy Source for Bioethanol Production**
Fabiola Wah, 17 Senior, Centro Residencial de Oportunidades Educativas de Villalba, Villalba, PR
Virtual.
<https://projectboard.world/isef/project/85286>
- EGSD031 Increasing Efficiency of Electrolysis**
Gabriela Journee, 17 Junior, St. Joseph's Academy, Baton Rouge, LA
Virtual.
<https://projectboard.world/isef/project/85296>
- EGSD032 Design of a Low-Cost Weather Station for Photovoltaic Modeling**
Chad Bo, 18 Senior, Eleanor Roosevelt High School, Greenbelt, MD
Virtual.
<https://projectboard.world/isef/project/85789>
- EGSD033 Hydrogen and Oxygen Gas Production From Water for a Marine Engine as a Function of Voltage and Electrolyte Concentration**
Andrew Wagner, 17 Junior, Nouvel Catholic Central High School, Saginaw, MI
In-person.
<https://projectboard.world/isef/project/85281>
- EGSD034 A Mighty Mushroom and the Power of Poop: Testing Biogas Production Using Spent Mushroom Substrate V2**
Calvin Karthik, 15 Sophomore, Kenner Collegiate Vocational Institute, Peterborough, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/85840>
- EGSD035 Engineering Compositionally Uniform Whole-Cell Biocatalyst for Biofuel**
Margaret Yang, 17 Senior, Cranbrook Kingswood School, Bloomfield Hills, MI
In-person.
<https://projectboard.world/isef/project/85262>
- EGSD036 Optimizing Zinc Anode Porosity for Suppressing Dendrite Growth in Aqueous Zinc-Ion Batteries To Improve Performance and Prolong Cycle Life**
Hatoon Alanqary, 17 Senior, AlTarbyah Allislamiya Schools, Riyadh, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85309>
- EGSD037 An Investigation on the Use of *Tradescantia pallida* as a Sensitizer for the Dye-Sensitized Solar Cell**
Isabel Liu, 15 Freshman, Dunbar High School, Fort Myers, FL
Virtual.
<https://projectboard.world/isef/project/85630>

EGSD038T Walk-Move-Charge: Piezoelectric Shoes To Generate Electricity

Anush Arakelyan, 17, Senior,
Edvard Tovmasyan, 18, Senior,
High School 139 after Karen Demirchian,
Yerevan, Nor Nork, Armenia
Virtual.

<https://projectboard.world/isef/project/85931>

EGSD039 Pura Aer: A Low-Cost, Energy-Efficient Portable Air Purifier System Using Disposable Face Mask for Emergency and Daily Uses

Jordan Prawira, 15 Sophomore, Mountain House High School, Mountain House, CA
Virtual.

<https://projectboard.world/isef/project/85938>

EGSD040T Simultaneous Azo Dye Removal and Bioelectricity Generation by an Up-Flow Constructed Wetland-Microbial Fuel Cell With Biochar Substrate

Christian Kim, 15, Sophomore,
Ericka Lai, 16, Junior,
Manhasset High School, Manhasset, NY
In-person.

<https://projectboard.world/isef/project/85966>

EGSD041 Redesigning Surface Conduction Manifolds To Improve the Efficiency and Reliability of Solar Cells

Otto Beall, 16 Junior, Plano East Senior High School, Plano, TX
In-person.

<https://projectboard.world/isef/project/86064>

EGSD042 Electrifying Lake Mud! Part 3

Fianna Smith, 15 Freshman, Early Light Academy, South Jordan, UT
In-person.

<https://projectboard.world/isef/project/86066>

EGSD043 PAMNSys: An Integration of Novel Machine Learning and Reinforcement Learning Algorithms To Accurately Predict and Optimize Electrical Energies Within Heaving Point Absorbers Based on Placement, Implementation and Real-Time Control

Shaunak Sinha, 16 Junior, George C. Marshall High School, Falls Church, VA
In-person.

<https://projectboard.world/isef/project/86067>

EGSD044 Harnessing the Energy in Waves To Generate Electricity

Landon Choy, 17 Junior, Kamehameha Schools Kapalama Campus, Honolulu, HI
Virtual.

<https://projectboard.world/isef/project/86123>

EGSD045T Energetic Countryside From Maize Corn

Basmallah Mohamed, 18, Senior,
Malak Selim, 18, Senior,
STEM School of Alexandria, Alexandria, Egypt
In-person.

<https://projectboard.world/isef/project/86209>

EGSD046T Sustainable Electricity From Dirt: Microbial Fuel Cell

Miguel Mathis, 16, Sophomore,
Makayla McMullen, 15, Sophomore,
Syracuse Academy of Science, Syracuse, NY
In-person.

<https://projectboard.world/isef/project/86255>

EGSD047 Enzymatically Treated Cellulosic Packaging Waste Utilized To Release Fermentable Sugars for the Production of Bioethanol: A Third Year Study

Serenity Derosie, 18 Senior, Ridgeview High School, Orange Park, FL
In-person.

<https://projectboard.world/isef/project/86388>

EGSD048T The Effectiveness of Various Hydroelectric Turbines

Ben Mahdessian, 15, Sophomore,
Sam Troy, 16, Sophomore,
Langley High School, Mclean, VA
In-person.

<https://projectboard.world/isef/project/86407>

EGSD049T Polymer Nanocomposites for Energy Harvesting Application

Salwa Al-Kuwari, 17, Senior,
Fajer Al-Shamari, 17, Senior,
Qatar Academy for Science and Technology, Education City, Doha, Qatar
Virtual.

<https://projectboard.world/isef/project/86533>

EGSD050 Synthesis and Characterization of Doped Carbon Materials for Supercapacitor Applications

Ahmad Alam, 15 Sophomore, Little Rock Central High School, Little Rock, AR
In-person.

<https://projectboard.world/isef/project/86594>

EGSD051 Effects of Nutrient Deprivation on the Production of Algal Biodiesel
Sneha Yelamanchili, 17 Senior, Signature School, Evansville, IN
In-person.
<https://projectboard.world/isef/project/86839>

EGSD052 The Use of Alternative Non-Solid Chemicals To Create an Advanced Energy Storage System With a Machine Learning Charging System
Mars Kapadia, 18 Senior, Gilbert Classical Academy, Gilbert, AZ
In-person.
<https://projectboard.world/isef/project/86864>

Biomedical Engineering

- ENBM001 Walking Tall**
Liberty Jacob, 18 Senior, Barker College,
Sydney, New South Wales, Australia
Virtual.
<https://projectboard.world/isef/project/78789>
- ENBM002 Redesigning Carbon Monoxide Detectors for Industrial Environments**
Alyssa Reed, 15 Freshman, Fayette County High School, Fayetteville, GA
In-person.
<https://projectboard.world/isef/project/79439>
- ENBM003TBIONIC STEP II: Biped Mechanical Device for the Locomotion of People With Spinal Cord Injury**
Julia Isabel da Rosa, 19, Senior,
Julia Otoni Vilela, 19, Senior,
Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo,
Rio Grande do Sul, Brazil
In-person.
<https://projectboard.world/isef/project/82819>
- ENBM004TAsthmometer: A System for Recording and Predicting Asthma Attacks**
Evelyn Fung, 15, Sophomore,
Hei Tung Christy Lee, 16, Sophomore,
Diocesan Girls' School, Hong Kong, China,
Hong Kong Special Administrative Region
Virtual.
<https://projectboard.world/isef/project/83176>
- ENBM005TCombating Antibiotic-Resistant Bacteria With Leptospermum Honey-Incorporated Calcium Alginate Dressing**
Ting Yan Chung, 17, Senior,
Tsz Ki Liu, 18, Senior,
St. Paul's Convent School, Hong Kong, China,
Hong Kong Special Administrative Region
Virtual.
<https://projectboard.world/isef/project/82791>
- ENBM006 XPGAN: A Patch-Based Generative Adversarial Network for X-Ray Super-Resolution**

Aria Vikram, 17 Senior, National Public School, Indiranagar, Bangalore, Karnataka, India
Virtual.
<https://projectboard.world/isef/project/82503>
- ENBM007T Mouthscope: Autonomous Detection of Oral Precancerous Lesions Using Fluorescent-Imaging and Computer-Vision**
Maanav Kothari, 17, Junior,
Aditya Mehta, 16, Junior,
Dhirubhai Ambani International School,
Mumbai, Maharashtra, India
In-person.
<https://projectboard.world/isef/project/82959>
- ENBM008 Boric Acid Added Composite Hydrogel Synthesis, Characterization and Investigation of Usage as Soft Contact Lens Material**
Aybuke Sener, 17 Senior, Kayseri Cetin Sen Bilim ve Sanat Merkezi, Kayseri, Kayseri, Turkey
In-person.
<https://projectboard.world/isef/project/85086>
- ENBM009 Enzymatic Inactivation of the Veterinary Antibiotic Florfenicol**
Marik Muller, 18 Senior, Hermann-von-Helmholtz Gymnasium Potsdam, Potsdam, Brandenburg, Germany
In-person.
<https://projectboard.world/isef/project/83018>
- ENBM010T Enhanced Auricular Reconstruction: Translating Bioprinted Auricles Into Clinical Practice Using Smartphone-Driven Scanning Applications**
Donata Henkel, 19, Senior,
Celina Stitz, 19, Senior,
Theresa Weber, 18, Senior,
Albert-Schweitzer-Gymnasium, Erfurt, Thuringen, Germany
In-person.
<https://projectboard.world/isef/project/82930>
- ENBM011 Diagnosis of Respiratory Diseases Through Physiological Sound Analysis**
Sachin Mohan, 17 Senior, Horizon International High School, Johannesburg, Gauteng, South Africa
In-person.
<https://projectboard.world/isef/project/83148>

ENBM012T EMG Rehab System: A Package for Stroke Self Rehabilitation

Sau Nam Cheung, 16, Junior,
Wang Yui Chow, 16, Junior,
Christian Alliance SW Chan Memorial College,
Hong Kong, China, Hong Kong Special
Administrative Region
Virtual.

<https://projectboard.world/isef/project/83230>

ENBM013 A Novel End-to-End Deep Learning Pipeline for Stereotactic Cranial Surgery Planning

Emirhan Kurtulus, 18 Senior, Cagaloglu Anadolu
Lisesi, Istanbul, Fatih, Turkey

In-person.

<https://projectboard.world/isef/project/85137>

ENBM014 Wearable Electrochemical Sweat Sensor for Patients With Chronic Kidney Disease (CKD): Year III

Suran Somawardana, 18 Senior, BASIS San
Antonio Shavano Campus, San Antonio, TX
In-person.

<https://projectboard.world/isef/project/82806>

ENBM015 Using (PVDF) Sensors and Microphones To Determine Infant Heart Rate and Respirations in Novel Machine Learning Modeling Approach to SIDS Detection

Eshan Singhal, 16 Junior, The Oakridge School,
Arlington, TX

Virtual.

<https://projectboard.world/isef/project/83074>

ENBM016T A New Paradigm of Ankle CPM Machine: A Portable Two Axes Ankle CPM Machine Using Linear Actuators

Gyujin Kim, 18, Senior,
Gyeongmin Kwon, 18, Senior,
Seogyun Yim, 17, Senior,
Incheon Academy of Science and Arts,
Incheon, Incheon, South Korea
Virtual.

<https://projectboard.world/isef/project/83246>

ENBM017 Image Analysis of Single DNA Molecules

Teodor Kirilov, 18 Senior, Sofia High School of
Mathematics, Sofia, Bulgaria
In-person.

<https://projectboard.world/isef/project/85132>

ENBM018T Portable Homemade Ventilators: Alleviating Global Medical Shortages

Hio Cheng Lam, 18, Senior,
Weng Si Si Tou, 17, Junior,
Evelyn Teng, 17, Junior,
The Affiliated School of the University of
Macao, Macao, China, Macao Special
Administrative Region
Virtual.

<https://projectboard.world/isef/project/83014>

ENBM019 Demyelination: A Research Into the Use of Electrical Models in the Study of Demyelinating Diseases

Despina Iuliana Gica, 18 Senior, Mihai Viteazul
National College, Bucharest, Bucharest,
Romania

Virtual.

<https://projectboard.world/isef/project/83240>

ENBM020 Applications of Electromagnetic Forces in Medicine

Cristiana Murgoci, 19 Senior, International
Computer High School of Bucharest, Bucharest,
Romania

In-person.

<https://projectboard.world/isef/project/82908>

ENBM021 Brain-Computer Interface: Ambient Environment Control for the Paralyzed

Eesh Trivedi, 17 Junior, Gwinnett School of
Mathematics, Science, and Technology,
Lawrenceville, GA

In-person.

<https://projectboard.world/isef/project/82963>

ENBM022 Engineered 3D Cellular Co-Culture To Study How Fibroblasts Alter Extracellular Matrix Composition Estrogen Receptor Positive Breast Cancer

Margaret Moe, 16 Junior, St. Joseph's Academy,
Baton Rouge, LA

In-person.

<https://projectboard.world/isef/project/82795>

ENBM023 Smart Leukemia Labs: A Low-Cost Microscope and Diagnostic Tool That Uses Semantic Segmentation, Image Processing and Object Detection To Detect Acute Lymphoblastic Leukemia

Adelle Jia Xin Yong, 16 Junior, Westlake High
School, Austin, TX

In-person.

<https://projectboard.world/isef/project/82754>

- ENBM024 Posture Detection and Multi-Dimensional Feedback System for AIS Rehabilitation Training**
Zihan Wang, 16 Sophomore, Shanghai Pinghe Bilingual School, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/85233>
- ENBM025 Ergonomic Finger Exoskeleton for Hand Muscle Rehabilitation and Protection: Four-Bar Linkage, Finger-Length Personalized, Low Cost**
Chenglin Guo, 16 Junior, Beijing 101 Middle School, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/82874>
- ENBM026 Procoagulant Synthetic Platelets To Restore Hemostatic Clot Quality in Platelet Dysfunction Settings**
Neha Sangani, 15 Sophomore, Hathaway Brown School, Shaker Heights, OH
In-person.
<https://projectboard.world/isef/project/83140>
- ENBM027 Silk Fibroin-Coated Drug-Eluting Sutures**
Mila McKay, 17 Junior, Hellgate High School, Missoula, MT
In-person.
<https://projectboard.world/isef/project/85681>
- ENBM028 Automatic Diagnosis of Cardiovascular Disease: 12-Lead Electrocardiogram and Elucidating Sex Differences via Deep Learning**
Natalia Pahlavan, 16 Junior, Jericho High School, Jericho, NY
In-person.
<https://projectboard.world/isef/project/83215>
- ENBM029 Gastro-tastic: Using Stomach Acid To Power Smart Pills**
Josie Billett, 18 Senior, Arundel High School, Gambrills, MD
In-person.
<https://projectboard.world/isef/project/82799>
- ENBM031 Incorporating an Articulating Facemask Into a Multi-Directional Self-Centering Linear Damping Football Helmet System**
Rachel Pizzolato, 18 Senior, Elearning Academy, Metairie, LA
In-person.
<https://projectboard.world/isef/project/82879>
- ENBM032T Prototyping and Testing an IoT-Based Solar Rechargeable Wound Care Monitoring System Using a Lilypad Arduino**
Savdiel Ducret - Santana, 17, Senior,
Endrick Garcia - Torres, 18, Senior,
Colegio Rosa-Bell, Guaynabo, Guaynabo, Puerto Rico
In-person.
<https://projectboard.world/isef/project/85734>
- ENBM033 ACEREVERS 1: Development of an Artificial Prototype Biosensor System for Identification and Treatment of Diabetic Ketoacidosis (DKA)**
Priyam Kumar, 16 Junior, Santa Gertrudis Academy High School, Kingsville, TX
In-person.
<https://projectboard.world/isef/project/82964>
- ENBM034 An Efficient and Accurate Super-Resolution Approach to Low-Field MRI via U-Net Architecture With Logarithmic Loss and L2 Regularization**
Aryan Kalluvila, 17 Junior, Hartford Union High School, Hubertus, WI
In-person.
<https://projectboard.world/isef/project/85836>
- ENBM035T Evaluating the Viability of an Asymmetric Electrospun Nanofiber Composed of Polycaprolactone, Chitosan, and Curcumin To Promote Chronic Wound Healing**
Laasya Doppalapudi, 18, Senior,
Brett Wilson, 18, Senior,
Academies of Loudoun, Leesburg, VA
In-person.
<https://projectboard.world/isef/project/85183>
- ENBM036T The Development of a Low-Cost Holistic System for the Stratified Screening of Pancreatic Ductal Adenocarcinoma Utilizing Urinary miRNA Biomarkers**
Rishabh Ranjan, 16, Sophomore,
Gopalaniruddh Tadinada, 16, Sophomore,
duPont Manual High School, Louisville, KY
In-person.
<https://projectboard.world/isef/project/85246>
- ENBM037 A Novel Bioinspired Skin Substitute for Accelerated Wound Healing**
Cindy Cheng, 15 Freshman, Sir John A. Macdonald Secondary School, Waterloo, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/85265>

- ENBM038 Specular: A Comprehensive Teleophthalmology Platform for People Centered Eyecare**
Hardit Singh, 16 Sophomore, Cameron Heights Collegiate Institute, Kitchener, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/85133>
- ENBM039T Conscious Brain Mind-Controlled Cybonthitic Cyborg Bionic-Leg - V2**
Mohamed Abdelsamee, 16, Junior,
Ahmed Mohammed Abd El-Monsef, 16, Junior,
El-Sadat STEM School, El-Sadat, Menofia, Egypt
In-person.
<https://projectboard.world/isef/project/85873>
- ENBM040 Innovative Augmented Reality Based Rehabilitative Tool for Arm Injuries Utilizing HoloLens 2**
Aditya Pillai, 17 Junior, University School of Milwaukee, Milwaukee, WI
In-person.
<https://projectboard.world/isef/project/85178>
- ENBM041 Method of Spatial Information Transmission Through Acoustic Channel**
Yurii Sahaidak, 17 Junior, Lviv Physics and Mathematics Lyceum, Lviv, Lviv Oblast, Ukraine
Virtual.
<https://projectboard.world/isef/project/85796>
- ENBM042 Designing and Constructing an Automatic, Electrical Independent, Pneumatic-Based, Cardiopulmonary Resuscitation Machine To Eliminate Human Error in the Medical Field**
Andreas Tempereau, 16 Junior, Palos Verdes High School, Palos Verdes Estates, CA
In-person.
<https://projectboard.world/isef/project/85757>
- ENBM043 A Robotic Hand Orthosis and Novel Automatic Brunnstrom Evaluation for Stroke Patients**
Eric Ge, 16 Sophomore, Groton School, Groton, MA
Virtual.
<https://projectboard.world/isef/project/85588>
- ENBM044 Design of Oxygen-Carrying Autonomous Following and Health Monitoring Robot for Pulmonary Rehabilitation**
Yuxuan Tian, 18 Junior, Rutgers Preparatory School, Somerset, NJ
Virtual.
<https://projectboard.world/isef/project/85662>
- ENBM045 Designing, Prototyping, and Testing a Novel, Portable, Energy Efficient, 3D Printed Ventilator With a Diaphragm Mimicking Membrane and an Intuitive User Interface**

Harjaisal Brar, 16 Sophomore, Stockdale High School, Bakersfield, CA
Virtual.
<https://projectboard.world/isef/project/85623>
- ENBM046 Athlete Temperature Sensor: A Novel Approach to Heat Exhaustion Monitoring in Student Athletes**
Cuauhtemoc Zamora, 15 Freshman, Veterans Memorial High School, Corpus Christi, TX
In-person.
<https://projectboard.world/isef/project/85746>
- ENBM047T Digital Incentive Spirometer for the Treatment of Post-COVID Patients With Motivational Graphical Interface and Telemonitoring Support**
Ana Elisa Brechane da Silva, 14, Freshman,
Enso Carvalho, 14, Freshman,
E.E Professora Maria Das Dores Ferreira Da Rocha, Santa Rita Do Oeste, São Paulo, Brazil
In-person.
<https://projectboard.world/isef/project/85715>
- ENBM048 A Thermoreversible Gel for Delivery of Immunostimulant**
Jayden Shin, 17 Junior, West High School, Iowa City, IA
Virtual.
<https://projectboard.world/isef/project/85592>
- ENBM049 Immunano: The Future of the Immune Response**
Adam Elkaim, 18 Senior, Marianopolis College, Westmount, Quebec, Canada
Virtual.
<https://projectboard.world/isef/project/85926>
- ENBM050 Creating a Low-Cost Non-Invasive Blood Glucose Monitoring and Automatic Insulin Injection System With an Artificial Neural Network and Raspberry Pi**
Cuthbert Steadman, 15 Junior, Bangor High School, Bangor, ME
In-person.
<https://projectboard.world/isef/project/85930>

- ENBM051 Development of a Bioactive, Biodegradable, and Variable-Density 3D Printer Filament for Patient-Specific Bone Reconstructive Implants**
Jacob Rose, 18 Senior, North Carolina School of Science and Mathematics, Durham, NC
Virtual.
<https://projectboard.world/isef/project/85947>
- ENBM052 A Low-Cost Artificial Pancreas System With Integrated Machine Inference**
Landon Flemming, 17 Junior, Explore Academy, Albuquerque, NM
In-person.
<https://projectboard.world/isef/project/85952>
- ENBM053 MoJoint: A Motion Visualization and Kinematic Analysis Software for the Musculoskeletal System**
Angela Mei, 16 Junior, Academic Magnet High School, North Charleston, SC
In-person.
<https://projectboard.world/isef/project/85962>
- ENBM054 Enabling Oral Communication and Accelerating Recovery: The Creation of a Novel Low-Cost Electroencephalography-Based Brain-Computer Interface for the Differently Able**
Rishabh Ambavaneekar, 15 Sophomore, Vista del Lago High School, Folsom, CA
Virtual.
<https://projectboard.world/isef/project/86050>
- ENBM055 Sweet! - Integrating Glucose and Ketone Testing To Improve Efficiency in the Treatment of Diabetes**
Isra Bashir, 16 Junior, Westdale Secondary School, Hamilton, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/86127>
- ENBM056T BlueTech: Innovative Glasses To Decrease the Number of Eye Disorders and Disease Worldwide and the Amount of Plastic Waste**
Shevchenko Michel, 18, Senior,
Neïka Dallemand, 18, Senior,
Schnell Ghaly Jean, 18, Senior,
Collège Dominique Savio, Pétion-ville, Ouest, Haiti
In-person.
<https://projectboard.world/isef/project/86216>
- ENBM057T Guidance System for Visually Impaired People**
Mihai Dumitrescu, 16, Sophomore,
Matei Iosip, 16, Sophomore,
Mihai Varlan, 16, Sophomore,
Liceul Teoretic International de Informatica Bucuresti, Bucharest, Romania
Hermann Oberth German School, Ilfov, Romania
Colegiul National Mihai Viteazul, Bucharest, Romania
In-person.
<https://projectboard.world/isef/project/86236>
- ENBM058 Further Developing a Merged Aspiration Thrombectomy Device and Rotational Atherectomy Device for Efficacious Individual or Joint Removal of Thrombi and Plaque**
Shyam Ganesh Babu, 18 Senior, Spring Valley High School, Columbia, SC
In-person.
<https://projectboard.world/isef/project/86258>
- ENBM059 Development of an Electronic Nose: Detecting VOC Levels**
Brittney Williams, 18 Senior, Fred J. Page High School, Franklin, TN
In-person.
<https://projectboard.world/isef/project/86265>
- ENBM060T Using AI To Detect Morphological Abnormalities of Leukocytes To Diagnose Leukemia**
Anushka Aggarwal, 15, Sophomore,
Madison Burke, 16, Sophomore,
Dulles High School, Sugar Land, TX
In-person.
<https://projectboard.world/isef/project/86267>
- ENBM061 Personal Wearable Arduino-Based UV Index Detector Integrated With a Mobile IoT App Data Analyzer for UV Radiation Exposure Monitoring and Medical Research**
Daniel Villafuerte-Gonzalez, 17 Junior, Colegio San Ignacio de Loyola, San Juan, Puerto Rico
In-person.
<https://projectboard.world/isef/project/86383>
- ENBM062 The Future of Organ Replacement: Using Bioinformatics To Determine the Best Protein Environment To Bioengineer the Optimum Renal Vasculature System Using hiPSCs**
Shreya Sunil, 16 Junior, James Clemens High School, Madison, AL
Virtual.
<https://projectboard.world/isef/project/86385>

- ENBM063 Utilization of Biomimetic and Mechanical Designs To Engineer a More Efficient Surgical Laparoscopic Grasper**
Carter Smith, 16 Sophomore, Camdenton High School, Camdenton, MO
In-person.
<https://projectboard.world/isef/project/86403>
- ENBM064 Swim Smart, Swim Fast: Development and Application of a Fitbit App for Swim Technique Study**
Rockwell Li, 15 Freshman, Ocean Lakes High School, Virginia Beach, VA
Virtual.
<https://projectboard.world/isef/project/86406>
- ENBM065 Adaptive Multi Sigmoid Contrast Enhancement**
Samuel Iskhakov, 17 Senior, The Bronx High School of Science, Bronx, NY
In-person.
<https://projectboard.world/isef/project/86416>
- ENBM066 A Precise, Portable, Non-Invasive Melanoma Detection Device Using Image-Based Deep Learning Approach**
Shubhan Bhattacharya, 15 Freshman, William G. Enloe High School, Raleigh, NC
Virtual.
<https://projectboard.world/isef/project/86422>
- ENBM067T Novel Technique To Fabricate Ultraviolet Sensor Using Photopolymer Resin With 3D Printing Technology To Avoid Skin Cancer**
Mohammed Redhwani, 16, Junior,
Ali Shams, 17, Senior,
Al-Jazeera Academy, Doha, Qatar
Virtual.
<https://projectboard.world/isef/project/86532>
- ENBM068T BioWaveNet: A Novel Multi-Scale Convolutional Neural Network for Generalized Bio-Signal Applications**
Thee Mateepithaktham, 17, Junior,
Punnawish Thuwajit, 18, Senior,
Suankularb Wittayalai School, Phra Nakorn, Bangkok, Thailand
In-person.
<https://projectboard.world/isef/project/86540>
- ENBM069T Microneedles for Creatinine Detection: Novel Prototype of Non-Invasive Portable Tool Towards Chronic Kidney Disease Risk Assessment**
Peerathat Lapnarongchai, 17, Junior,
Thanapat Reechewa, 17, Junior,
Mahidol Wittayanusorn School, Nakhon Pathom, Nakhon Pathom, Thailand
In-person.
<https://projectboard.world/isef/project/86543>
- ENBM070 A Novel Approach to Early Directional Diagnosis of Prescription Opioid Addiction**
Gitanjali Rao, 16 Junior, STEM School Highlands Ranch, Highlands Ranch, CO
In-person.
<https://projectboard.world/isef/project/86621>
- ENBM071T IR Thermometers: Optimizing the Degree of Accuracy Through the Inspection of Energy Transfer**
Alexander Ajouri, 16, Junior,
Zachary Chen, 16, Sophomore,
Boston Latin School, Boston, MA
Virtual.
<https://projectboard.world/isef/project/86645>
- ENBM072 A Novel Robust and Low-Cost Anthropomorphic Myoprosthesis: Utilizing an Articulated Soft Robotic System and Convolution Kernel Compensation-Based Non-Invasive EMG Decoding for Bionic Restoration of Upper Limb Function to Amputees**
Okezue Bell, 15 Junior, Moravian Academy, Bethlehem, PA
In-person.
<https://projectboard.world/isef/project/86710>
- ENBM073T Low-Cost 3D Printed Modular and Adjustable Pediatric Prosthesis Leg**
Hakimuddin Kitabwalla, 16, Sophomore,
Luc Nguyen, 15, Sophomore,
Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, GA
In-person.
<https://projectboard.world/isef/project/86715>

- ENBM074 Synthetic DNA Engineering With ICOR: Improving Codon Optimization With Recurrent Neural Networks Towards Efficient, Low-Cost, High-Efficacy Recombinant Vaccine and Pharmaceutical Manufacturing**
Rishab Jain, 17 Junior, Westview High School, Portland, OR
In-person.
<https://projectboard.world/isef/project/86771>
- ENBM075 Dynamic Extraocular Filtering: A Novel Method for Active Correction of Color Vision Deficiency, Validated With Steady-State Visual Evoked Potentials**
Vladimir Mamchik, 16 Junior, Jesuit High School, Portland, OR
Virtual.
<https://projectboard.world/isef/project/86773>
- ENBM076 MusTENG: A Wearable Triboelectric Nanogenerator for Personalized Muscle Spasticity Data for Improved Rehabilitation and Monitoring of Children With Cerebral Palsy**
Ishan Ahluwalia, 16 Sophomore, Jesuit High School, Portland, OR
In-person.
<https://projectboard.world/isef/project/86775>
- ENBM077 Sticky Stitches**
Ahmad Elbiad, 16 Sophomore, Pleasant View School, Memphis, TN
Virtual.
<https://projectboard.world/isef/project/86856>
- ENBM078 Non-Invasive Method To Efficiently Detect Bronchial Carcinoma, Chronic Obstructive Pulmonary Disease, and Emphysema Without Deleterious Effects on the Chest's Cavity**
Grace Yacobe, 15 Freshman, Academy of Notre Dame de Namur, Villanova, PA
In-person.
<https://projectboard.world/isef/project/86859>
- ENBM079 Producing the Polyketide Antibiotic Actinorhodin From Azo Dye Waste: *In silico* Design and Optimization of a Synthetic Pathway in *Pseudomonas putida* KT2440**
Parsa Nayyara, 18 Senior, SMA Negeri 5 Surabaya, Surabaya, East Java, Indonesia
Virtual.
<https://projectboard.world/isef/project/86860>
- ENBM080 An Optimized Whitewater Helmet Designed Using a Newly Developed Helmet STAR Evaluation System and 3D Printing**
Brock Duma, 18 Senior, Blacksburg High School, Blacksburg, VA
In-person.
<https://projectboard.world/isef/project/86929>
- ENBM081 Mask Collecting Aerosol Droplets**
Gracie Young, 17 Junior, Mountain Pine High School, Mountain Pine, AR
In-person.
<https://projectboard.world/isef/project/87031>

Environmental Engineering

- ENEV001** **Sustainable Habitats for *Crassostrea virginica***
Emily White, 16 Junior, McIntosh High School, Peachtree City, GA
In-person.
<https://projectboard.world/isef/project/82898>
- ENEV002** **Oil Absorption Abilities of Superhydrophobic *Salvinia molesta*: Potential for Crude Oil Spill Clean-Up**
Dominique Woodford, 18 Senior, Gosford High School, Gosford, NSW, Australia
Virtual.
<https://projectboard.world/isef/project/82687>
- ENEV003** **Remote-Control Raft Cleaner**
Max Zhao, 18 Senior, Barker College, Sydney, New South Wales, Australia
Virtual.
<https://projectboard.world/isef/project/85190>
- ENEV004** **Not Your Average Soil: A Modern Solution to the Predicted 2050 Soil Crisis That Is Applicable to All Types of Plant and Crop Types**
Zoe Orange, 16 Sophomore, Paxton High School, Paxton, FL
Virtual.
<https://projectboard.world/isef/project/82858>
- ENEV005** **Artificially Intelligent Electronic Waste Sorting Selective Compliance Robot Arm**
Sam Rogers, 15 Junior, Proserpine State High School, Proserpine, QLD, Australia
Virtual.
<https://projectboard.world/isef/project/83050>
- ENEV006** **GrasCPAC (Sustainable Packaging from Cocopeat and Grass Fibres)**
Najwa Ariena Mohamad, 16 Junior, Sekolah Menengah Kebangsaan Kubang Bemban, Pasir Mas, Kelantan, Malaysia
In-person.
<https://projectboard.world/isef/project/85216>
- ENEV007** **Development of an Engineered Face Mask With Optimized Nanoparticle Layering for Filtration of Air Pollutants and Viral Pathogens**
Ishika Nag, 16 Junior, Oviedo High School, Oviedo, FL
In-person.
<https://projectboard.world/isef/project/82896>
- ENEV008** **3 in 1: A Novel Method for Microplastic, Industrial Dye and Biological Pollutant Removal From Wastewater**
Yusuf Efe Kivilcim, 18 Senior, Ankara Fen Lisesi, Ankara, Turkey
In-person.
<https://projectboard.world/isef/project/85072>
- ENEV009** **A Novel Magnetic System With Carbon Nanotubes To Remove Microplastics From Water**
Ayse Pelin Dedeler, 17 Junior, Cakabey Schools, IZMIR, Turkey
In-person.
<https://projectboard.world/isef/project/85159>
- ENEV010T** **Smart Water-Efficient System**
Lale Huseynova, 17, Junior, Nigar Namazova, 17, Junior, Young Talents Lyceum, Baku, Azerbaijan
In-person.
<https://projectboard.world/isef/project/83064>
- ENEV011T** **Synthesizing Biofuels From Waste Oil for a Sustainable Alternative in Diesel Engines**
Abigail Andal, 17, Junior, Diana Gegaj, 16, Junior, Raaghuv Nandur, 17, Junior, Vanguard High School, Ocala, FL
In-person.
<https://projectboard.world/isef/project/85115>
- ENEV012T** **Comparison of Ambient Air Pollutants in Varying Income Tracts Using a Constructed, Portable Device That Precisely Measures Ambient Air Concentrations (PAQMS)**
Pablo Garcia, 15, Sophomore, Mary Parmigiani, 15, Sophomore, Joe Parmigiani, 15, Sophomore, Corvallis High School, Corvallis, OR
In-person.
<https://projectboard.world/isef/project/82877>
- ENEV013** **An Inexpensive and Easily Produced System To Reduce Indoor Air Pollution**
Tanaka Chirara, 17 Senior, ZRP High School, Harare, Zimbabwe
Virtual.
<https://projectboard.world/isef/project/83081>

- ENEV014 Specialized Drone for Tropospheric Ozone Research With Precise Positioning and Wireless Data Transmission**
Marek Rauchfleisz, 17 Junior, University High School, Torun, Kuyavian-Pomeranian, Poland
Virtual.
<https://projectboard.world/isef/project/85298>
- ENEV015T The Use of Laminar Flow To Reduce Aerosolized Particle Dispersion: A Strategy for Respiratory Disease Prevention**
Max Watchmaker, 17, Junior,
David Watkins, 16, Junior,
University School of Milwaukee, Milwaukee, WI
In-person.
<https://projectboard.world/isef/project/83250>
- ENEV016 Wastewater Treatment: The Use of Mealworm Gut Bacteria (*Tenebrio molitor*) To Isolate and Identify Bacteria That Can Biodegrade Polystyrene**
Rowan Rock, 17 Junior, Cloquet Senior High School, Cloquet, MN
In-person.
<https://projectboard.world/isef/project/82944>
- ENEV017 Greener Concrete and Cleaner Oceans**
Rachel Cochran, 15 Sophomore, Bartlesville High School, Bartlesville, OK
In-person.
<https://projectboard.world/isef/project/85145>
- ENEV018T Termite Biomimicry for Affordable, Eco-Friendly Homes**
Mihika Eratne, 16, Junior,
Sathina Trevino, 16, Junior,
Keystone School, San Antonio, TX
In-person.
<https://projectboard.world/isef/project/83133>
- ENEV019 Hydrokinetic Power in the Mississippi Riverbed**
Caitlin Estrada, 16 Junior, Isidore Newman School, New Orleans, LA
In-person.
<https://projectboard.world/isef/project/83107>
- ENEV020T ESStab: Eco-Friendly Soil Stabilizing Powder**
Narawit Pratueangsukpong, 17, Senior,
Pojarpa Puanglumyai, 18, Senior,
Ek-amon Srijomkwan, 17, Senior,
Kamnoetvidya Science Academy, Rayong, Thailand
In-person.
<https://projectboard.world/isef/project/85883>
- ENEV021T Sustainable Subsistence: A Low-Cost Method of Greywater Recycling for Hydroponic Agriculture**
Josephine Barber, 16, Junior,
Mason Sufnarski, 18, Senior,
Mercer Island High School, Mercer Island, WA
Marvin Ridge High School, Waxhaw, NC
In-person.
<https://projectboard.world/isef/project/83264>
- ENEV022 Pollution and Reduction or Fragmentation of the Natural Habitat in the Wetlands of the Purumpampa Grasslands, Huamachuco - Peru**
Jhoana Ruiz Mendoza, 14 Sophomore, I.E. 80779 La Inmaculada, Huamachuco, La Libertad, Peru
Virtual.
<https://projectboard.world/isef/project/82891>
- ENEV023 Use of Bivalve Mollusc Residues as Aggregate for the Manufacture of Concrete**
Joanna Galan Alvarez, 16 Senior, Maria Adele Garnier, Sechura, Piura, Peru
Virtual.
<https://projectboard.world/isef/project/82970>
- ENEV024 Removal of Hexavalent Chromium With Pectin Extracted From Lignocellulosic Residues of *Citrus sinensis* 'Valencia'**
Day Cahuapaza Choquehuanca, 16 Senior, Adventista Tupac Amaru, Juliaca, San Roman, Peru
Virtual.
<https://projectboard.world/isef/project/85203>
- ENEV025 Constructing Soil Moisture Spatial Variability Maps of Golf Course Fairways**
Michael (Mac) Chaloupka, 17 Senior, Christ the King Cathedral School, Lubbock, TX
In-person.
<https://projectboard.world/isef/project/83025>
- ENEV026 Saccharification and Degradation of Inedible Waste in Bioregenerative Life Support System**
Jingyuan Zhang, 17 Junior, Beijing No. 4 High School, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/82892>

- ENEV027 Design and Performance of a Plant-Microbial Fuel Cell To Treat Kitchen Wastewater**
Xinning Zhang, 17 Junior, No. 2 High School of East China Normal University, Shanghai, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/83062>
- ENEV028 Improving the Degrading Rate of PETase and Developing Highly Efficient Enzyme Activity Screening Strategies**
Yanbing Jin, 17 Junior, Shanghai Pinghe Bilingual School, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82973>
- ENEV029 Novel and Environmentally Friendly Method of Heavy Metals and Radionuclides Removal Using Radiation Resistance Bacteria**
Anas Arafat, 17 Senior, Riyadh School for Boys and Girls, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85579>
- ENEV030 Synthesis of a Photo-Induced Multifunctional Zr Based Metal-Organic Framework for CO₂ Capture and Conversion**
Mansour Al Marzooqi, 18 Senior, Riyadh School for Boys and Girls, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85195>
- ENEV031 Degradation of Organic Pollutants Using (ZnO/Mo) Photocatalyst**
Maymounah Al Shahrani, 17 Senior, University Schools, Dhahran, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85835>
- ENEV032T Electrocoagulation With Aluminum, Copper, and Zinc for Aqueous Methylene Blue Remediation and Sustainable Energy Production**
Ava Malysa, 17, Junior,
Samantha Palmadessa, 16, Junior,
Manhasset High School, Manhasset, NY
In-person.
<https://projectboard.world/isef/project/82796>
- ENEV033 Now You See It, Now You Don't: Investigating the Effectiveness of Various Agri-Waste Biochars as Adsorbents for Methylene Blue in Aqueous Solutions**
Jonah Visser, 15 Sophomore, Tuscumbia High School, Tuscumbia, MO
In-person.
<https://projectboard.world/isef/project/83235>
- ENEV034 Clean Hydrogen Production From Photocatalytic Degradation of Plastic Wastes**
Haoyu Wang, 16 Junior, Centennial High School, Las Cruces, NM
Virtual.
<https://projectboard.world/isef/project/83225>
- ENEV035 RB5 Dye Removal Using Activated Carbon Under UV Irradiation**
Emily Kim, 16 Junior, Jericho High School, Jericho, NY
In-person.
<https://projectboard.world/isef/project/82735>
- ENEV036 A Low-Cost Device To Improve the Quality of Drinking Water: Utilization of Ultrasonic Transduction in Conjunction With Filtration**
Jose Atilano, 18 Senior, Greybull High School, Greybull, WY
Virtual.
<https://projectboard.world/isef/project/83060>
- ENEV037 A Mechanism Utilizing Renewable Energy for Eliminating Aquatic Trash in Waterways That Does Not Contribute to Global Warming and Air Pollution**
Dakota Perry, 15 Sophomore, WP Davidson High School, Mobile, AL
In-person.
<https://projectboard.world/isef/project/82727>
- ENEV038T Sea It To Believe It: Machine Learning-Based Prediction of Harmful Algal Bloom (HAB) Intensity**
Ada Wang, 17, Junior,
Olivia Ye, 16, Junior,
College Park High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/83082>

- ENEVO39T Applications of Cellulose Acetate Extracted From Paper Waste for Wastewater Treatment**
Sara Alqasem, 17, Junior,
Mira Khalil, 16, Junior,
Jubilee School, Amman, Jordan
In-person.
<https://projectboard.world/isef/project/85785>
- ENEVO40T Making and Utilizing Wave Generator Using Eco-Friendly Buoy**
Yeo Jin Cho, 17, Junior,
Jin woo Seong, 17, Senior,
Hyewon Shin, 17, Senior,
Changwon Science High School, Changwon-si,
Gyeongsangnam-do, South Korea
Virtual.
<https://projectboard.world/isef/project/83149>
- ENEVO41 A Novel Biodegradable Device To Combat and Prevent Water Eutrophication**
Anushka Rawat, 17 Junior, Parkway South High School, Manchester, MO
Virtual.
<https://projectboard.world/isef/project/83094>
- ENEVO42 Biodigestion: Turning Nothing Into Something**
Alexia Munson, 16 Sophomore, Grants High School, Grants, NM
In-person.
<https://projectboard.world/isef/project/82927>
- ENEVO43T Utilizing Cow Dung Ash and Volcanic Ash To Manufacture Eco-Friendly Building Materials To Solve Environmental Pollution and Provide Accessibility to Cheap Housing**
Ngoc Pham, 17, Junior,
William Rosser, 16, Sophomore,
Danylo Starepravo, 17, Senior,
New Mexico Military Institute, Roswell, NM
In-person.
<https://projectboard.world/isef/project/85192>
- ENEVO44 Engineering and Testing of Metakaolin Al₂Si₂O₇ and Calcium Bentonite Al₂H₂O₁₂Si₄ Concretion-Spheres: A Novel Composite for the Remediation of Hydrocarbons and Heavy Metals**
Jaden Luna, 18 Senior, Sanger High School, Sanger, CA
In-person.
<https://projectboard.world/isef/project/85209>
- ENEVO45 Designing the Installation for Cleaning the Tasotkel Reservoir From Fishing Nets**
Akadil Aitu, 15 Freshman, Nazarbayev Intellectual School of Physics and Math, Taraz City, Taraz City, Kazakhstan
Virtual.
<https://projectboard.world/isef/project/85238>
- ENEVO46 The Effects of Pyrolysis on Upcycling Polyvinyl Chloride (PVC) Present in Gloves Through Reattaining Hydrochloric Acid (HCl) for Higher-Value Applications**
Grace Chen, 16 Junior, Mentor High School, Mentor, OH
Virtual.
<https://projectboard.world/isef/project/85240>
- ENEVO47 Turbid or Not Turbid? That Is the Question: Creating a Water Filtration and Sanitation Method for Developing Countries**
Kiersten Knobbe, 17 Junior, Guthrie Center High School, Guthrie Center, IA
In-person.
<https://projectboard.world/isef/project/85236>
- ENEVO48 Capacitive Deionization With Bipolar Membranes**
Sophia Manuel, 17 Junior, Saint Joseph's Academy, Baton Rouge, LA
In-person.
<https://projectboard.world/isef/project/85779>
- ENEVO49T Development of a Low-Cost Highly Efficient Filter for Heavy Metal and Organic Contaminant Removal**
Omar Chinyanga, 17, Senior,
Stanley Madziyire, 17, Senior,
Nyaradzo Mutiti, 18, Senior,
Saint George's College, Harare, Zimbabwe
In-person.
<https://projectboard.world/isef/project/85250>
- ENEVO50T The Phytoproject: *Ex situ* Bioremediation of Water From Lagoa da Ervedeira: Use of the Microalgae *Chlorella vulgaris* Immobilized in Calcium Alginate**
Mariana Simoes, 17, Senior,
Matilde Tarenta, 17, Senior,
Escola Secundaria Engenheiro Acacio Calazans Duarte, Marinha Grande, Leiria, Portugal
In-person.
<https://projectboard.world/isef/project/85310>

- ENEV051T Creating the New ANKH**
Adham Eid, 16, Junior,
Ahmed Gouda, 16, Junior,
Obour STEM School, Obour, Kalubya, Egypt
In-person.
<https://projectboard.world/isef/project/85199>
- ENEV052 Engineering a Bioplastic With *Aspergillus oryzae* To Increase Degradation Rate**
Anna Armstrong, 18 Senior, Joel E. Ferris High School, Spokane, WA
Virtual.
<https://projectboard.world/isef/project/85851>
- ENEV053 Eqwis: Rapid Animal Detection and Driver Warning System To Mitigate Animal Vehicle Collisions Using Artificial Intelligence**
Vedant Srinivas, 15 Sophomore, Eastlake High School, Sammamish, WA
In-person.
<https://projectboard.world/isef/project/85071>
- ENEV054 Implementing Nontoxic Modified Biochar Enhanced Filtration for the Efficient Removal of Emerging Contaminants in an Aqueous Solution**
Snigtha Mohanraj, 14 Freshman, Engineering and Science University Magnet School, West Haven, CT
In-person.
<https://projectboard.world/isef/project/85304>
- ENEV055T A Study on Purification Method of Expired Medication Through Biofilm Sponge Manufacturing**
Seo Yeon Choi, 17, Senior,
Chan Woo Oh, 18, Senior,
Min Kyeong Shin, 17, Senior,
Taejang high school, Suwon-si, Gyeonggi-do, South Korea
Virtual.
<https://projectboard.world/isef/project/85589>
- ENEV056T Improvement of *Pantoea sp.* Denitrification Activity at Low Temperature Using Carbon Sources**
Ling-Yi Chang, 18, Senior,
Yi-Wei Chung, 17, Junior,
Kaohsiung Municipal Kaohsiung Girls' Senior High School, Kaohsiung, Kaohsiung, Taiwan
In-person.
<https://projectboard.world/isef/project/85718>
- ENEV057T River Water Purification Process With *Moringa oleifera* Lam. Tablet**
Maria Eduarda Prates Brandao, 17, Senior,
Sarah Fernandes de Oliveira, 17, Senior,
Ana Luiza Nogueira Oshiro, 17, Senior,
Escola Sesi Ignez Pitta de Almeida, Barreiras, Bahia, Brazil
In-person.
<https://projectboard.world/isef/project/85752>
- ENEV058 Year 4: Small-Scale Multilevel Bioremedial Water Filtration System (Prototyping)**
Sania Naik, 17 Senior, Dr. Ronald E. McNair Academic High School, Jersey City, NJ
Virtual.
<https://projectboard.world/isef/project/85648>
- ENEV059 Developing and Assessing Fucose-Based Water-Soluble Bioplastics**
Olivia Pollock, 17 Senior, Pelham Memorial High School, Pelham, NY
In-person.
<https://projectboard.world/isef/project/85631>
- ENEV060 Biomimetic Removal of Microsphere Water Contaminants, via Calcite-Infused, Coral-Like Melamine Sponges**
Naomi Park, 15 Sophomore, Greenwich High School, Greenwich, CT
In-person.
<https://projectboard.world/isef/project/85566>
- ENEV061T Integration of Mechanical and Chemical Treatment in the Hydrological Cycle of the Paper and Pulp Industry**
Adam Ahmed, 18, Senior,
Abdullah Elafifi El-Ehwany, 19, Senior,
Ismailia STEM High School, Ismailia, Ismailia, Egypt
In-person.
<https://projectboard.world/isef/project/85607>
- ENEV062 Integrated Ecogreen System for Sustainable Waste Management**
Hager Hasan, 17 Junior, Al Orman Governmental Language School, Giza, Dokki, Egypt
In-person.
<https://projectboard.world/isef/project/85771>

- ENEV063 Hydrotherapy and Soil Treatment Using Agricultural Wastes**
Alaa Elgarhy, 16 Junior, Dr. Mahmoud Omar School Secondary School for Girls, Giza Governorate, Egypt
In-person.
<https://projectboard.world/isef/project/85569>
- ENEV064 A West Coast Estuarine Case Study: A Novel, Predictive Approach To Monitor Estuarine Eutrophication**
Vedant Janapaty, 16 Sophomore, Silver Creek High School, San Jose, CA
In-person.
<https://projectboard.world/isef/project/85732>
- ENEV065 Ocean X: A Device That Cleans Ocean Oil Spills Without Harming the Environment**
Leen Allouh, 15 Sophomore, Maysoon Al-Demashqia, Irbid, Jordan
In-person.
<https://projectboard.world/isef/project/85841>
- ENEV066 The Effect of Magnetic Carbon Nanotubes on the Oil Degrading Ability, Vitality, and Gene Mutations of *A. borkumensis***
Tejasvi Kari, 17 Senior, Palm Beach Central High School, Wellington, FL
In-person.
<https://projectboard.world/isef/project/85918>
- ENEV067 The Efficiency of Wetland Plants on Absorbing Contaminated Runoff**
Lily Anderson, 18 Senior, Olathe North High School, Olathe, KS
In-person.
<https://projectboard.world/isef/project/85929>
- ENEV068 Developing a Novel Autonomous Swarm-Based Beach Cleaning Robot**
Varun Hariprasad, 16 Junior, Paul Laurence Dunbar High School, Lexington, KY
In-person.
<https://projectboard.world/isef/project/85942>
- ENEV069 Amphibious Vehicle for Collecting Water Samples**
Curtis Cheng, 18 Junior, Lancaster Country Day School, Lancaster, PA
In-person.
<https://projectboard.world/isef/project/85956>
- ENEV070 Effect of *Nannochloropsis oceanica* in Carbonic Acid Acidification**
Gunnar Ternstrom, 17 Junior, Hilton Head Preparatory School, Hilton Head Island, SC
In-person.
<https://projectboard.world/isef/project/85960>
- ENEV071T Eco-House: Sustainable House Design From Environmentally Friendly Concrete**
Paulingda Francois, 16, Sophomore, Ludwicka Joseph, 17, Junior, Ronelle Thelemaque, 16, Sophomore, Institution Saint-Francois Xavier, Cap-Haitien, Nord, Haiti
In-person.
<https://projectboard.world/isef/project/85987>
- ENEV072T ZEolation in Agriculture**
Rawan Abdelaziz, 17, Senior, Salma Wafa, 17, Senior, Dakahlia STEM Cchool in Egypt, Gamasa, Dakahlia, Egypt
In-person.
<https://projectboard.world/isef/project/86089>
- ENEV073 Treatment of Polluted Water From Wells and Aflaj Using Waste Materials From Date Palm Trees Enhanced With Carbon Nanoparticles Decorated With Activated Carbon**
Abdullah Al-Azri, 15 Junior, Abo Obaida for Basic Education for Boys, Nizwa, Al Dakhiliyah Governorate, Oman
In-person.
<https://projectboard.world/isef/project/86096>
- ENEV074T Environmental Engineering in the Manufacture of Technology-Enhanced Bioplastics and Its Impact Study**
Neeam AL Harrasi, 15, Sophomore, Doa'a AL Hashmi, 15, Sophomore, Doa'a AL Hashmi, 15, Sophomore, Al Rustaq School, Rustaq, Batinah South, Oman
In-person.
<https://projectboard.world/isef/project/86097>
- ENEV075 Microfibers, a Macroproblem: Optimizing Washing Machine Filters To Reduce Microfiber Emissions**
Dennis Van Hoesel, 17 Junior, Rome Free Academy, Rome, NY
In-person.
<https://projectboard.world/isef/project/86118>

- ENEV076 WAL-SEA: Development of a Home Built, Multifunctional Remotely Operated Vehicle for the Study of the Near-Shore Ocean Ecosystems**
Faye Lin, 16 Sophomore, Mission San Jose High School, Fremont, CA
In-person.
<https://projectboard.world/isef/project/86126>
- ENEV077 Rationalize Water Consumption While Waiting for Hot Water To Reach the Tap by Returning It to the Cold Water Tank**
Dana Eshtaya, 16 Sophomore, Talae' Al-Amal Secondary Schools, Nablus, West Bank, Palestine
In-person.
<https://projectboard.world/isef/project/86128>
- ENEV078 Testing the Effectiveness of a Polyvinyl Alcohol Polymer Layer Bonded to Lead-Chelating Agents vs. a Phosphate Salt Layer on the Minimization of Lead Iodide Leaching in Perovskite Solar Cells**
Sasha Masson, 16 Sophomore, The Harker School, San Jose, CA
In-person.
<https://projectboard.world/isef/project/86129>
- ENEV079 Development of Seaweed Bioplastics to Alleviate Environmental Plastic Pollution**
Elizabeth Djajalie, 16 Sophomore, Thunder Mountain High School, Juneau, AK
In-person.
<https://projectboard.world/isef/project/86200>
- ENEV080 Making Removal of Chemical Contaminants in Drinking Water Affordable and Available Anywhere and Everywhere**
Muhil Thendral, 16 Sophomore, Thomas S Wootton High School, Rockville, MD
In-person.
<https://projectboard.world/isef/project/86252>
- ENEV081T The Smart Programmer for Rationalizing Water During Showering and Ablution**
Najah Halabiya, 16, Sophomore,
Marah Zeer, 15, Sophomore,
Abu Dis Secondary Girls School, Abu Dis, Jerusalem, Palestine
In-person.
<https://projectboard.world/isef/project/86278>
- ENEV082 Effect of Isopropyl Alcohol on the Prolongation of Surgical Mask's Lifespan During COVID-19**
Hsiang-En Liu, 18 Junior, Tabor Academy, Marion, MA
Virtual.
<https://projectboard.world/isef/project/86391>
- ENEV083 The Utilization of Biochar and *Bacillus subtilis* To Remove Regionally Prevalent Heavy Metals From Wastewater**
Shrihari Nagarajan, 18 Senior, Thomas Jefferson Independent Day School, Joplin, MO
Virtual.
<https://projectboard.world/isef/project/86402>
- ENEV084T EcoProtein: 3 Problems, 1 Solution**
Mane Kurghinyan, 18, Senior,
Mger Sarafyan, 17, Senior,
Yerevan State Medical University Heratsi High School, Yerevan, Yerevan, Armenia
Virtual.
<https://projectboard.world/isef/project/86460>
- ENEV085 Eyes in the Water Can Save the World for Life: A Device Which Remotely Measures Seawater Quality Below the Surface of the Water**
Dimitrios Deliakidis, 15 Sophomore, 4th Lyceum of Alexandroupolis, Alexandroupolis, Evros, Greece
Virtual.
<https://projectboard.world/isef/project/86536>
- ENEV086 A Novel Model-Based Constrained-Optimization Approach To Maximize Water Productivity Under Deficit Irrigation**

Chloe Zhan, 15 Sophomore, Hamilton High School, Chandler, AZ
In-person.
<https://projectboard.world/isef/project/86600>
- ENEV087 Automatic Dual-Purpose Trash Collector Based on Soft Tooth Collection Structure**
Xiayi Jin, 17 Junior, The Hill School, Pottstown, PA
Virtual.
<https://projectboard.world/isef/project/86650>

- ENEV088T Further Studies on the Application of Novel Rapidly Degrading Bioplastics Derived From Upcycled Waste Products To Replace Polystyrene and Polypropylene in Single-Use Hard Plastics Like Cutlery**
 ## Kaitlyn Zuravel, 18, Senior,
 # Lauren Zuravel, 16, Sophomore,
 Terry Sanford High School, Fayetteville, NC
 Virtual.
<https://projectboard.world/isef/project/86654>
- ENEV089 The Development of Recyclable Wind Turbine Blades Using Autodesk 3D Simulations**
 Paige DeMino, 15 Sophomore, Our Lady of Lourdes High School, Poughkeepsie, NY
 Virtual.
<https://projectboard.world/isef/project/86665>
- ENEV090 Removal of Arsenic(III) and Chromium(VI) From Contaminated Water Using Novel Chitosan Coated Polyamide Adsorbent With Ethylenediaminetetraacetic Acid, EDTA, Regeneration**
 Johan DeMessie, 17 Junior, William Mason High School, Mason, OH
 In-person.
<https://projectboard.world/isef/project/86690>
- ENEV091 Saving Water Around the House**
 Sky Teeples, 16 Sophomore, Provo High School, Provo, UT
 In-person.
<https://projectboard.world/isef/project/86697>
- ENEV092 Exploring Algal Applications to the Aerobic and Anaerobic Bioremediation of Wastewater and Developing a Low-Cost Biofertilizer To Enhance Plant Growth**
 Shemai'ya Peak, 17 Senior, Stanhope Elmore High School, Millbrook, AL
 In-person.
<https://projectboard.world/isef/project/86721>
- ENEV093 Reduce, Reuse, Digest? Optimizing pETase Function Within k-12 *E. coli***
 Chloe Hindes, 18 Senior, Monte Vista High School, Monte Vista, CO
 In-person.
<https://projectboard.world/isef/project/86730>
- ENEV094 Filed Instrumentation and Their Importance in Landslide Assessment**
 Cameorn Jae Bernardo, 17 Junior, Notre Dame High School, Talofoto, GU
 In-person.
<https://projectboard.world/isef/project/86740>
- ENEV095 Bringing Contaminated Soils Back to Life, Remediating Brine Contaminated and Alkaline Soils Using Phytoremediation and Engineered Drainage Techniques**
 Benjamin Ellingson, 18 Senior, Maddock High School, Maddock, ND
 In-person.
<https://projectboard.world/isef/project/86851>
- ENEV096 Printing Our Future**
 Kiley Conlon, 17 Junior, Lowell High School, Lowell, MA
 Virtual.
<https://projectboard.world/isef/project/86884>
- ENEV097 Low-Cost Electrochemical Arsenic Detection (LEAD): A Novel Quantitative, Portable and Ultra-Sensitive Arsenic Sensor Using Pencil Lead**
 Aseel Rawashdeh, 17 Senior, L C Anderson High School, Austin, TX
 In-person.
<https://projectboard.world/isef/project/86891>
- ENEV098T Development of Efficient Catalyzers From Waste Shells for the Production of High Purity Biodiesel From the Household Cooking Waste Oil**
 Noor Aldahabj, 17, Senior,
 Noralhuda Almubarak, 17, Senior,
 Umm Ayman Secondary School for Girls, Doya, Al Rayyan, Qatar
 Virtual.
<https://projectboard.world/isef/project/86948>
- ENEV099 Clay Bricks: An Ultimate Solution to Zimbabwe's Clean Water Crisis**
 Ruvarashe Moyo, 16 Sophomore, Queen Elizabeth Girls' High School, Harare, Zimbabwe
 In-person.
<https://projectboard.world/isef/project/87303>

Engineering Technology: Statics & Dynamics

- ETSD001 Arduino Controlled Robotic Arm Utilizing Flux Pinning**
Cason Allen, 18 Senior, Luella High School,
Locust Grove, GA
In-person.
<https://projectboard.world/isef/project/79440>
- ETSD002 Polaris II: Gamma Ray Visualization System and Risk Mitigation Through Real-Time Radionuclide Atmospheric Dispersion Modeling**
Naphat Siripun, 17 Junior, Oregon Episcopal School, Portland, OR
In-person.
<https://projectboard.world/isef/project/83053>
- ETSD003 A Novel Design of W-Shaped Pipe-Climbing Robot**
Xin Yu Ai, 16 Junior, Shanghai American School - Pudong Campus, Shanghai, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82813>
- ETSD004 X-Hedgehog: Enhanced Safety for Firefighters Through Avoiding the Entrance of Dangerous Areas**
Jan Heinemann, 19 Senior, Bertha von Suttner Gymnasium Andernach, Andernach, Rheinland Pfalz, Germany
In-person.
<https://projectboard.world/isef/project/82820>
- ETSD005 Around the World in Eighty Days: Small Radiosondes on a Great Mission**
Amon Schumann, 17 Senior, Robert-Havemann-Gymnasium, Berlin, Germany
In-person.
<https://projectboard.world/isef/project/82797>
- ETSD006 Ultrasonic Soundbar**
Ali Orsel, 18 Senior, Melikgazi Mustafa Eminoglu Anatolian High School, Kayseri, Turkey
In-person.
<https://projectboard.world/isef/project/85184>
- ETSD007T Airless Terrain Wheel With Adjustable Articulating Arms Enclosing Multi-Suspension System**
Eyup Tarik Engin, 18, Senior,
Eyup Alper Saygili, 18, Senior,
Ozel Final Anadolu Lisesi, Denizli, Merkezefendi, Turkey
Samsun Bahcesehir College Atakum Science And Technology High School, Samsun, Atakum, Turkey
In-person.
<https://projectboard.world/isef/project/85219>
- ETSD008 Creating Naturally Enhanced Concrete for Seismic Resistance**
Genesis Cely, 16 Junior, Trinity Preparatory School, Winter Park, FL
In-person.
<https://projectboard.world/isef/project/82924>
- ETSD009T Microfluidic Fabrication of Double Emulsion Photonic Microlasers**
Bhanuprakash Kunam, 17, Junior,
Jayanth Pandit, 17, Junior,
Texas Academy of Mathematics and Science, Denton, TX
Virtual.
<https://projectboard.world/isef/project/83130>
- ETSD010T Effect of Magnetic Field on Frequency Generated From an Active Magnetic Buzzer**
Wachirawit Nisapruksachart, 18, Senior,
Pojchara Ounjaroen, 18, Senior,
Settasit Settagaroon, 18, Senior,
Kamnoetvidya Science Academy,
Rayong, Thailand
In-person.
<https://projectboard.world/isef/project/85859>
- ETSD011T A Rotor Fault Detection System Based on Nonlinear and Dynamic Response**
Ka Wai Huang, 18, Senior,
Jia Ning Weng, 17, Senior,
Un Man Wong, 17, Senior,
The Workers' Children High School, Macao, Macao, China, Macao Special Administrative Region
Virtual.
<https://projectboard.world/isef/project/83141>

- ETSD012T Small Satellite and Launch Vehicle for Climate Change Research**
 Joey Gorman, 18, Senior,
 Jonathan Gutknecht, 18, Senior,
 Gwinnett School of Mathematics, Science, and
 Technology, Lawrenceville, GA
 In-person.
<https://projectboard.world/isef/project/82750>
- ETSD013T Biomimicry: The Effect of Mother Nature on the Automotive Industry**
 William Brumback, 17, Junior,
 Jorge Escalera, 17, Junior,
 Rockdale Magnet School for Science and
 Technology, Conyers, GA
 In-person.
<https://projectboard.world/isef/project/83203>
- ETSD014 First Insights Into a Novel Synchronous Reluctance Electric Motor Design**
 Robert Sansone, 17 Junior, Fort Pierce Central
 High School, Fort Pierce, FL
 In-person.
<https://projectboard.world/isef/project/82939>
- ETSD015 The Buoy: A Novel Pool Alarm To Save Lives**
 ## Grayson Barron, 18 Senior, John Curtis Christian
 School, River Ridge, LA
 In-person.
<https://projectboard.world/isef/project/83129>
- ETSD016 Under the RADAR: Modeling the RADAR Cross-Section of Aircraft To Enhance Stealth Capabilities**
 Rushyendranath Reddy Nalamalapu, 16
 Sophomore, Cleveland Central High School,
 Cleveland, MS
 In-person.
<https://projectboard.world/isef/project/85901>
- ETSD017 A Multi-Joint Geometer-Like Spatial Wall-Climbing Robot With Vacuum Suction Used in Assisting High Altitude Tasks and Terrain Prosepection**
 # Jiarong Sheng, 16 Junior, Shanghai Pinghe
 Bilingual School, Shanghai, China
 Virtual.
<https://projectboard.world/isef/project/83226>
- ETSD018 Active Noise Control in Ventilation Ducts Using the LMS Algorithm**
 Xinle Song, 17 Junior, YK Pao School, Shanghai,
 Shanghai, China
 Virtual.
<https://projectboard.world/isef/project/82865>
- ETSD019 Soft Bionic Starfish Robot Based on Suckers**
 Chengyue Jiang, 15 Sophomore, Shanghai
 Pinghe Bilingual School, Shanghai, China
 Virtual.
<https://projectboard.world/isef/project/83242>
- ETSD020 Development and Experiments on a Kind of Small Dolphin Robot**
 Zihao Wang, 16 Junior, Shanghai Xuhui High
 School, Shanghai, China
 Virtual.
<https://projectboard.world/isef/project/83173>
- ETSD021 A Chemical Kinetic Modeling Study for Enhancing the Combustion Properties of Ammonia: A Zero-Carbon Fuel**
 Fahad Al Hazmi, 17 Senior, Dar Althikr Private
 School, Jeddah, Mecca, Saudi Arabia
 In-person.
<https://projectboard.world/isef/project/85633>
- ETSD022 Studying the Auto-Ignition Characteristics of Hydrogen in Homogenous Charge Compression Ignition Engines**
 Rafea Qanash, 17 Senior, Talented Secondary
 School, Jeddah, Makkah, Saudi Arabia
 In-person.
<https://projectboard.world/isef/project/85104>
- ETSD023 Controlling Combustion Conditions of Ammonia for Eco-Friendly Energy**
 Ali Alali, 18 Senior, Alkifah Academy, Al Hufuf,
 Eastern Province, Ahsaa, Saudi Arabia
 In-person.
<https://projectboard.world/isef/project/85769>
- ETSD024 Conquering Chaos: Can Engineering Design Be Applied To Prove Coin Flips Are Not Random?**
 Abigail Hindman, 15 Sophomore, Saint John's
 School, Houston, TX
 In-person.
<https://projectboard.world/isef/project/82809>
- ETSD025T Engine-ering the Future of Air Travel**
 Aiden Gandhi, 15, Freshman,
 Eli Hatton, 15, Freshman,
 Evan Weinstein, 15, Freshman,
 Rowland Hall- Lincoln Street Campus,
 Salt Lake City, UT
 In-person.
<https://projectboard.world/isef/project/83183>

- ETSD026 Weight Plate Loader**
 Skye Sriratana, 15 Sophomore, Tintern Grammar, Melbourne, Victoria, Australia
 Virtual.
<https://projectboard.world/isef/project/82815>
- ETSD027 Applications of Fluid Mechanics on Cars and Wings**
 Mohammad Abdullah Salman, 15 Sophomore, The City School - Gulshan Campus A - Boys, Karachi, Sindh, Pakistan
 Virtual.
<https://projectboard.world/isef/project/85160>
- ETSD028 Food Deserts: Developing a Self-Sustaining Greenhouse**
 Jill Seater, 16 Sophomore, Campolindo High School, Moraga, CA
 In-person.
<https://projectboard.world/isef/project/82951>
- ETSD029T From Space to Horizon: Improving Efficiency and Modeling the Future of Ion Thrusters**
 Felipe Aceves, 18, Senior,
 Mahi Patel, 18, Senior,
 College Park High School, The Woodlands, TX
 In-person.
<https://projectboard.world/isef/project/83177>
- ETSD030 Modification of Squirrel Cage and Slip Ring Induction Motors for a Higher Efficiency and Starting Torque**
 Paul Varricatt, 17 Junior, Waiakea High School, Hilo, HI
 Virtual.
<https://projectboard.world/isef/project/83004>
- ETSD031 Engineering a New Foundation for Buildings To Withstand Seismic Disruptions and Soil Liquefaction**
 Harold Cacal, 16 Junior, Waipahu High School, Waipahu, HI
 Virtual.
<https://projectboard.world/isef/project/85691>
- ETSD032 Fire, Smoke and Evacuation Modeling: The Ideal Theater**
 George Jamaldinian, 18 Senior, Eleanor Roosevelt High School, Greenbelt, MD
 Virtual.
<https://projectboard.world/isef/project/83103>
- ETSD033 Constructing a Reusable Solid-Fuel Rocket Capable of Propulsive Landing**
 Ravin Joshi, 17 Senior, Academies of Loudoun, Leesburg, VA
 In-person.
<https://projectboard.world/isef/project/85280>
- ETSD034T Raspberry Pi Is Enough for an Anti-Drone Laser: Achieving an Efficient and Simple Anti-Drone Laser Tracking System**
 Donghwa Choi, 18, Senior,
 Sihyeon Park, 17, Senior,
 Sejong Academy of Science and Arts, Sejong, Chungcheong, South Korea
 Virtual.
<https://projectboard.world/isef/project/85814>
- ETSD035T Performance Enhancement of PMMA/GOx Hybrid Rocket Engine Using Swirling Injection**
 Guan-Yu Chen, 18, Senior,
 Yu-Sheng Wang, 17, Senior,
 Taipei Municipal Jianguo High School, Taipei City, Chinese Taipei
 In-person.
<https://projectboard.world/isef/project/85572>
- ETSD036 Adaptation of "Roof Flaps" to Sedan Body Cars To Increase the Probability of Regaining Control at High Speeds**
 Abdiel Saez Barcelo, 16 Junior, Dr. Pedro Albizu Campus, Ponce, Puerto Rico
 Virtual.
<https://projectboard.world/isef/project/85297>
- ETSD037 Designing and Testing a Prototype Automatic Electronic Control System for Active Magnetic Levitation of a Ferromagnet Towards Magnetically Deflected Ballistic Mass Technology**
 Carlton Cort, 17 Senior, University School, Chagrin Falls, OH
 In-person.
<https://projectboard.world/isef/project/85063>
- ETSD038 Vehicle Rollover Prevention Through Dynamic Shifting of Center of Mass**
 Vivian Hui, 16 Junior, Albemarle High School, Charlottesville, VA
 Virtual.
<https://projectboard.world/isef/project/85161>

- ETSD039 Motion in Motion**
Jon Cottingham, 17 Junior, Riverside High School, Lake City, AR
In-person.
<https://projectboard.world/isef/project/85096>
- ETSD040 Increasing Drone Flight Times Without Sacrificing FPV Flight Capability**
Caden Perry, 17 Junior, Moscow High School, Moscow, ID
In-person.
<https://projectboard.world/isef/project/85761>
- ETSD041 Electromagnetic Braking System: A Rotary Design Which Applies Electromagnetism To Achieve Reduced-Friction/Frictionless Braking**
Jesse St. Onge, 18 Senior, Lewiston Senior High School, Lewiston, ID
In-person.
<https://projectboard.world/isef/project/85188>
- ETSD042 The Relative Seismic Resistance of Different Structural Aspects of the Pantheon**
Clare Tyson, 18 Senior, Wentzville Holt High School, Wentzville, MO
In-person.
<https://projectboard.world/isef/project/85792>
- ETSD043 An Investigation Into Active Control for Accessible Orbital Flight**
Timothy Cai, 17 Senior, Fraser Heights Secondary, Surrey, British Columbia, Canada
Virtual.
<https://projectboard.world/isef/project/85235>
- ETSD044 Finding the Optimal Combination of Touch, Color, and Infrared Sensors To Navigate a Robot Explorer Through Simulated Space-Like Conditions**
Nikolai Zemliansky, 17 Junior, Blindern VGS, Oslo, Norway
In-person.
<https://projectboard.world/isef/project/85207>
- ETSD045 A Novel Approach to Biomimicking the Avian Tail on Fixed Wing Micro Air Vehicles**
Kevin Shen, 15 Freshman, Olympia High School, Olympia, WA
Virtual.
<https://projectboard.world/isef/project/85289>
- ETSD046 Faster Than the Wind**
Elizabeth Wallace, 17 Senior, Northwest Technology Center, Fairview, OK
In-person.
<https://projectboard.world/isef/project/85777>
- ETSD047 The Application of Higher Visibility Road Markings in Inclement Weather**
Joshua Hilbig, 16 Junior, Farmington High School, Farmington, UT
In-person.
<https://projectboard.world/isef/project/85632>
- ETSD048 Designing an Efficient Propeller by Prototyping With 3D Printing**
Logan Honors, 17 Senior, Olathe North High School, Olathe, KS
In-person.
<https://projectboard.world/isef/project/85567>
- ETSD049 Design and Fabrication of a Flapping-Wing Robot Based on Slider-Crank Mechanism**
Jue Wang, 17 Junior, Milton Academy, Milton, MA
Virtual.
<https://projectboard.world/isef/project/85869>
- ETSD050 Novel Magnetic Levitation Train Using a Triple-Dipole-Line Track System**
Nathanael Gunawan, 16 Junior, Westwood Regional High School, Township of Washington, NJ
Virtual.
<https://projectboard.world/isef/project/85855>
- ETSD051 Autonomous UGV Inspection and Monitoring of Electrical Substations**
Julia Meyerson, 17 Junior, Pelham Memorial High School, Pelham, NY
In-person.
<https://projectboard.world/isef/project/85612>
- ETSD052T Car Seat Safety**
Grayson Girard, 14, Freshman, Bentlee Kollbaum, 15, Freshman, Elk Point Jefferson High School, Elk Point, SD
In-person.
<https://projectboard.world/isef/project/85729>
- ETSD053 Bouncing Off the Walls (Testing Safety of Walls Around Welders)**
Lexie Zuniga, 17 Junior, Northwest Technology Center, Fairview, OK
In-person.
<https://projectboard.world/isef/project/85856>

- ETSD054 The Design and Creation of a Solar Powered Trail Water System That Uses a Turbidity Sensor**
 Tarini Neeladaran, 14 Freshman, El Toro High School, Lake Forest, CA
 In-person.
<https://projectboard.world/isef/project/85874>
- ETSD055 Creation of an Artificial Atmosphere at Orbital Altitudes To Combat Space Debris**
 Cooper Weisman, 16 Junior, Alexander W. Dreyfoos School of the Arts, West Palm Beach, FL
 In-person.
<https://projectboard.world/isef/project/85919>
- ETSD056 Boats vs. Waves**
 Dominick Spradling, 17 Sophomore, Mountain Pine High School, Mountain Pine, AR
 In-person.
<https://projectboard.world/isef/project/85934>
- ETSD057 A Novel Way To Clean Solar Panels Using a Self-Powered Arduino Controlling a Servo**
 George Panagopoulos, 15 Sophomore, Cascia Hall Preparatory School, Tulsa, OK
 In-person.
<https://projectboard.world/isef/project/85955>
- ETSD058 Cubesat Propulsion With Magnets**
 Caoimhe Dudgeon, 15 Sophomore, Homer Senior High School, Homer, NY
 In-person.
<https://projectboard.world/isef/project/85983>
- ETSD059 Reducing the Impact of Wingtip Vortices on Aircraft Through the Use of a Novel Winglet Design**
 Nevin Thinagar, 16 Sophomore, Shrewsbury High School, Shrewsbury, MA
 Virtual.
<https://projectboard.world/isef/project/86049>
- ETSD060T Solar-Powered Drone: Creating an Airplane That Is Solar Powered and Autonomous**
 Aziz Kitana, 16, Junior,
 Mohammadamin Tabari Nia, 16, Junior,
 Kells Academy, Montreal, Quebec, Canada
 Virtual.
<https://projectboard.world/isef/project/86052>
- ETSD061 Analyzing the Dynamics of Swirl Flames Using a Novel Lean Premixed Dual-Swirl Burner**
 Raghad Alaseeri, 17 Senior, Talented Secondary School, Jeddah, Makkah, Saudi Arabia
 In-person.
<https://projectboard.world/isef/project/86053>
- ETSD062 Building a Prosthetic Hand With Microcomputers and Sensors**
 Jeron Osguthorpe, 16 Junior, SUCCESS Academy - SUU, Cedar City, UT
 In-person.
<https://projectboard.world/isef/project/86065>
- ETSD063 Reduction of Internal Parasites Through Improved Feeder Design**
 # Matthias Hefty, 16 Sophomore, DeKalb High School, Waterloo, IN
 In-person.
<https://projectboard.world/isef/project/86241>
- ETSD064 Structural Dynamic Simulation: Mathematical Modeling of Bridge Deformations Using Analytical Methods**
 Emily Hu, 17 Junior, Paul Laurence Dunbar High School, Lexington, KY
 Virtual.
<https://projectboard.world/isef/project/86247>
- ETSD065 Design and Optimization of Toroidal Aerospike Nozzle**
 Aprameya Pandit, 16 Junior, North Attleboro High School, North Attleboro, MA
 Virtual.
<https://projectboard.world/isef/project/86248>
- ETSD066 The Application of Hybrid Prediction Models in Investigating Sources of Railway Interior Noise and Achieving Noise Reduction**
 Kaiqing Dai, 17 Junior, Northfield Mount Hermon School, Gill, MA
 Virtual.
<https://projectboard.world/isef/project/70294>
- ETSD067T Glove-Shaped Hand Manipulative and Application Integration for Hearing People to Learn Basic American Sign Language (ASL)**
 Sharlotte Aquino Lopez, 16, Junior,
 Shanttale Aquino Lopez, 18, Senior,
 The San Juan Math, Science and Technology Center, San Juan, PR
 In-person.
<https://projectboard.world/isef/project/86375>

- ETSD068 Automated Greenhouse: Is Its Use a Good Way To Boost the Plants' Growth?**
Bernat Carnota Torres, 18 Senior, IES Damia Campeny, Mataró, Barcelona, Spain
In-person.
<https://projectboard.world/isef/project/86378>
- ETSD069 Open-Source DIY Unmanned Aerial System for Remote Sensing: Open Plane Project**
Matej Gurnak, 18 Senior, High School of Jura Hronca, Bratislava, Slovakia
In-person.
<https://projectboard.world/isef/project/86380>
- ETSD070T The Wheelchair Project**
Antonio Marzoratti, 16, Junior,
Arav Tyagi, 16, Junior,
Franklin High School, Franklin, MA
Virtual.
<https://projectboard.world/isef/project/86395>
- ETSD071 Design and Control of a Three-DoF Ball Joint With Applications in Robotic COVID-19 Swabbing and Surgery**
Samuel Rossberg, 17 Senior, The Bronx High School of Science, Bronx, NY
In-person.
<https://projectboard.world/isef/project/86415>
- ETSD072 AWSOM: Designing an Active Wrist Mechanism Utilizing Spherical-Gears and a One-Drive Mechanism**
Alexander Huang, 15 Sophomore, Hamilton High School, Chandler, AZ
In-person.
<https://projectboard.world/isef/project/86598>
- ETSD073 To Apogee and Beyond: A Home-Grown Space Program**
Rhys Hanson, 17 Junior, Conifer High School, Conifer, CO
In-person.
<https://projectboard.world/isef/project/86620>
- ETSD074T Decentralized Shared Intelligence of Autonomous Vehicles With Real-Time Multi-Agent Reinforcement Learning**
Eugene Choi, 17, Senior,
Raffu Khondaker, 18, Senior,
Irfan Nafi, 17, Senior,
Thomas Jefferson High School for Science and Technology, Alexandria, VA
In-person.
<https://projectboard.world/isef/project/86700>
- ETSD075T Design, Manufacture a Semi-Automatic Passion Fruit Juice Suction Machine**
An Dao, 18, Senior,
Ha Vi, 17, Junior,
Dong Du Secondary and High School, Buon Ma Thuot, Dak Lak, Viet Nam
Virtual.
<https://projectboard.world/isef/project/86706>
- ETSD076 Designing and Fabricating a Vortex Aerospike Rocket Engine**
Cayden Shaffer, 17 Senior, Whitewater High School, Fayetteville, GA
In-person.
<https://projectboard.world/isef/project/86732>
- ETSD077 The Update of the Outdated Mosquito Collection Device**
Heewon Eum, 17 Junior, North Oconee High School, Bogart, GA
In-person.
<https://projectboard.world/isef/project/86768>
- ETSD078 Innovative Climate Change Emissions Reduction: Flettner Vortex Scrubber With Active Seakeeping**
Charlotte Lenore Michaluk, 15 Sophomore, Hopewell Valley Central High School, Pennington, NJ
Virtual.
<https://projectboard.world/isef/project/86889>
- ETSD080 Study and Application of a Biomimetic Fish Propulsion System Mimicking the Body Structure and Stroke of Black Marlin for Energy-Efficient Propulsion With Respect to the Added Mass Effect**
Jake Chung, 18 Senior, Interlake High School, Bellevue, WA
In-person.
<https://projectboard.world/isef/project/87030>
- ETSD081 Measure Time With an Apple (Innovative Indicator To Determine the Duration of Consumable Goods, and Plant To Extract Raw Materials To Allow Its Industrial Production)**
Viorel Bohotici, 19 Senior, Istituto Istruzione Superiore Galileo Galilei, Jesi, Italy
In-person.
<https://projectboard.world/isef/project/87059>

**ETSD083T An Efficient and Interpretable Vehicle
Controller for Safe Navigation in
Neighborhood Environment With Riemannian
Motion Policies**

Zitong Wang, 17, Junior,

Eddy Xu, 18, Junior,

Shanghai Pinghe Bilingual School,

Shanghai, China

Miller School of Albemarle, Charlottesville, VA

Virtual.

<https://projectboard.world/isef/project/87304>

Mathematical Sciences

- MATH001 Validating a Predictive Mathematical Modelling Paradigm for Travelling From Point A to Point B**
Edward Garth, 18 Senior, Redeemer Baptist School, North Parramatta, NSW, Australia
Virtual.
<https://projectboard.world/isef/project/82888>
- MATH002 Fast and Furious: Designing an Ultra-Efficient Hybrid Matrix Multiplication Algorithm**
Meryl Zhang, 14 Freshman, R. C. Clark High School, Plano, TX
In-person.
<https://projectboard.world/isef/project/85818>
- MATH003 An Investigation on Non-Repetitive Coloring of Trees**
Yuxiang Wu, 16 Junior, Chinese International School, Hong Kong, China, Hong Kong Special Administrative Region
Virtual.
<https://projectboard.world/isef/project/83167>
- MATH004 On Ramanujan's Identity for Odd Zeta Values and Its Generalization**
Sarth Chavan, 16 Junior, Aditya English Medium School, Pune, Maharashtra, India
In-person.
<https://projectboard.world/isef/project/83249>
- MATH005 On Worker-Optimal Matchings in Many-to-Many Markets With Indifferences**
Niranjan Baskaran, 17 Senior, Gateway International School, Chennai, Tamil Nadu, India
In-person.
<https://projectboard.world/isef/project/85170>
- MATH006 Minimal Number of Monochromatic Edges in Bicolored Graphs**
Iliyas Noman, 17 Junior, Sofia High School of Mathematics, Sofia, Bulgaria
In-person.
<https://projectboard.world/isef/project/83033>
- MATH007T Solving Some Algebraic Problems With the Help of Vectors**
Leyla Abbasova, 16, Sophomore,
Nigar Mirzali, 16, Sophomore,
The Modern Educational Complex in Honour of Heydar Aliyev, Baku, Nasimi region, Azerbaijan
In-person.
<https://projectboard.world/isef/project/85875>
- MATH008 Investigation of the Cryptographic Applications of a Recurrence Relation Through Elliptic Curves and Collatz Conjecture**
Huseyin Sahin, 18 Senior, Uskudar American Academy, Istanbul, Turkey
In-person.
<https://projectboard.world/isef/project/85119>
- MATH009 A Circular Approach to the Broken Pick-Up Sticks Problem**
Yavuz Yurduseven, 19 Senior, Amasya Sehit Ferhat Unelli Bilim ve Sanat Merkezi, Amasya, Turkey
In-person.
<https://projectboard.world/isef/project/85090>
- MATH010T Study on the Solution Set of Knot Colorings**
Dongin Kim, 18, Senior,
Sihyeong Yang, 18, Senior,
Seokyoung Yoon, 18, Senior,
Korea Science Academy of KAIST, Busan, Busan, South Korea
Virtual.
<https://projectboard.world/isef/project/85121>
- MATH011 Utilizing Convergence Tests and Complex Analysis To Redefine the Provability of the Partition Formula**
Emilie Steinberg, 18 Senior, Dr. Michael M. Krop Senior High School, Miami, FL
In-person.
<https://projectboard.world/isef/project/83089>
- MATH012 LD-Based Mapping by Cluster Analysis of the GWAS To Determine a Single Variant Most Associated With Alzheimer's Disease**
Lucas Gutman, 16 Sophomore, iPrep Academy North, Miami, FL
Virtual.
<https://projectboard.world/isef/project/82730>

- MATH013 Can High School Baseball Players Optimize Their College Recruiting by Analyzing Their Athletic Metrics?**
Peter Frometa, 18 Senior, Westminster Christian School, Palmetto Bay, FL
In-person.
<https://projectboard.world/isef/project/83127>
- MATH014 Emergency Savings Fund vs. Emergency Relief Fund: An Economic Model**
Joyce Yang, 17 Junior, Bartlesville High School, Bartlesville, OK
In-person.
<https://projectboard.world/isef/project/82801>
- MATH015T The Relationship Between *Colletotrichum gloeosporioides* Distribution Area on the Skin and the Flesh of Nam Dok Mai Mangos**
Puntira Bunkokuea, 18, Senior,
Kolunya Lopradit, 18, Senior,
Thanchanok Nuenin, 18, Senior,
Princess Chulabhorn Science High School
Phetchaburi, Cha-Am, Phetchaburi, Thailand
In-person.
<https://projectboard.world/isef/project/85182>
- MATH016 Some Notes About Power Residues Modulo Prime: The Challenge To Find a Pattern of Mersenne Primes and To Discover New Primes**
Yuki Kiriu, 18 Senior, Shizuoka Salesio High School, Shizuoka City, Shizuoka Prefecture, Japan
Virtual.
<https://projectboard.world/isef/project/83276>
- MATH017 Attempting To Define Tetration of Non-Integer Heights**
Morgan Holien, 17 Senior, Monarch High School, Louisville, CO
In-person.
<https://projectboard.world/isef/project/82800>
- MATH018 The Application of Grover Quantum Algorithm in Lifting Stage Restoration Problem**
Ziru Song, 17 Junior, Beijing Academy, Beijing, China
Virtual.
<https://projectboard.world/isef/project/83026>
- MATH019 Preliminary Exploration of Fractal Geometry and the Application of Fractal Measurement To Explore the Fractal of Rock Sugar and Hydroxide**
Bozhi Bai, 16 Junior, Hefei NO.1 High School, Hefei, Anhui, China
Virtual.
<https://projectboard.world/isef/project/83007>
- MATH020TFarey Sequences and Ford Spheres in Higher Dimensions**
Ming-Te Hong, 18, Senior,
Chia-Wei Lu, 18, Senior,
The Affiliated Senior High School of National Taiwan Normal University, Taipei City, Chinese Taipei
In-person.
<https://projectboard.world/isef/project/85781>
- MATH021 Nxnxn Rubik's Cubes and God's Number**
Daniel Salkinder, 17 Senior, Half Hollow Hills High School East, Dix Hills, NY
In-person.
<https://projectboard.world/isef/project/83022>
- MATH022 Analyzing the Value of a Lego Investment Based on the Set's Factors**
Kevin Durden, 16 Sophomore, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/82761>
- MATH023 Exact Analytical Solutions and Bifurcation Analysis of the Modified SIR Model With Time Dependent Population and Vaccination**
Zulfa Zakia, 16 Junior, Madrasah Aliyah Putri PUI Talaga, Majalengka, West Java, Indonesia
Virtual.
<https://projectboard.world/isef/project/85879>
- MATH024 Functional Analysis of Parameterized Torus Knots**
Nhi Dao, 17 Junior, Caddo Parish Magnet High School, Shreveport, LA
In-person.
<https://projectboard.world/isef/project/82920>
- MATH025 Random Forest To Predict Dengue Cases and Outbreaks**
Sanuja Manage, 16 Junior, College Park High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/85220>

- MATH026 Finding Number Sequences Using the Pascal Triangle and the Newton Binomial**
 Karina Miranda, 15 Sophomore, CROEM HS,
 Mayaguez, Puerto Rico, Puerto Rico
 Virtual.
<https://projectboard.world/isef/project/85300>
- MATH027 The Perimeter of an Ellipse and New Suggested Formula K**
 Helen Li, 17 Junior, Dr. Pedro Albizu Campus,
 Ponce, Puerto Rico
 Virtual.
<https://projectboard.world/isef/project/85772>
- MATH028T COVID-19: The Effect on the CNMI's Visitors**
 Vidal Camacho, 16, Junior,
 Brent Matthew Ortizo, 17, Junior,
 Mount Carmel School, Saipan, Northern
 Mariana Islands
 Virtual.
<https://projectboard.world/isef/project/85860>
- MATH029T Preserving Uru'ngauwit Batik by Applying a Geometry Transformation Approach**
 Nadia Aulia, 18, Senior,
 Putri Irmayanti, 18, Senior,
 SMAN 1 Nunukan, Nunukan, Kalimantan Utara,
 Indonesia
 Virtual.
<https://projectboard.world/isef/project/85228>
- MATH030 From the Manhattan Project to Statistics of Zeros of L-Functions**
 Jiahui Li, 17 Junior, Emma Willard School,
 Troy, NY
 In-person.
<https://projectboard.world/isef/project/85617>
- MATH031 A Heuristic Solution to the Closest String Problem Using Wave Function Collapse Techniques**
 Shirley Xu, 16 Junior, The Bishop's School, CA
 Virtual.
<https://projectboard.world/isef/project/85620>
- MATH032 Schrodinger Bridges on Discrete Domains**
 Donald Liveoak, 18 Senior, Allen Park High
 School, Allen Park, MI
 In-person.
<https://projectboard.world/isef/project/85638>
- MATH033 Modifying the ABCs of Number Theory**
 Akilan Sankaran, 14 Freshman, Albuquerque
 Academy, Albuquerque, NM
 In-person.
<https://projectboard.world/isef/project/85951>
- MATH034 Gauss Circle Primes**
 Thomas Ehrenborg, 16 Junior, Henry Clay High
 School, Lexington, KY
 Virtual.
<https://projectboard.world/isef/project/86246>
- MATH035 On Lucas Sequences of the First Kind With Finitely Many Primes**
 Aaron Kim, 17 Sophomore, Bronx High School
 of Science, Bronx, NY
 In-person.
<https://projectboard.world/isef/project/86290>
- MATH036 Using Arithmetic To Determine a Future Time**
 Mohammad Ahmad, 17 Senior, Dr. Pedro Albizu
 Campus, Ponce, Puerto Rico
 Virtual.
<https://projectboard.world/isef/project/86373>
- MATH037 Factorizations in Evaluation Monoids of Laurent Semirings**
 Sophie Zhu, 15 Junior, Williamsville East High
 School, East Amherst, NY
 In-person.
<https://projectboard.world/isef/project/86675>
- MATH038 Determining the Pebbling Number for Endpoint Root Vertices of Generalized Theta Graphs**
 Kevin Liu, 16 Junior, High Technology High
 School, Lincroft, NJ
 In-person.
<https://projectboard.world/isef/project/86735>
- MATH039 Products of Reflections in Smooth Bruhat Intervals**
 Ram Goel, 17 Junior, Krishna Homeschool,
 Portland, OR
 In-person.
<https://projectboard.world/isef/project/86772>

Materials Science

MATS001 An Evaluation of the Performance of Post-Use Firefighter Turnout Gear Using NFPA Standards

Zane Carter, 17 Junior, Haines City IB East, Lake Wales, FL

In-person.

<https://projectboard.world/isef/project/83263>

MATS002T Preparation of a Superhydrophobic and Oleophilic Membrane Inspired by Taro Leaves for Oil-Water Separation

Devika Girish, 17, Senior,
Sara Varghese, 18, Senior,
St. Peter's Senior Secondary School,
Kolenchery Ernakulam, Kerala, India
Virtual.

<https://projectboard.world/isef/project/82875>

MATS003T Silver Nanowire On-Skin Flexible Electrodes for Electrophysiological Monitoring

Woojin Hong, 17, Junior,
Jonathan Lu, 16, Junior,
Concordia International School Shanghai,
Shanghai, Pudong, China
Virtual.

<https://projectboard.world/isef/project/83030>

MATS004 A New Polysiloxane/Ceramic Composite for Space and Nuclear Fusion Applications

Feridun Balaban, 18 Senior, Malatya Bilim ve Sanat Merkezi, Malatya, Malatya, Turkey
In-person.

<https://projectboard.world/isef/project/85117>

MATS005 Studying the Effects of Print Angle on the Impact Resistance of 3D Printed Pieces

Jared Geppert, 15 Freshman, Blaine High School, Blaine, MN
Virtual.

<https://projectboard.world/isef/project/83179>

MATS006T A Novel Type of Piezoelectric Device: Development and Utilization of Bio Piezoelectric Device Using Jellyfish Collagen

Minseo Jo, 16, Junior,
Seonwoo Kang, 16, Junior,
Chungnam Science High School, Gongju Si, Chungcheongnamdo, South Korea
Virtual.

<https://projectboard.world/isef/project/82736>

MATS007 Analysis and Classification of Directional Motions of Cholesterol Crystals Surfing on a Lipid Membrane

Melissa Kim, 16 Sophomore, Seoul International School, Seoul, Gyunggi-Do, South Korea
Virtual.

<https://projectboard.world/isef/project/83054>

MATS008 Green Interpenetrated Silicone-Based Elastomeric Webs Engineered as Wave Energy Harvesters

Luiza Ionescu, 18 Senior, Mihai Viteazul National College, Bucharest, Bucharest, Romania
In-person.

<https://projectboard.world/isef/project/82830>

MATS009T Rebuilding the Zeppelin: The Power and Purity of Hydrogen

Robert Gavin, 18, Senior,
Cameron Tinney, 17, Senior,
Veritas Christian Community School,
Sierra Vista, AZ
Virtual.

<https://projectboard.world/isef/project/82783>

MATS010 Shining Lights: How Curing Lights Polymerize Different Thicknesses of Pigmented Dental Fillings

Fatima Duran, 18 Senior, Yuma High School, Yuma, CO
In-person.

<https://projectboard.world/isef/project/83271>

MATS011 Three-Dimensional Hierarchical Porous Electrode Structure for Improved Performance in Battery Applications

Alan Wang, 17 Junior, Westlake High School, Austin, TX
In-person.

<https://projectboard.world/isef/project/83168>

MATS012T A Novel Hemp Reinforced Auxetic Structure To Develop Sustainable Wind Turbine

Iclal Seker, 19, Senior,
Safa Merve Zehiroglu, 18, Senior,
Atakum Anadolu Imam Hatip Lisesi, Samsun, Atakum, Turkey
In-person.

<https://projectboard.world/isef/project/85180>

- MATS013T WO-: Preparation and Application of SERS Substrate Materials**
Hio Cheng Ho, 16, Junior,
Ka I Lou, 17, Junior,
Hoi Lei Song, 18, Junior,
Macao Pooito Middle School, Macao, China,
Macao Special Administrative Region
Virtual.
<https://projectboard.world/isef/project/82940>
- MATS014 Solving the Worldwide Mask Pollution Crisis: A Biodegradable High-Performance Low-Cost Mask Made From Natural Polymers**
Enshuo Zhang, 16 Sophomore, The High School
Affiliated to Renmin University of China, Beijing,
Beijing, China
Virtual.
<https://projectboard.world/isef/project/83181>
- MATS015 Development of Highly Efficient and Environmentally Friendly CsSnI₃ Perovskite Materials for Solar and Thermoelectric Energy Harvesting**
Tahani Ahmed, 15 Sophomore, KFUPM Schools,
Dhahran, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85870>
- MATS016 Boosting the Photoelectrochemical Water Splitting Performance of CuO-Cu₂O Heterojunction Thin Films**
Elaf Muayqil, 17 Senior, Riyadh School for Boys
and Girls, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85088>
- MATS017 Development of High Performance Nanocrystalline BiO_{0.8}Cu_xSb(1.2-x)Te₃ Thermoelectric Films Using Advanced Pulsed Laser Deposition**
Lama Al Sayid, 16 Junior, KFUPM Schools,
Dhahran, Eastern Province, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85291>
- MATS018 Date Seeds Derived Phosphorus and Nitrogen Doped Graphene Oxide for Supercapacitor Applications**
Naif Al Qahtani, 18 Senior, Abha Private School,
Abha, Aseer, Saudi Arabia
Virtual.
<https://projectboard.world/isef/project/85105>
- MATS019 Enhancing the Photostability and Efficiency of Tin-Lead Perovskite Solar Cells Using Nickel Oxide and Self Assembled Monolayers**
Muhanad Alammari, 17 Senior, Riyadh School
for Boys and Girls, Riyadh, Saudi Arabia
Virtual.
<https://projectboard.world/isef/project/85307>
- MATS020T Synergistic Effects of Polysaccharides on Protein Adsorption and Tribological Behaviors of Orthokeratology Lens**
Hsin Chang, 16, Junior,
Kai Ting Lin, 17, Junior,
Taipei Municipal LiShan High School, Taipei
City, Chinese Taipei
In-person.
<https://projectboard.world/isef/project/85887>
- MATS021 Programmable Matter: A Microscale, Self-Reconfigurable, Modular Robotic Metamaterial**

Sohi Patel, 16 Junior, College Park High School,
The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/83126>
- MATS022T Vegan Leather Obtained From *Cedrus deodara***
Syeda Umm E Kulsoom Bukhari, 19, Senior,
Talia Kulsoom, 18, Senior,
PakTurk Maarif International School and
Colleges, Gulshan-e-Iqbal, Girls Campus,
Karachi, Sindh, Pakistan
In-person.
<https://projectboard.world/isef/project/85810>
- MATS023 Generating Bioplastics From Banana Peels: An Innovative Approach To Reduce Artificial Plastic Pollution**
Caroline Guerra, 17 Junior, Community School
of Naples, Naples, FL
In-person.
<https://projectboard.world/isef/project/85092>
- MATS024 Engineering of Antimicrobial Bioplastics From Invasive Algae *Caulerpa prolifera*, *Undaria pinnatifida*, and Waste Corn Cobs**
Julianna Serna-Ortiz, 15 Sophomore, Harvest
Preparatory Academy, Yuma, AZ
In-person.
<https://projectboard.world/isef/project/85099>

- MATS025 "Weather" Leather Will Withstand**
Audrey Rumney, 15 Freshman, Cascade Public Schools, Cascade, MT
In-person.
<https://projectboard.world/isef/project/83052>
- MATS026 DiSCoVeR: An Attention and Density-Based Machine Learning Algorithm for Discovering Novel Superhard Materials**
Marianne Liu, 16 Junior, West High School, Salt Lake City, UT
In-person.
<https://projectboard.world/isef/project/85126>
- MATS027 3D Printed Foam Structures for Safer High School Football Helmets**
Varun Nathan, 17 Junior, James Madison Memorial High School, Madison, WI
In-person.
<https://projectboard.world/isef/project/85152>
- MATS028 Increase the Conductivity and the Crystallinity of PP by CNPs**
Rashed Abu Saleh, 16 Junior, Jubilee School, Amman, Jordan
In-person.
<https://projectboard.world/isef/project/85255>
- MATS029 Magnetic Brakes**
Tameem Masadeh, 14 Freshman, Levant International School, Amman, Jordan
In-person.
<https://projectboard.world/isef/project/83169>
- MATS030 The Degradation of H₂S Through the Utilization of UV-C Light and a TiO₂ Quartz Felt Photocatalyst**
Keanna Luo, 16, Junior,
Alexander Wu, 17, Junior,
Baton Rouge Magnet High School,
Baton Rouge, LA
In-person.
<https://projectboard.world/isef/project/85251>
- MATS031 Novel Biodegradable and Eco-Friendly Porous Carbon Dioxide Adsorbent Porous Coordination Polymer**
Samantha Kaseke, 18 Senior, Queen Elizabeth Girls' High School, Harare, Zimbabwe
In-person.
<https://projectboard.world/isef/project/85753>
- MATS032 Moon-opoly: Utilizing *in situ* Resources (ISRU) for the Construction of Lunar Concrete**
Nathaniel Ellis, 15 Sophomore, Durango High School, Durango, CO
In-person.
<https://projectboard.world/isef/project/85157>
- MATS033 Clay Polymer Nanocomposite for Efficient and Rapid Removal of Organic Matter From Water**
Idan Zilcha, 16 Junior, Harel High School, Mevaseret Zion, Israel
In-person.
<https://projectboard.world/isef/project/85151>
- MATS034 Biogrape: Bacterial Cellulose Biosynthesis Using Grape Byproduct, Phase II**
Amanda Machado, 16 Senior, Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul (IFRS) - Campus Osório, Osorio, Rio Grande do Sul, Brazil
In-person.
<https://projectboard.world/isef/project/85823>
- MATS035 Mechanical Properties of Antimicrobial Starch-Based Plastic Food Storage Films Phase II**
Libby Knipper, 17 Junior, Beckman Catholic High School, Dyersville, IA
In-person.
<https://projectboard.world/isef/project/85574>
- MATS036 Designing 3D Printed Diatom-Biomimicking Materials Using Unsupervised Machine Learning**
Aaditya Saha, 18 Senior, Chamblee Charter High School, Chamblee, GA
In-person.
<https://projectboard.world/isef/project/85577>
- MATS037 Optimization of Magnetic Nanoparticle Load in Fluorescent Magnetic Nanocarriers for Application in Magnetic Hyperthermia**
Anny Gabriela Marcal de Carvalho Araujo, 18 Senior, Centro de Ensino e Pesquisa Aplicada à Educacao, Goiania, Goiás, Brazil
In-person.
<https://projectboard.world/isef/project/85837>
- MATS038 Growing Sustainable Packaging Material With Mycelium and Agricultural Waste**
Luca Gagliano, 16 Junior, Athens High School, The Plains, OH
In-person.
<https://projectboard.world/isef/project/85637>

- MATS039 Biodegradable Chitosan-Silver Hydrogel as a Delivery Mechanism for Cyclic Lipopeptide-4**
Satviki Singh, 18 Senior, Florida Atlantic University High School, Boca Raton, FL
In-person.
<https://projectboard.world/isef/project/85916>
- MATS040 Cyclo.Cloud: Development of Fish Scale Waste-Derived Materials for Adsorbance of Aquatic Pollutants**

Jacqueline Prawira, 17 Senior, Mountain House High School, Mountain House, CA
Virtual.
<https://projectboard.world/isef/project/85937>
- MATS041 ScGAN: A Generative Adversarial Network To Predict Hypothetical Superconductors**
Evan Kim, 16 Junior, Nikola Tesla STEM High School, Redmond, WA
In-person.
<https://projectboard.world/isef/project/85941>
- MATS042T MXene Synthesis Using Lewis Acidic Etching for Li-Ion Battery Applications**
Samadhi Attanayaka, 17, Junior,
Salena Zhu, 16, Junior,
Kalamazoo Area Mathematics and Science Center, Kalamazoo, MI
In-person.
<https://projectboard.world/isef/project/86057>
- MATS043 Growth and Characterization of 2D Magnetic Materials**
Taksh Patel, 16 Junior, Fayetteville High School, Fayetteville, AR
In-person.
<https://projectboard.world/isef/project/86070>
- MATS044T Mighty Wood: We Transform the Cardboard's Waste Into a Better Substitute of Wood-Based Planks**
Giovanny Exilus, 19, Senior,
Daraelle Ismael, 19, Senior,
Christopher Laguerre, 18, Senior,
College Dominique Savio, Petion-Ville,
Port-au-prince, Haiti
In-person.
<https://projectboard.world/isef/project/86212>
- MATS045 Development and Characterization of a Novel Laponite-Enhanced Tannic Acid-Based Hydrogel**
Nolan Wen, 17 Junior, American Heritage School of Boca Delray, Delray Beach, FL
In-person.
<https://projectboard.world/isef/project/86229>
- MATS046 Development of a Magneto-Optical Kerr Effect System To Study Magnetic Molecules**
Jonathan Yang, 15 Sophomore, Carmel High School, Carmel, IN
In-person.
<https://projectboard.world/isef/project/86242>
- MATS047 "Sotong"-Nidin: The Detection of Squid Freshness Using Red Cabbage Extract (RCE)**
Rui Xuan Lee, 18 Senior, Nanyang Junior College, Singapore, Singapore
Virtual.
<https://projectboard.world/isef/project/86262>
- MATS048 Rapid Detection and Inactivation of SARS-CoV-2 with Bio-Conjugated Nanomaterial**

Vinod Ruppa-Kasani, 17 Junior, Chattahoochee High School, Johns Creek, GA
In-person.
<https://projectboard.world/isef/project/86359>
- MATS049 One Fish, Two Fish, Bright Fish, Clean Fish: Thermal Induced Biofluorescence of Fish Scale for Enhanced Chemical Adsorptivity**
Malcolm Sow, 18 Senior, National University of Singapore High School of Mathematics and Science, Singapore, Singapore
Virtual.
<https://projectboard.world/isef/project/86376>
- MATS050 Synthesis of 2D Tin-Sulfide Nanosheets Through Liquid Phase Exfoliation**
Sanjana Mupparaju, 17 Senior, The Alabama School of Math and Science, Mobile, AL
In-person.
<https://projectboard.world/isef/project/86537>
- MATS051 Creating a Unique Floating Concrete**
Jesse Kemper, 15 Freshman, Pratt High School, Pratt, KS
In-person.
<https://projectboard.world/isef/project/86642>

MATS052 Biodegradable Plastic Made Up by *Tacca leontopetaloides* Starch

Thu Tran, 17 Senior, Thu Khoa Nghia Highschool for the Gifted, Chau Doc, An Giang, Viet Nam
Virtual.

<https://projectboard.world/isef/project/86704>

MATS053 Deployment of Thermoplastic and Thermosetting Technologies To Improve the Durability of Solar Sails

Destynn Keuchel, 18 Senior, Hawken School, Gates Mills, OH
In-person.

<https://projectboard.world/isef/project/86890>

MATS054 Developing Novel Plant Waste-Based Hydrogels for Skin Regeneration and Infection Detection in Diabetic Wounds

Calvin Mathew, 15 Freshman, American Heritage School, Plantation, FL
Virtual.

<https://projectboard.world/isef/project/86976>

MATS055 CarbNN: A Novel Active Transfer Learning Neural Network to Build *de novo* Metal Organic Frameworks (MOFs) for Carbon Capture

Neel Redkar, 17 Junior, Dougherty Valley High School, San Ramon, CA
In-person.

<https://projectboard.world/isef/project/87117>

Microbiology

MCRO001 The Clash of the Modern Crises: A Study Investigating the Development of Antibiotic Resistance in *Escherichia coli* Under Increasing Carbon Dioxide

Tahlia Martignago, 18 Senior, Menai High School, Illawong, New South Wales, Australia
Virtual.

<https://projectboard.world/isef/project/83224>

MCRO002 Laboratory Investigations of a Possible Biosignature at Columbia Hills, Mars

Lily Miranda, 18 Senior, Brigidine College Randwick, Randwick, NSW, Australia
Virtual.

<https://projectboard.world/isef/project/83233>

MCRO003 Computational Analysis of the Cystic Fibrosis Lung Microbiome and Development of a Non-Toxic Quorum Quenching Cocktail Therapy To Inhibit Multispecies Biofilm Proliferation

Shriya Bhat, 17 Junior, Plano East Senior High School, Plano, TX
In-person.

<https://projectboard.world/isef/project/83201>

MCRO004 The Development of an Effective Antibiotic Treatment To Limit the Bacterial Growth of *Staphylococcus epidermidis* on Total Joint Arthroplasties

Raven Pascua, 18 Senior, Wiregrass Ranch High School, Wesley Chapel, FL
In-person.

<https://projectboard.world/isef/project/83083>

MCRO005T Identifying Metabolites in *Aspergillus heteromorphus* and *Magnaporthe grisea* and the Overproduction of Cytochalasins

Arianna Fa, 16, Junior,
Neha Singaravelan, 17, Junior,
Texas Academy of Mathematics and Science,
Denton, TX
Virtual.

<https://projectboard.world/isef/project/83115>

MCRO006T Gene Expression Mechanism of Alternative Sigma Factors SigE and SigB Inducing Rifampicin Resistance in *Mycobacterium Smegmatis*

Jungho Kim, 18, Junior,
Minjae Kim, 18, Junior,
Sanghyun Park, 17, Senior,
Korea Science Academy of KAIST, Busan,
Busan, South Korea
Virtual.

<https://projectboard.world/isef/project/83204>

MCRO007 Utilizing Glycolysis in *Streptococcus pyogenes* To Model Gastrointestinal Stromal Tumors (GISTs) in Response to Endogenous Stimulus-Powered Nanoreactors (Year 6)

Om Patel, 18 Senior, Eau Gallie High School, Melbourne, FL
In-person.

<https://projectboard.world/isef/project/82923>

MCRO009 New Research, Old Medicine: Exploring Antibacterial Properties of Plants and Fungi Used in Indigenous Medicine

Caroline Schlehber, 18 Senior, Visitation School, Mendota Heights, MN
In-person.

<https://projectboard.world/isef/project/83080>

MCRO010 A Look into the Tiny Earth: Finding Antibiotic Producing Bacteria in Yellowstone Soil

Elizabeth Levinshteyn, 15 Freshman, Spring Lake Park High School, Blaine, MN
Virtual.

<https://projectboard.world/isef/project/83236>

MCRO011T Germs and You

Aubrie Aguilar, 16, Junior,
Juan Avila, 18, Senior,
Alexis Gonzales, 17, Junior,
Marfa High School, Marfa, TX
In-person.

<https://projectboard.world/isef/project/83199>

- MCRO012 **Determining If Bacterial Genera Found in Natural Bat Roosts Are Known Fungal Inhibitors of *Pseudogymnoascus destructans* (Pd) (Y7)**
Calvin Carpenter, 16 Sophomore, All Saints Episcopal High School, Lubbock, TX
In-person.
<https://projectboard.world/isef/project/82903>
- MCRO013 **Inhibiting *Streptococcus mutans* With Antibacterial and Antioxidant Hibiscus Polyphenolic Compounds**
Isabella Scalise, 18 Senior, Wilsonville High School, Wilsonville, OR
In-person.
<https://projectboard.world/isef/project/83266>
- MCRO014 **Decomposition of Microplastics by *Tenebrio molitor* (Mealworm) Intestinal Facultative Anaerobes Facilitate Wheat Growth**
Yujia Ji, 17 Junior, No. 2 High School of East China Normal University, Shanghai, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82914>
- MCRO015 **Aquatic Plant Surface Micro-Flora and the Coliform Response**
Maddie Kirklin, 16 Sophomore, Live Oak Classical School, Waco, TX
In-person.
<https://projectboard.world/isef/project/82740>
- MCRO016 **Improving the Dental Health in Developing Countries With a Toothpaste Infused With *Psidium guajava* and *Acmella oleracea* Extracts Against Tooth Decay Causing Bacteria *Streptococcus mutans***
Ashley Valencia, 15 Sophomore, Harvest Preparatory Academy, Yuma, AZ
In-person.
<https://projectboard.world/isef/project/83084>
- MCRO017 **Developing a Monomolecular Model To Describe the Disease Progress Curve for Early Blight in Tomato (*Solanum lycopersicum*), Potato (*Solanum tuberosum*), and Bell Pepper (*Capsicum annuum*), Treated With Novel Microbial Formulations**
Shloke Patel, 16 Junior, Hillsborough High School, Tampa, FL
In-person.
<https://projectboard.world/isef/project/85196>
- MCRO018 ***Pseudomonas stutzeri* VR2004 for Green Synthesis of ZnO Loaded Onto a Starch-Gelatine Biopolymer Matrix for Remediation of Xenobiotics in Aquatic Systems**
Vishwadeep Balakrishnan, 17 Senior, Shiva Niketan School, Mangalam, Tamil Nadu, India
In-person.
<https://projectboard.world/isef/project/82909>
- MCRO019 **Characterizing the Secretion of the *Francisella tularensis* Protein FTL_1123**
Lakshanna Raveendran, 17 Senior, Commack High School, Commack, NY
In-person.
<https://projectboard.world/isef/project/83252>
- MCRO020 **The Influence of Sound Frequencies on Bacterial Growth: A New Perspective on a New Research Field**
Nanna Kalmar, 18 Senior, Egaa Gymnasium, Aarhus, Midtjylland, Denmark
In-person.
<https://projectboard.world/isef/project/83165>
- MCRO021 **Beat That Blemish**
Skylar Rattana, 16 Junior, Southeast High School, Bradenton, FL
In-person.
<https://projectboard.world/isef/project/82774>
- MCRO022 **What's Lurking in Your Mask?**
Chloe Rychener, 17 Junior, Grants High School, Grants, NM
In-person.
<https://projectboard.world/isef/project/82838>
- MCRO023T **The Antimicrobial Effect of Heavy Metals Nanoparticles on Bacteria**
Yara Daqa, 16, Junior,
Sidra Naser, 17, Junior,
Jubilee School, Amman, Jordan
In-person.
<https://projectboard.world/isef/project/85064>
- MCRO024 **Evaluation of Three Naturally Occurring Phytochemicals as Alternatives to Aminoglycosides on the Inhibition of *Escherichia coli in vitro***
Niveditha Suresh, 18 Senior, Floyd B. Buchanan High School, Clovis, CA
In-person.
<https://projectboard.world/isef/project/85267>

- MCRO025 The Resistance of Bacteria**
Carter Brotherton, 16 Sophomore, Great Mills High School, Great Mills, MD
Virtual.
<https://projectboard.world/isef/project/85880>
- MCRO026 Determining Which Acne Medications Prevent the Growth of *Staphylococcus epidermis* Most Successfully**
Avi Crosby, 16, Sophomore,
Solunne Fedovskiy, 15, Sophomore,
Lily Reilly, 16, Sophomore,
Henry W. Grady High School, Atlanta, GA
In-person.
<https://projectboard.world/isef/project/85866>
- MCRO027 Characterizing HBV Viral Particles Propagated by Five Different Host Methods**
Annabel Tiong, 16 Junior, Northwood High School, Irvine, CA
In-person.
<https://projectboard.world/isef/project/85166>
- MCRO028 How Do Endophytic Bacteria From Mango Affect the Growth of Fungus *Botrytis cinerea* and the Use of 16S rDNA Sequence To Identify Bacteria?**
Madison Adkins, 17 Junior, Lincoln Park Academy, Fort Pierce, FL
In-person.
<https://projectboard.world/isef/project/85163>
- MCRO029 Assessment of Alternative Antimicrobial Substances on *Staphylococcus epidermidis***
Joyce Essuman, 18 Senior, Nicolet High School, Glendale, WI
In-person.
<https://projectboard.world/isef/project/85060>
- MCRO030 Exploiting Plasmid-Mediated Resistance: Discovery of Small-Molecule Inhibitors for the Artificial Activation of the Kid-Kis Toxin-Antitoxin System in Plasmid R1**
Pinyu Liao, 16 Junior, Inglemoor High School, Kenmore, WA
In-person.
<https://projectboard.world/isef/project/85838>
- MCRO031 Evaluating the Carbon Degradation Potential of Marine Plasmids**
Pranav Moudgalya, 18 Senior, University High School, Irvine, CA
In-person.
<https://projectboard.world/isef/project/85867>
- MCRO032 A Solid State: Growing *Chlorella vulgaris* in Different Media**
Mark Lin, 16 Sophomore, Palos Verdes High School, Palos Verdes Estates, CA
In-person.
<https://projectboard.world/isef/project/85578>
- MCRO033 Changing the Martian Atmosphere: Examining Lichen's Effect on Oxygen Percentage in a Simulated Martian Atmosphere**
Fiona Dreesbach, 17 Senior, Hayfield Secondary School, Alexandria, VA
In-person.
<https://projectboard.world/isef/project/85754>
- MCRO034 Anti-Biofilm Activity of Isolated Bacteriophages for the Treatment of Multidrug-Resistant Pulmonary Infections**
Julia Brodsky, 16 Junior, H-B Woodlawn Secondary Program, Arlington, VA
Virtual.
<https://projectboard.world/isef/project/85853>
- MCRO035 Investigating the Effectiveness of the Eradication of *Microcystis aeruginosa* Using Sonication and Magnetic Filtration**
Ashlyn Hutchinson, 18 Senior, Hudson Falls High School, Hudson Falls, NY
In-person.
<https://projectboard.world/isef/project/85587>
- MCRO036 Analysis of Antibiotic and Disinfectant Resistance in *E. coli* Implicated UTIs**
Laci Goldner, 17 Junior, Grove High School, Grove, OK
In-person.
<https://projectboard.world/isef/project/85801>
- MCRO037 Antibacterial Potential of Brazilian Green Propolis in Periodontitis Treatment**
Maria Eduarda Ferreira, 17 Senior, Escola Estadual Prof. José Ignácio de Sousa, Uberlândia, MG, Brazil
In-person.
<https://projectboard.world/isef/project/85652>
- MCRO038 Turmeric Bandage: A Natural and Sustainable Way for Faster Wound Healing**
Ishita Mukadam, 16 Sophomore, Maharishi School of the Age of Enlightenment, Fairfield, IA
In-person.
<https://projectboard.world/isef/project/85581>

- MCRO039 Inhibition of *Staphylococcus epidermidis* Utilizing Borate-Based and Silica-Based Bioactive Glass**
Lindsey Preston, 16 Junior, Conrad Weiser High School, Robesonia, PA
In-person.
<https://projectboard.world/isef/project/85575>
- MCRO040 Bacteriophage Resistance in *E. coli* Impacts Sensitivity to Antibiotics**
Maya Zheng, 17 Junior, Massachusetts Academy of Math and Science at WPI, Worcester, MA
Virtual.
<https://projectboard.world/isef/project/85913>
- MCRO041 Antibacterial Effectiveness of Hand Soaps**
Elise Elliot, 16 Sophomore, Hankinson Public School, Hankinson, ND
In-person.
<https://projectboard.world/isef/project/85949>
- MCRO042 The Inhibitory Effects of Essential Oils on *Staphylococcus epidermidis* Biofilms on Stainless Steel and Glass**
Catherine Przybyla, 18 Senior, Archbishop Walsh Academy, Olean, NY
Virtual.
<https://projectboard.world/isef/project/85984>
- MCRO043 Cross-Species Transmission of *Drosophila melanogaster* Nora Virus in Other Species of Insect and the Prevalence of Nora Virus in Insect Populations in Central Nebraska**
Ella Buhlke, 18 Senior, Central City High School, Central City, NE
Virtual.
<https://projectboard.world/isef/project/86062>
- MCRO044 Antibiotic Resistance**
Jada Bonogofsky, 17 Junior, Flasher High School, Flasher, ND
Virtual.
<https://projectboard.world/isef/project/86120>
- MCRO046 Designing a Litter Box That Neutralizes *Toxoplasma gondii*: A Parasite That Causes Toxoplasmosis in Humans**
Doonya Khan, 16 Junior, Center for Advanced Technical Studies, Chapin, SC
In-person.
<https://projectboard.world/isef/project/86260>
- MCRO047T Comparison of Commercial and Natural Disinfectants and Their Effect on Microorganisms**
Katarina Fabulova, 17, Junior, Laura Ivancova, 17, Junior, Saint Nicholas Grammar School, Presov, Slovakia
In-person.
<https://projectboard.world/isef/project/86381>
- MCRO048T Growth of a Possible Bacteria That Degrades Polyethylene Terephthalate (PET) Particles in a Controlled Environment**
Diego Corales Casillas, 18, Senior, Joy Velazquez Colon, 18, Senior, The San Juan Math, Science and Technology Center, San Juan, PR
In-person.
<https://projectboard.world/isef/project/86384>
- MCRO049 Antimicrobial Activity of Garlic and Ginger Extracts Against Oral Bacteria**
Disha Ram, 15 Freshman, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/86595>
- MCRO050 Real-Time Imaging Reveals the Antimicrobial Effectiveness of Natural Bromelain on Bacteria**
Madelyn Cerney, 18 Senior, Marian High School, Mishawaka, IN
In-person.
<https://projectboard.world/isef/project/86639>
- MCRO051 Genome Engineering of Bacteriophage MooMoo**
Sahil Chhabra, 17 Senior, The Carol Martin Gatton Academy of Mathematics and Science in Kentucky, Bowling Green, KY
Virtual.
<https://projectboard.world/isef/project/86644>
- MCRO052 Animals vs. Human Bacteria**
Abrianna Volz, 15 Freshman, Tioga High School, Tioga, ND
Virtual.
<https://projectboard.world/isef/project/86659>

- MCRO053 Function of Neurons AVA, BAG, and RIM in Response to an Aversive Stimulus in *Caenorhabditis elegans***
 Maya Sarikonda, 18 Senior, Sylvania Northview High School, Sylvania, OH
 In-person.
<https://projectboard.world/isef/project/86688>
- MCRO054 Thrautochytrids: The Understudied Coral Symbionts**
 George Warfel, 17 Senior, Lancaster Country Day School, Lancaster, PA
 In-person.
<https://projectboard.world/isef/project/86692>
- MCRO055 Abundance of Multidrug Resistant Genes (MDRs) in Suburban Residential Community Soil**
 Anand Shah, 14 Freshman, Unionville High School, Kennett Square, PA
 In-person.
<https://projectboard.world/isef/project/86733>
- MCRO056 Monitoring the Cellular Immune Profiles of COVID-Vaccinated Donors Using *in silico*-Designed Immunogenic Epitopes From SARS-CoV-2 Proteins**
 Rayan Jawa, 16 Senior, Holmdel High School, Holmdel, NJ
 In-person.
<https://projectboard.world/isef/project/86734>
- MCRO057 Identifying the Role of Alternative Ribosomes in Inducing Biofilm Formation**
 Ayana Sakamoto, 18 Senior, President Theodore Roosevelt High School, Honolulu, HI
 Virtual.
<https://projectboard.world/isef/project/86769>
- MCRO058 Modeling Quorum Sensing Cycles in *Pseudomonas aeruginosa* Using Longitudinal Approaches by Measuring Gene Expression**
 Maryam Abdel-Azim, 15 Sophomore, Central Bucks High School East, Doylestown, PA
 In-person.
<https://projectboard.world/isef/project/86777>
- MCRO059 The Effect of Different Types of Masks on the Amount of Bacteria Spread**
 Nicole Lee, 14, Freshman,
 Brianna Nguyen, 15, Freshman,
 Wilbert Tucker Woodson High School,
 Fairfax, VA
 In-person.
- <https://projectboard.world/isef/project/86825>
- MCRO060 The Effects of Mississippi River Pollutants on the Growth of *Microcystis aeruginosa***
 Emerson Morris, 17 Junior, St. Patrick Catholic High School, Biloxi, MS
 In-person.
<https://projectboard.world/isef/project/86846>
- MCRO061 Antibiotics vs. Essential Oils**
 Alivia Geffre, 16 Sophomore, Flasher High School, Flasher, ND
 Virtual.
<https://projectboard.world/isef/project/86848>
- MCRO062 Bacterial Growth in Runner's Shoes**
 Hanna Spoon, 17 Junior, St. Clair High School, St. Clair, MO
 In-person.
<https://projectboard.world/isef/project/86852>
- MCRO063 Use of Zizphus Leaves Extract as a Safe Alternative Against Some Isolated Fungi From Soil**
 Raghad Abu Halawa, 18, Senior,
 Raghad Alkhuzaei, 16, Junior,
 Zubaida Secondary School for Girls, Al-Doha, Al-Doha, Qatar
 Virtual.
<https://projectboard.world/isef/project/86863>
- MCRO064 Eukaryotic Algicide: Environmental Remediation of Harmful Algal Blooms via Microencapsulation for Bioactivation of Programmed Cell Death**
 # Christopher Kwok, 17, Junior,
 # Nicholas Kwok, 17, Junior,
 Sequoia High School, Redwood City, CA
 In-person.
<https://projectboard.world/isef/project/87142>
- MCRO065 Creating Novel Bacteriophage Solutions as a Preventative Measure for *Escherichia coli* Biofilm Formation on Elastomer Biomaterials in Medically Relevant Settings *in vitro***
 Gabriella La Cour, 17, Junior,
 Alahna Moreno, 16, Junior,
 Anisha Ramakrishnan, 16, Junior,
 Governor's School at Innovation Park,
 Manassas, VA
 Virtual.
<https://projectboard.world/isef/project/87331>

Physics and Astronomy

- PHYS001 Quantifying the Emissions Per Kg Mass Returned From an Asteroid Mining Mission**
Benjamin Ritchie, 18 Senior, Barrenjoey High School, Avalon, NSW, Australia
Virtual.
<https://projectboard.world/isef/project/80640>
- PHYS002 Particle Physics: Does Altitude Affect the Quantity of Background Radiation?**
Amelie Nanclares, 16 Junior, Kirrawee High School, Sydney, New South Wales, Australia
Virtual.
<https://projectboard.world/isef/project/82767>
- PHYS003 Optimization of Distributed Phased Arrays**
Akash Anand, 18 Senior, Palos Verdes Peninsula High School, Rolling Hills Estates, CA
In-person.
<https://projectboard.world/isef/project/82873>
- PHYS004T The Affect of Airfoil Characteristics on the Laminarity of Fluid Flow**
James Kearin, 16, Junior,
Vaughn Sirkis, 17, Junior,
Vanguard High School, Ocala, FL
In-person.
<https://projectboard.world/isef/project/83005>
- PHYS005 Dynamic Contact Angle Measurements of Superhydrophobicity in Face Masks To Minimize Exposure to COVID-19 (Year 3: Lab-to-Market)**
Annika Vaidyanathan, 17 Senior, Winter Springs High School, Winter Springs, FL
In-person.
<https://projectboard.world/isef/project/85260>
- PHYS006 Cosmic Radiation Protection Simulation**
Clare Reidy, 18 Senior, Our Lady's Bower, Athlone, Co. Westmeath, Ireland
In-person.
<https://projectboard.world/isef/project/82691>
- PHYS007 Hurricane in the Cup: Vortices' Trochoidal Motion and the Effects of Instability During Diffusion in Liquids**
Nina Cielica, 18 Senior, III LO im. Adama Mickiewicza, Katowice, Slaskie, Poland
Virtual.
<https://projectboard.world/isef/project/85200>
- PHYS008 Analyzing Earth's Bow Shock Compression Ratio With Magnetohydrodynamic Limits**
Kenta Sakamoto, 18 Senior, President Theodore Roosevelt High School, Honolulu, HI
In-person.
<https://projectboard.world/isef/project/83001>
- PHYS009T Lightwhiskers: Branched Flow of Light**
Jan Dajnec, 16, Junior,
Maximilian Dorzweiler, 16, Junior,
Max-Planck-Gymnasium Saarlouis, Saarlouis, Germany
In-person.
<https://projectboard.world/isef/project/85139>
- PHYS010 Formula One Aerodynamics**
Dashayin Gilbert, 17 Senior, Curro Durbanville High School, Cape Town, Western Cape, South Africa
In-person.
<https://projectboard.world/isef/project/82749>
- PHYS011 Preparation and Characterization of Spin Polarized Tips for Tunneling Microscopy**
Petr Kahan, 19 Junior, Gymnazium Dr. Antona Randy, Jablonec nad Nisou, prispevkova organizace, Jablonec nad Nisou, Liberecky kraj, Czech Republic
Virtual.
<https://projectboard.world/isef/project/83085>
- PHYS012T New Nano Dimensional Water Concept (Nano Water)**
Haver Nur Aslanova, 16, Sophomore,
Solmaz Garibova, 16, Sophomore,
Baku European Lyceum, Baku, Absheron, Azerbaijan
In-person.
<https://projectboard.world/isef/project/83205>
- PHYS013 A Simulation of Pluto's Tholin Creation in Its Intermittent Atmosphere Due to Its Elliptical Orbit**
Ryan Fletcher, 17 Senior, John Jay Science and Engineering Academy, San Antonio, TX
In-person.
<https://projectboard.world/isef/project/83221>

- PHYS014T Is Quantum Mechanics Wrong?: Verification of Bell-Type Inequality Violation and Suggestion of the Improved Form Inequality**
Sanghwa Lee, 18, Senior,
Jiwan Seo, 18, Senior,
Hyeondong Yoo, 17, Senior,
Korea Science Academy of KAIST, Busan,
Busan, South Korea
Virtual.
<https://projectboard.world/isef/project/83120>
- PHYS015 Age Determination and Comparison of Open and Globular Star Clusters by HR-Diagram**
Chalisa Srikum, 17 Junior, Varee Ciang Mai School, Muang, Chiang Mai, Thailand
In-person.
<https://projectboard.world/isef/project/83143>
- PHYS016 Habitable Zones of Galaxies: Finding Metal-Rich Zones in Various Galaxies and Their Relation to Color**
Anica Ancheta, 15 Sophomore, Henry Perrine Baldwin High School, Wailuku, HI
Virtual.
<https://projectboard.world/isef/project/83100>
- PHYS017 The Effects of Cymatics on Artificially Auditory-Impaired Hearing Individuals' Ability To Learn Music**
Isabelle Gruner, 17 Junior, St. Joseph's Academy, Baton Rouge, LA
In-person.
<https://projectboard.world/isef/project/83124>
- PHYS018 A Measurement of Naturally Occurring Ambient Light Levels Near Peak Wavelength = 540 nm Near Twilight Hours**
Audrey MacLachlan, 15 Sophomore, Hedgesville High School, Hedgesville, WV
In-person.
<https://projectboard.world/isef/project/83029>
- PHYS019 Simulating Off-Axis Short Gamma-Ray Burst Afterglows To Inform Electromagnetic Follow-Up to Future Gravitational Wave Events**
Leon Garcia, 17 Junior, Corvallis High School, Corvallis, OR
In-person.
<https://projectboard.world/isef/project/83097>
- PHYS020 The Effects of Qubit Entanglement in Quantum Teleportation**
Galilea Rodriguez, 16 Junior, Harmony Science Academy - El Paso, El Paso, TX
In-person.
<https://projectboard.world/isef/project/82862>
- PHYS021 Modeling the Atmospheric Evolution of Exoplanets in the Habitable Zone of M-Dwarfs**
Ashini Modi, 18 Senior, Caddo Parish Magnet High School, Shreveport, LA
In-person.
<https://projectboard.world/isef/project/82872>
- PHYS022T Physical Description and Modeling of Paper Strip Flights**
Leonard Muenchenbach, 17, Senior,
Leo Neff, 18, Senior,
Gewerbliche und Hauswirtschaftlich-Sozialpflegerische Schulen Emmendingen (GHSE), Baden-Württemberg, Germany
In-person.
<https://projectboard.world/isef/project/83251>
- PHYS023 Investigate the Effects of Active Galactic Nucleus on Star Formation Rate Through Cavity Energetics and SED Fitting**
Yang Shen, 17 Junior, Shanghai United International School, Gubei, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/83008>
- PHYS024 Optimization and Application of Kelvin Water Dropper**
Haotian Sun, 17 Senior, Nanjing Foreign Language School, Nanjing, Jiangsu, China
Virtual.
<https://projectboard.world/isef/project/83189>
- PHYS025 Discovery of Superconductivity and Structural Phase Transition in Heusler Compound HfPd2Sn**
Yuxuan Chen, 17 Junior, Hangzhou Xuejun High School, Hangzhou, Zhejiang, China
Virtual.
<https://projectboard.world/isef/project/83162>
- PHYS026 How Does Ring "Dance" in a Bowl?: Study on Chaos-Like Dynamic Behavior of Rigid Rings Using Lagrange Mechanical Analysis**
Ruiqi Zhang, 17 Junior, Shanghai Kongjiang Senior High School, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82728>

- PHYS027T The Deformation Analysis and Experimental Study of Chinese Brush Based on the Central Spine Model With Seven Segments**
Huirui Dai, 18, Senior,
Xuan Zhang, 17, Senior,
Chongqing Nankai Secondary School,
Chongqing, Chongqing, China
Virtual.
<https://projectboard.world/isef/project/83102>
- PHYS028T Critical Solar Parameters for Prediction of Geomagnetic Storm**
Hsin-Yu Lin, 18, Senior,
Yu-Chen Liu, 17, Senior,
Taipei First Girls High School, Taipei City,
Chinese Taipei
In-person.
<https://projectboard.world/isef/project/85264>
- PHYS029 Mutual Influence of Two Drops Falling Through Water; Complex Behavior of Vortex Rings of Drops Fragmenting Due to Hydrodynamic Instabilities**
Rina Nakajima, 17 Junior, Osaka Prefectural
Tennoji High School, Osaka, Japan
Virtual.
<https://projectboard.world/isef/project/85288>
- PHYS030 Exploration of Chaotic Orbits Using the Lyapunov Exponent in the Restricted Three-Body Problem**
Yaritzza Durazo, 18 Senior, Sunnyside High
School, Tucson, AZ
In-person.
<https://projectboard.world/isef/project/83044>
- PHYS031T Characterizing the Altitude and Variability of the Martian Mesopause Over the MAVEN Mission**
Allison Inge, 17, Senior,
Langley Nakari, 18, Senior,
Monarch High School, Louisville, CO
In-person.
<https://projectboard.world/isef/project/82934>
- PHYS032 Physical Properties Analysis of Double-Perovskite Oxide (La₂CoMnO₆) for Spintronics Devices: A First-Principles Density Functional Theory Study**
Rala Abu Sualmi, 17 Senior, Manarat Al-Madinah
National School, Madinah, Madinah,
Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85293>
- PHYS033 Hydrodynamic Analogs of Quantum Tunneling**
Ahitagni Das, 17 Junior, Delhi Public School
Siliguri, Siliguri, West Bengal, India
Virtual.
<https://projectboard.world/isef/project/85563>
- PHYS034 Testing the Effects of Mixture Ratio on Rocket Impulse**
Jonah Bieger, 18 Senior, Perham High School,
Perham, MN
In-person.
<https://projectboard.world/isef/project/83125>
- PHYS035T Comparing the Leidenfrost Effect on Distilled Water and Ethanol**
Bailey Link, 17, Junior,
Giulia Roccasalva, 17, Junior,
Brush High School, Brush, CO
In-person.
<https://projectboard.world/isef/project/82982>
- PHYS036 A Comparison of Machine Learning Algorithms for Higgs Boson Identification**
Ourania-Maria Glezakou-Elbert, 16 Junior,
Hanford High School, Richland, WA
Virtual.
<https://projectboard.world/isef/project/85749>
- PHYS037T Providing a Simulator for the N Body Problem Using Programming and Euler's Method, After Basing It on Our Solar System**
Rakan Hamarneh, 16, Junior,
Maeen Tell, 16, Junior,
National Orthodox School, Amman, Jordan
Amman Baccalaureate School, Amman,
Amman, Jordan
In-person.
<https://projectboard.world/isef/project/82755>
- PHYS038 System of the Particle-Permeation Controllable Soap Membrane Filter With High Self-Recovering Property as Multiscale Particle "Switches"**
Taekyung Lee, 17 Senior, Korean Minjok
Leadership Academy, Hoengseong, Gangwon,
South Korea
Virtual.
<https://projectboard.world/isef/project/83011>

- PHYS039 Skew-Axis Cylinder Lens Optical System: Physical Properties, Application for Novel Method of Clinical Optometry of Astigmatism, and Engineering Implementation**
Alexander Plekhanov, 16 Sophomore, Beaverton Academy of Science and Engineering, Hillsboro, OR
In-person.
<https://projectboard.world/isef/project/83109>
- PHYS040 Real-Time Prediction of Solar Flares and Coronal Mass Ejections**
Rohit Prasanna, 17 Senior, Academies of Loudoun, Leesburg, VA
In-person.
<https://projectboard.world/isef/project/85790>
- PHYS041 Utilizing InSb/Si Quantum Dots for the Development of Next-Generation Multivalued High-Mobility Transistor Technology**
Ayush Nayak, 17 Junior, Westview High School, San Diego, CA
In-person.
<https://projectboard.world/isef/project/85079>
- PHYS042 The Study of Globular Cluster Systems in Virgo Cluster Dwarf Galaxies**
Nicole Tian, 17 Senior, The Harker School, San Jose, CA
In-person.
<https://projectboard.world/isef/project/85168>
- PHYS043 The Search for Dark Matter Through Soft Unclustered Energy Patterns at CMS**
Michelle Park, 18 Senior, Solon High School, Solon, OH
In-person.
<https://projectboard.world/isef/project/85756>
- PHYS044 Identifying the Source of a Hydroxyl Outflow in a Region of High-Mass Star Formation**
Cade Rigg, 17 Junior, Southeastern Junior/Senior High School, Augusta, IL
Virtual.
<https://projectboard.world/isef/project/85175>
- PHYS045T Efficient Computation of Interference Between Pathways in Quantum Control Systems**
Erez Israeli Miller, 18, Senior,
Michael Kasprzak, 17, Senior,
Bergen County Academies, Hackensack, NJ
In-person.
<https://projectboard.world/isef/project/85892>
- PHYS046 Phase Noise Characterization in Optical Fiber-Based Sensors**
Omer Arian, 17 Junior, Ort Ironi D, Modi'in, Israel
In-person.
<https://projectboard.world/isef/project/85815>
- PHYS047 Analysis of Ring Galaxies Detected Using Deep Learning With Real and Simulated Data**
Harish Krishnakumar, 17 Junior, Nikola Tesla STEM High School, Redmond, WA
In-person.
<https://projectboard.world/isef/project/85861>
- PHYS048T The Impacts of Cosmic Rays on Planetary Climate Change**
Stephanie Ressel, 17, Senior,
Hailee Sexton, 18, Senior,
Mississippi School for Mathematics and Science, Columbus, MS
In-person.
<https://projectboard.world/isef/project/85590>
- PHYS049 The Effect of Dimples on a Mid-Sized Automobile's Aerodynamics**
Sivaditya Padmanabhan, 16 Sophomore, Dr. Ronald E. McNair Academic High School, Jersey City, NJ
Virtual.
<https://projectboard.world/isef/project/85811>
- PHYS050 Designing a Quantum Teleportation Circuit on Novel Qubits**
Anisha Musti, 16 Junior, Edgemont High School, Scarsdale, NY
In-person.
<https://projectboard.world/isef/project/85598>
- PHYS051 27th Compact Hierarchical Trinary System Discovered Using Machine Learning**
Alina Yuan, 18 Senior, The Harker School, San Jose, CA
Virtual.
<https://projectboard.world/isef/project/85775>
- PHYS052 Simulating Quantum Key Distribution in Three Polarization Bases**
Katherine Panebianco, 17 Senior, North Carolina School of Science and Mathematics, Durham, NC
Virtual.
<https://projectboard.world/isef/project/85948>

- PHYS053 Understanding the Variability of Optical Spectra of H₂O Megamasers**
William St. John, 18 Senior, Massanutten Regional Governor's School, Mt. Jackson, VA
Virtual.
<https://projectboard.world/isef/project/86206>
- PHYS054 Analyzing the Acoustics of Violins With FAST: Utilizing Graphical Analysis To Determine the Correlation Between Price and Quality**
Hannah Shu, 16 Junior, Carmel High School, Carmel-By-The-Sea, CA
In-person.
<https://projectboard.world/isef/project/86225>
- PHYS055 Powerful Quasar-Driven Outflows in the Local Universe From the Cosmic Origins Spectrograph Hubble Space Telescope Far-Ultraviolet Spectroscopic Archive**
Orion Foo, 17 Senior, Poolesville High School, Poolesville, MD
In-person.
<https://projectboard.world/isef/project/86251>
- PHYS056 Home-Brew Quantum Key Distribution**
Fletcher Murray, 18 Senior, Woods Cross High School, Woods Cross, UT
In-person.
<https://projectboard.world/isef/project/86268>
- PHYS057 Consumer-Grade Virtual Reality as a Tool and Methodology for Mars and Other Off-World 3D Immersive Experiential and Scientific Exploratory Research**
Theresa White, 14 Freshman, Fayetteville-Manlius High School, Manlius, NY
In-person.
<https://projectboard.world/isef/project/86293>
- PHYS058 A Specialized Searching Algorithm Towards the Improvement in Detection of Single-Transit and Long-Period Exoplanets in Brightness Time-Series Data**
Joseph Nadol IV, 18 Senior, Hackley School, Tarrytown, NY
In-person.
<https://projectboard.world/isef/project/86347>
- PHYS059 Modification of a Surfboard in Shape and Fin, for People With Balance Problems Due to Neuromuscular Disabilities**
Noeliz Cordero, 16 Junior, Abelardo Martinez Otero, Arecibo, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/86374>
- PHYS060 Goldilocks' Paradox**
Samantha Brodeen, 18 Senior, Avon High School, Avon, SD
In-person.
<https://projectboard.world/isef/project/86409>
- PHYS061T The Three-Body Problem: A Stability Analysis of Multiple Star Systems**
Simon Holmqvist, 18, Senior, Albin Sjogren, 19, Senior, Polhemskolan, Lund, Skane, Sweden
In-person.
<https://projectboard.world/isef/project/86454>
- PHYS062 Detecting Cosmic Rays by Self-Build Scintillation Detector and a Muon Telescope**
Barbora Cabalkova, 19 Senior, Gymnazium Zamberk, Zamberk, Pardubicky kraj, Czech Republic
In-person.
<https://projectboard.world/isef/project/86459>
- PHYS063T A Design for an Affordable 2-Qubit Optical Quantum Computer**
Konstantinos Pavlakis, 17, Junior, Dimitrios Tzounakis, 17, Senior, 1st General Lyceum of Thermi, Thermi, Thessaloniki, Greece
Virtual.
<https://projectboard.world/isef/project/86535>
- PHYS064 Bob Pendulum Oscillation Under Air Flow: An Experimental and Numerical Investigation**
Witchayoot Nakasoon, 18 Senior, Benjamarachutit School, Mueng Nakon Si Thammarat, Nakhon Si Thammarat, Thailand
In-person.
<https://projectboard.world/isef/project/86573>
- PHYS065 Towards the Exploration of the Exoplanets: Studying Key Physical Parameters for the Habitability of Primitive Earth Using Climate Models**
Yana Surtchev, 16 Junior, BASIS Ahwatukee, Phoenix, AZ
In-person.
<https://projectboard.world/isef/project/86607>
- PHYS066 Modeling Triton's Seasonal Atmospheric Change: Applications of the VT3D Model to Triton**
Natalie Pujet, 16 Junior, Fairview High School, Boulder, CO
In-person.
<https://projectboard.world/isef/project/86626>

PHYS067T Are You Experiencing a Muffled Voice, or Having Trouble Hearing? What Mask Is the Most Effective for Sound Projection?
Mathena Nguyen, 16, Junior,
Lena Tran, 17, Junior,
Boston Latin School, Boston, MA
Virtual.
<https://projectboard.world/isef/project/86646>

PHYS068 Discovering Extremely Rare Neutral Carbon Absorbers in Intergalactic Medium Using Machine Learning
Ashley Xu, 17 Junior, The Winsor School,
Boston, MA
Virtual.
<https://projectboard.world/isef/project/86648>

PHYS069T Learning From the Shadows: Exploring North Polar Impact Craters in Mercury's Permanently Shadowed Regions
Jasmine Palma, 17, Senior,
Michelle Wu, 17, Senior,
Townsend Harris High School, Flushing, NY
In-person.
<https://projectboard.world/isef/project/86669>

PHYS070T An Analysis of the Factors Affecting Make Rate When Putting
Luke Dalebout, 17, Junior,
Jack Wadsworth, 16, Junior,
Fremont High School, Plain City, UT
In-person.
<https://projectboard.world/isef/project/86696>

PHYS071 Trailer Towing Safety: How Load Weight Distribution and Tow Vehicle Size Affects Trailer Sway
Anderson Washburn, 14 Freshman, Canyon
View Junior High School, Orem, UT
In-person.
<https://projectboard.world/isef/project/86698>

PHYS072T Faster Than Light: Voltage and Resistance Phenomena on a 1 km Loop
Logan Kusher, 17, Senior,
Cam Srivastava, 17, Junior,
Spartanburg Day School, Spartanburg, SC
In-person.
<https://projectboard.world/isef/project/86932>

PHYS073 Inferring the Neutron Star Maximum Mass and Lower Mass Gap in Neutron Star-Black Hole Systems With Spin
Christine Ye, 17 Senior, Eastlake High School,
Sammamish, WA
In-person.
<https://projectboard.world/isef/project/86971>

PHYS074 Calculating Transition Amplitudes of an Observable Using the Rodeo Algorithm for Quantum Computing
Max Bee-Lindgren, 18 Senior, Decatur High
School, Decatur, GA
In-person.
<https://projectboard.world/isef/project/87026>

Plant Sciences

PLNT001 Hydroponics: What Method of Hydroponics Would Increase the Growth Rate of a Lettuce Plant?

Ariana Zarazua-Benitez, 17 Senior, Wildwood High School, Wildwood, FL

In-person.

<https://projectboard.world/isef/project/83028>

PLNT002 How Do Flavonoids and Isoflavonoids Improve Nodulation in Legumes?

Abbey Curran, 18 Senior, Daramalan College, Canberra, ACT, Australia

Virtual.

<https://projectboard.world/isef/project/83174>

PLNT003T Innovative Farming of Edible Microgreens Indoors

Yee Hern Cha, 16, Senior,
Dong Tze Chan, 15, Sophomore,
Heng Ee High School, George Town, Penang, Malaysia

In-person.

<https://projectboard.world/isef/project/83035>

PLNT004 Spatio-Temporal Generation of Morphological Features for Plant Growth Prediction Using Progressively Growing GANs

Dhruv Sheth, 16 Junior, Pace Junior Science College, Mumbai, Maharashtra, India

In-person.

<https://projectboard.world/isef/project/83128>

PLNT005T A Sound Solution: An Innovative Application of Insects' Bioacoustics Effect on Herbaceous Plants

Jessica Li, 17, Junior,
Lena Wang, 16, Junior,
Shanghai American School - Puxi Campus, Shanghai, Shanghai, China

Virtual.

<https://projectboard.world/isef/project/83075>

PLNT006T *Silphium perfoliatum*: A Newcomer for an Ecologically Sustainable Energy Agriculture

Melina Reckermann, 17, Senior,
Isabell Seibel, 17, Senior,
Immanuel-Kant-Gymnasium Tuttlingen, Tuttlingen, Baden-Wuerttemberg, Germany

In-person.

<https://projectboard.world/isef/project/83112>

PLNT007 Examining the Effect of a Simulation of Varied Microplastic Types on *Rhizophora mangle*

Jacob Friedman, 16 Sophomore, Spruce Creek High School, Port Orange, FL

In-person.

<https://projectboard.world/isef/project/82904>

PLNT008 Effects of Treading Stress on Changes in Morphology and DRO1 Gene Expression of Barley Roots

Ayumi Ishihara, 18 Senior, Notre Dame Seishin Gakuen Seishin Girls' High School, Kurashiki City, Okayama-Pref., Japan

Virtual.

<https://projectboard.world/isef/project/82732>

PLNT009T Electric Shock Can Protect Plants Against Viruses

Shao-Jyun Lai, 17, Senior,
Fu-Ru Li, 18, Senior,
Taipei First Girls High School, Taipei City, Chinese Taipei

In-person.

<https://projectboard.world/isef/project/85624>

PLNT010T Identification and Characterization of Genes Functioning With HR4, a Newly Identified Gene Conferring Resistance to the Green Peach Aphid

Shreya Nair, 17, Junior,
Siddhartha Shah, 18, Senior,
Texas Academy of Mathematics and Science, Denton, TX

Virtual.

<https://projectboard.world/isef/project/82887>

PLNT011 The Study of Biomimicry in Architecture

Daniel Fletcher, 15 Freshman, John Jay Science and Engineering Academy, San Antonio, TX

In-person.

<https://projectboard.world/isef/project/82905>

PLNT012 The Potential of Forage Soybeans as a Grazing Source for Cattle

Abby Berger, 17 Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, AR

In-person.

<https://projectboard.world/isef/project/82851>

- PLNT013T Zein Extract Tea Solution: Eco-Friendly and Cost Effective Delayed Ripening Solution for Bananas**
Yan Yi Cheong, 17, Junior,
Zhan Hoong Chin, 17, Junior,
Yi Fan Lee, 16, Junior,
Chung Ling High School Penang, Georgetown,
Penang, Malaysia
Virtual.
<https://projectboard.world/isef/project/85713>
- PLNT014 Analysis of Pollen-Pistil Interactions To Model Reproductive Thermotolerance in Tomato**
Alexander Nelson, 18 Senior, Nelson Home
School, Tucson, AZ
Virtual.
<https://projectboard.world/isef/project/83002>
- PLNT015 Study on Leaf Epidermal Hair Characteristics of Eggplant and Its Effects on Cold and Drought Resistance**
Hanyue Cao, 17 Junior, Shanghai Qibao High
School, Shanghai, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82829>
- PLNT016 Suicidal Germination of *Striga hermonthica* in Response to Various Cytokinins in Combination With Fluridone/1-Aminocyclopropane-1-Carboxylic Acid**
Ahmed Behisi, 17 Senior, Dhahran Ahliyya
School, Dammam, Eastern Province,
Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85223>
- PLNT017 Isolation and Characterization of Plant Growth Promoting Bacteria From Olive Tree Cultivated Under Desert Farming in Saudi Arabia**
Faisal Al Khwaiter, 18 Senior, Riyadh School for
Boys and Girls, Riyadh, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85082>
- PLNT018 A Heterologous System Examination of JACKDAW Mutant Variants' Effects on Complex Formation With SHORT-ROOT and SCARECROW**
Faisal AlGhamdi, 18 Senior, Riyadh School for
Boys and Girls, Riyadh, Saudi Arabia
Virtual.
<https://projectboard.world/isef/project/85726>
- PLNT019 Measuring the Effects of Varying Wavelengths of Light on the Growth of Hydroponically Grown *Allium fistulosum***
Aarushi Pandey, 14 Freshman, College Park
High School, The Woodlands, TX
In-person.
<https://projectboard.world/isef/project/82943>
- PLNT020 A Low-Cost Deep Learning Solution for Early Detection of Lettuce Stress in Indoor Farms**
Naman Agarwal, 17 Junior, Governor's School at
Innovation Park, Manassas, VA
In-person.
<https://projectboard.world/isef/project/82839>
- PLNT021T Prevention of Guava Fruit Flies Using New Trap From Combination of Baits With Methyl Eugenol Extract From Local Plants**
Seksan Aphai, 18, Senior,
Mekhim Panchasin, 18, Senior,
Suthini Thoebthip, 18, Senior,
Huaynamhomwittayakan School, Nakhon
Sawan, Thailand
In-person.
<https://projectboard.world/isef/project/86955>
- PLNT022 Smart Management System for Indoor Plant**
Nebras Alrawashdeh, 14 Freshman, Mua'ath Bin
Jbal Primary School, Ma'an, Jordan
In-person.
<https://projectboard.world/isef/project/83048>
- PLNT023 Simulate To Innovate: Cell Signaling Simulations of Stem Cell Mutants With Enhanced Transcription Factor Binding To Optimize Crop Productivity**
Ishan Gonehal, 15 Freshman, Martin Luther King
High School, Riverside, CA
Virtual.
<https://projectboard.world/isef/project/82947>
- PLNT024T Effect of Plant Growth Promoting Rhizobacteria (PGPR) on Native Korean Wheat**
Alexander Hong, 16, Junior,
Chea-Yeon Shin, 17, Senior,
Cheongshim International Academy, Seoul,
South Korea
Virtual.
<https://projectboard.world/isef/project/85302>

- PLNT025T **Early Detection of Drought Stress Through a Novel AI Drought Assessment (AIDA) Model in Field Grown Tomato (*Solanum lycopersicum*) Plants Using a Custom-Built "Spectra-Rover"**
John Benedict Estrada, 17, Junior,
Pauline Estrada, 15, Freshman,
Clovis North High School, Fresno, CA
In-person.
<https://projectboard.world/isef/project/85244>
- PLNT026T **Broccoli: The Source of Obtaining Biologically Active Components**
Maria Ciocoi, 17, Junior,
Marina Rusnac, 17, Junior,
LTPR Mihai Marinciuc, Chisinau, Republic of Moldova, Republic of Moldova
Virtual.
<https://projectboard.world/isef/project/85274>
- PLNT027 **Comparative Analysis on the Effect of the Dosage of Hydrogen Peroxide in the Germination Process in Legumes *Phaseolus vulgaris* L. (Pink and Red Bean Variety) and *Cicer arietinum* (Chickpea)**
Joel Sanchez-Medina, 18 Junior, Florencia Garcia High School, Las Piedras, Las Piedras, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/85186>
- PLNT028 **Seed Dispersal of *Achyrachaena mollis***
Rachel Warner, 17 Junior, Oregon City High School, Oregon City, OR
In-person.
<https://projectboard.world/isef/project/85259>
- PLNT029 **Overcrowding: Is It a Problem?**
Sydney Wolf, 15 Sophomore, The Academies at Jonesboro High School, Jonesboro, AR
Virtual.
<https://projectboard.world/isef/project/85269>
- PLNT030 **Elucidating Terrestrial Optical Refrigeration Through Transpiration in *Rhizophora mangle* and Chlorophyll A Fluorescence in Low-Polarity Mediums**
Aaron Song, 17 Senior, Ossining High School, Ossining, NY
In-person.
<https://projectboard.world/isef/project/85797>
- PLNT031 **Using Computers To Optimize Crop Yield**
Rachel Hoffman, 18 Senior, Lane Technical College Prep High School, Chicago, IL
Virtual.
<https://projectboard.world/isef/project/85748>
- PLNT032 **A Chemical-Free Apple Tree Thinning Technique: Using Hail Netting To Achieve Ideal Crop Load**
Grace Finnerty, 18 Senior, Cotter High School, Winona, MN
Virtual.
<https://projectboard.world/isef/project/85750>
- PLNT033 **Bitter Melon, a Miracle Fruit To Control Diabetes: Its Cultivation and Selection of the High Yielding Varieties**
Rishi Nautiyal, 15 Sophomore, Oxford High School, Oxford, MS
In-person.
<https://projectboard.world/isef/project/85745>
- PLNT034 **Analysis of Chelated Minerals on *Brassica rapa* and *Raphanus sativus* as a Post-Germination Fertilizer**
Grace Helle, 17 Junior, Beckman Catholic High School, Dyersville, IA
In-person.
<https://projectboard.world/isef/project/85651>
- PLNT035 **Abolition of Unfurling Nutrients Is the Solution for Elimination of Microalgae in the Indian River Lagoon (Year III)**
Erin Gaydar, 18 Senior, Edgewood Junior Senior High School, Merritt Island, FL
In-person.
<https://projectboard.world/isef/project/85720>
- PLNT036 **Effects of Various Soil Microbiomes on Native and Invasive Plants**
Eric Wang, 17 Junior, Millburn High School, Millburn, NJ
Virtual.
<https://projectboard.world/isef/project/85765>
- PLNT037 **Application of Indigenous Technical Knowledge (ITK) in the Geographic Context of Mid-Atlantic/North-Eastern American Agriculture**
Saumitra Prabhu, 16 Junior, Dr. Ronald E. McNair Academic High School, Jersey City, NJ
Virtual.
<https://projectboard.world/isef/project/85629>

- PLNT038 **Computational Analysis of the Rhizosphere Metagenome and a Wet Lab Approach To Derive an Optimal Strategy for Heavy Metal Remediation *in situ***
Prisha Bhat, 14 Freshman, Plano East Senior High School, Plano, TX
In-person.
<https://projectboard.world/isef/project/85562>
- PLNT039 **The Impact of Compost Composition on Plant Growth**
Jack Bailey, 18 Senior, Olathe North High School, Olathe, KS
In-person.
<https://projectboard.world/isef/project/85927>
- PLNT040 **The Biofortification of *Raphanus sativus* With Calcium Through Irrigation With Ca²⁺ Solutions**
Grace Johnson, 18 Senior, Lebanon High School, Lebanon, MO
In-person.
<https://projectboard.world/isef/project/85943>
- PLNT041 **Developing a Model *in situ* Resource Utilization System for Oxygen Sustaining Life Support and Launch Cost Reduction for Mars**
Ariella Blackman, 17 Junior, Harrison High School, Harrison, NY
In-person.
<https://projectboard.world/isef/project/85973>
- PLNT042T **The Effects of Cauterization on *Nandina domestica* and *Ligustrum sinense***
Sheridan Dethrow, 18, Senior,
Gweneth Keith-Powell, 17, Senior,
Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, AR
In-person.
<https://projectboard.world/isef/project/86055>
- PLNT043T **Effects of Perfluorooctane Sulfonic Acids (PFOS) on the Growth and Development of Plants**
Ashika Gullapalli, 17, Junior,
Katherine Opria, 17, Senior,
Tanmay Shekhar, 18, Senior,
Kalamazoo Area Mathematics and Science Center, Kalamazoo, MI
In-person.
<https://projectboard.world/isef/project/86253>
- PLNT044 **Soil Farms II: Optimizing Cropland Soil Conditions for Microbiological Supplementation**
Emma Kratcha, 18 Senior, Hankinson Public School, Hankinson, ND
In-person.
<https://projectboard.world/isef/project/86254>
- PLNT045 **Soilization of Sand Indicated by Photosynthetic Rate, Water Retention Rate, and Health of Plants**
Ava Zhang, 18 Senior, Brooklyn Technical High School, Brooklyn, NY
In-person.
<https://projectboard.world/isef/project/86291>
- PLNT046 **The Effect of Fertilizers on the Germination of *Vigna radiata* Seeds**
Julia Chen, 16 Sophomore, North Quincy High School, Quincy, MA
Virtual.
<https://projectboard.world/isef/project/86393>
- PLNT047 **Impact of Fish Fertilizer on Plant Growth**
Julie Sundheim, 18 Senior, Elk Point Jefferson High School, Elk Point, SD
In-person.
<https://projectboard.world/isef/project/86410>
- PLNT048 **Plastic Mulch and Organic Amendments: Can They Help Us Control Nutsedge?**
Nira Goyal, 15 Sophomore, Martin County High School, Stuart, FL
In-person.
<https://projectboard.world/isef/project/86605>
- PLNT049 **Molecular, Physiological, and Ecological Evaluation of Latvian Genetic Resources of Valuable Wild Legume Species *Trifolium fragiferum* in the Context of Sustainable Agriculture**
Magnolia Garbarino, 16 Junior, Pawling High School, Pawling, NY
In-person.
<https://projectboard.world/isef/project/86664>
- PLNT050 **Effectiveness of Plant Growth in Vertical Aeroponics vs. Horizontal Raft Aquaponics**
Sadie Zehner, 17 Senior, Berwick Area High School, Berwick, PA
In-person.
<https://projectboard.world/isef/project/86691>

PLNT051 How Does Nitrate Absorption Differ Between the *Rhizophora mangle*, *Laguncularia racemosa*, and *Avicennia germinans* Over a 48 Hour Period?

Mary Reed, 17 Senior, Ridgeview High School,
Orange Park, FL

In-person.

<https://projectboard.world/isef/project/86716>

PLNT052T Using the Kirby Bauer Method To Test the Effectiveness of Phenols Extract From Pecan Shells and Saponin Extract From Prickly Pear Cactus in Inhibiting the Growth of *E. coli*

Ivan Belyaev, 17, Junior,

Ngoc Pham, 17, Junior,

New Mexico Military Institute, Roswell, NM

In-person.

<https://projectboard.world/isef/project/86854>

PLNT053T The Effect of *Lonicera maackii* on Kentucky's Understory

Ishani Kulkarni, 15, Sophomore,

Aiden Vilo, 16, Sophomore,

duPont Manual High School, Louisville, KY

In-person.

<https://projectboard.world/isef/project/86895>

PLNT054 The Creation and Sustainability of a Symbiotic Atmosphere in Relation to Surface Area

Bryce Krohnfeldt, 17 Junior, Estero High School,
Estero, FL

Virtual.

<https://projectboard.world/isef/project/86930>

Robotics and Intelligent Machines

ROBO001T AI Surgery Robot

Danish Edupuganti, 16, Junior,
Charles Pratt, 17, Junior,
Pensacola High School, Pensacola, FL
In-person.

<https://projectboard.world/isef/project/82808>

ROBO002T Soft Origami-Inspired 3D Print-In-Place Artificial Intelligence Robots

Sheng Ze Yeoh, 15, Sophomore,
Saan Cern Yong, 16, Junior,
Sekolah Menengah Kebangsaan Katholik,
Petaling Jaya, Selangor, Malaysia
In-person.

<https://projectboard.world/isef/project/83216>

ROBO003 Adaptive Learning: Evolving Explainable Predictions

Harshal Bharatia, 17 Senior, Plano Senior High School, Plano, TX
In-person.

<https://projectboard.world/isef/project/83247>

ROBO004T PHYSIOARM: Device To Assist in Upper Limbs Physiotherapy of Post-Stroke Patients

Rafaela Machado, 20, Senior,
Samuel Simao, 19, Senior,
Fundacao Escola Tecnica Liberato Salzano
Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brazil
In-person.

<https://projectboard.world/isef/project/83040>

ROBO005T Universal Solution to Extension and Translation of Fonts Across Languages

Lap Yan Lennon Chan, 16, Junior,
Justin Cheng, 16, Junior,
Justin Kit Hang Tang, 17, Senior,
St. Paul's Co-Educational College,
Hong Kong, China, Hong Kong Special Administrative Region
Virtual.

<https://projectboard.world/isef/project/82966>

ROBO006 Neural Layer Bypassing Network: A Novel Neural Network Architecture To Increase the Speed of Forward Propagation Without Sacrificing Accuracy, Network Structure, or CPU Resources

Amogh Palasamudram, 18 Senior, The International School of Bangalore (TISB), Bangalore, Karnataka, India
Virtual.

<https://projectboard.world/isef/project/83110>

ROBO007 Penden: Making the Internet More Accessible to the Blind

Abhijith Chandran, 19 Senior, Mahindra United World College, Pune, Maharashtra, India
Virtual.

<https://projectboard.world/isef/project/83045>

ROBO008 An Eco-Friendly Deep Learning Tool for Disrupting Insect Mating Behavior of Diaphorina citri Supporting the Mitigation of Unwarranted Pesticide Usage in Citrus Greening Control

Sruthi Sentil, 17 Junior, James Rickards High School, Tallahassee, FL
In-person.

<https://projectboard.world/isef/project/83261>

ROBO009 Research on CRNN-Based Piano Music Transcription Systems

Victor Yin, 16 Junior, Tsinghua University High School, Beijing, China
Virtual.

<https://projectboard.world/isef/project/85876>

ROBO010 The Smartest Know Their Limits: A Novel Semi-Supervised Causal Inference Deep Learning Model for Open Set Recognition

Richard Xue, 17 Junior, Shanghai American School - Puxi Campus, Shanghai, China
Virtual.

<https://projectboard.world/isef/project/82884>

- ROBO011 Q-NEST: Quantum Neuroevolutionary Strategies for Parametrically Optimizing and Topologically Augmenting Artificial Neural Networks via Novel Mutation, Translocation, and Crossover Hybrid Quantum-Classical Genetic Operators**
Paarth Tara, 18 Senior, North Carolina School of Science and Mathematics, Durham, NC
In-person.
<https://projectboard.world/isef/project/82751>
- ROBO012 Using Hand Tracking and Server Architecture to Allow Online Control of a Robotic Hand**
Jaxon Poentis, 17 Junior, President Theodore Roosevelt High School, Honolulu, HI
In-person.
<https://projectboard.world/isef/project/82935>
- ROBO013 Using Machine Learning To Diagnose Pneumonia and Skin Cancer: DoctorNet**
Kutlwano Tshatiwa, 16 Senior, Gabonewe High School, Madikwe Township, North West, South Africa
Virtual.
<https://projectboard.world/isef/project/82999>
- ROBO014T iGlide: An ROV SeaGlide Design Engineered To Collect Oil in a Marine Environment**
Tashareny Baez, 17, Senior,
Adrian Gonzalez-Vega, 17, Senior,
James Pace High School, Brownsville, TX
In-person.
<https://projectboard.world/isef/project/85123>
- ROBO015T Project SERSI: Smartphone-Enabled Robotic Sign Language Interpreter**
Ruth Mellin, 17, Senior,
Alex Moore, 18, Senior,
Saint Paul Academy and Summit School,
Saint Paul, MN
In-person.
<https://projectboard.world/isef/project/82775>
- ROBO016 3D AttnGAN for Text to Voxel Generation**
Seungwoo Yoon, 17 Senior, Chung Nam Samsung Academy, Asan-si, Chungcheongnam-do, South Korea
Virtual.
<https://projectboard.world/isef/project/83159>
- ROBO017 The GatedTabTransformer: An Attention-Based Deep Learning Architecture for Tabular Modeling**
Radostin Cholakov, 16 Sophomore, Model High School of Mathematics "Akademik Kiril Popov", Plovdiv, Bulgaria
In-person.
<https://projectboard.world/isef/project/82996>
- ROBO018 Constructing a Neural Network To Classify Lung Cancer**
Bisrat Kassahun, 16 Junior, Edgewood Junior Senior High School, Merritt Island, FL
In-person.
<https://projectboard.world/isef/project/82812>
- ROBO019T Developing a Low-Cost Portable Electronic Nose for the Detection of Colorectal Cancer by Using Convolutional Neural Networks**
Mei Fong Lei, 17, Sophomore,
Jiahao Liang, 15, Sophomore,
Yuelong Wang, 16, Sophomore,
Escola Kao Yip, Macao, China
Virtual.
<https://projectboard.world/isef/project/83255>
- ROBO020 A Novel Amyotrophic Lateral Sclerosis Diagnostic Tool Using Machine Learning and Biomarkers**
Elisa Diop-Weyer, 16 Junior, Harare International School, Harare, Zimbabwe
In-person.
<https://projectboard.world/isef/project/85895>
- ROBO021 Applying Deep Learning in Recognizing Endometrial Carcinoma**
Sophie Chen, 15 Sophomore, Caddo Parish Magnet High School, Shreveport, LA
In-person.
<https://projectboard.world/isef/project/83186>
- ROBO022 Real-Time American Sign Language (ASL) Detection and Translation Using Kinect Sensor**
Claire Jaroonjetjumng, 16 Junior, Oregon Episcopal School, Portland, OR
In-person.
<https://projectboard.world/isef/project/83065>

- ROBO023 Search and Rescue System Using Omni-Orientation Mapping Robot**
Matthew Kim, 17 Junior, Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, GA
In-person.
<https://projectboard.world/isef/project/83046>
- ROBO024 Medical Device Recall Prediction Using MAUDE Reports**
Krish Inba Rajashankar, 16 Junior, Minnetonka High School, Minnetonka, MN
In-person.
<https://projectboard.world/isef/project/83031>
- ROBO025 Creating an Autonomous Path Navigator To Generate Interest in Machine Learning Among Children**
Avery Simon, 18 Senior, Hathaway Brown School, Shaker Heights, OH
In-person.
<https://projectboard.world/isef/project/82792>
- ROBO026 Binary Synthesis: Applying Philosophical Principles to Artificial Neural Networks**
Gryphon Patlin, 18 Senior, The Classical Academy, Colorado Springs, CO
In-person.
<https://projectboard.world/isef/project/82913>
- ROBO027 Sibling Safe With LIDAR**
Sydney Bostic, 14 Freshman, Spring Mills High School, Martinsburg, WV
In-person.
<https://projectboard.world/isef/project/83166>
- ROBO028T Filament Extruder: A Free Manufacturer of Material for a 3D Printer**
Rajmund Dejnaka, 19, Sophomore, Adrian Przybylski, 19, Senior, Zespól Szkól Technicznych i Ogólnokształcących im. Stefana Banacha w Jarosławiu, Jarosław, Podkarpacie, Poland
Virtual.
<https://projectboard.world/isef/project/85239>
- ROBO029 A Novel Approach of Deep Learning on Detection and Classification of Leukemic Cells and BCR-ABL1 Gene**
Leonardo de Farias, 16 Junior, Lubbock High School, Lubbock, TX
In-person.
<https://projectboard.world/isef/project/83039>
- ROBO030 Research on Landscape Painting Colorization Based on Generative Adversarial Networks**
Yinghan Chen, 16 Junior, Beijing No. 4 High School, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/85767>
- ROBO031 Intelligent Object Finding for the Elderly With Alzheimer's Disease Based on Neural-Symbolic Reasoning**
Yutang Lin, 16 Junior, Beijing 101 Middle School, Beijing, Beijing, China
Virtual.
<https://projectboard.world/isef/project/83243>
- ROBO032 Single-Actuator Wave-Like Pipeline Robot**
Sicheng Dong, 17 Junior, Shanghai Foreign Language School Affiliated to SISU, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82803>
- ROBO033 Autonomous Rapid Disaster Damage Assessment Using Machine Learning Techniques**
Anish Goswami, 17 Junior, West Linn High School, West Linn, OR
In-person.
<https://projectboard.world/isef/project/83057>
- ROBO034 Recognition of American Sign Language (ASL) Trigger Words Using RF Sensors in Combination with Deep Neural Networks**
Catherine Kung, 16 Senior, Indian Springs School, Indian Springs, AL
In-person.
<https://projectboard.world/isef/project/82807>
- ROBO035 A Novel Object Detection-Based Method To Detect Craters and Rilles on the Lunar Surface**
Fadil Younes, 17 Senior, Al Khobar Secondary School, Al Khobar, Eastern, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85169>
- ROBO036 Using Multivariate Time Series Forecasting Neural Networks With Sentimental Analysis To Determine Future Stock Prices**
Karthik Nadimpally, 16 Junior, Ballard High School, Louisville, KY
In-person.
<https://projectboard.world/isef/project/82814>

- ROBO037 Systematic Parkinson Audio Recognition Construct (SPARC): A Novel Approach Implementing a Machine Learning Method To Diagnose Parkinson's Disease Using Voice Features**
Anu Iyer, 17 Junior, Little Rock Central High School, Little Rock, AR
In-person.
<https://projectboard.world/isef/project/82954>
- ROBO038 Development and Construction of a Low-Cost Six-Axis Robot Arm**
Noa Sendlhofer, 19 Senior, Academia Engiadina, Samedan, Graubünden, Switzerland
In-person.
<https://projectboard.world/isef/project/85181>
- ROBO039 Optimizing Machine Learning Algorithms for Multiclass Neuroimaging Segmentation**
Arjan Kohli, 18 Senior, Peachtree Ridge High School, Suwanee, GA
In-person.
<https://projectboard.world/isef/project/85692>
- ROBO040T Wrong-Way Detector: Optoelectronic System To Detect Vehicles in the Wrong-Way Direction on Highways**
Tommaso Caligari, 16, Sophomore, Marco Zecchin, 15, Sophomore, Istituto Tecnico Industriale G. Omar, Novara, Italy
In-person.
<https://projectboard.world/isef/project/83222>
- ROBO041 A Deep Learning Approach to Detection of Metastasis in H&E-Stained Lymph Node Sections**
Neel Kondapalli, 16 Sophomore, Dougherty Valley High School, San Ramon, CA
In-person.
<https://projectboard.world/isef/project/83034>
- ROBO042T Autonomous Base Station for Drone Storage and Battery Swapping**
Cosmin Ciorba, 17, Junior, Andrei Copaci, 18, Senior, Theoretical Lyceum "Ion Creanga", Chisinau, Republic of Moldova
Liceul de Creativitate si Inventica Prometeu-Prim, Chisinau, Republic of Moldova
Virtual.
<https://projectboard.world/isef/project/85173>
- ROBO043 Analyzing the Effects of Non-Generative Augmentation on MRI-Based Classification of Brain Tumors Using Convolutional Neural Networks**
Adam Rolander, 15 Sophomore, Prospect Ridge Academy, Broomfield, CO
Virtual.
<https://projectboard.world/isef/project/85812>
- ROBO044 Soft Bio-Mimetic Caterpillar Robot**
Dajun Yuan, 17 Junior, Armand Hammer United World College, Montezuma, NM
Virtual.
<https://projectboard.world/isef/project/82764>
- ROBO045 Evaluating Machine Learning Methods for Modeling the Distribution of the Two Form Bumble Bee (*Bombus bifarius*) in Wyoming**
Padmalakshmi Ramesh, 15 Freshman, Laramie High School, Laramie, WY
In-person.
<https://projectboard.world/isef/project/85824>
- ROBO046 Realtime ASL Translation Using ML and Computer Vision**
Enzo Tiptur, 18 Senior, Academies of Loudoun, Leesburg, VA
In-person.
<https://projectboard.world/isef/project/85084>
- ROBO047 PathFinder: Novel Inverse Kinematical Path Tracking for Autonomous Vehicles Using Pure Pursuit and Bezier Curves**
Rohan Bosworth, 16 Junior, Poway High School, Poway, CA
In-person.
<https://projectboard.world/isef/project/85890>
- ROBO048 Determining the Probability of Intensive Care Unit Admission Based on Patient Characteristics Using Machine Learning**
Karen Medina, 16 Junior, University Gardens High School, San Juan, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/85305>
- ROBO049 Forecasting Beach Safety in Iowa's Recreational Lakes Using Machine Learning Models**
Claire Gu, 17 Junior, Valley High School, West Des Moines, IA
Virtual.
<https://projectboard.world/isef/project/85066>

- ROBO050 Designing a Robotic Arm Prosthesis With the Integration of FDM 3D Printing, Haptic Feedback, FSRs, and Machine Vision**
 Jilly Choi, 15 Freshman, duPont Manual High School, Louisville, KY
 In-person.
<https://projectboard.world/isef/project/85112>
- ROBO051 Low-Cost Quadruped Robot With Rough Terrain Traversal, Obstacle Avoidance, and Autonomous Navigation**
 Henry Zhao, 17 Junior, Collingwood School, West Vancouver, British Columbia, Canada
 Virtual.
<https://projectboard.world/isef/project/85136>
- ROBO052T COVision: A Novel Convolutional Neural Network for the Differentiation of COVID-19 From Common Pulmonary Conditions**
 Timothy Mathew, 16, Sophomore,
 Kush Parikh, 16, Sophomore,
 Troy High School, Troy, MI
 In-person.
<https://projectboard.world/isef/project/85128>
- ROBO053 Geometric Consistency-Based Self-Supervised Neural Network: A Novel Deep Learning Framework for 3D Human Shape and Motion Reconstruction**
 # Michelle Hua, 17 Junior, Cranbrook Kingswood School, Bloomfield Hills, MI
 In-person.
<https://projectboard.world/isef/project/85862>
- ROBO055 Real-Time Sign Recognition for ASL to Text Conversion**
 Nidhi Krishna Kumar, 17 Junior, Olympia High School, Olympia, WA
 Virtual.
<https://projectboard.world/isef/project/85813>
- ROBO056 Glasses for the Blind Using Finger Tracking and OCR**
 Du-go Park, 16 Junior, Korea Digital Media High School, Ansan-si, South Korea
 Virtual.
<https://projectboard.world/isef/project/85248>
- ROBO057T Using Computer Vision and Augmented Reality To Utilize Pupil Movement as an Alternative to Traditional Tactile Input Systems**
 William Savage, 16, Sophomore,
 Alexander Shipley, 16, Sophomore,
 H-B Woodlawn Secondary Program,
 Arlington, VA
 In-person.
<https://projectboard.world/isef/project/85627>
- ROBO058 Using Subpixel Interpolation and Deep Learning Convolution Models To Compress Domain-Specific Audio Waveforms**
 Nikhil Nayak, 15 Sophomore, Sunset High School, Portland, OR
 In-person.
<https://projectboard.world/isef/project/85839>
- ROBO059 Neural Networks Learn Lazily: Improving Generalization and Adversarial Robustness via Learning Capacity-Complexity Constraints**
 # Andy Phung, 17 Junior, Independence High School, San Jose, CA
 In-person.
<https://projectboard.world/isef/project/85626>
- ROBO060 Comparative Research of Image Processing Algorithms for Segmentation of Natural Water Bodies in Satellite Images**
 Noam Zamski, 17 Senior, Brenner Regional High School, Givat Brenner, Israel
 In-person.
<https://projectboard.world/isef/project/85773>
- ROBO061T Intelligent Driver Status Monitoring System**
 Diana Melnikova, 16, Junior,
 Kamila Utegenova, 17, Junior,
 Ozat Boarding School of Information
 Technology, Kostanay, Kostanay, Kazakhstan
 Virtual.
<https://projectboard.world/isef/project/85613>
- ROBO062 How To Train Your Multi-View Cloth Classifier**
 Chigozirim Ifebi, 16 Junior, Elmont Memorial Junior-Senior High School, Elmont, NY
 In-person.
<https://projectboard.world/isef/project/85976>

- ROBO063 Simulation of Abnormal Crouch Gait and Development of a Generalized Torque-Additive Rehabilitative Technique for Complex Mobility Issues**
Allen Shen, 17 Senior, Clear Lake High School, Houston, TX
In-person.
<https://projectboard.world/isef/project/86100>
- ROBO064 Novel Multipurpose Air-Handling Robot With AI-Based Anomaly Detection**
Mikul Saravanan, 17 Junior, Cranbrook Kingswood School, Bloomfield Hills, MI
In-person.
<https://projectboard.world/isef/project/86121>
- ROBO065 Detecting Cracks in Concrete Structures Using a Deep Learning Wall-Climbing Robot**
Anthony Saturnino, 16 Junior, Bishop Ryan Catholic Secondary School, Hannon, Ontario, Canada
Virtual.
<https://projectboard.world/isef/project/86207>
- ROBO066 Designing a LiDAR Topographic Navigation System: A Novel Approach To Aid the Visually Impaired**
Tiffani Gay, 15 Freshman, Orlando Science Schools, Orlando, FL
In-person.
<https://projectboard.world/isef/project/86227>
- ROBO067 Early Predator Identification System (EPIS): A Powerful Machine Learning Model To Stop the Epidemic of Child Predators on the Modern Internet**
Jai Agrawal, 15 Sophomore, BASIS Chandler, Chandler, AZ
In-person.
<https://projectboard.world/isef/project/86237>
- ROBO068 Automatic Detection of Stroke-Induced Aphasia**
Satvik Nelakuditi, 15 Sophomore, Spring Valley High School, Columbia, SC
In-person.
<https://projectboard.world/isef/project/86259>
- ROBO069 Detection of Benign and Malignant Lung Nodules in 3D Volumes Generated From Thoracic Computed Tomography Scans Leveraging Artificial Intelligence, Year 2**
Bianka Albert, 17 Junior, West Shore Junior/Senior High School, Melbourne, FL
In-person.
<https://projectboard.world/isef/project/86360>
- ROBO070 Applying OpenCV and Machine Learning to the Enforcement of COVID-19 Prevention Guidelines**
Hector Lugaro, 18 Senior, Centro Residencial de Oportunidades Educativas de Mayagüez, Mayagüez, Puerto Rico, Puerto Rico
Virtual.
<https://projectboard.world/isef/project/86382>
- ROBO071 A Helmholtzian Deep Learning Approach to Glomeruli Segmentation Using Energy-Based Models for Uncertainty Estimation**
Omar Abul-Hassan, 17 Senior, Ocean Lakes High School, Virginia Beach, VA
Virtual.
<https://projectboard.world/isef/project/86405>
- ROBO072 Emulating Human Vision Processes To Quantify an Environment**
Manu Kiiskila, 16 Freshman, Finnish International School of Tampere, Tampere, Pirkanmaa, Finland
In-person.
<https://projectboard.world/isef/project/86456>
- ROBO073 Hard Missions Robot**
Abd Elrahman Draz, 18 Senior, Future International Schools Sadat City Branch, Sadat City, El Sadat, Egypt
In-person.
<https://projectboard.world/isef/project/86457>
- ROBO074 Lan-DLE: Uncertainty-Aware Autonomous Landing of Fixed-Wing Aircraft With Deep Learning Ensembles**
Daniel Zhao, 17 Junior, Alabama School of Fine Arts, Birmingham, AL
In-person.
<https://projectboard.world/isef/project/86575>
- ROBO075 Early Detection of Acromegaly Using a Novel Convolutional Neural Network**
Anish Leekkala, 16 Junior, Bentonville High School, Bentonville, AR
In-person.
<https://projectboard.world/isef/project/86596>

- ROBO076 Neuron-Specific Dropout: A Deterministic Regularization Technique To Prevent Neural Networks From Overfitting and Reduce Dependence on Large Training Samples**
Joshua Shunk, 17 Junior, Perry High School, Gilbert, AZ
In-person.
<https://projectboard.world/isef/project/86599>
- ROBO077 Electronic Breaking System**
Kylan Takakusagi, 18 Senior, Waimea High School, Waimea, HI
Virtual.
<https://projectboard.world/isef/project/86637>
- ROBO078 A.I. T.A.**
Gracie Nutt, 17 Junior, Tioga High School, Tioga, ND
Virtual.
<https://projectboard.world/isef/project/86658>
- ROBO079 Coding a Goniometer Robot To Replicate Human Eye Movements as Tool for Improved Disease Research**
Sree Kolla, 17 Junior, Staten Island Technical High School, Staten Island, NY
In-person.
<https://projectboard.world/isef/project/86666>
- ROBO080 Ceres: A Novel Device Utilizing Raspberry Pi and Neural Networks To Detect Crop Diseases Using Imaging**
Laasya Acharya, 14 Freshman, William Mason High School, Mason, OH
In-person.
<https://projectboard.world/isef/project/86689>
- ROBO082T Anti-Virus Autobots: Predicting More Infectious Virus Variants for Pandemic Prevention Through Deep Learning**
Tze Erhn Koay, 17, Senior,
Glenda Tan, 17, Senior,
Raffles Institution, Singapore, Singapore
Virtual.
<https://projectboard.world/isef/project/86725>
- ROBO083 Mind Beacon: A Portable Spatial Recognition Device for the Visually Impaired Using a 3D Depth Sensor and Custom Tactile Display**
Seoyoung Jun, 16 Sophomore, Thomas Jefferson High School for Science and Technology, Alexandria, VA
In-person.
<https://projectboard.world/isef/project/86737>
- ROBO084 Demonstration and Accuracy of Machine Learning for Sorting Recyclables**
Anish Aradhey, 16 Junior, Harrisonburg High School, Harrisonburg, VA
Virtual.
<https://projectboard.world/isef/project/86824>
- ROBO085 The Creation of a Convolutional Neural Network To Classify Chronic Ulcer Infectivity**
Avi Gupta, 16 Junior, Iolani School, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/86830>
- ROBO086 Explore the Protein Folding Problem Using Reinforcement Learning**
Jiachen Lu, 17 Sophomore, Culver Academies, Culver, IN
In-person.
<https://projectboard.world/isef/project/86841>
- ROBO087T Screen CXR: A Novel Deep Learning-Based Multi-Model Pipeline for Detection of Any Lung Tissue Disease Through Automatic Chest X-Ray Image Analysis**
Rudransh Agnihotri, 17, Senior,
Ayush Biswal, 14, Freshman,
Utkarsh Mittal, 17, Senior,
Birla Vidya Niketan, New Delhi, Delhi, India
Coppell High School, Coppell, TX
Virtual.
<https://projectboard.world/isef/project/86870>
- ROBO088 Deepfake Detection Using Deep Learning**
Michelle Hu, 16 Sophomore, Woodside High School, Newport News, VA
Virtual.
<https://projectboard.world/isef/project/86957>

Systems Software

- SOFT001 Gamifying Learning by Repetition**
Alicia Daraban, 18 Senior, James B. Castle High School, Kaneohe, HI
In-person.
<https://projectboard.world/isef/project/82916>
- SOFT002 Development of Immersive Metaverses Applied to Astrobiology Teaching**
Henrique Amorim, 17 Senior, Colegio Dante Alighieri, Sao Paulo, São Paulo, Brazil
In-person.
<https://projectboard.world/isef/project/83147>
- SOFT003T NuAR: Technology and Creative Language Together To Tell the Great Stories of Women Who Did Science Around the World**
Ariadne de Paula, 18, Senior,
Bianca Ribas, 18, Senior,
Instituto Federal de Mato Grosso do Sul -
Campus Campo Grande, Campo Grande, Mato Grosso do Sul, Brazil
In-person.
<https://projectboard.world/isef/project/83253>
- SOFT004 Novel AI-Powered Sign Language Translator**
Nand Vinchhi, 17 Junior, National Public School - Koramangala, Bangalore, Karnataka, India
In-person.
<https://projectboard.world/isef/project/83259>
- SOFT005 Enhancing the Security of Websites With Virtual Identification Code Steganography**
Krish Yadav, 17 Junior, MKH Sancheti Public School, Nagpur, Maharashtra, India
In-person.
<https://projectboard.world/isef/project/82689>
- SOFT006 Horizon Scan Vision**
Balazs Szonyi, 18 Senior, TSZC Benki Donat - Pech Antal High Schools, Tatabanya, Komarom-Esztergom, Hungary
In-person.
<https://projectboard.world/isef/project/85120>
- SOFT007 Overcoming the Air Gap: Experimentation on Data Transfer**
Joy Dong, 17 Junior, Louisiana School for Math, Science, and the Arts, Natchitoches, LA
In-person.
<https://projectboard.world/isef/project/82793>
- SOFT008 Building Silent Activation and Improved Location Accuracy Into the Current 911 System**
Roan Wainscoat, 18 Senior, Kalaheo High School, Kailua, HI
In-person.
<https://projectboard.world/isef/project/82784>
- SOFT009T Mobile Wallet Platform To Fit the Need of Regional Markets**
Anita Algu, 19, Senior,
Paul Jurgens, 19, Senior,
Grete Paat, 19, Senior,
Hugo Treffner Gymnasium, Tartu, Tartu County, Estonia
In-person.
<https://projectboard.world/isef/project/82742>
- SOFT010 Allover the Place: AI-Powered E-Commerce and Social Media Platform Makes Daily Business Fun and Easy**
Javad Aslanov, 14 Freshman, Dunya School, Baku, Azerbaijan
In-person.
<https://projectboard.world/isef/project/83032>
- SOFT011 An Investigation Into Worldwide Electoral Systems and the Development of a Novel Internet Voting System**
Andrei Florian, 18 Junior, Saint Aidans C.B.S, Dublin, Ireland
Virtual.
<https://projectboard.world/isef/project/85134>
- SOFT012T Mind Plateau: A Collaborative Mobile Application and Procedural Puzzle Generation for Mind Games Education**
Muhammed Yusuf Kartal, 18, Junior,
Yusuf Efdal Yilmaz, 17, Junior,
Kartal Anadolu Imam Hatip High School, Istanbul, Turkey
In-person.
<https://projectboard.world/isef/project/85308>

- SOFT013T U-TAB: User-Centered Transparent Aid Platform Using Blockchain**
 Yechan Lee, 16, Sophomore, Yates Park, 14, Freshman, Goo Ha Park, 18, Junior, Dublin High School, Dublin, CA
 Seoul International School, Seoul, Gyunggi-Do, South Korea
 Chadwick International School, Incheon, South Korea
 Virtual.
<https://projectboard.world/isef/project/83187>
- SOFT014 Argus III: A Novel Image Optimization and Augmentation Framework To Enable an Improved Patient Experience for the Next Generation Epiretinal Prosthesis**
 William Huang, 17 Junior, Palos Verdes Peninsula High School, Rolling Hills Estates, CA
 In-person.
<https://projectboard.world/isef/project/82953>
- SOFT015 Watershed Computer Game**
 Benjamin Whithurst, 17 Senior, Pearl City High School, Pearl City, HI
 Virtual.
<https://projectboard.world/isef/project/85150>
- SOFT016 A Home Automation System for Neuromuscular Disorder Patients Using Brain-Computer Interface**
 Navya Ramakrishnan, 18 Senior, Plano Senior High School, Plano, TX
 In-person.
<https://projectboard.world/isef/project/82955>
- SOFT017T WatchfuLock**
 # Dylan Bracey, 18, Senior, Joshua Burk, 19, Senior, Jesuit High School, New Orleans, LA
 In-person.
<https://projectboard.world/isef/project/82825>
- SOFT018 Implementation of the Covhelp Mobile Application as a Guidance Tool in the Face of the COVID-19 Pandemic**
 Megan Espinoza Luna, 16 Senior, San Juan Macias, Callao, Callao, Peru
 Virtual.
<https://projectboard.world/isef/project/83182>
- SOFT019 Indoor Ranging System for Athletic Discus Throwing**
 Shijia Li, 18 Senior, Jinling High School, Nanjing, Jiangsu, China
 Virtual.
<https://projectboard.world/isef/project/83154>
- SOFT020 The Hash Algorithm Based on Three-Body Chaotic Motion**
 Huayi Zhang, 16 Junior, Shanghai Kongjiang Senior High School, Shanghai, China
 Virtual.
<https://projectboard.world/isef/project/83157>
- SOFT021 Predicting Structural Similarity Between Molecules Using Graph Neural Networks**
 Sichen Deng, 17 Junior, High School Affiliated to Shanghai Jiao Tong University, Shanghai, Shanghai, China
 Virtual.
<https://projectboard.world/isef/project/82925>
- SOFT022 Face-Recognition Food Consumption Tracker**
 Mingyue Deng, 17 Senior, Guiyang No. 1 High School, Guiyang, Guizhou, China
 Virtual.
<https://projectboard.world/isef/project/82770>
- SOFT023 Program Development To Check Students' Concentration During Online Class**
 Ju-Young Shim, 17 Junior, SeHyun High School, Seoul, Gangseo-gu, South Korea
 Virtual.
<https://projectboard.world/isef/project/85114>
- SOFT024 Detecting Glaucoma From Retinal Fundus Images Using Machine Learning**
 Rohan Kalia, 15 Freshman, Wheeler High School, Marietta, GA
 In-person.
<https://projectboard.world/isef/project/82902>
- SOFT025T Comparing the Efficiency of Novel Point-of-Care, Low-Cost Neural Networks in Identifying Specific Stages of Diabetic Retinopathy Across a Limited Retinal Dataset**
 Aum Dhruv, 17, Junior, Nicholas Harty, 16, Junior, Fort Myers High School, Fort Myers, FL
 In-person.
<https://projectboard.world/isef/project/85158>

- SOFT026T Novel Search Algorithms To Efficiently Solve the Shortest Vector Problem in Post-Quantum Cryptography**
 Luke Bousfield, 17, Junior,
 James Liu, 18, Senior,
 Timberline High School, Boise, ID
 In-person.
<https://projectboard.world/isef/project/82745>
- SOFT027 Coding for STEM Education**
 ##
 Marlea Martens, 17 Senior, Elko High School,
 Elko, NV
 In-person.
<https://projectboard.world/isef/project/82899>
- SOFT028T A New Approach to Image-Based 3D Virtual Try-On Using Deep Learning**
 Chae Young Huh, 18, Senior,
 Eun Woo Chang, 17, Senior,
 ChaeWon Huh, 16, Junior,
 Daegu NamSan High School
 Gyeongil Girl's High School, Nam-gu,
 Kyeongbuk High School, Daegu, South Korea
 Virtual.
<https://projectboard.world/isef/project/83068>
- SOFT029T An Enhanced Adversarial Attack Method for Defending Against CAPTCHA Solvers**
 Bo-Feng Lai, 16, Junior,
 Luther Wei, 16, Junior,
 Taipei Municipal Jianguo High School, Taipei
 City, Taiwan
 In-person.
<https://projectboard.world/isef/project/85610>
- SOFT030 Chemistry 101: A Chemistry Guide and Simulation Mobile App**
 Jenan Ghaith, 17 Junior, Mayar International
 Schools, Amman, Jordan
 In-person.
<https://projectboard.world/isef/project/82855>
- SOFT031 Combating Disease in Under-Resourced Areas: Synthetic Degradation as a Method to Low-Quality Image Classification**
 Raahi Chada, 17 Senior, Academies of Loudoun,
 Leesburg, VA
 In-person.
<https://projectboard.world/isef/project/85780>
- SOFT032 Using Kleisli Morphisms for Malware Detection With Graph Convolution Networks**
 Landon Colaresi, 16 Junior, Pittsburgh
 Allerdice High School, Pittsburgh, PA
 In-person.
<https://projectboard.world/isef/project/85225>
- SOFT033T Abstract Image Search Algorithm Based on Color Histogram**
 Juntae Jeong, 16, Junior,
 Jiwoo Kim, 16, Junior,
 Sihwan Lee, 17, Senior,
 Gyeongnam Science High School, Jinju-si,
 Gyeongsangnam-do, South Korea
 Virtual.
<https://projectboard.world/isef/project/85146>
- SOFT034T Evaluating Machine Learning-Based Static Malware Classifiers**
 Daniel Link, 16, Junior,
 Andrew Yin, 17, Junior,
 Martin Luther King High School, Riverside, CA
 Virtual.
<https://projectboard.world/isef/project/85174>
- SOFT035 Novel Method for the Identification of High-Risk Space Debris**
 #
 Thomas Vielmetti, 18 Senior, Nicolet High
 School, Glendale, WI
 In-person.
<https://projectboard.world/isef/project/85863>
- SOFT036 Versatile and Customizable Gesture Recognition-Based Computer Control Using Open Source, Inexpensive Computer Vision Technology**
 Glen Warren, 17 Senior, Dearborn Center for
 Math, Science, and Technology, Dearborn
 Heights, MI
 In-person.
<https://projectboard.world/isef/project/85226>
- SOFT037 Million.js: A Fast, Compiler-Augmented Virtual DOM for Performant JavaScript UI Libraries**
 #
 Aiden Bai, 17 Senior, Camas High School,
 Camas, WA
 Virtual.
<https://projectboard.world/isef/project/85154>

SOFT038T A Secret Sharing Scheme Without Third-Party Dealers

Gunwook Jeon, 17, Senior,
Minwoo Kim, 17, Senior,
Taehyun Lee, 18, Senior,
Korea Science Academy of KAIST, Busan,
Busan, South Korea
Virtual.

<https://projectboard.world/isef/project/85231>

SOFT039 Using Machine Learning To Augment Dynamic Time Warping-Based Signal Classification

Arvind Seshan, 17 Junior, Fox Chapel Area High School, Pittsburgh, PA

In-person.

<https://projectboard.world/isef/project/85241>

SOFT040 Waycat - Scratch-Like Code Editor That Can Translate Blocks To Code and Vice Versa

Mykhailo Shynder, 17 Junior, Richelieu Scientific Lyceum, Odesa, Odes'ka, Ukraine
Virtual.

<https://projectboard.world/isef/project/85816>

SOFT041 Educaccess - Software for Transcribing Video Lessons Into Compact PDFs Using Keyframe Extraction, Summarization and Transcription Algorithms

Ligia Keiko Carvalho, 17 Senior, Colegio Tecnico de Campinas, Campinas, São Paulo, Brazil
In-person.

<https://projectboard.world/isef/project/85653>

SOFT042 A Novel Deep Learning-Based Symptom Recognition System for Effective Physician Decision-Making

Jonathan Fan, 16 Junior, West High School, Iowa City, IA

In-person.

<https://projectboard.world/isef/project/85635>

SOFT043 Explore-and-Fuse: A Physarum-Inspired Approach to the Steiner Tree Problem

Sheryl Hsu, 17 Senior, Valley Christian High School, San Jose, CA

In-person.

<https://projectboard.world/isef/project/85570>

SOFT044T Auto Accident Report System

Ju-Hyeong Choi, 17, Senior,
Hyoung Ju Seon, 16, Junior,
Da Won Yang, 16, Junior,
Yedang High School, Deungnyang-myeon,
Boseong-gun, Jeollanam-do, South Korea
Virtual.

<https://projectboard.world/isef/project/85922>

SOFT045 Internet Broadcast Management System: Post-Broadcast File Management and Editing Point Extraction

Shin Doyun, 17 Senior, Incheon Daegun High School, Incheon, Yeonsu-gu, South Korea

Virtual.

<https://projectboard.world/isef/project/85932>

SOFT046 Using Logistic Regression Markov Chain-Based Machine Learning Models To Predict Basketball Using NBA Data

Sherwin Thiyagarajan, 17 Senior, Albuquerque School of Excellence, Albuquerque, NM

In-person.

<https://projectboard.world/isef/project/85954>

SOFT047 Analyzing the Musical "Genome" With Neural Networks

Nathaniel Abrams, 17 Junior, Hilton Head Preparatory School, Hilton Head Island, SC
In-person.

<https://projectboard.world/isef/project/85959>

SOFT048 An Active Fairness Algorithm for Estimating Socioeconomic Status From Household Surveys and Satellite Images

Ritika Brahmadesam, 18 Senior, Ossining High School, Ossining, NY

In-person.

<https://projectboard.world/isef/project/85967>

SOFT049 Using Cellular Automata To Simulate Liquid, Gas, and Powder Physics

Erick Graham, 16 Sophomore, InTech Collegiate High School, North Logan, UT

In-person.

<https://projectboard.world/isef/project/85986>

SOFT050T Smart Shopping Cart App

Azad Hamdan, 15, Sophomore,
Dania Smeeq, 17, Junior,
Shaimaa Girls Secondary School, Qalqilya,
Palestine

In-person.

<https://projectboard.world/isef/project/86279>

SOFT051 Sustainability Scanner: Empowering Consumers To Make Eco-Friendly Grocery Purchases
Jay Nimbalkar, 17 Junior, Green Hope High School, Cary, NC
Virtual.
<https://projectboard.world/isef/project/86420>

SOFT052T How Far Can You See?: Simulations of Sightlines in Swedish Landscapes
Moltas Lindell, 18, Senior,
Andreas Tornkvist, 18, Senior,
Curt Nicolin Gymnasiet, Finspang,
Ostergotland, Sweden
In-person.
<https://projectboard.world/isef/project/86453>

SOFT053 qSimulator: A Novel Method for Rapid Quantum Simulation of Molecules Using Cliques
Arun Moorthy, 17 Junior, BASIS Scottsdale, Scottsdale, AZ
Virtual.
<https://projectboard.world/isef/project/86591>

SOFT054 Subscript: A Functional Programming Language for Scripting in Data-Driven JVM Applications
Elliott Krzeminski, 18 Senior, Red Mountain High School, Mesa, AZ
In-person.
<https://projectboard.world/isef/project/86602>

SOFT055 Quantum Bogosort
George Huebner, 18 Senior, Walter Payton College Preparatory High School, Chicago, IL
Virtual.
<https://projectboard.world/isef/project/86672>

SOFT056T A Humanitarian Blood Donation Application That Facilitates the Search for Potential Blood Donors and the Smart Management of Blood Storage
Phong Tran, 17, Junior,
Chi Tran, 16, Junior,
Lao Cai High School for Gifted Students, Lao Cai, Lao Cai, Viet Nam
Virtual.
<https://projectboard.world/isef/project/86708>

SOFT057T Sufficiency of Electric Vehicle Charging Infrastructure
Justus Hansen, 17, Junior,
Joonatan Korpela, 17, Junior,
Paivola School of Mathematics, Valkeakoski, Finland
In-person.
<https://projectboard.world/isef/project/86726>

SOFT058 Geography Education Computer Application
Dillon Browning, 17 Senior, Warner High School, Warner, SD
Virtual.
<https://projectboard.world/isef/project/86978>

SOFT059 Xnet: A Novel Machine Learning Model for Fast MRI Reconstruction
Shoumik Roychowdhury, 18 Senior, Westwood High School, Austin, TX
In-person.
<https://projectboard.world/isef/project/87479>

Translational Medical Science

TMED001T Using Fluorescent Imaging To Make Cancer Detection More Accurate

Sahil Hemrajani, 16, Sophomore,
Ibrahim Mohammad, 15, Sophomore,
Chattahoochee High School, Johns Creek, GA
In-person.

<https://projectboard.world/isef/project/83150>

TMED002 To What Extent Does the L Form of Beta-Hydroxybutyrate (BHB) Have Unique Anti-Cancer Effects Compared to the D Form, on U87 Brain Cancer Cells *in vitro*?

Cheyenne Shirley, 17 Senior, South Sumter High School, Bushnell, FL
In-person.

<https://projectboard.world/isef/project/83024>

TMED003T The Production of Tumor Suppressor Protein TP53 and the Relative Homologous Properties Identified Using Gorilla Genome To Account the Absence of Cancer

Avory Andrei, 18, Senior,
Colby Rinberger, 16, Sophomore,
South Sumter High School, Bushnell, FL
Virtual.

<https://projectboard.world/isef/project/83265>

TMED004T FlickerAI: Resolution of Photosensitive Epileptic Visual Content With Spatio-Temporal Luminance Frequency Analysis

Jaisal Kothari, 17, Senior,
Ashay Srivastava, 18, Senior,
Amity International School – Saket, New Delhi
Delhi Public School, R. K. Puram, Delhi, New Delhi, India
Virtual.

<https://projectboard.world/isef/project/82880>

TMED005 A Quantum Machine Learning-Based Framework for Early Cancer Detection and Biomarker Identification Through Transcriptome Profiles

Rushank Goyal, 16 Junior, 7i World School,
Gwalior, Madhya Pradesh, India
Virtual.

<https://projectboard.world/isef/project/82932>

TMED006 GliomAssist: Computational Glioma Grading and Prognosis With PET

Vishnu Sampathkumar, 18 Senior, National Public School, Indiranagar, Bangalore, Karnataka, India
Virtual.

<https://projectboard.world/isef/project/85793>

TMED007 Determination of Therapeutic Potential of Apigenin on Philadelphia Negative Acute Lymphoblastic Leukemia

Ayse Serra Kosger, 17 Senior, Izmir Fen Lisesi, Izmir, Bornova, Turkey
In-person.

<https://projectboard.world/isef/project/85628>

TMED008 Mitigating Impaired Drug Absorption To Shorten Medical Treatment and Enable Pharmaceutical Product Development: Critical Evaluation of Human Oral Bioavailability for Pharmaceutical Drug Paracetamol

Ra'ees De Witt, 18 Senior, Curro Hermanus Independent School, Hermanus, Western Cape, South Africa
In-person.

<https://projectboard.world/isef/project/85294>

TMED009T Essential Protection: Using UV-Sensitive Yeast To Evaluate Essential Oils as an Alternative to Sunscreen

Ava Jaffe, 17, Junior,
Amrit Menon, 18, Senior,
Breck School, Golden Valley, MN
In-person.

<https://projectboard.world/isef/project/85097>

TMED010T BiDEx - A Screening System for Rapid Proactive Detection of Patients With Liver Fluke Infection Using a CNN Model To Detect *Orphistorchis viverrini* Eggs From Microscopic Fecal Images and a NN Model for Infection Risk Assessment

Napassorn Litchiowong, 17, Junior,
Chris Tiditjumreonpon, 16, Junior,
Wattanapong Uttayota, 17, Junior,
The Prince Royal's College, Mueang Chiang Mai, Chiang Mai, Thailand
In-person.

<https://projectboard.world/isef/project/82840>

- TMED011 Assessment of the Neurological Effects of *Withania somnifera* and Resveratrol Using a *Drosophila* Model**
Roshna Mannuthoduvil, 17 Senior, Tavares High School, Tavares, FL
In-person.
<https://projectboard.world/isef/project/82994>
- TMED012 Understanding the Molecular Mechanisms Underlying the Anticancer Pathway of a Traditional Hawaiian Herb**
Rachel Tao, 16 Junior, Waiakea High School, Hilo, HI
Virtual.
<https://projectboard.world/isef/project/82926>
- TMED013 The Role of Melanotropins in the Improvement of Cognitive Functions in Dementia-Related Disorders**
Patrik Wekwejt, 18 Senior, Joseph Bem High School No.1 in Ostroleka, Ostroleka, Mazowieckie, Poland
Virtual.
<https://projectboard.world/isef/project/85256>
- TMED014 EyeGen: A Low-Cost Biomarker for the Ophthalmological Assessment of Ophthalmic Diseases Using Deep Learning Models**
Abhinav Gurram, 16 Sophomore, Green Hope High School, Cary, NC
In-person.
<https://projectboard.world/isef/project/85242>
- TMED015 Attenuating the Consequences of Ethanol Exposure With Probiotics**
Heidi Houck, 15 Freshman, Transmountain Early College High School, El Paso, TX
Virtual.
<https://projectboard.world/isef/project/85868>
- TMED016T A Novel Methodology To Improve Hand Hygiene Compliance Using Computer Vision and 3D Depth Sensors**
Laya Yalamanchili, 18, Senior, Kaavya Yalamanchili, 16, Sophomore, L C Anderson High School, Austin, TX
In-person.
<https://projectboard.world/isef/project/83185>
- TMED017 Use of Bio-Electrical Impedance Analysis To Detect Changes in Bone Density Indicative of Osteoporosis**
Sanskriti Manoharan, 14 Freshman, Hightower High School, Missouri City, TX
In-person.
<https://projectboard.world/isef/project/85808>
- TMED018T Determining the Cumulative Effects of Saccharin, Ethanol, and Taurine on the Developing Embryo of *Danio rerio***
Gaddiel Garcia, 18, Senior, ## Rianna Trevino, 18, Senior, Hanna Early College High School, Brownsville, TX
In-person.
<https://projectboard.world/isef/project/82922>
- TMED019 A Pneumatic Hand Muscle Rehabilitation Training Glove Based on the EMG Signal: AI-Powered, Improved Robustness, and High Durability**
Zeyuan Wei, 17 Junior, Shanghai World Foreign Language Academy, Shanghai, China
Virtual.
<https://projectboard.world/isef/project/82746>
- TMED020 Using Machine Learning To Detect and Prevent Early Stages of Skin Cancer in Underrepresented Communities**
Emma Nordstrom, 16 Sophomore, Trinity Lutheran High School Bend Oregon, Bend, OR
In-person.
<https://projectboard.world/isef/project/82831>
- TMED021 Wastewater-Based Epidemiology (WBE) To Monitor COVID-19 in a Private Community Campus**
Elaf Alahdal, 17 Senior, Secondary Gifted School, Jeddah, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85075>
- TMED022 1,4-Benzodioxin Derivatives as Dual Inhibitors for Alpha-amylase and Alpha-glucosidase for Managing Type 2 Diabetes**
Maryam Al Abdulbaqi, 17 Senior, Safwa First Secondary School, Safwa, Eastern, Saudi Arabia
In-person.
<https://projectboard.world/isef/project/85826>

- TMED023 Targeting Glut3 and GABA Receptors Alleviates the Intestinal Side Effects of HER2 TKIs**
Yu-Wei Huang, 16 Sophomore, Taipei Fuhsing Private School, Taipei, Chinese Taipei
In-person.
<https://projectboard.world/isef/project/85842>
- TMED024 SmartClick: A Novel Automated Segmentation Tool for Medical Images With Interactive Optimization Capabilities Designed for Liver Cysts**
Collin Li, 18 Senior, William A. Shine Great Neck South High School, Great Neck, NY
In-person.
<https://projectboard.world/isef/project/82997>
- TMED025 Analyzing the Viability of Pure Mushroom-Derived Chitosan as an Alternative to Pure Crustacean-Derived Chitosan in Hemostatic Agents**
Lara Kendall, 17 Junior, Canterbury School, Fort Myers, FL
In-person.
<https://projectboard.world/isef/project/85135>
- TMED026 Investigating the Cytotoxicity of *Centella asiatica* Methanolic Leaf Extracts on MDA-MB-231 Human Breast Cancer Cells**
Mercedes Randhahn, 16 Junior, Saint Joseph Catholic High School, Ogden, UT
In-person.
<https://projectboard.world/isef/project/85877>
- TMED027 Development of a Polydiacetylene-Based Paper Biosensor for Naked-Eye Detection of COVID-19 in Saliva**
Christopher Prainito, 17 Senior, John F. Kennedy High School, Bellmore, NY
In-person.
<https://projectboard.world/isef/project/83073>
- TMED028 Regression Analysis of Pectoralis Major Muscle Electromyography To Estimate Anterior Thoracic Cage Forces**
Ansel LaPier, 18 Senior, Central Valley High School, Spokane Valley, WA
Virtual.
<https://projectboard.world/isef/project/85165>
- TMED029T Development of Novel, Selective, Orally Available Small Molecule CDK9 Inhibitors for Prostate Cancer Therapy - Mechanistic Studies**
Sowmya Paritala, 17, Junior,
Saisha Vankayalapati, 16, Junior,
Hillcrest High School, Midvale, UT
In-person.
<https://projectboard.world/isef/project/85103>
- TMED030 NeuroHealth: An Automated Screening Pipeline To Detect Undiagnosed Cognitive Impairment in Electronic Health Records Using Deep Learning and Natural Language Processing**
Tanish Tyagi, 17 Junior, Phillips Exeter Academy, Exeter, NH
In-person.
<https://projectboard.world/isef/project/85608>
- TMED031 Enabling Ankle-Brachial Index Prediction From Dopplers Using Deep Learning for Peripheral Arterial Disease Diagnosis**
Adrit Rao, 14 Freshman, Palo Alto Senior High School, Palo Alto, CA
Virtual.
<https://projectboard.world/isef/project/85205>
- TMED032 OncoRx: An Integrative Approach to Identification of Pan-Cancer Molecular Biomarkers and Prediction of Targeted Multi-Drug Cancer Therapeutics**
Darsh Mandera, 17 Junior, Jesuit High School, Portland, OR
Virtual.
<https://projectboard.world/isef/project/85094>
- TMED033 FluVaxAI: A Novel AI-Inspired Regional Flu Vaccine Formulation**
Cameron Sharma, 18 Senior, Mills E. Godwin High School, Henrico, VA
In-person.
<https://projectboard.world/isef/project/85276>
- TMED034 A Precision Medicine Approach: *In silico* Analysis of a Novel Anti-Tumor Peptide as a Future Targeted Therapy**
Rebecca Qiu, 16 Junior, Roanoke Valley Governor's School for Science and Technology, Roanoke, VA
In-person.
<https://projectboard.world/isef/project/85820>

- TMED035 Nano-Antioxidants' Effects on Oxidizing Agent Exposure**
Catherine Diyakonov, 17 Senior, Lord Byng Secondary School, Vancouver, British Columbia, Canada
Virtual.
<https://projectboard.world/isef/project/85794>
- TMED036 The Development of a Videogame That Serves as a Diagnostic Tool for Depression in Teenagers**
Daniela Gonzalez -Romano, 17 Senior, The San Juan Math, Science and Technology Center, San Juan, PR
In-person.
<https://projectboard.world/isef/project/85191>
- TMED037 A Looming Epidemic: Personal Music Player Use in a Young Adult Sample and Its Implications for Future Noise-Induced Hearing Loss**
Lilly Graham, 16 Sophomore, West High School, Iowa City, IA
In-person.
<https://projectboard.world/isef/project/85799>
- TMED038 Development of a Readily Accessible Machine Learning Diagnostic for Early-Stage Mild TBI Using Eye Tracking Methods**
Ashley Malkin, 15 Freshman, Greenwich High School, Greenwich, CT
In-person.
<https://projectboard.world/isef/project/85821>
- TMED039 AURA: A Novel Digital Health Device To Predict Glioblastoma Progression**
Diya Sreedhar, 15 Freshman, Troy High School, Fullerton, CA
In-person.
<https://projectboard.world/isef/project/85595>
- TMED040 *In silico* High-Throughput Identification of Novel Dual Amyloid Beta and Tau Aggregation Inhibitors for Alzheimer's Disease Treatments**
Amrutha Srivatsav, 17 Senior, Palos Verdes Peninsula High School, Rolling Hills Estates, CA
In-person.
<https://projectboard.world/isef/project/85616>
- TMED041 Post-Traumatic Stress Disorder (PTSD) Biomarker Identification Using Integrative Network Fusion and Deep Learning With Bayesian Hyperparameter Optimization**
Sohini Banerjee, 18 Senior, Thomas Jefferson High School for Science and Technology, Alexandria, VA
In-person.
<https://projectboard.world/isef/project/85580>
- TMED042 Novel Prediction of Five-Year Survival and Recurrence Rates and Discovery of Cancer Genetic Biomarkers Using MIBI Scans in the Tumor-Immune Microenvironment**
Snikitha Banda, 16 Junior, Notre Dame High School San Jose, San Jose, CA
In-person.
<https://projectboard.world/isef/project/85656>
- TMED043T A Novel Modification on Medical Face Mask To Filter Carbon Monoxide for Secondhand Smokers**
Shahd Nooh, 16, Sophomore, Sama Nooh, 16, Sophomore, Sharkya STEM School, Zagazig, Sharkia, Egypt
In-person.
<https://projectboard.world/isef/project/86634>
- TMED044 Designing a Deep Learning-Based Resource-Efficient Diagnostic System for Metastatic Breast Cancer: Reducing Long Delays of Clinical Diagnosis and Improving Patient Survival in Developing Countries**
William Gao, 16 Sophomore, Centennial High School, Ellicott City, MD
In-person.
<https://projectboard.world/isef/project/85659>
- TMED045 SMART-Screen: A Point-of-Care COVID-19 Active Replication Detection System**
Tista Goswami, 17 Senior, Mamaroneck High School, Mamaroneck, NY
In-person.
<https://projectboard.world/isef/project/85728>
- TMED046 Diagnostic Accuracy of Deep Learning's Computational Photography in the Morphology of Acute Myeloid Leukemia**
Leah Sherbansky, 16 Junior, Pelham Memorial High School, Pelham, NY
In-person.
<https://projectboard.world/isef/project/85770>

- TMED047 A Novel Approach for Early Detection of Alzheimer's Disease: Developing an AlexNet Convolutional Neural Network Enhanced by Class Activation Mapping**
William Xu, 16 Junior, Bangor High School, Bangor, ME
In-person.
<https://projectboard.world/isef/project/85928>
- TMED048 Cancer-Specific NF-kB Inhibition via Novel Small Molecule IT-848: Investigating IT-848 Monotherapy and Combination Therapy for Hematological Malignancy Treatment**
Janice Rateshwar, 18 Senior, Jericho High School, Jericho, NY
In-person.
<https://projectboard.world/isef/project/85982>
- TMED049 Evaluation and Comparison of the Effectiveness and Safety of Fecal Microbiota Transplantation, Anti-Inflammatory Drugs, and Biologics for the Treatment of Inflammatory Bowel Disease**
Laia Uya Caba, 17 Senior, Escola Mare de Deu de la Salut, Sabadell, Barcelona, Spain
In-person.
<https://projectboard.world/isef/project/86059>
- TMED050T Intergenerational Substance Abuse Transmission - A Novel Testing Model: Impact of Parental Exposure to Nicotine or Alcohol on Conditioned Place Preference of Regenerated Offspring in Brown Planaria**
Eva Bennet, 16, Sophomore, Esha Bennet, 14, Freshman, Hopkinton High School, Hopkinton, MA
Virtual.
<https://projectboard.world/isef/project/86095>
- TMED051 Development of a Home N-Terminal Pro-Brain Natriuretic Peptide Assay for Early Detection of Congestive Heart Failure**
Maya Chiravuri, 17 Junior, Choate Rosemary Hall, Wallingford, CT
In-person.
<https://projectboard.world/isef/project/86125>
- TMED052 Predicting Onset of Depressive Disorder Using Machine Learning**
Varun Srivastava, 16 Junior, Redlands High School, Redlands, CA
In-person.
<https://projectboard.world/isef/project/86130>
- TMED053 Representation and Deep Learning on Brain Surface Data for Transcranial Magnetic Stimulation**
Dhruv Pai, 18 Senior, Montgomery Blair High School, Silver Spring, MD
In-person.
<https://projectboard.world/isef/project/86250>
- TMED054 AZCARE: A Novel Data-Centric AI Approach for Early Detection of Alzheimer's Disease With Multi-Modal Data and Multi-Model Ensemble**
Alexis Li, 15 Sophomore, Hamilton High School, Chandler, AZ
In-person.
<https://projectboard.world/isef/project/86386>
- TMED055 A Multi-Output Convolutional Neural Network Model for Melanoma Detection and Prevention**
Anya Parambath, 16 Junior, Girls Preparatory School, Chattanooga, TN
In-person.
<https://projectboard.world/isef/project/86408>
- TMED056 AutoFlow: A Novel Method for Assessing Minimal Residual Disease in Breast Cancer Patients by Identifying Bone Marrow Disseminated Tumor Cells Using Flow Cytometry Data**
Dheepthi Mohanraj, 17 Senior, North Carolina School of Science and Mathematics, Durham, NC
Virtual.
<https://projectboard.world/isef/project/86421>
- TMED057 DermaTech: A Novel, Non-Invasive Technology To Detect Skin Cancer**
Janvi Srivastava, 15 Sophomore, BASIS Scottsdale, Scottsdale, AZ
Virtual.
<https://projectboard.world/isef/project/86619>
- TMED058 Protective Effect of Bromelain and Pineapple Extracts on UV-Induced Damage in Human Skin Cell**
Atena Mori, 17 Junior, Iolani School, Honolulu, HI
Virtual.
<https://projectboard.world/isef/project/86636>

TMED059 The Evasion of Cell Death by Cancer Cells Detached From the Extracellular Matrix
Luke Reynolds, 17 Junior, Marian High School, Mishawaka, IN
In-person.
<https://projectboard.world/isef/project/86638>

TMED060T Breast Cancer Detection in Mammographic Images Using an Ensemble Deep Learning Model
Harshitha Jasti, 16, Sophomore,
Eesha Patel, 15, Sophomore,
Ardrey Kell High School, Charlotte, NC
Virtual.
<https://projectboard.world/isef/project/86655>

TMED061 Investigating *Daphnia magna* Response To Sleep Aids as an Indirect Correlation With Humans
Jacqueline Springer, 16 Junior, Coral Academy of Science Las Vegas, Henderson, NV
In-person.
<https://projectboard.world/isef/project/86661>

TMED062 Overcoming Melphalan Resistance in the Treatment of Multiple Myeloma
Isha Kapoor, 16 Sophomore, Mayo High School, Rochester, MN
In-person.
<https://projectboard.world/isef/project/86685>

TMED063 EZ Rhythm: ECG Diagnosis Framework Using Novel Patient-Specific Morphology Comparison To Screen Disadvantaged Populations
Ronald Lin, 16 Junior, International School of Beaverton, Beaverton, OR
In-person.
<https://projectboard.world/isef/project/86774>

TMED064 PANDwriting: An Accessible, High-Sensitivity Parkinson's and Alzheimer's Screening System Using Vision-Based Handwriting Kinematic Analysis and Machine Learning
Ron Nachum, 17 Senior, Thomas Jefferson High School for Science and Technology, Alexandria, VA
In-person.
<https://projectboard.world/isef/project/86827>

TMED065 A Novel Approach to Burn Wound Assessment: Analysis of Cell Packing Behavior in Wound Healing and Regeneration
Erin Kim, 17 Junior, Phillips Academy, Andover, MA
Virtual.
<https://projectboard.world/isef/project/86885>

TMED066 The Effect of Polymer Coating on Taste-Masking Ability of AZT (HIV Drug) for Pediatric Oral Delivery
Maggie Zhang, 18 Senior, Blue Valley Center for Advanced Professional Studies, Overland Park, KS
In-person.
<https://projectboard.world/isef/project/86927>