The Regeneron Science Talent Search (Regeneron STS), a program of Society for Science, is the nation’s most prestigious science and math competition for high school seniors. Alumni of STS have made extraordinary contributions to science and hold more than 100 of the world’s most distinguished science and math honors, including the Nobel Prize and the National Medal of Science. Each year, 300 Regeneron STS scholars and their schools are recognized. From that select pool of scholars, 40 student finalists are invited to participate in final judging, display their work to the public, meet with notable scientists and compete for awards, including the top award of $250,000.
ARIZONA

Chandler

BASIS Chandler
Wang, Ella, 17
Assessing Light-Induced Fading of Colored Art Objects via Digital Visualization Techniques

Hamilton High School
Sinha, Savar, 17
The Persistence of Homology: Unity and Diversity in Eukaryotic ATP Synthases

Gilbert

Gilbert Classical Academy
Parikh, Khushi, 17
A Deep Convolutional Neural Network to Detect Antibiotic Resistance Polymorphisms in *S. Pneumoniae* DNA

CALIFORNIA

Arcadia

Arcadia High School
Wong, Ethan, 17
Yaw Characteristics of Aircraft With a Bell-Shaped Lift Distribution Built With a Novel Manufacturing Technique

Claremont

Vivian Webb School
Jiang, Fiona, 18
Characterizing Decades of Technological Advances With Graph Neural Networks: An Innovation Network Perspective

Cupertino

Redwood Grove Academy
Chi, Nathan Andrew, 17
A Machine Learning System to Classify Autism from Crowdsourced Semi-Structured Speech Recordings

Eastvale

Eleanor Roosevelt High School
Garuadapuri, Dimple Amitha, 18
Developing a Pre-Risk Assessment Incorporating Machine-Learning and Biomarkers to Diagnose Alzheimer’s Disease

Goleta

Dos Pueblos High School
Belkin, Ryan Seth, 18
Albuterol Extends Lifespan of *Caenorhabditis elegans*

Irvine

Northwood High School
Parthasarathy, Nithin, 17
“Minimally Calibrated High Performance Communication Interfaces for the Neurologically Impaired”: New Directions Using Language Models Along With Gaming Extensions to Assist ADHD Subjects

University High School
Im, Haedam, 19
EXoplanet ConfrimaTioN throuGh Transits (EXCITING)

La Cañada-Flintridge

Flintridge Preparatory School
Lee, Aaron C., 18
STROKEFAST: A Mobile Diagnostic Application to Facilitate Rapid Stroke Intervention
Flintridge Preparatory School
Sivakumar, Ashwin, 17
Late Pleistocene Fossils Recontextualize the Ecology of Introduced Turkeys in California

La Jolla
Bishops School
Zeng, Michael, 17
PI(t)D(t) Control and Motion Profiling for Omnidirectional Mobile Robots

Mission Viejo
Capistrano Valley High School
Kara, Su, 18
Identification and Localization of Endotracheal Tube on Chest Radiographs Using a Cascaded Convolutional Neural Network Approach

Mountain House
Mountain House High School
Prawira, Jacqueline, 17
CycloPlas 2: A Dual-Focus Development as Alternative Materials to Plastic by Upcycling Fish Scale Waste Components

Mountain House High School
Roic, Ashlyn, 18
PepPredBBB: A Novel Machine-Learning Powered Virtual Screening Method to Identify Blood-Brain Barrier Penetrating Peptides Using Vector Embeddings With Molecular Intuition

Pacific Palisades
Palisades Charter High School
Jiang, Theodore Tianqi, 18
Deciphering the Language of Genetic Variants: Using a Transformer-Based Language Model to Identify Pathogenic Missense Mutations Associated With Human Inherited Diseases and Cancer

Palo Alto
Palo Alto High School
Rathi, Neil, 17
Cross-Linguistic Universals of Morphological Fusion: An Information-Theoretic Approach

Palo Alto High School
Wang, Franklin, 17
The Fast and Inconspicuous: New Near-Earth Asteroids Discovered in Zwicky Transient Facility Data Using Neural Networks and Artificial Data Generation are Both Fast and Faint

Rolling Hills Estates
Palos Verdes Peninsula High School
He, Vivien, 18
Qube: A Low-Cost Internet-of-Things Device for On-Site and Regional Earthquake Early Warning

Palos Verdes Peninsula High School
Lew, Jennifer, 18
SafeBuild: The Risk-Based Power Grid Design Software

San Diego
Canyon Crest Academy
Agrawaal, Ayush, 17
Detection of Arsenic Contamination Using Satellite Imagery and Machine Learning

Canyon Crest Academy
Clairmont, Ryan, 17
Evolution of the Cat’s Eye Nebula Revealed through Morpho-Kinematic and Hydrodynamic Modeling
Canyon Crest Academy
Gao, Andrew, 18
Doctor PEPper: Novel Antiviral Peptide Generation via Bioactivity and Hemolysis-Aware Approach

Canyon Crest Academy
Huang, Ryan Yuki, 17
Multiplex Immuno-Strips With Object Detection Simultaneously Quantify Titers of Antibodies to SARS-CoV-2 and Influenza Virus

Torrey Pines High School
Cai, Daniel, 18
Deep Learning-Aided Diagnosis of Autoimmune Blistering Diseases

Westview School
Mandyam, Atulya, 17
Novel Biomarker for Identification of Bipolar Disorder Treatment Response

San Francisco
Proof School
Zitzewitz, Zachary, 18
A Theoretical Model of the Surface Geometry of Laminar Fluid Chains

San Jose
Leigh High School
Kocalar, Selin, 18
De novo Design of Biologically-Inspired Proteins as Novel Chelating Agents for the Remediation of Environmental Mercury Contamination

Lynbrook High School
Huang, William, 17
An Investigation of the Formation of Fast Radio Bursts (FRBs)

Lynbrook High School
Nishi, Kento, 18
Augmentation Strategies for Learning With Insufficient Data

Lynbrook High School
Zhang, Alexander, 17
A Novel and Efficient Method of Persistent Homology to Detect and Remove Topological Errors in Triangle Mesh Data

Lynbrook High School
Zhao, Luke Yuchen, 17
Single-Cell Transcriptomic Analysis Reveals Genetic Drivers of Fast/Slow Motor Neuron Identity

The Harker School
Feng, Alice, 17
Deep Learning Modeling of the Relationship of Protein and RNA Levels With Manifold-Preserving Regularization

The Harker School
Hu, Alexander, 17
Improved Graph Formalism for Quantum Circuit Simulation

The Harker School
Parthasarathy, Rishab, 16
A Novel Combination of Natural Language Processing (NLP) and Pathway Analysis for Predicting Oncogenic Mutation Progression and Recommending Targeted Therapies
The Harker School
Ramachandran, Sasvath, 17
Genomic Reconstruction and Phylogenetic Analyses of *Cycloclasticus*, a Dominant Microbe at the Deepwater Horizon Oil Spill

The Harker School
Wang, Aimee, 17
Monitoring Pinto Abalone Recruitment in Sitka Sound, Alaska

The Harker School
Zhou, Emily A., 18
Computer-Assisted Detection of Intracranial Aneurysms Using a Transformer Deep Neural Network in 3D MR Angiography

Valley Christian High School
Hsu, Sheryl, 17
Explore-and-Fuse: A *Physarum*-Inspired Approach to the Steiner Tree Problem

San Mateo
The Nueva School
Chu, Andrew Kai, 18
Synergy and Competition between Long and Short Duration Storage in Renewable Power Grids

The Nueva School
Guo, Karen, 18
Sex Chromosome Dosage Effects on Children’s Neurocognitive Profiles of Mathematics and Literacy

The Nueva School
Narayan, Yash, 17
DeepWaste: Applying Deep Learning on a Mobile Device for Accurate, Low Cost, and Ubiquitous Waste Classification

San Ramon
Dougherty Valley High School
Shi, Sophia, 17
A Novel Hybrid Deep Learning Architecture for Predicting Acute Kidney Injury Using Patient Record Data and Ultrasound Kidney Images

Saratoga
Saratoga High School
Agarwal, Naisha, 17
Recommendation Algorithms that Increase Equitable Access to Influencers (Fairness) in a Network

Saratoga High School
Gupta, Riya, 17
Formulating a Gene Signature for the Diagnosis of Autoimmune and Infectious Diseases

Saratoga High School
Zuo, Ethan, 18
Optimization of Novel Two-Phase Jet Impingement Cooling for Datacenter High Power-Density Processors

Sherman Oaks
The Buckley School
Rasmussen, Vale, 17
Enhancing Performance and Sustainability of Firefighting Aircraft in the Era of Wildfires Fueled by Global Warming
COLORADO

Boulder

Fairview High School
Cui, Jason, 17
Sodium Benzoate, a Common Food Preservative, Shortens Lifespan, Induces Premature Aging, and Accelerates Neurodegeneration in *Caenorhabditis elegans*

CONNECTICUT

Greenwich

Greenwich Academy
Laumas, Sachi, 18
The Genetic and Epigenetic Mechanisms by Which MYB Regulates MEP Fate Decision

Greenwich Academy
Shell, Natalie Anne, 18
Developing and Testing Updated Geometric Structures to Model the Optical Properties of Spirulina, a Helical Photosynthetic Microorganism

Greenwich High School
Blank, Steven, 17
Design of a Rapid, Sensitive SARS CoV-2 Nucleocapsid Luminescent Detection Card for COVID-19

Greenwich High School
Moore, Ella, 18
Inhibition of Covid-19 Respiratory Complications via an R-954 Peptide Bradykinin 1 Receptor Antagonist

Greenwich High School
Nakanishi, Alexa, 17
Multi-Component Fixation Tracking in Gaze Interaction for Rapid, Non-Invasive Diagnosis of Specific Learning Disorders

Guilford

Guilford High School
Li, Jerry Y., 17
Optimizing Pool Size for Pooled Testing of SARS-CoV-2

New Haven

Hopkins School
Kenkare, Cyrus Jay, 18
MSRB2 in SARS-CoV-2 Infection: A Bioinformatic Analysis

Trumbull

Christian Heritage School
Li, Bangzheng, 19
A Weak Ascending Chain Condition on Principal Ideals and New Classes of Atomic Domains

Wallingford

Choate Rosemary Hall
Bang, Seyun, 18
TFAM-DNA Complex, A Novel Digital Data Storage Model: A Histone-Like Architectural Role for the Stability of DNA

DELAWARE

Wilmington

Charter School of Wilmington
Andreasen, Claire, 18
Strain-Induced Second-Order Jahn-Teller Reconstruction and Magnetic Moment Modulation
Charter School of Wilmington
Kahlon, Arjan Singh, 18
Remote Gait Analysis as a Proxy for Traditional Gait Laboratories: Utilizing Smartphones as a Wearable Patient-Implemented Solution for Assessment of Gait Across Differing Terrains

Charter School of Wilmington
Yang, Heran, 17
Electronic and Mechanical Properties of Sub-nm Diameter Carbon Nanotubes

Tower Hill School
Miao, Benjamin, 17
Glucose Transporter Type 1 is Essential to the Transcription of Thrombomodulin in Human Brain Microvascular Endothelial Cells Under High Glucose Condition

FLORIDA

Boca Raton
Florida Atlantic University High School
Lian, Julianna, 17
Sargassum sp. Reductive, Polyphenol Extract Modulates D. dorotocephala Regeneration by Reduction of ROS, and has Potential as an Anti-Inflammatory Agent

Florida Atlantic University High School
Sreejithkumar, Vivek, 18
The Evolution of the Identifiable Analysis of the COVID-19 Virus

Fort Lauderdale
Pine Crest School
Ghosh, Shaurnav, 18
Using Convolutional Encoder Networks to Determine the Optimal Magnetic Resonance Image for the Automatic Segmentation of Multiple Sclerosis

Gainesville
Buchholz High School
Balachandar, Anjana, 17
Extending the Boundaries of 3D Printing of Soft Matter

Homestead
Medical Academy of Science and Technology
Gastelumendi-Franco, Lara, 17
Immunomodulatory Properties of Mesenchymal Stem Cells for Knee Osteoarthritis Prevention and Treatment

Miami
Coral Reef Senior High School
Li, Krystal S., 17
Isolating and Characterizing Phosphorus Solubilizing Bacteria from Rhizospheres of Native Plants Grown in Calcareous Soils and Sediments

Naples
Community School of Naples
Hoffmann, Heloise, 18
Self-Reported Reduced Sleep Quality and Excessive Daytime Sleepiness in Facioscapulohumeral Muscular Dystrophy

Orlando
Lake Highland Preparatory School
Madan, Varun Raj, 17
Developing a Novel Multiple Linear Regression Model to Optimize Honey Bee Gut Immunity Using a Lactic Acid Bacteria Probiotic Mixture
Plantation
American Heritage School
Ma, Larissa, 17
White Matter Connectivity of the Superior Longitudinal Fasciculus II and Executive Function in Young Children With Attention Deficit Hyperactivity Disorder

Tampa
C. Leon King High School
Ghosh, Arko, 17
A Novel Approach to Citrus Disease Management: Leveraging Computer Vision, Machine Learning and Convolutional Neural Networks

Winter Springs
Winter Springs High School
Naga, Varsha, 17
Prevention of Healthcare-Associated Infections Using Antibacterial Boron Carbonitride Nanoparticle Coating on Medical Devices

Winter Springs High School
Vaidyanathan, Annika, 17
Dynamic Contact Angle Measurements of Superhydrophobicity in Dip-Coated Face Masks to Minimize Exposure to COVID-19 Sized Nanoparticles

GEORGIA
Alpharetta
Denmark High School
Dasari, Srihitha, 17
Improving Multiclass Classification of Alzheimer’s Disease Using Cortical Volumetry and Inter-Cortical Ratios as Combined Markers

College Park
Woodward Academy
Jung, Samuel C., 18
The Electric Response of Wood for Guitar Pickups Using Surface Acoustic Wave Transducers

Decatur
Decatur High School
Bee-Lindgren, Max, 18
Calculating Transition Amplitudes of an Observable Using the Rodeo Algorithm for Quantum Computing

Dexter
West Laurens High School
Mishra, Vaibhav, 17
NeuroXNet: Creating A Novel Deep Learning Architecture that Diagnoses Neurological Disorders, Finds New Blood Biomarkers, and Assesses Surgical, Drugs, and Radiation Treatment Plans Using Medical Imaging and Genomic Data

ILLINOIS
Aurora
Illinois Mathematics and Science Academy
Tiwari, Siddharth, 16
On the Relationship Between Pain Variability and Relief in Randomized Clinical Trials

Des Plaines
Maine West High School
Bhattacharyya, Pratiksha, 18
Molecular Mechanisms of Momordin in the Regulation of Glucose Homeostasis

Hinsdale
Hinsdale Central High School
Khankari, Jui, 17
Automated Detection of Arterial Landmarks and Vascular Occlusions in Acute Stroke Patients on Digital Subtraction Angiography Using Deep Learning
**INDIANA**

**Bloomington**

**Bloomington High School**

Larsen, Daniel, 18

Bertrand’s Postulate for Carmichael Numbers

**West Lafayette**

**West Lafayette Junior-Senior High School**

Goel, Siya, 17

PanCan Diagnosed (a miRNA Approach): Using Feature Selection, Ensemble Algorithms, and Interpretability for the Early Diagnosis and Personalized Treatment of Pancreatic Cancer

**IOWA**

**Council Bluffs**

**Lewis Central High School**

Orth, Amara, 18

Secret Sounds of Bees: Analysis of Honey Bee Vibroacoustics Using Hidden Markov Models

**KENTUCKY**

**Louisville**

**duPont Manual Magnet High School**

Chandrashekhar, Varun, 18

SpeakUp: A Machine Learning Based Speech Aid to Enable Real-Time Silent Communication for the Paralyzed by Translating Neuromuscular EMG Signals to Speech

**duPont Manual Magnet High School**

Kar, Shreyas, 17

Impact of Electronic Health Record Discontinuity in Prediction Modeling Algorithms

**LOUISIANA**

**New Orleans**

**eLearning K12**

Pizzolato, Rachel Michelle, 18

An Exploration Into the Effects of Incorporating a Novel 3D Printed Mount Design that Allows for Extension of a Custom Damping System During Front and Rear Oblique Impacts to a Football Helmet Facemask in an Effort to Reduce, or Possibly Eliminate, Concussions and Chronic Traumatic Encephalopathy (CTE)

**Shreveport**

**Caddo Parish Magnet High School**

Burks, Elijah Eshaun, 17

The Effect of Freshwater Acidification on Clams

**Caddo Parish Magnet High School**

Modi, Ashini, 18

An Evolutionary Model for Stellar Wind-Induced Atmospheric Escape of Small Exoplanets

**MARYLAND**

**Bethesda**

**Walter Johnson High School**

Choi, Lauren Elizabeth, 18

Automated Breast Cancer Detection Pipeline via Mitotic Cell Recognition Using Artificial Intelligence

**Poolestown**

**Poolestown High School**

Foo, Orion Chuanyi, 17

Powerful Quasar-Driven Outflows in the Local Universe from the Cosmic Origins Spectrograph Hubble Space Telescope Far-Ultraviolet Spectroscopic Archive
Poolesville High School
Nachod, Benjamin Ethan, 18
Assessment of Petroleum-Based Plastic and Bioplastics Degradation Using Anaerobic Digestion

Poolesville High School
Xiao, Vivian, 18
Clustering Gut Metabolomic NMR Data

Silver Spring
Montgomery Blair High School
Eroz, Efe, 17
A Novel Short Block-Length Coding Method for Arbitrary Channels

Montgomery Blair High School
Guo, Phillip H., 17
Bandit-Based Multi-Start Strategies for Global Continuous Optimization

Montgomery Blair High School
Pai, Dhruv, 18
Representation and Deep Learning on Brain Surface Data for Transcranial Magnetic Stimulation

MASSACHUSETTS
Andover
Phillips Academy
Xiong, Nathan, 18
The Master Field and Free Brownian Motions

Phillips Academy
Yang, Ali, 17
Multimodal Contrastive Learning Matches the Transcriptome With Pathological Diagnoses

Phillips Academy
Yue, William, 18
Reconstructing Spider Trees from Traces Using Bivariate Littlewood Polynomials

Boston
Boston University Academy
Xi, Zoe, 17
Approximation Algorithms for Dynamic Time Warping on Run-Length Encoded Strings

Brantree
CATS Academy Boston
Tuchinda, Waris, 19
Planar Heterojunction Perovskite Solar Cell With Graded Energy Band Architecture via Fast-Drying Spray Deposition

Lexington
Lexington High School
Liu, Francis, 18
aFIP: Evaluating Pitchers’ Abilities With Regard to Strength of Schedule Using a Universal Law

Milton
Milton Academy
Jiang, Yanan, 18
Generalizing Ruth-Aaron Numbers

Newton Centre
Newton South High School
Guo, Joshua, 18
On the Gauss-Epple Homomorphism of the Braid Group B_n, and Generalizations to Artin Groups of Finite Type
Newton South High School
Liu, Frank, 17
PRESTO: Rapid Protein Mechanical Strength Prediction With an End-to-End Deep Learning Model

Wayland
Wayland High School
Zhao, Kevin Edward, 17
More than BERT: oLMpics on Diverse Language Models

MICHIGAN
Allen Park
Allen Park High School
Liveoak, Donald J., 18
Schrödinger Bridges on Discrete Domains

Bloomfield Hills
Cranbrook Kingswood School
Yang, Margaret L., 17
Engineering Multi-Enzyme Whole-Cell Biocatalysts for Biofuel Production

Okemos
Okemos High School
Kulkarni, Kaivalya R., 17
On the 3-Rank of Class Groups of Quadratic Fields

MINNESOTA
Minneapolis
Blake School Northrop Campus
Bhavsar, Atreyus Abdhish, 18
The Spread of Macroscopic Droplets from a Simulated Cough With and Without the Use of Masks or Barriers

MISSISSIPPI
Columbus
Mississippi School for Mathematics & Science
Yan, Jessica Cindy, 18
Reinforced Lignin Foams With Higher Adsorption Capability

MISSOURI
Ballwin
Parkway West High School
Gao, Wilson, 17
Toxic Metal Accumulation in Shellfish Commercially Available in the US Market

NEBRASKA
Lyons
Lyons-Decatur Northeast High School
Chavira-Prieto, Samantha Janitza, 17
Surface Biofilm and Spectral Analyses of Eight Common Plastic Materials Exposed to Different Environmental Conditions Using Basic Spectrophotometry and Advanced Microscopy

NEVADA
Las Vegas
Edward Clark High School
Zhang, Anya, 17
Spatial Variability of Ocean Acidification and Its Influencing Factors in Massachusetts Bay
NEW HAMPSHIRE

Exeter

Phillips Exeter Academy
Chowdhury, Neil, 18
Modeling the Effect of Histone Methylation on Chromosomal Organization in Colon Cancer Cells

Phillips Exeter Academy
Cong, Kevin, 17
On the Sizes of Furstenberg Sets in Finite Fields

NEW JERSEY

Basking Ridge

Ridge High School
Xia, Daniel, 18
A Minkowski-Type Inequality in AdS-Melvin Space

Hackensack

Bergen County Academies
Alan, Julie, 17
Using Antihistamines to Target α-synuclein for the Treatment of Parkinson’s Disease

Bergen County Academies
Kumar, Rishi, 17
Co-Culturing S. cerevisiae and K. marxianus to Bioremediate Copper from Water

Bergen County Academies
Liu, Seton, 17
A Novel Role for Fis1-Mediated Mitochondrial Fission in Senolytic Drug Development

Bergen County Academies
Mantena, Rohit, 18
The Critical Role of Glutamine Transporter ASCT2 on Parkinson's Disease Progression

Bergen County Academies
Pichappan, Kannammai O., 17
A Novel, Non-Invasive, Schwann Cell-Supporting Approach to Peripheral Nervous System Degenerative Disease

Bergen County Academies
Shi, Isabel, 18
5G Network High Frequency Radiation Exerts Biological Effects on the Health of Differentiated Neuroblastoma Cell and Silkworm Models

Bergen County Academies
Volkova, Alexandra, 17
The Potential of TGF-β and Steroid-Induced Osteoblastic Transdifferentiation of Human Fibroblasts in Replacing the Bone Graft

Kinnelon

Kinnelon High School
Yu, Zara, 15
Many-Body Quantum State Control in the Presence of Environmental Noise

Lincroft

High Technology High School
Chang, David Zhu, 18
Searching for Exoplanets in Kepler Data With Deep Learning
<table>
<thead>
<tr>
<th>Location</th>
<th>School/Institution</th>
<th>Student Name</th>
<th>Grade</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livingston</td>
<td>Newark Academy</td>
<td>Recce, Brandon, 17</td>
<td>Quantitative Analysis of the Impact of Highly Skilled Immigrant Workers on American Innovation</td>
<td></td>
</tr>
<tr>
<td>Martinsville</td>
<td>The Pingry School</td>
<td>Xie, Katherine, 18</td>
<td>The Impact of Structural Changes on Learning Capacity in the Fly Olfactory Neural Circuit</td>
<td></td>
</tr>
<tr>
<td>Millburn</td>
<td>Millburn High School</td>
<td>Park, Ryan, 17</td>
<td>V-BIND: SARS-CoV-2 Inhibitor Design via Geometric Transformer</td>
<td></td>
</tr>
<tr>
<td>Princeton</td>
<td>Princeton High School</td>
<td>Huan, Mulin, 18</td>
<td>Effect of Temperature on Action Potential Propagation by Trigger Hairs of the Venus Flytrap (Dionaea muscipula) When Exposed to Mechanical Stimuli</td>
<td></td>
</tr>
<tr>
<td>Princeton</td>
<td>Princeton High School</td>
<td>Metaxas, Ada, 18</td>
<td>Imbalances in Copper or Zinc Concentrations Trigger Further Trace Metal Dyshomeostasis in Amyloid-Beta Producing Caenorhabditis elegans</td>
<td></td>
</tr>
<tr>
<td>Princeton</td>
<td>Princeton International School of Math and Science</td>
<td>Wang, Atticus, 17</td>
<td>Representation Stability and Finite Orthogonal Groups</td>
<td></td>
</tr>
<tr>
<td>Princeton</td>
<td>Princeton International School of Math and Science</td>
<td>Yu, Xinkai, 18</td>
<td>Modeling and Mitigating Infection Risks of COVID-19 in Aircraft Cabins</td>
<td></td>
</tr>
<tr>
<td>Princeton Junction</td>
<td>West Windsor-Plainsboro High School</td>
<td>Ayyalapu, Neha, 18</td>
<td>A Machine Learns to Predict the Stability of Highly Diverse Multi-Planetary Systems</td>
<td></td>
</tr>
<tr>
<td>Princeton Junction</td>
<td>West Windsor-Plainsboro High School</td>
<td>Oruganti, Suraj, 18</td>
<td>Early/Late Chemotherapy: Mathematically Modeling Prostate-Specific Antigen Parameters and Investigating their Effects on Intermittent Androgen Deprivation</td>
<td></td>
</tr>
<tr>
<td>Tenafly</td>
<td>Tenafly High School</td>
<td>Park, Hannah, 17</td>
<td>Altered Development of Thymus in Tmem131 Knockout Mouse Model of Down Syndrome</td>
<td></td>
</tr>
<tr>
<td>Tenafly</td>
<td>Tenafly High School</td>
<td>Selver, Maxwell, 18</td>
<td>Expressional Correlations Between SERPINA6 and Pancreatic Ductal Adenocarcinoma-Linked Genes</td>
<td></td>
</tr>
</tbody>
</table>
NEW MEXICO

Los Alamos

Los Alamos High School
Struss, Robert Russell, 17
Neuromorphic Computing: Simulating the Brain's Visual Cortex for More Efficient Computation

NEW YORK

Armonk

Byram Hills High School
Araki-Kurdyla, Derek, 17
Elucidating the Role of Environmental Context in Carbon Sequestration and Preservation of Seagrass Sediment Carbon through Analysis of Sediment Grain Size and Carbon Lability

Byram Hills High School
Bachmann, Edith, 18
Tell Me a Story: The Effects of Storytelling vs. Story-Reading on the Executive Functions of Fourth Graders

Byram Hills High School
Levy, Sydney, 17
Revealing the Mechano-sensitive-ATP-Purinergic Signaling Pathway that Underlies Fibrosis Resulting From Mitral Valve Prolapse

Bellmore

John F. Kennedy High School
Brown, Michelle, 17
The Concurrent Effects of Metformin and Dietary Restriction on Parkinson’s Disease in a Drosophila melanogaster Model

John F. Kennedy High School
Lin, Brandon, 17
A Novel Approach to Examine the Effect of Dietary Restriction and Exercise on Aging Drosophila melanogaster Involving Custom-Built 3D Printed Equipment

John F. Kennedy High School
Luisi, Christopher Vincenzo, 17
How Dietary Restriction Affects the Athleticism, Metabolic Rate, and Lifespan of Drosophila melanogaster

John F. Kennedy High School
Prainito, Christopher, 17
Development of a Polydiacetylene-Based Paper Biosensor for Naked-Eye Detection of COVID-19 in Saliva

John F. Kennedy High School
Rigaud, Desiree, 17
COVID-19 Induced Economic Stress: The Effect on Marital Functioning and Methods of Alleviating Financial Stress

John F. Kennedy High School
Su, Shannon, 17
The Combined Effect of HIF-1α Inhibition With Azacitidine and Venetoclax in Acute Myeloid Leukemia
Bethpage

Bethpage High School
Bhatia, Aurrel, 18
Utilizing a Long Short-Term Memory (LSTM) Machine Learning Algorithm to Create Soil Moisture Prediction Models and Improve Water Productivity in Southern California

Brentwood

Brentwood High School — Ross Center
Lopez, Ricardo, 17
Evaluating Salt Marsh Restoration at Sunken Meadow: Analysis of Sediment Loss and Accretion

Brentwood High School — Ross Center
Lopez, Roberto Antonio, 17
Evaluating Phragmites australis Wrack Accumulation in a Long Island Salt Marsh Ecosystem and Assessing its Effect on Carbon Sequestration, the Nitrogen Cycle, and Sediment Biota

Bronx

Bronx High School of Science
Fisher, Aliya Rose, 18
Non-Genetic Parental Effects on the Free-Running Period of Drosophila Circadian Clocks

Bronx High School of Science
Gu, Richard, 17

Bronx High School of Science
Iskhakov, Samuel, 17
Adaptive Multi-Sigmoid Contrast Enhancement

Bronx High School of Science
Labre, Enrique Clevecilla, 18
Gaining Sustainable Development Insights for Data-Driven Decision Making through Artificial Intelligence

Bronx High School of Science
Le, Kathryn, 17
Methodology of Network Connection Removal Reveals Connection and Node Impact and Function in C. elegans Locomotion Neural Network for Guiding Effective Designs for Artificial Neural Networks

Bronx High School of Science
Morange, Genevieve, 17
An Examination of the Relationship Between Eating Disorder Symptoms and Sexual Assault Disclosure among College Students: A National Study

Bronx High School of Science
Rossberg, Samuel, 17
Design and Control of a Three-DoF Ball Joint With Applications in Robotic Surgery and COVID-19 Swabbing

Bronx High School of Science
Shah, Arnav, 17
A Novel Reinforcement Learning-Assisted Self-Correcting Hybrid Quantum-Classical Algorithm to Simulate Molecular Systems and Compute Ground State Energies

Bronx High School of Science
Shido, Eiki, 17
Urban Bat Activity and Correlates of Urban Landscape Features
Bronx High School of Science
Vogel, Jay, 17
Influence Signals Improve Accuracy in Social Media-Based Cryptocurrency Price Prediction Models

Carmel
Carmel High School
Doherty, Ryan, 17
The Effects of Race and Other Social Determinants of Health on HIV Pre-Exposure Prophylaxis Use: A County-Level Analysis Using the PrEP-to-Need Ratio

Chappaqua
Horace Greeley High School
Puri, Anika, 17

Commack
Commack High School
Moon, Soyoun, 18
Exploring Sexual Dimorphism and Sex Hormone Receptor Expression in the Bed Nucleus of the Stria Terminalis (BNST) in the Monogamous Prairie Vole

East Setauket
Ward Melville High School
Luo, Amber, 18
RiboBayes: A Wavelet Transform-Based Computational Platform to Assess the Transcriptomic Distribution and Regulation of Ribosome Pause Sites in Ribosome Profiling Data

Eastchester
Eastchester High School
Keating, Riley Gabrielle, 17
Simulating the Impacts of Climate Change on Hurricanes Using the Columbia Hazard (CHAZ) Model

Eastchester
Eastchester High School
Tsapatsaris, Ava, 17
Project ScanVan: Mobile Mammography Services to Decrease Socioeconomic Barriers and Racial Disparities Among Medically Underserved Women in New York City

Glen Head
North Shore High School
McCreery, Evelyn Claire, 17
Physiological Effects of PET Plastic Leaching and Polystyrene Microsphere Ingestion in Wild Type Drosophila melanogaster

Great Neck
John L. Miller Great Neck North High School
Yeroushalmi, Olivia, 17
Peripheral Vision Preferences: The Influence of Handedness and Eye Dominance on Peripheral Vision

John L. Miller Great Neck North High School
Zbizika, Renee, 17
Aerosol Optical Depth Estimation Using a Deep Neural Network: Assessing the Potential of Using Meteorological Data and Biomass Burning Event Data
William A. Shine Great Neck South High School
Chan, Karly, 17
A User-Friendly and Non-Invasive Voice Progress Tracker

William A. Shine Great Neck South High School
Kotlyar, Jeremy Nathaniel, 17
Treatment of *D. tigrina* With Calcium Chloride as a Novel Method of Inhibiting an Epilepsy Pathology Associated With the *Soxb1* Monogenic Driver Pathway

William A. Shine Great Neck South High School
Wang, Isabel, 18
Coping During COVID-19: How Locus of Control Influences Coping Response in an Uncontrollable Situation

Harrison
Harrison High School
Blaustein, Mai, 18
Identification of Chemical Contaminants in Spiked Beverages With the Use of Infrared Spectroscopy through Development of an Inexpensive and Inconspicuous Device to Identify Date Rape Drugs

Harrison High School
Pflieger, Katherine Sirotkin, 18
The Addition of Functional Groups to the BNM-III-170 Molecule to Improve the Efficiency of its Inhibitory Abilities by Decreasing the Effectiveness of the CD4 Receptors on the gp-120 Molecule

Harrison High School
Vaswani, Keelan Mitin, 17
Patterns in Cognitive Distortions Among High School Students: An Analysis of How Social and Achievement Situations Influence Types of Thinking

Hastings-on-Hudson
Hastings High School
Walsh Fuchs, Oliver Sebastian, 17
Examining the Associations Between Historical Redlining Maps and Asthma Emergency Department Visits Across New York City

Hauppauge
Hauppauge High School
Saravanan, Varsha, 18
Baseline Framework for Assessing Community Resilience Using a Balanced Index Approach and Spatial Autocorrelation in the Mill River Watershed, Nassau County, New York

Hempstead
Sacred Heart Academy
Guerra, Bella, 18
Assessing Gender-Based Microaggressions Present in “Friend-Texts” at a Single-Sex School

Irvington
Irvington High School
Dunefsky, Brooke Ann, 18
A Novel Device that Utilizes Neuroplasticity for the Rehabilitation of Stroke Victims

Jericho
Jericho Senior High School
Chan, Sara Emily, 17
A Study of Polarization in Media During the Age of Media Consolidation and Social Media through a Sentiment Analysis of *The New York Times* and *Wall Street Journal*
**Jericho Senior High School**
Rateshwar, Janice, 18
Novel Small Molecule 9-chloro-8-(hexyloxy)-2H-chromeno[2,3-d]pyrimidine-2,4(3H)-dione (IT-848)* Treatment of Hematological Malignancies: IT-848 Directly Inhibits NF-KAPPAB Transcription Factors and Bolsters Combination Cancer Therapy

**Jericho Senior High School**
Wang, Ethan, 17
Copper in Alzheimer's Disease: Investigating the Role of Copper Dysregulation With the Immune System

**Latham**
Shaker High School
Bargeer, Ayaan Abidalli, 17
A New Device for Agricultural Assistance: Crop Prediction Yield Using Satellite Imagery and Soil Data

**Lincolndale**
Somers High School
Dodd, Emily, 18
Altered Homer1b/c and mGluR1/5 Volumes and Colocalization in Parkinson's Disease-Linked LRRK2 G2019S Mice

**Locust Valley**
Friends Academy
Labelson, Ethan L., 17
Improving Trustworthiness of Deep Neural Network Explanations With Regularization

**Mamaroneck**
Mamaroneck High School
Orans, Jerry, 18
Development of a Multi-Terrain RHex Leg for Swimming, Running, and Climbing

**Manhasset**
Manhasset High School
Lee, Rachel, 18
Implementation of *Salvinia cucullata* and *Salvinia minima* Fronds in an Oil Spill Simulation

Manhasset High School
Patel, Shivani Tejas, 18
Neuronal Death in Alzheimer's Disease is Triggered by Extracellular CIRP through Calpain

Manhasset High School
Zhang, Allison, 17
Fabrication and Implementation of an Angled Hydrophilic–Hydrophobic Patterned Surface for Fog-Harvesting Inspired by the Namib Desert *Stenocara* Beetles

**Mount Sinai**
Mount Sinai High School
Chai, Lawrence, 17
AlphaFold Protein Structure Database for Sequence-Independent Molecular Replacement

**New Hyde Park**
Herricks High School
Chheda, Caitlin, 18
The Impact of Sex and MDMA on Social Anxiety Evaluated by Subjective Responses

Herricks High School
Goel, Aanya, 18
Inflammatory Markers Associated With Early Life Adversity in the Postmortem Human Brain
Herricks High School
Patel, Roshni, 17
Connectivity Between the Medial Dorsal Nucleus of the Thalamus and the Cingulo-Opercular Network is Related to Psychosis Symptom Severity in a Youth Community Sample

New York
College of the City University of New York
Hamdan, Reem, 17
AI Epidemiology: A Linear Regression Modeling and Structured Machine Learning Protocol for the Analysis of Alzheimer’s Disease Genomic Data

Columbia Grammar & Preparatory School
Zou, Yuqiao, 18
Developing Photo-Crosslinking Peptide Probes as Substrate Mimics to Trap Protein Lysine Methyltransferases

Hunter College High School
Cao, Eric, 17
Deep Learning Multimodal Prediction of Mild Cognitive Impairment to Alzheimer’s Disease Conversion Within 3 Years of Diagnosis Using Whole-Brain 3D PET, 3D MRI, and Neurocognitive Measures

Hunter College High School
Li, Victoria, 17
CROTON: An Automated and Variant-Aware Deep Learning Framework for Predicting CRISPR/Cas9 Genome Editing Outcomes

Léman Manhattan Preparatory School
Sosnick, Lucas, 18
Exploring the Viability of Different Chemical Analogs of Psilocin that Target the 5-HT2A Receptor to Treat Depression Using AutoDock Vina

Stuyvesant High School
Shin, Nina, 18
Using Immunophenotyping to Investigate Mumps Virus Infection of Natural Killer Cells

North Massapequa
Plainedge High School
Hamdan, Reem, 17
AI Epidemiology: A Linear Regression Modeling and Structured Machine Learning Protocol for the Analysis of Alzheimer’s Disease Genomic Data

North Salem
North Salem High School
Takken, Mark, 18
Transferring Go AI to New Topological Surfaces Without Additional Training

Ossining
Ossining High School
Calman, Natalie, 17
Mindfulness-Based Stress Reduction Training Improves the Emotional Well-Being of Adolescents

Ossining High School
Cioffi, Rose, 17
Chronic Exercise Paired With Immersive Virtual Reality Reduces Stress and Improves Cognitive Performance in Adolescents

Ossining High School
Nyoni, Nyasha, 17
Unhealthy Scrolling: Instagram Influencers Endorse More Unhealthy Food and Beverage Products Compared to Celebrities
Ossining High School
Song, Aaron Min, 17
Elucidating Terrestrial Optical Refrigeration through Transpiration in *Rhizophora mangle*
and Chlorophyll a Fluorescence in Low-Polarity Mediums

Ossining High School
Takmil, Cameron Ali, 17
Effects of Virtual Learning on Education: Disparities linked to Socioeconomic Status
and Resiliency Diminished Amidst the Pandemic

Pelham
Pelham Memorial High School
Kelly, Andrew Robert, 18
The Purification of Oleic Acid and the Effect of Oleic Acid Purity on the Size
of CdSe Nanocrystals

Pelham Memorial High School
Liu, Ann, 18
Investigating Strategies for Retinal Regeneration in Mammals via a Meta-Analysis
of Single-Cell RNA Sequencing Datasets

Pittsford
Pittsford Sutherland High School
Feng, Amy, 17
Extending Choice Probability to High Dimensional Neural Data

Plainview
Plainview-Old Bethpage John F. Kennedy High School
Lev, Abigail, 18
The Inadverted Detrimental Effects of Caucasian Performative Activism
on Perceived Societal Marginalization of the African American Population

Plainview-Old Bethpage John F. Kennedy High School
Oliva, Gabrielle Joy, 17
The Impact of Ascribed Gender Stereotypes on Public Perceptions
of Sexual Assault Victims

Plainview-Old Bethpage John F. Kennedy High School
Schmidt, Olivia, 17
Investigating Detrimental Effects of Text-Based Digital Communication
on Emotional Literacy of Adolescents

Port Washington
Paul D. Schreiber High School
Atchley, Jacqueline, 17
The Relationship Between Levels of Extraversion, Restorative Niche Trait-Congruency,
and Positive Affect

Paul D. Schreiber High School
Franchetti, Abraham Daniel, 17
Analyzing Political and Economic Variation in United States’ COVID-19 Response

Paul D. Schreiber High School
Vesselinov, Alexandra, 17
The Effects of Hypobaria Following Traumatic Brain Injury Plus Hemorrhagic Shock
on Neuroinflammation and Behavior

Roslyn Heights
Roslyn High School
Fabricant, Lindsay, 17
The Construction and Simulation of a Four-Finger Soft Robotic Gripper
**Roslyn High School**
Groothuis, Maya Rose, 17  
Climate Change Action: The Role of Environmental Efficacy Beliefs

**Roslyn High School**
Sehgal, Harshita, 18  
Understanding the Evolutionary Development of Radio-Resistance in the *Brassicae* Family

**Roslyn High School**
Youn, Han Byur, 17  
Why We Vote: How Positive Descriptive Norms and Holding a Minority Political Viewpoint Increase Citizens' Intention and Responsibility to Vote

**Rye**
Graseck, Maggie, 18  
Oysters and Crabs: Comparing the Eating Habits of *Hemigrapsus sanguineus* and *Panopeus herbstii*

**Saint James**
Chung, Jonathan, 17  
Microbial Associations Constrain Coral Adaptations to Heat Stress: An Integrative Multi-Dataset Analysis

**Smithtown East High School**
Schubel, Sarah Kathryn, 18  
Loss of NMDA Receptor Signaling Results in Excess Proliferation of CNS and Neural Crest-Derived Cells

**Scarsdale**
Uppuluri, Nishi, 17  
Developing the Writing Skills of Elementary Schoolers Using Computational Linguistics Techniques

**Scarsdale High School**
Ahmed, Armaan, 17  
Design of a SHERLOCK-Based Low Resource Screening Assay for HIV-1 Drug Resistance

**Syosset**
Chen, Sabrina, 17  
Negative Charges at T168, S169, and/or S170 of *ECM11* Promote Wild-Type Meiotic Progression and Synapsis in Meiotic *Saccharomyces cerevisiae* Cells

**Syosset High School**
Chiu, Ethan, 17  
Developing a Self-Formed Ectodermal Autonomous Multi-Zone Organoid Model Using Human Stem Cells to Examine the Effect of Doxycycline Treatment on Uveal Melanoma

**Syosset High School**
Ghotra, Rohan Singh, 17  
Uncovering Motif Interactions from Convolutional Attention Networks for Regulatory Genomics

**Syosset High School**
Huang, Eric, 17  
Compliant and Aerodynamic Characteristics of a 3D Printed Variable Camber Aircraft Wing
West Sayville

**Sayville High School**

Weng, Gene, 17
Utilizing a Carbon Dioxide-Producing Reaction in a Low-Cost CO$_2$ Vessel (LCCV) to Support the Growth of Mammalian Cells in Lieu of a Commercial CO$_2$ Incubator

North Carolina

Durham

**North Carolina School of Science and Mathematics**

Cruz, Levi, 18
Signaling Pathways During Wound Closure in Planarian Epithelium

**North Carolina School of Science and Mathematics**

Ghosh Dastidar, Prabuddha, 18
Pre-mRNA Splicing Inhibition as a Potential Pancreatic Cancer Treatment: An Innovative Approach by Identifying Vulnerabilities in Pancreatic Cancer Cells Using Biflavonoid Isoginkgetin and Pladienolide B

**North Carolina School of Science and Mathematics**

Mohanraj, Dheepthi, 17
AutoFlow: A Novel Method for Assessing Minimal Residual Disease in Breast Cancer Patients by Identifying Bone Marrow Disseminated Tumor Cells Using Flow Cytometry Data

**North Carolina School of Science and Mathematics**

Panebianco, Katherine Mary, 17
Simulating Quantum Key Distribution in Three Polarization Bases

**North Carolina School of Science and Mathematics**

Roychoudhury, Hrishika, 17
Development of an Anticancer Agent by Green Synthesis of Biogenic Silver Nanoparticles Using Agri-Food Byproducts as a Novel Reducing Agent

**North Carolina School of Science and Mathematics**

Vaughan, Sophie Caroline, 17
Turmeric-Derived Treatment of Alzheimer’s Disease through Inhibition of Acetylcholinesterase and Butyrylcholinesterase

North Carolina School of Science and Mathematics

Wang, Lucia, 17
Tertiary DNA Structure Probing Using Nanochannels

Raleigh

**William G. Enloe High School**

Shen, Daniel, 18
TC-DTW: An Algorithm Breaking the Long-Standing Efficiency Barriers of Temporal Data Analytics

Research Triangle Park

**Research Triangle High School**

Jacob, Michael George, 16
Modeling the Frequency Shift of Light Emitted From Stars Orbiting Around Black Holes
NORTH DAKOTA

Hankinson

**Hankinson Public School**
**Kratcha, Emma, 18**
Soil Farms: A New Approach to Cropland Restoration

OHIO

Mason

**William Mason High School**
**Mao, Gilbert Lou, 17**
Nature of Deep Earthquakes in the Pacific Plate from Unsupervised Machine Learning

OREGON

Portland

**Jesuit High School**
**Karamchedu, Mithra, 18**
Cryosphere Melting Risk: Predictive Model of Glacial and Permafrost Melting Using Fractal Analysis of Remote Sensed Images and Correlations to Timeseries Geoglacial and Permafrost Data

**Krishna Homeschool**
**Goel, Ram Krishna, 17**
Products of Reflections in Smooth Bruhat Intervals

**Oregon Episcopal School**
**Carson, Madison Susanne Nicole, 17**
Predicting Knee Luxation Force for Various Gallinaceous Bird Species Using Musculoskeletal Measurements of the Leg

**Sunset High School**
**Bao, Maggie, 17**
Quantum Machine Learning by Optimizing Ternary-Input Binary-Output Kronecker Reed-Muller Forms

**Sunset High School**
**Vangal, Pratik, 18**
A Biologically-Inspired, Biomarker-Driven, Rapid Early Warning System for Epileptic Onset Prediction and Seizure Detection Using Machine Learning

**Westview High School**
**Choi, Jaiyoun, 17**
An Examination of the Relationship Between Screen Time and Achievement Motivation in an Adolescent Population

PENNSYLVANIA

Allentown

**Parkland High School**
**Cai, Victor, 18**
Designing a Narrowband Radar Using GNU Radio and Software Defined Radio for Tomography and Indoor Sensing

Berwyn

**Conestoga High School**
**Wylonis, Leo, 17**
Novel Fully MRI Compatible Nonmagnetic and Dielectric Pneumatic Servo Motor for MRI Guided Surgical Robotics
Fairless Hills  
Pennsbury High School  
Lane, Henry B., 18  
Less Wrong: A More Realistic Initial Condition for Simulations of Turbulent Molecular Clouds

Kennett Square  
Unionville High School  
Sircar, Arnab, 18  
Characterization of Emotional Contagion in Collaborative Decision Support Systems

Pittsburgh  
Fox Chapel Area High School  
Lakkis, Zoe, 16  
Data Mining to Identify Therapeutic Targets for Transplant Rejection  

Shady Side Academy  
Liu, Steven Diwen, 18  
Techno-Economic Assessment of a Cost and Quality-Based Algal Biodiesel Production Process

RHODE ISLAND  
Portsmouth  
Portsmouth Abbey School  
Shon, David, 19  
Effect of Alloferon Peptide for the Improvement of Growth Performance and Survival Rate of Mealworms (*Tenebrio molitor*) in Large-Scale Insect Farming

SOUTH CAROLINA  
Columbia  
Spring Valley High School  
Chen, Eileen, 17  
Discovery of Potential SARS-CoV-2 Main Protease Inhibitors from Medicinal Plants

Spring Valley High School  
Ganesh Babu, Shyam, 18  
Exploring How to Merge an Aspiration Thrombectomy Device and a Rotational Atherectomy Device For Efficacious Individual or Joint Removal of Thrombi and Plaque through In-Vitro Testing

TENNESSEE  
Nashville  
Hume-Fogg Academic High School  
Gilmer, Emi, 18  
The Effects of Daily Activities on Depressive Mood in High Schoolers

Hume-Fogg Academic High School  
Li, Jennifer, 17  
Effect of Range of Color Temperature and Melatonin Administration on Model Organism *Lymnaea stagnalis*

TEXAS  
Austin  
L.C. Anderson High School  
Rawashdeh, Aseel, 17  
Larvicidal “Trojan-Horse”: Experimentally Developing a Novel Low-Cost and Eco-Friendly Mosquito Vector Control Treatment
Liberal Arts & Science Academy
Latawa, Paridhi, 17
A Novel Computational Modeling Framework to Analyze Synovial-Tissue Based Drug Targets and Diagnostic Biomarkers in Rheumatoid Arthritis

St. Stephens Episcopal School
Meyers, Eli Pinchas, 17
Equivalence in Discrete Morse Functions on Graphs

Coppell Senior High School
Liang, Jessica E., 17
CS-VAE: Compressive Sensing-Based Variational Autoencoder: Theory and Design

St. Mark's School of Texas
Chen, Jeffrey, 18
A Privacy Preserving Federated Learning Framework to Predict COVID-19 Vulnerability

Robitaille Homeschool
Robitaille, Luke, 18
Topological Entropy of Simple Braids

Rick Reedy High School
Kogilathota, Vivek, 17
iPonder: A Multimodal Approach to Teen Mental Health Diagnosis and Therapy via Deep Transfer Learning

Carnegie Vanguard High School
Bhattacharya, Disha, 17
Investigating Short-Term Effects of Critically High Environmental Metal Concentrations on Usnic Acid Production in Cladonia rangiferina Lichens

Carnegie Vanguard High School
Kota, Nikitha, 18
Tense of Psychological Distancing Self Talk and Test Performance Among GT High School Students

Michael E. DeBakey High School for Health Professions
Song, Kevin, 18
Rational Design for improving PD-1 Immunotherapy by Combining With Bacterial Protein Flagellin Against Prostate Cancer

Plano East Senior High School
Peddinti, Sidhya, 17
Parkinsensor: Computer Vision and Ensemble Machine Learning-Based Incipient Diagnosis for Parkinson's Disease Using Neuromuscular Biomarkers

Plano Senior High School
Bharatia, Harshal, 17
Autonomous Learning With Automatically Created Models and a Novel Model Selection

Plano Senior High School
Ramakrishnan, Navya, 17
An Intelligent System for the Prediction of Epileptic Seizures Using Machine Learning Algorithms

Plano West Senior High School
Ganesh, Rithvik, 18
Tackling Tau: Identification of a Novel Inhibitor for the MSUT-2 Protein Using Quantum Machine Learning for the Treatment of Neurodegenerative Diseases
Plano West Senior High School
Krajmalnik, Sophie Reese, 17
Optimizing Automotive Seating Position to Reduce Injury Severity in Short-Statured Drivers

UTAH
Logan
Logan High School
Zhan, Gary, 17
Toward Sustainable Agriculture: Establishing Novel Soil-Bacteria-Based Biotechnologies to Promote Crop Growth

VIRGINIA
Alexandria
Episcopal High School
Wang, Susan, 18
Single-Cell RNA Sequencing Analysis of Human Neural Grafts Revealed an Unexpected Cell Type Underlying the Genetic Risk of Parkinson's Disease

Thomas Jefferson High School for Science and Technology
Banerjee, Sohini, 18
Post-Traumatic Stress Disorder (PTSD) Biomarker Identification Using Integrative Network Fusion and Deep Learning With Bayesian Hyperparameter Optimization

Thomas Jefferson High School for Science and Technology
Ganesh, Harrish, 17
The Analysis of the Viral Transmission and Structural Interactions Between the HIV-1 Envelope Glycoprotein and the Lymphocyte Receptor Integrin $\alpha_4\beta_7$

Thomas Jefferson High School for Science and Technology
Heller, Garrett Aaron, 18
Strichartz and Multi-Linear Estimates for the One-Dimensional Periodic Dysthe Equation

Thomas Jefferson High School for Science and Technology
Huang, Grace, 17
Bone and Bone Marrow Segmentation From Hip 3T Magnetic Resonance Imaging by Using Local Salient Anatomy Structure to Guide Deep Learning-Based Object Localization and Delineation

Thomas Jefferson High School for Science and Technology
Nachum, Ron, 17
PANDwriting: An Accessible, High-Sensitivity Parkinson's and Alzheimer's Screening System Using Vision-Based Handwriting Kinematic Analysis and Machine Learning

Thomas Jefferson High School for Science and Technology
Putalapattu, Pravalika Gayatri, 17
DORC: Dynamic Operating Room Companion for Gallbladder Removal Surgical Workflow Verification

Thomas Jefferson High School for Science and Technology
Tan, Wanli, 18
A Predictive Model for the Incidence of COVID-19: The Impact of Demographic and Socioeconomic Factors

Thomas Jefferson High School for Science and Technology
Zhou, Andrew, 17
The Role of Integrity and Ability in Leadership
Manassas  
**Osbourn Park Senior High School**  
Ohajunwa, Comfort Chinwendu, 17  
Mathematical Modeling, Analysis, and Simulation of the COVID-19 Pandemic With Explicit and Implicit Behavioral Changes

McLean  
**Potomac School**  
Bravewolf, Yanna Maria, 18  
Chimeric Antigen Receptor Macrophages as a Potential Cell-Based Therapy to Treat Alzheimer’s Disease

**Potomac School**  
Choi, Benjamin, 17  
An Ultra-Low Cost, Mind-Controlled Transhumeral Prosthesis Operated via a Novel Artificial Intelligence-Driven Brainwave Interpretation Algorithm

Richmond  
**Mills E. Godwin High School**  
Sharma, Cameron, 18  
FluVaxAI: A Novel AI Inspired Regional Flu Vaccine Formulation

WASHINGTON  
Camas  
**Camas High School**  
Wang, Sunny, 18  
MRI-Based Diagnosis of Alzheimer’s Disease Using Deep Learning With CycleGAN for Data Augmentation

Kirkland  
**Eastside Preparatory School**  
Sharma, Maya, 17  
Computational Analysis of Specific Indicators to Manage Crop Yield and Profits Under Extreme Heat and Climate Change Conditions

Redmond  
**Eastlake High School**  
Gruian, Audrey Liv, 18  
ALDIN: An Intelligent, Stereoscopic Aerial Olfactory System for Autonomous Odor Localization

**Eastlake High School**  
Ye, Christine, 17  
Inferring the Neutron Star Maximum Mass and Lower Mass Gap in Neutron Star – Black Hole Systems With Spin

Seattle  
**The Lakeside School**  
Li, Eric, 17  
Computational Identification and Characterization of Genetic Biomarkers With High Expression and Immune Infiltration in Breast Cancer

WISCONSIN  
Mequon  
**Homestead High School**  
Wang, Ethan Tianyou, 17  
Efficient Cauchy Distribution-Based Quantum State Preparation by Using the Comparison Algorithm

Shorewood  
**Shorewood High School**  
Dey, Riju, 17  
Discovery of Novel Eukaryotic-Like Dual Phosphatase Kinase Regulating Secretion of the Toxin Pyocyanin in *Pseudomonas aeruginosa*
CHINA
Shenzhen
Zhou, Leon Lee, 18
Visual Detection of Mercury Ions Based on the Tug-of-War Between Hg2+ and Oxidized Tetramethylbenzidine for Glutathione

SINGAPORE
Singapore
Lu, David, 18
On Optimal Favoritism in Asymmetric Competitions

SWITZERLAND
Reinach
Singhal, Ankit, 18
Political Conflict Prediction through Deep Learning and Time Series Classification in South Sudan and Yemen

Scholars are listed by their age as of the Regeneron STS 2022 Awards Gala in March 2022.
Agarwal, Naisha ...........................................4
Agrawal, Ayush ..............................................2
Ahmed, Armaan .............................................20
Alan, Julie .......................................................11
Andreasen, Claire ............................................5
Araki-Kurtdya, Derek .......................................13
Atchley, Jacqueline .........................................19
Ayyalapu, Neha ................................................12
Bachmann, Edith .............................................13
Balachandar, Anjana .........................................6
Banerjee, Sohini ...............................................25
Bang, Seyun .....................................................5
Bao, Maggie .....................................................22
Bargeer, Ayaan Abidalli .......................................17
Bee-Lindgren, Max ...........................................7
Belkin, Ryan Seth ..............................................1
Bharatia, Harshal ..............................................24
Bhatia, Aurrel ...................................................14
Bhattacharya, Disha .........................................24
Bhattacharyya, Pratiksha .....................................7
Bhavsar, Atreyus Abdish ....................................10
Blank, Steven ...................................................5
Blaustein, Mai ..................................................16
Bravewolf, Yanna Maria ......................................26
Brown, Michelle ..............................................13
Burks, Elijah Eshaun .........................................8
Cai, Daniel .......................................................3
Cai, Victor .......................................................22
Calman, Natalie ...............................................18
Cao, Eric ..........................................................3
Carson, Madison SN .........................................22
Chai, Lawrence ...............................................17
Chan, Karly .....................................................16
Chan, Sara Emily .............................................16
Chandrashekar, Varun .......................................8
Chang, David Zhu ............................................11
Chavira-Prieto, Samantha Janitza .........................10
Chen, Eileen ....................................................23
Chen, Jeffrey ...................................................24
Chen, Sabrina ..................................................20
Chheda, Caitlin ...............................................17
Chi, Nathan Andrew .........................................1
Chiu, Ethan .....................................................20
Choi, Benjamin ...............................................26
Choi, Jayiyoun ................................................22
Choi, Lauren Elizabeth .......................................8
Chowdhury, Neil ..............................................11
Chu, Andrew Kai ..............................................4
Chung, Jonathan .............................................20
Cioffi, Rose .....................................................18
Clairmont, Ryan ...............................................2
Cong, Kevin ....................................................11
Cruz, Levi ........................................................21
Cui, Jason ..........................................................5
Dasari, Srihitha ...................................................7
Dey, Riju ...........................................................26
Dod, Emily .......................................................17
Doherty, Ryan ...................................................15
Dunefsky, Brooke Ann .......................................16
Eroz, Efe ............................................................9
Fabricant, Lindsay ............................................19
Feng, Alice .......................................................3
Feng, Amy ........................................................19
Fisher, Aliya Rose ..........................................14
Foo, Orion Chuanyi ...........................................8
Franchetti, Abraham Daniel ................................19
Ganesh, Harish ...............................................25
Ganesh, Rithvik ...............................................24
Ganesh Babu, Shyam ......................................23
Gao, Andrew ...................................................3
Gao, Wilson .....................................................10
Garudadupuri, Dimple Amitha ............................1
Gastelumendi-Franco, Lara ................................6
Ghost, Arko .....................................................7
Ghost, Shaurnav ...............................................6
Ghost Dastidar, Prabuddha ................................21
Ghotra, Rohan Singh .......................................20
Gilmer, Emi .....................................................23
Goel, Aanya ....................................................17
Goel, Ram Krishna ...........................................22
Goel, Siya .......................................................18
Graseck, Maggie ............................................20
Groothuis, Maya Rose .....................................20
Gruian, Audrey Liv .........................................26
Gu, Richard ....................................................14
Guerra, Belle ...................................................16
Guo, Joshua ....................................................9
Guo, Karen .....................................................4
Guo, Phillip H. ...............................................18
Gupta, Riya .....................................................4
Hamdan, Reem ...............................................18
He, Vivien ......................................................12
Heller, Garrett Aaron .......................................25
Hoffmann, Heloise ..........................................16
Hsu, Sheryl .....................................................14
Hu, Alexander ...............................................10
Huan, Mulin ...................................................12
Huang, Eric ....................................................20
Huang, Grace ...............................................25
Huang, Ryan Yuki ............................................3
Huang, William ...............................................3
Im, Haedam ....................................................1
Iskhakov, Samuel ..........................................14
Jacob, Michael George ....................................21
Jiang, Fiona .................................................... 1
Jiang, Theodore Tianqi ..................................... 2
Jiang, Yanan ................................................... 9
Jin, Sonya ......................................................12
Jung, Samuel C. ............................................... 7
Kahlon, Arjan Singh ......................................... 6
Kara, Shreyas ................................................... 8
Kara, Su ........................................................... 2
Karamchedu, Mithra .........................................22
Keating, Riley Gabrielle .....................................15
Kelly, Andrew Robert .......................................19
Kenkare, Cyrus Jay ......................................... 5
Khankari, Jui .................................................... 7
Kocalar, Selin ................................................... 3
Kogilathota, Vivek ...........................................24
Kota, Nikitha ....................................................24
Kotlyar, Jeremy Nathaniel ................................16
Krajmalnik, Sophie Reese ................................25
Kratcha, Emma ...............................................22
Kulkarni, Kaivalya R. .......................................10
Kumar, Rishi ....................................................11
Labelson, Ethan L. ...........................................17
Labre, Enrique Clavecilla ....................................14
Lakiss, Zoe ....................................................23
Lane, Henry B. ...............................................23
Larsen, Daniel ...................................................8
Latawa, Paridhi .................................................24
Laumas, Sachi ...................................................5
Le, Kathryn .....................................................14
Lee, Aaron C. ...................................................1
Lee, Rachel .....................................................17
Lev, Abigail .....................................................19
Levy, Sydney ...................................................13
Lew, Jennifer ...................................................2
Li, Bangzheng ..................................................5
Li, Eric ...........................................................26
Li, Jennifer .....................................................23
Li, Jerry Y. ..........................................................5
Li, Krystal S. .................................................... 6
Li, Victoria .....................................................18
Lian, Julianna ...................................................6
Liang, Jessica E. ...............................................24
Lin, Brandon ...................................................13
Liu, Ann ........................................................19
Liu, Francis .................................................... 9
Liu, Frank .....................................................10
Liu, Seton ..................................11
Liu, Steven Diwen .........................23
Liveoak, Donald J. ..........................10
Lopez, Ricardo ..............................14
Lopez, Roberto Antonio ....................14
Lu, David ....................................27
Luisi, Christopher Vincenzo ...............13
Luo, Amber ..................................15
Ma, Larissa ....................................7
Madan, Varun Raj .............................6
Mandyam, Atulya ..............................3
Mantena, Rohit ................................11
Mao, Gilbert Lou ..............................22
McCreery, Evelyn Claire ....................15
Metaxas, Ada ..................................12
Meyers, Eli Pinchas ...........................24
Miao, Benjamin ...............................6
Mishra, Vaibhav ...............................7
Modi, Ashini ....................................8
Mohanraj, Dheepthi ......................... 21
Moon, Soyoun ..................................15
Moore, Ella ......................................5
Morange, Genevieve .........................14
Nachod, Benjamin Ethan ...................9
Nachum, Ron ..................................25
Naga, Varsha ...................................7
Nakanishi, Alexa ...............................5
Narayan, Yash ...................................4
Nishi, Kento ......................................3
Nyoni, Nyasha ...................................18
Ohajunwa, Comfort Chinwendu ...........26
Oliva, Gabrielle Joy ...........................19
Orans, Jerry .....................................17
Orth, Amara ....................................8
Oruganti, Suraj ................................12
Pai, Dhruv ........................................9
Panebianco, Katherine Mary .............21
Parikh, Khushi ...................................1
Park, Hannah ....................................12
Park, Ryan ......................................12
Parthasarathy, Nithin .........................1
Parthasarathy, Rishab .........................3
Patel, Roshni ....................................18
Patel, Shivani Tejas ...........................17
Peddinti, Sidhya ...............................24
Pfleger, Katherine Sirotkin .................16
Pichappan, Kannammal O. .................11
Pizzolato, Rachel Michelle ...................8
Pizzorusso, Emily ..............................13
Prainito, Christopher .......................13
Prawira, Jacqueline ......................... 2
Puri, Anika ......................................15
Putalapattu, Pravalka Gayatri ............25
Ramachandran, Sasvath .................... 4
Ramakrishnan, Navya .......................24
Rasmussen, Vale ...............................4
Rateshwar, Janice .............................17
Rathi, Neil .......................................2
Rawashdeh, Aseel .............................23
Reccie, Brandon ...............................12
Rigaud, Desiree .................................13
Robitaille, Luke ...............................24
Roice, Ashlyn ....................................2
Rossberg, Samuel ..............................14
Roychoudhury, Hrishika .....................21
Saravanan, Varsha .............................16
Schmidt, Olivia .................................19
Schubel, Sarah Kathryn .....................20
Sehgal, Harshita ...............................20
Selver, Maxwell ................................12
Shah, Arnav .....................................14
Sharma, Cameron .............................26
Sharma, Maya ...................................26
Shell, Natalie Anne ............................5
Shen, Daniel ....................................21
Shi, Isabel .......................................11
Shi, Sophia ......................................14
Shido, Eiki .......................................14
Shin, Nina .......................................18
Shon, David .....................................23
Singhal, Ankit ................................. 27
Sinha, Savar .....................................1
Sircar, Arnab .................................... 23
Sivakumar, Ashwin ............................2
Song, Aaron Min ...............................19
Song, Kevin ......................................24
Sosnick, Lucas ................................. 18
Sreejithkumar, Vivek ......................... 6
Strauss, Robert Russell .......................13
Su, Shannon .................................... 13
Takken, Mark ................................. 18
Takmil, Cameron Ali ..........................19
Tan, Wanli ......................................25
Tiwari, Siddharth .............................. 7
Tsapatsaris, Ava ...............................15
Tuchinda, Waris ................................9
Uppuluri, Nishi .................................20
Vaidyanathan, Annika ....................... 7
Vangal, Pratik ...................................22
Vaswani, Keelan Mitin ...................... 16
Vaughan, Sophie Caroline ............... 21
Vesselinov, Alexandra ...................... 19
Vogel, Jay ..................................... 15
Volkova, Alexandra .........................11
Walsh Fuchs, Oliver Sebastian .............16
Wang, Aimee ................................... 4
Wang, Atticus ...................................12
Wang, Ella ....................................... 1
Wang, Ethan ....................................17
Wang, Ethan Tianyou ....................... 26
Wang, Franklin ................................. 2
Wang, Isabel .....................................16
Wang, Lucia .....................................21
Wang, Sunny ....................................26
Wang, Susan ....................................25
Wang, Winnie ...................................21
Weng, Gene .....................................21
Wong, Anthony G. .............................18
Wong, Ethan .................................... 1
Wylonis, Leo ....................................22
Xi, Zoe .......................................... 9
Xia, Daniel .....................................11
Xiao, Vivian ..................................... 9
Xie, Katherine .................................12
Xiong, Nathan ...................................9
Yan, Jessica Cindy .............................10
Yang, Ali ......................................... 9
Yang, Heran ..................................... 6
Yang, Margaret L. .............................10
Ye, Christine ...................................26
Yeroushalmi, Olivia ......................... 15
Youn, Han Byur .................................20
Yu, Xinkai .......................................12
Yu, Zara ..........................................11
Yue, William ................................... 9
Zbizika, Renee .................................15
Zeng, Michael ................................. 2
Zhan, Gary .....................................25
Zhang, Alexander ............................. 3
Zhang, Allison ..................................17
Zhang, Anya ................................... 10
Zhang, William .................................15
Zhao, Kevin Edward .........................10
Zhao, Luke Yuchen ........................... 3
Zhou, Andrew ..................................25
Zhou, Emily A. ................................. 4
Zhou, Leon Lee .................................27
Zitzewitz, Zachary ............................ 3
Zou, Yiqiao .....................................18
Zuo, Ethan .......................................4
About Regeneron

Regeneron is a leading biotechnology company that invents life-transforming medicines for people with serious diseases. Founded and led for over 30 years by physician-scientists, our unique ability to repeatedly and consistently translate science into medicine has led to nine FDA-approved treatments and numerous product candidates in development, nearly all of which were homegrown in our laboratories. Our medicines and pipeline are designed to help patients with eye diseases, allergic and inflammatory diseases, cancer, cardiovascular and metabolic diseases, pain, hematologic diseases, infectious diseases and rare diseases.

Regeneron believes that operating as a good corporate citizen is crucial to delivering on our mission. We approach corporate responsibility with three goals in mind: to improve the lives of people with serious diseases, to foster a culture of integrity and excellence and to build sustainable communities. Regeneron is proud to be included on the Dow Jones Sustainability World Index and the Civic 50 list of the most “community-minded” companies in the United States. Regeneron empowers and supports employees to give back through our volunteering, pro-bono and matching gift programs. Our most significant philanthropic commitments are in the area of science education, including the Regeneron Science Talent Search and Regeneron International Science and Engineering Fair.

Learn more about our programs at: www.regeneron.com/scienceeducation and follow us on 
Facebook www.facebook.com/Regeneron 
Twitter @Regeneron 
Instagram @Regeneron 
Youtube https://www.youtube.com/regeneron 
LinkedIn https://www.linkedin.com/company/regeneron-pharmaceuticals

About Society for Science

Society for Science is a champion for science and engineering. We are dedicated to expanding scientific literacy, STEM education and scientific research. Founded in 1921, the Society is a nonprofit 501(c)(3) membership organization best known for our world-class science research competitions, including the Regeneron Science Talent Search, the Regeneron International Science and Engineering Fair and the Broadcom MASTERS, our suite of outreach and equity programs, and the award-winning magazine, Science News and digital media properties, including Science News for Students.

Learn more at: www.societyforscience.org and follow us on 
Facebook https://www.facebook.com/societyforscience 
Twitter @Society4Science 
Instagram @Society4Science 
Snapchat Society4Science