



Congratulations to the 2024 Regeneron STS Scholars!

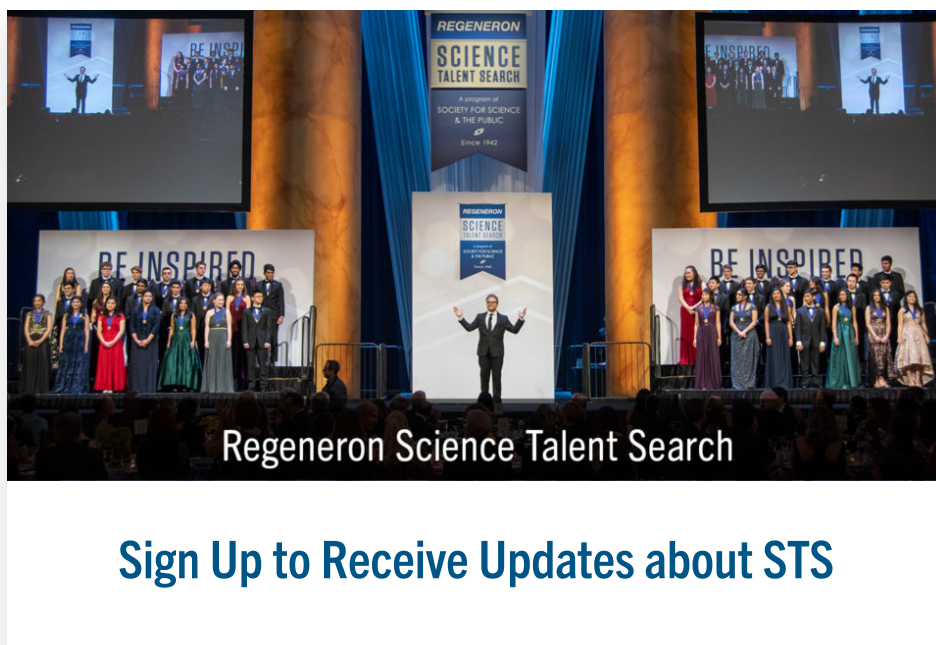
Society for Science proudly announces the top 300 scholars in the [Regeneron Science Talent Search](#) 2024, the nation's oldest and most prestigious science and math competition for high school seniors. The Regeneron Science Talent Search provides students a national stage to present original research and celebrates the hard work and novel discoveries of young scientists who are bringing a fresh perspective to significant global challenges. The 300 scholars and their schools will be awarded \$2,000 each.

The Regeneron Science Talent Search scholars were selected from 2,162 applications received from 712 high schools across 46 states, Guam, Puerto Rico and ten other countries. Scholars were chosen based on their exceptional research skills, commitment to academics, innovative thinking and promise as scientists and hail from 196 American and international high schools and homeschooled in 36 states and China.

[VIEW THE PRESS RELEASE](#)



[View the 2024 Scholar Book](#)



2024 Scholars

Maryam Abdel-Azim, Age: 17

Central Bucks High School, PA

Project Title: Targeting Signaling Molecules of *P. aeruginosa* by Using Mucin as an Anti-Quorum Sensing Drug: A Novel Design To Evaluate Efficacy in the Context of Multidrug Resistance

Aiden Z. Ackerman, Age: 18

Stuyvesant High School, NY

Project Title: Assessing the Accuracy of a Generative Model for Creating Novel Spider Silk Proteins

Nikita Agrawal, Age: 18

Whitney Young Magnet High School, IL

Project Title: A Novel Approach for Predicting Large Wildfires Using Machine Learning Toward Environmental Justice via Environmental Remote Sensing and Atmospheric Reanalysis Data Across the United States

Shaurya Agrawal, Age: 17

Adlai E. Stevenson High School, IL

Project Title: Combinatorial Optimization and Machine Learning To Predict Optimal Cell-State Conversion Paths

Ishan Ahluwalia, Age: 18

Jesuit High School, OR

Project Title: NeuroMotus: An Intelligent Exoskeleton System To Improve Cerebral Palsy Patient Mobility Using Brain Computer Interface

Milo Akerman, Age: 18

School for Advanced Studies – Wolfson, FL

Project Title: Classification of Poisonous *Russula* Species Using CBAM-Integrated Convolutional Neural Networks and Bayesian Optimization

Saraswathy Amjith, Age: 18

Tesla STEM High School, WA

Project Title: A Novel Integrated Machine Learning Approach Utilizing Radar and Satellite Imagery for Selective Logging Remote Sensing Detection and Accompanying AI-Logging Map-Generating Webtool

Lily Anchin, Age: 17

Byram Hills High School, NY

Project Title: Investigating the Immunophenotypic Differences Among T-Cell Acute Lymphoblastic Leukemia Patients of Distinct Subtype, Sex and Race in Efforts To Improve Chimeric Antigen Receptor T-Cell Therapy

Aarav Arora, Age: 18

Del Norte High School, CA

Project Title: A Mechanistic Basis for the Analysis of SARS-CoV-2 Omicron Variant Severity

Margaret Madeleine Arthur, Age: 18

Fairview High School, CO

Project Title: A Novel Phosphosite Localization Approach Using Tandem Phosphoprotein Mass Spectra and Temporal Dilated Networks

Aditi Avinash, Age: 17

Rock Canyon High School, CO

Project Title: Model Validation and Preclinical Testing of Digestive Enzymes for Gluten Breakdown: A Move To Cure Gluten Intolerance and Celiac Disease

Harshil Avlani, Age: 17

BASIS Chandler, AZ

Project Title: Analyzing the Effect of Mid-Circuit Measurement (MCM) on Spectator Qubits

Noah Kalyn Babel, Age: 17

Menlo School, CA

Project Title: Stable Equilibria Under Random Fitness and Recombination Rates

David Rodrigo Backer Peral, Age: 17

La Canada High School, CA

Project Title: Hot Button: Non-Invasive Approach for Studying Aggressive States

Reyansh Bahl, Age: 17

Green Level High School, NC

Project Title: Mapping Soil Organic Carbon for Regenerative Agriculture and Reducing Atmospheric Carbon Using Multispectral Satellite Imagery and Machine Learning

Justin Baldassarre, Age: 18

Hastings High School, NY

Project Title: STING-Rich Ciliated Cells Protect the Fallopian Tube From Early Transformation in the Development of Ovarian Cancer

Kunal Samir Bham, Age: 18

Thomas Jefferson High School for Science and Technology, VA

Project Title: Discovering Hidden Pathways: A Network-Centric Approach Reveals Novel Pathways Impacted by Prader-Willi Syndrome

Arav Bhargava, Age: 18

The Potomac School, VA

Project Title: Low-Cost, 3D-Printed, Universal-Fit, Transradial Socket for Amputees in Developing Countries

Soumyadeep Bhattacharjee, Age: 15

Williamsville East High School, NY

Project Title: EM²GeM: Explainable Multiview Multimodal Behavioral Modelling for Generalized Mental Health Analytics**Aditi Bhattamishra**, Age: 18

Amity Regional High School, CT

Project Title: The SFSA Ankle: A Novel Smart Fluidic Servo Actuator With Real-Time Environment Sensing for Low-Cost, Low-Power, High-Efficiency Transtibial Bionics

Neil Bhavikatti, Age: 17

Cherry Creek High School, CO

Project Title: On Algorithmic Cache Optimization

Matvey Borodin, Age: 18

Brookline High School, MA

Project Title: The Action of the Cactus Group on Arc Diagrams

Rebecca Bover, Age: 17

Herricks High School, NY

Project Title: The Novel Effect of Rosuvastatin on Cholesterol 25-Hydroxylase (Ch25h) Oxysterol Metabolism and IL-6 in Response to LPS and ssRNA40 Stimulation

Alexia Bravo, Age: 17

Union High School, WA

Project Title: An Investigation of New Brown Dwarf Spectral Binary Candidates From the Backyard Worlds: Planet 9 Citizen Science Initiative

Alan Bu, Age: 17

Phillips Exeter Academy, NH

Project Title: On the Maximum Number of Spanning Trees in a Planar Graph With a Fixed Number of Edges: A Linear-Algebraic Connection

Anwen Cao, Age: 17

Horace Greeley High School, NY

Project Title: An Exploration of mTOR in Epstein-Barr Virus: Evaluating the Effect of EBV Deubiquitinating Enzyme BPLF1 on mTOR Complex 1 and 2

David Lu Cao, Age: 18

Thomas Jefferson High School for Science and Technology, VA

Project Title: The Implications of 'Oumuamua on Panspermia

Elton Cao, Age: 17

Fairview High School, CO

Project Title: National Ground-Level NO₂ Predictions via Satellite Imagery-Driven Convolutional Neural Networks

Gaby Cao, Age: 18

Dana Hall School, MA

Project Title: Mining Novel Glaucoma Drug Target Using Disease-Associated Multiomics Between Ocular Hypertension-Dependent and Independent Pathways

Calvin Kirtley Harold Carpenter, Age: 18

All Saints Episcopal School, TX

Project Title: Identifying Novel Modes of Inhibition of *C. pusillum* and *B. subtilis* Bacteria Against Deadly Bat Fungus *Pseudogymnoascus destructans*

Aidan Czalet, Age: 17

Saint Anthony's High School, NY

Project Title: Examination of the Effects by a Salinity and Temperature Gradient on *Microcystis aeruginosa* Morphology: A Keyence Fluorescence Microscope Analysis

Arnav N. Chakravarthy, Age: 18

Homestead High School, CA

Project Title: Leveraging Mitochondrial DNA Mutations for Macrophage Lineage Tracing in Primary Human Tissues

Alex Chen, Age: 17

Syosset High School, NY

Project Title: Evaluating the Neuroprotective Effects of Spearmint Oil in the *Caenorhabditis elegans* Model of Alzheimer's Disease

Maxwell Chen, Age: 17

Lincoln High School, OR

Project Title: Improving Stability of Perovskite Solar Cells Using Nanoscale Metal Coatings

Sophie Chen, Age: 17

Caddo Parish Magnet High School, LA

Project Title: Intraoperative Histological Analysis of Squamous Cell Carcinoma Tumor Margins Using a Convolutional Neural Network

Hiuyi Cheng, Age: 17

Herricks High School, NY

Project Title: Evaluating Border Associated Macrophages: A Novel Approach to Investigating Cerebral Blood Flow Dysregulation in ApoE4 Mice

Grace Seyoung Choi, Age: 18

Bloomington High School, IN

Project Title: Improving Transient Expression of Recombinant Proteins in *Nicotiana benthamiana* Using Color-Optimized Plastic Mulch Covers

Thomas Cong, Age: 17

Ossining High School, NY

Project Title: Overlooked Covariates in Metabolite Abundance Levels: Systematically Quantifying the Information Overlap Between Gene Expression and Metabolism Across Multiple Cancer Types

Jessica Mary Curran, Age: 18

Westhampton Beach High School, NY

Project Title: Analyzing the Effectiveness of *Dasysiphonia japonica* as a Seaweed Liquid Fertilizer Through *Abelmoschus esculentus* Growth and Pigment Concentration

Yash Dagade, Age: 17

Eden Prairie High School, MN

Project Title: SkyWindFarm: Harnessing High-Altitude Wind Power in a Scalable Manner

Rohan Keyur Dalal, Age: 17

Johns Creek High School, GA

Project Title: Neuromesodermal Progenitor Cells Give Rise to Blood Through a Myoblast/Hemangioblast Bipotential Intermediate

Sophie D'Halleweyn, Age: 17

Bronx High School of Science, NY

Project Title: Alleviating the Energy Crisis: A Novel Multi-Task Machine Learning Algorithm for Designing Efficient Nanocatalysts To Reduce Industrial Energy Impact

Elizabeth Djajalie, Age: 18

Thunder Mountain High School, AK

Project Title: Quantitative Environmental DNA Metabarcoding for the Enumeration of Pacific Salmon (*Oncorhynchus* spp.)**Anna Chang Du**, Age: 18

Phillips Academy, MA

Project Title: Developing an AI-Enhanced Protocol for Simulating Abiogenesis: Novel Nano-Structured Carbon Materials as a Templating Surface for Prebiotic Nucleic Acid Oligomer Formation

Timucin Erbas, Age: 17

Acton-Boxborough Regional High School, MA

Project Title: Autonomous Precision Rocket Landing Algorithm

Emma Bangai Fan, Age: 17

Chongqing Nankai Secondary School, China

Project Title: Unexpected Chemistry in the Synthesis of a Key Drug Intermediate Under Buchwald-Hartwig Amination Conditions

Jonathan Matthew Fan, Age: 18

Montgomery Blair High School, MD

Project Title: A Genomic Meta-Data Analysis of Alzheimer's and Related Diseases Reveals New Insights for Future Research

Michelle Fan, Age: 17

Canyon Crest Academy, CA

Project Title: A High-Throughput Screening Pipeline Targeting Mitochondrial Energetic Dysfunction in Patient-Derived Neurons

Roger J. Fan, Age: 18

Henry M. Gunn High School, CA

Project Title: Multidisperse Random Sequential Adsorption and Generalizations

Katherine Fang, Age: 18

High Technology High School, NJ

Project Title: Surveying Water Surface and Wetlands Using Cloud-Removed LandSat Data

Xinxin Fang, Age: 18

Episcopal Academy, PA

Project Title: A Graphical Approach to the Frobenius Number Problem in Three Variables

Jacob Noah Federici, Age: 18

American Heritage School, FL

Project Title: Mitigation of Decreased Protein Synthesis Under Elevated Carbon Dioxide in *Arabidopsis thaliana* Using Transgenic and Exogenous Approaches

Aiden Fel, Age: 17

Ossining High School, NY

Project Title: Deficiency of Tetrahydrobiopterin Impairs Cognition in Alzheimer's Disease and in Mild Cognitive Impairment

Jonathan Feldman, Age: 16

Robert L. Paschal High School, TX

Project Title: A Novel Multimodal Deep Learning-Based Approach to the Recognition and Analysis of Pro-Eating Disorder Content on Social Media

Hannah Flitman, Age: 18

Berkeley Preparatory School, FL

Project Title: Exploring Racial Disparities in Auto Insurance Pricing: A Novel Geographical Information Systems Approach to Analyzing Fatality and Rate Discrepancies

Christiana Foufas, Age: 18

Wellington C. Mephram High School, NY

Project Title: Adapting to Pressure: The Bone Structure-Function Relationship in the Rabbit Talus

Esabella Sunshine Fung, Age: 17

Saratoga High School, CA

Project Title: A Machine Learning Approach for Assessing Labor Supply to the Online Labor Market

Ruohan Gao, Age: 18

Noble and Greenough School, MA

Project Title: Deep Learning-Based Satellite Image Analysis for Predicting the Correlated Density of *Ailanthus altissima***Sophie Gao**, Age: 17

Hunter College High School, NY

Project Title: Uncovering Mechanisms of Action and Resistance for KRAS G12D Inhibitor MRTX1133 Using *Drosophila melanogaster* Models**William Gao**, Age: 18

Centennial High School, MD

Project Title: Designing a Federated Learning-Driven Collaborative Diagnostic System for Metastatic Breast Cancer: Reducing Long Diagnosis Delays and Improving Patient Survival Outcomes in Developing Countries

Arnav Garg, Age: 18

North Carolina School of Science and Mathematics, NC

Project Title: Treating Anorexia Nervosa Using Fluoxetine and Olanzapine in the Model Organism *Caenorhabditis elegans***Ria Garg**, Age: 17

Texas Academy of Mathematics and Science, TX

Project Title: Early Diagnosis of Post-Traumatic Stress Disorder in Nurses Based on Physical Behavior and Circadian Rhythm Modeled by a Recurrent Neural Network

Eric Ge, Age: 18

Groton School, MA

Project Title: An Autonomous Assisted-Feeding Robotic Arm With Computer Vision Capabilities

Wendy Geng, Age: 17

Liberal Arts & Science Academy, TX

Project Title: Mutation Effects on Chromophore Incorporation in the All1280 His-GAF2 Protein

Priya Ghanta, Age: 18

Pine Crest School, FL

Project Title: Soluble Plasma Proteins of Tumor Necrosis Factor and Immunoglobulin Superfamilies Reveal New Insights Into Immune Regulation in People With HIV and Opioid Use Disorder

Ishani Ghosh, Age: 18

Centennial High School, MD

Project Title: Saturated Lipid-Mediated Abrogation of Neurogenesis: A New Paradigm for Therapeutic Implication in Traumatic Brain Injury Among Obese and High Lipid-Indexed People

Vikram Srinivas Goddla, Age: 17

Detroit Country Day School, MI

Project Title: Optimal Policy Sparsification and Low-Rank Decomposition for Reinforcement Learning

Sarang Goel, Age: 18

Texas Academy of Mathematics and Science, TX

Project Title: IVY – Intelligent Vision System for the Visually Impaired: Innovative Low-Cost, AI-Based Eyeglasses To Help the Visually Impaired Overcome Mobility Limitations Through Navigational Assistance and Object Avoidance Algorithms and an Intuitive Vibration and Audio Guidance System

Jacob Goldman-Wetzler, Age: 17

Hastings High School, NY

Project Title: Investigating the Impact of Optimal Flashcard Creation Principles on Memory

Ethan Ryan Gonzalez, Age: 18

Bishop O'Dowd High School, CA

Project Title: Impact of Electric Fields on Aqueous Phase Contaminants

Benjamin Gordon, Age: 18

Paul D. Schreiber High School, NY

Project Title: Impact of Cannabinoids on Prostaglandin Synthesis in Activated Inflammatory Cells

Nira Goyal, Age: 17

Martin County High School, FL

Project Title: Quantification of *Macrophomina phaseolina* Survival After Organic Soil Treatments Under Multiple Temperature Regimes

Molly Rose Graff, Age: 17

Wellington C. Mephram High School, NY

Project Title: Think Fast: An Assessment of Cognitive Processing in Relation to Smartphone Proximity

Jacob Tyler Gross, Age: 17

Roslyn High School, NY

Project Title: Investigating Synergistic Interactions Among SARS-CoV-2 Neutralizing Antibodies

Aanya Gupta, Age: 17

Bergen County Academies, NJ

Project Title: Initiating Astrocyte to Neuron Transdifferentiation Through MiR-124a: Implications in Neurodegenerative Disease

Aditya Gupta, Age: 18

William Fremd High School, IL

Project Title: Agri-GNN: A Novel Genotypic-Topological Graph Neural Network Framework Built on GraphSAGE for Optimized Yield Prediction

Gautam Gupta, Age: 17

Briarcliff High School, NY

Project Title: Predicting Future Internal Migration Patterns Within the United States Resulting From Shifts in Temperature and Precipitation

William Gvozdjak, Age: 17

Bellevue High School, WA

Project Title: Classification of Low-Rank Odd-Dimensional Modular Categories

Gracelynn Hao, Age: 17

Bridgewater-Raritan High School, NJ

Project Title: Green Synthesis of Black TiO₂ Nanoparticles: A Promising Candidate for Solar-Driven Photocatalytic Water Decontamination

Charlie Haywood, Age: 17

Interlake High School, WA

Project Title: Real-Time Blind Deblurring Based on Lightweight Deep-Wiener-Network

Aiden Hightower, Age: 17

Bronx High School of Science, NY

Project Title: Molecular Fusion: A New Methodology for the Rational Design of Novel DNA Motifs via the DX-Mediated Binding of DNA Tensegrity Triangle Unit Blocks

Griffin Hon, Age: 17

Syosset High School, NY

Project Title: Evaluating Differential Nutritional Regulation of Stem Cell Plasticity

Samuel Hsu, Age: 17

George W. Hewlett High School, NY

Project Title: A Matrix Metalloproteinase (MMP) Regulated by Salicylic Acid (SA) and Lipopolysaccharide (LPS) Plays an Integral Role in Prothallial Development of Gametophytes of *Ceratopteris richardii*

Chelsea Hu, Age: 17

BASIS Independent McLean, VA

Project Title: Silk Fibroin Microspheres: An Innovative Approach To Improve Drug Delivery to the Lungs for the Treatment of Neonatal Respiratory Distress Syndrome (NRDS)

Katherine Hua, Age: 17

Woodbridge High School, CA

Project Title: An AI-Powered Assistive Device for the Visually Impaired

Luke Huang, Age: 17

New Canaan High School, CT

Project Title: Binary Cellular Analysis: Understanding the Link Between Aging and Mortality Risk

Luke Huang, Age: 17

William A. Shine Great Neck South High School, NY

Project Title: Multiscale Analysis of the Hubble Tension in an Evaluation of the Λ CDM Model

Vincent Weisi Huang, Age: 17

Syosset High School, NY

Project Title: A Smart Computer Program *LauePt4* for Recognizing and Simulating Laue Patterns and Its Applications

Leslie Elizabeth Hunter, Age: 17

C. E. Byrd High School, LA

Project Title: To What Extent Do Pesticides Alter Antioxidant Properties Found Within Rabbiteye Blueberries?

Emily Xingbao Huo, Age: 17

Augusta Preparatory Day School, GA

Project Title: Targeting Macrophage Glycolysis Suppresses Kidney Scarring in a Rodent Model

Isabella Jabbour, Age: 17

Edgemont High School, NY

Project Title: Insights Into Cellular Senescence: p16 and p21 Dynamics in Healthy Aging Spinal Cord Tissues

Howard Ji, Age: 17

University High School, CA

Project Title: Development of a Novel Autonomous Column-Climbing Robotic System (AutoBot) for Real-Time Detection and Mapping of Surface Cracks on Bridges

Melody Jiang, Age: 18

Bronx High School of Science, NY

Project Title: Characterizing Effects of Natural Killer Cell Neural Cell Adhesion Molecule 1 Interactions With Stromal Cells on Natural Killer Cell Development

Kaitlyn Jin, Age: 18

North Carolina School of Science and Mathematics, NC

Project Title: A Novel and Sustainably Synthesized Imine Resveratrol Analog as a Multi-Target-Directed Ligand for the Treatment of Alzheimer's Disease

Ishan Milind Joshi, Age: 17

Amador Valley High School, CA

Project Title: Development of a Mycorrhizae-Assisted Plant Microbioelectrochemical Fuel Cell for Optimized Bioelectricity Production and Copper Sulfate Mycorrhizoremediation

Seoyoung Jun, Age: 18

Thomas Jefferson High School for Science and Technology, VA

Project Title: Integrated Assistive Technology for the Visually Impaired – Implementation of a 3D Scanner With a Tactile Display and Machine Learning in Obstacle Identification

Amanrai Singh Kahlon, Age: 17

Sanford School, DE

Project Title: Enhancing Wearable Gait-Monitoring Systems: Identifying Optimal Kinematic Inputs in Typical Adolescents

Rohan Kalahasty, Age: 18

Thomas Jefferson High School for Science and Technology, VA

Project Title: Hybrid Plasticity: Adaptive, Brain-Like Artificial Intelligence via Prefrontal Cortex-Inspired Meta-Learning

Gavriela Beatrice Kalish-Schur, Age: 18

Julia R. Masterman High School, PA

Project Title: IRE1 Knockdown Leads to an Anxiety Phenotype in *Drosophila* and Changes in BiP and BDNF Levels

Ashwin Kaliyaperumal, Age: 18

Tesla STEM High School, WA

Project Title: A Quantum Optimization Algorithm To Efficiently Route Public Transportation in Cities

Yifan Kang, Age: 18

Phillips Academy, MA

Project Title: CNOT-Optimal Circuit Synthesis

Saathvik R. Kannan, Age: 18

David H. Hickman High School, MO

Project Title: Revolutionizing Cancer Drug Discovery With DrugGen: Identifying a Novel Drug for DNA Polymerase θ

Isha Kapoor, Age: 18

Mayo High School, MN

Project Title: Overcoming Melphalan Resistance in the Treatment of Multiple Myeloma — Year 2

Shraman Kar, Age: 17

duPont Manual Magnet High School, KY

Project Title: Dynamic Layer Pruning and Quantization Using Proximal Policy Optimization: A Synergistic Approach for Efficient Deep Learning Models

Zeyneb N. Kaya, Age: 17

Saratoga High School, CA

Project Title: MADLIBS: A Novel Multilingual Data Augmentation Algorithm for Low-Resource Neural Machine Translation

Bradley Kelton, Age: 18

Ward Melville High School, NY

Project Title: Geochronologic and Dynamic Constraints on the Topographic Evolution and Critical Mineral Deposits of the Southwestern United States

Nema Khan, Age: 17

Bronx High School of Science, NY

Project Title: The Impact of Media Attention to Gun Violence on the Elevation of Mass Shootings: The Rise of Copycat Shooters

Rania Khan, Age: 18

Charles E. Gorton High School, NY

Project Title: Combined Sewer Overflow Neutralizing Agent Sodium Hypochlorite (NaOCl) Ramifications on the Vitality of the *Tetraselmis* Population Within the Hudson River

Syon Khatter, Age: 18

Plainview-Old Bethpage John F. Kennedy High School, NY

Project Title: Investigating Impacts of Sucralose on Hedonic Feeding Behaviors in *C. elegans* as a Model for Prevention and Treatment of Obesity and Eating Disorders

Kevin Khitrov, Age: 17

Ardsley High School, NY

Project Title: Autophagy in Non-Cell Autonomous Regulation of Adipogenesis

Andrea Choo Kim, Age: 17

Bergen County Academies, NJ

Project Title: qPCR Assay for the Detection of *Varroa destructor* in the eDNA of *Apis mellifera* Colonies

Brandon Kim, Age: 17

William A. Shine Great Neck South High School, NY

Project Title: Deciphering Receptor-Ligand Connectomes in Models of Lung Adenocarcinoma

Daniel Kim, Age: 18

Los Alamos High School, NM

Project Title: Engineered Underwater Vehicle for Ocean Litter Mapping

Joshua J. Kim, Age: 17

West Lafayette Junior-Senior High School, IN

Project Title: Camouflaged and Biosafe QR Code Bioprinting and Protein Tagging: Combatting Medicine Counterfeiting

Ryan Kim, Age: 17

Bronx High School of Science, NY

Project Title: Exploring the Pathways of c-Maf Endothelial Cell Reprogramming

Ryan Jisup Kim, Age: 17

Thomas Jefferson High School for Science and Technology, VA

Project Title: Hybrid Quantum-Classical Machine Learning for Dementia Detection

Antonia Maria Kolb, Age: 18

King School, CT

Project Title: DETICKT IT: A Machine Learning-Based Application for Real-Time Tick Identification and Spatiotemporal Disease Risk Assessment

Anoushka Kolluru, Age: 18

James Logan High School, CA

Project Title: Investigating the Proliferation, Invasion and Resistance to Chemotherapy-Induced Apoptosis of A549 Lung Cancer Cells in Relation to Synthetic Nicotine Exposure

Vaishnavi Kolluru, Age: 17

Dougherty Valley High School, CA

Project Title: Human Milk Immune Complexes Isolated Following Pregnancies Complicated by COVID-19 Infection Contain SARS-CoV-2 Nsp13 Helicase and Biologically Active Factors

Aditya Kiran Koushik, Age: 17

La Cueva High School, NM

Project Title: ACPLearn: A Deep Neural Network Model To Predict Novel Anticancer Peptides

Srikar Kovvuri, Age: 18

Adlai E. Stevenson High School, IL

Project Title: Multifaceted Wildfire-Induced Risk Assessment for Electric Power Grid: An Analytical Approach With Implications for Resilient Infrastructure

Natasha Kulviwat, Age: 17

Jericho Senior High School, NY

Project Title: The Neurobiology of Suicide: Blood-Brain Barrier Breakdown as a Novel Suicide-Risk Biomarker

Lucia Marie Lammers, Age: 17

Harrison High School, NY

Project Title: Colorimetric and Spectroscopic Analysis of Textiles Dyed With Local Invasive Plants Species and Waste-Derived Mordants

Ella Selina Lan, Age: 17

The Harker School, CA

Project Title: Creating HD-Performer: A Biomedical Waveform Transformer With Two New Attention Modules, TSA and SPA, for Diabetes Detection

Katherine Lee, Age: 18

Plano West Senior High School, TX

Project Title: Finding an Accessible, Environmentally Friendly Solution to Water Purification: Testing the Effectiveness of *Aloidendron barberae* and *Bambusa dolichomerithalla* as Natural Coagulants on Heavy Metal Concentration

Matthew Minwoo Lee, Age: 17

North Carolina School of Science and Mathematics, NC

Project Title: Using Spectral Entropy as a Measure of Chaos To Quantify the Transition From Laminar to Turbulent Flow

Reia Lee, Age: 17

Bergen County Academies, NJ

Project Title: Analyzing the gKDR-GMM Model's Simulation of *C. elegans* Brain Activity Data and Its Wider Applications in Time-Series Data Analysis

Benjamin Max Levy, Age: 17

Byram Hills High School, NY

Project Title: Using Machine Learning To Uncover Hidden Linguistic Differences Within Online Mental Health Disclosures Between Men and Women

Aaron Li, Age: 18

Newark Academy, NJ

Project Title: The Dynamics of a Neutrally Buoyant Particle in Laminar Flow

Alexis Li, Age: 17

Hamilton High School, AZ

Project Title: BrainSTEAM: A Practical Pipeline for Connectome-Based fMRI Analysis Toward Brain Disorder Classification

Arielsie Li, Age: 18

Phillips Academy, MA

Project Title: FlexLizard: A Fast-Running Bipedal Lizard Robot With Optimized Lateral Bending

Brian Minghan Li, Age: 18

Mission San Jose High School, CA

Project Title: Intertwining Operators Between Subregular Whittaker Modules for g/N and Non-Standard Quantizations

Lucy Li, Age: 17

Greenwich High School, CT

Project Title: Footprint Reduction of PET Fiber Waste in Refuse Environments via Non-Toxic *Ideonella sakaiensis* Degradation

Samuel Li, Age: 17

Stuyvesant High School, NY

Project Title: Turning Fat to Muscle by Activating Muscle-Specific Genes

Eric Liang, Age: 17

Branham High School, CA

Project Title: Predicting Pedestrian Crosswalk Behavior Using Convolutional Neural Networks

Katherine Liang, Age: 17

Ward Melville High School, NY

Project Title: Differentially Private Deep Learning in Biomedical Research

Yiwei Liang, Age: 18

Princeton International School of Math and Science, NJ

Project Title: Discovery and Validation of Small Molecule TIGIT Inhibitors for Cancer Immunotherapy

Kyleen Liao, Age: 17

Saratoga High School, CA

Project Title: Simulating the Air Quality Impact of Prescribed Fires Using a Graph Neural Network-Based PM2.5 Emissions Forecasting System

Audrey Lin, Age: 17

Greenwich High School, CT

Project Title: Eco-Friendly Remediation of Polycyclic Aromatic Hydrocarbons in Stormwater via Magnesium-Infused Calcite Crystal, Supramolecular Hydrogel Scaffolding

Felix Lin, Age: 18

Mission San Jose High School, CA

Project Title: Creation of WAL-SEA: The First Shallow-Ocean Multifunctional Remotely Operated Vehicle (ROV) for the Study of Near-Shore Ocean Ecosystems

Jonathan Lin, Age: 17

Bronx High School of Science, NY

Project Title: Analysis of Distinctive MicroRNA Conservation Patterns as Markers for Unique MicroRNA Processing Mechanisms

Collin Liou, Age: 17

Sequoia High School, CA

Project Title: Programmable Multistability and Rigid Flattenability in Origami Cubes by Adding a Minimal Cut

Allison An-Li Liu, Age: 17

Lexington High School, MA

Project Title: Next-Generation Synthetic Receptor Circuits for T-Cell Therapy

Brian Zhou Liu, Age: 17

William A. Shine Great Neck South High School, NY

Project Title: Evaluating the Applied Effectiveness of ECG Compression Algorithms for Myocardial Infarction Detection

Jiahe Liu, Age: 17

Edgemont High School, NY

Project Title: Forecasting Post-Wildfire Vegetation Recovery in California Using a Convolutional Long Short-Term Memory Tensor Regression Network

Sophia Liu, Age: 17

Cherry Hill High School East, NJ

Project Title: Global and Personalized Models for Detecting Myocardial Infarction With Wearable Devices

Katherine Lynch, Age: 18

Sacred Heart Academy, NY

Project Title: Mindset Over Matter: Can Self-Reported Implicit Theories of Intelligence Regulate the Desire for Academic Rigor, Academic Achievement and Motivation?

Dimitrios Mahairas, Age: 17

Bronx High School of Science, NY

Project Title: Overcoming Dataset Imbalance Using Light-Weight Vision Transformers With Applications to Computational Drug Design Derived From Botanical Prototypes During Post-Antibiotic Era

Alexandra Mahajan, Age: 17

Cambridge Rindge & Latin School, MA

Project Title: A Novel Method To Determine Precise Stellar Radii and Temperatures of Low Mass Stars Using *JWST* Transits and Occultations

Bhuvi Mamtani, Age: 18

BASIS Phoenix, AZ

Project Title: Identifying Potential Markers To Combat Afatinib Resistance in Esophageal Adenocarcinoma

Meghna Manjith, Age: 18

Wiregrass Ranch High School, FL

Project Title: Preventing Surgical Site Infections: Designing a Novel Post-Surgical Treatment Using Silver Nitrate and Ayurvedic Extracts in Combination With DNA Sequence Analysis

Jonathan M. Manowitz, Age: 17

Byram Hills High School, NY

Project Title: The Use of What Remains: Repurposing Harvest Waste From Romaine Lettuce Cultivation for Cell-Based Meat Production

Joshua Martoma, Age: 18

Pine Crest School, FL

Project Title: Predicting Criminal Recidivism With an Ensemble Machine Learning Model Using Logistic Regression, Random Forests and Neural Networks

Siddharth Maruvada, Age: 18

North Carolina School of Science and Mathematics, NC

Project Title: Design, Synthesis and Testing of Novel Small Molecule Interleukin-6 Inhibitors for the Amelioration of Inflammatory Bowel Disease

Daniel Mathew, Age: 17

Poolesville High School, MD

Project Title: MiniMesh: Real-Time 5,000-Node Anatomical Human Body Mesh Reconstruction for Portable Devices

Simran Mattikalli, Age: 17

Winston Churchill High School, MD

Project Title: Deep Learning Segmentation of Hip Radiographs for Guiding Opportunistic Management of Osteoporotic Bone Fractures

Arnav Meduri, Age: 18

North Carolina School of Science and Mathematics, NC

Project Title: Deep Learning-Based Detection of Posterior Vitreous Opacities for Retinal Tear Prediction

Akansha Mehta, Age: 17

American Heritage School, FL

Project Title: Quorum Quenching Potential of Novel Phytochemicals on *Chromobacterium violaceum* Quorum Sensing

Julie Meng, Age: 17

Belmont High School, MA

Project Title: Prevalence of Mental Disorders and Factors Associated With Not Receiving Mental Health Services Among Children With a Mental Disorder in Early Childhood in the United States, 2021-2022

Aryan Mhaskar, Age: 18

Mills E. Godwin High School, VA

Project Title: Hybrid Transcranial Magnetic Stimulation and Deep Brain Stimulation in the Presence of an Implantable Pulse Generator

Charlotte Lenore Michaluk, Age: 17

Hopewell Valley Central High School, NJ

Project Title: Innovative Climate Change Emissions Reduction: Cargo Ship Active Vortex Scrubber Sail

Ekansh Mittal, Age: 17

Westview High School, OR

Project Title: Harnessing Machine Learning and 3D Spheroid Cultures To Identify Biomarkers for Combating Drug Resistance in Breast Cancer.

Maya Mohanty, Age: 18

American Heritage School Boca-Delray, FL

Project Title: Utilizing *Caulobacter crescentus* To Target the NF- κ B-Bcl-2 Pathway and BH3-Only Proteins To Induce Apoptosis in Nasal Squamous Cell Carcinoma

Ramon Moreno Jr., Age: 17

Thousand Oaks High School, CA

Project Title: The Influence of Isonicotinamide on the Chronological Lifespan of *Saccharomyces cerevisiae* Strains

Sadie Rain Muller, Age: 17

Paul D. Schreiber High School, NY

Project Title: Inside the Echo Chamber: A Closer Look at Climate Change Discourse on Twitter (X) and Political Correlates of Affective Polarization

Madison Rieko Hiilani Murata, Age: 17

Kamehameha Secondary School, HI

Project Title: Studies on *Gracilaria salicornia*: Zinc Oxide (ZnO) Sunscreen Exposure and Use as Agricultural Fertilizer

Kiran C. Myneni, Age: 17

James Madison High School, VA

Project Title: Public Health Strategies for Disease Mitigation in the SIR Model

Rashmi Rajeev Narayanan, Age: 17

Briarcliff High School, NY

Project Title: Understanding Pathological Structures of Pyroglutamate Modified Amyloid- β ($A\beta$) in Alzheimer's Disease

Daniel Ndocaj, Age: 17

Byram Hills High School, NY

Project Title: Investigating the Potential of Optically Tunable Metasurfaces for Enhanced Detection of Fluorescent Molecules

Alfardi Nuruzzaman, Age: 17

Bergen County Academies, NJ

Project Title: SMAD4 Signaling Pathway's Role on Production of Exosomes and Associated Extracellular Vesicles

Haruki Ohara, Age: 17

Acton-Boxborough Regional High School, MA

Project Title: Bio-Physical Sensing of Feeding Patterns on Squid and Applications for Smart Recreational Fishing

Isabella Palit, Age: 17

Massachusetts Academy of Math & Science, MA

Project Title: Developing 2D and 3D Models of Human Myometrium To Improve Understanding of Intramural Uterine Leiomyoma Pathology and Study Potential Risk Factors

Christina Pan, Age: 17

Plainview-Old Bethpage John F. Kennedy High School, NY

Project Title: A Novel Application of the Fenton Reaction in the Chemical Upcycling of Polystyrene

Tej Parekh, Age: 17

Paul D. Schreiber High School, NY

Project Title: Utilizing Artificial Intelligence for Categorizing Wildfire Origins Through Satellite Image Analysis

Naomi Park, Age: 17

Greenwich High School, CT

Project Title: Development and Life Cycle Assessment of a Novel, Multi-Functional Remediation Framework for the Concurrent Removal of Oceanic Carbon Dioxide and Oil-in-Water Contaminants

Daniela Parmigiani, Age: 17

Saint Anthony's High School, NY

Project Title: The Optimization of the MS2/MCP-GFP Live Transcriptional Imaging Platform in *Caenorhabditis elegans***Heemali Kalpeshkumar Patel**, Age: 17

Herricks High School, NY

Project Title: Visualizing Correlational Trends Between Average Monthly Temperature and Total Monthly Precipitation With Amphibian Populations in Canadian National Parks: A Linear Regression Approach

Smruti Patil, Age: 17

William G. Enloe High School, NC

Project Title: Design and Synthesis of ATPase Inhibitors To Target the Activity of Rix7 in the Ribosome Assembly Pathway

Sruti Peddi, Age: 17

BASIS Scottsdale, AZ

Project Title: FloodCast: Real-Time Flood Mapping and Prediction in Southeast Asia Using Remote Sensing Data

Stella Margaret Goldman Perini, Age: 17

Harrison High School, NY

Project Title: Protective Effects of Resveratrol Following Repetitive Head Injury in Wild Type and Amyloid β 42 *Drosophila melanogaster***Ava June Phelps**, Age: 17

Spring Valley High School, SC

Project Title: Relationship Between Root-Zone Soil Moisture and Proportion of *E. solidaginis* Galls Attacked by Parasitic Insects in South Carolina Level III Ecoregions**Ella Pilacek**, Age: 17

Oviedo High School, FL

Project Title: Promoting Attraction of *Apis mellifera* to the Synthetic Scent of the Endangered Orchid *Prosthechea cochleata* Using Pavlovian Conditioning and Direct Feeding Paradigms for Conservation**Alanna Gabrielle Polyak**, Age: 17

Plano West Senior High School, TX

Project Title: Utilizing Planarian (*Dugesia tigrina*) Neoblast Stem Cells on Earthworms (*Lumbricus terrestris*) as a Model Organism To Investigate Possible Specializing Cures and Preventative Measures for Central Nervous System (CNS) Disorders

Aayush Prakash, Age: 18

Half Hollow Hills High School, NY

Project Title: Understanding the Cis-Regulatory Code of Mammary Epithelial Cells

Jordan Prawira, Age: 17

Mountain House High School, CA

Project Title: Pura Aer 2: Dual-Stage, Energy-Efficient, Modular Air Purifier System

Inspired by Porifera To Improve Air Quality

Elena Prisament, Age: 18

Ossining High School, NY

Project Title: Novel Annotations in Machine Translation Facilitate Language

Acquisition: A Proof-of-Concept Study

Lorenzo Pulmano, Age: 17

American Heritage School, FL

Project Title: A Microwave-Based Machine Learning Approach To Predict Eyewall

Replacement Cycles

Cindy Pyo, Age: 18

Tenafly High School, NJ

Project Title: Metabolic Program of Intestinal Stem Cell in Pediatric Development and

Inflammatory Bowel Disease

Andy Qin, Age: 17

Plano West Senior High School, TX

Project Title: An Improved Cooperative Perception Framework for 3D Vehicle

Detection Using Multiscale Feature Extraction

Yunjia Quan, Age: 17

Charlotte Country Day School, NC

Project Title: Enhancing Ethereum's Security With LUMEN, a Novel Zero-Knowledge

Protocol Generating Transparent and Efficient zk-SNARKs

Ankur Raghavan, Age: 17

Bethpage High School, NY

Project Title: The Reduction of Agricultural Water Consumption Through the

Utilization of Wireless Sensor Arrays

Achyuta Rajaram, Age: 17

Phillips Exeter Academy, NH

Project Title: Automatic Discovery of Visual Circuits

Rhea Rastogi, Age: 18

Loveless Academic Magnet Program High School, AL

Project Title: Understanding How the Maternal Epigenetic Reprogramming Function of LSD1 Contributes to Inherited Developmental Disease

Anabel Reed, Age: 17

Ossining High School, NY

Project Title: Musical Training Decreases Cognitive Workload During Hearing-in-Noise Tasks Among Adolescents

Logan Reich, Age: 17

Hunter College High School, NY

Project Title: A Detailed Analysis of the Active Galactic Nucleus in NGC 4151 Using *JWST* and *OSIRIS/Keck* With an Emphasis on the Possibility of a Recoiling or Binary Black Hole**Mihir Relan**, Age: 18

Michael E. DeBakey High School for Health Professions, TX

Project Title: Cultivation of Semi-Dwarf Wheat in an Indoor Hydroponic System as a Model for Food Security and Climate Change

Kun-Hyung Roh, Age: 18

Bronx High School of Science, NY

Project Title: Novel Drug Discovery Methodology Using Machine Learning for Gene Expression-Based Virtual Screening Predicts Novel Compounds To Reverse Alzheimer's Disease With Applications to Cancer and Longevity by Inhibiting CtBP2 Expression

Emmie Rose, Age: 18

North Carolina School of Science and Mathematics, NC

Project Title: Analyzing NO_x Removal Efficiency and Washing Resistance of Iron Oxide-Decorated g-C₃N₄ Nanosheets Attached to Recycled Asphalt Pavement Aggregate**Hannah Isabelle Rosenberg**, Age: 17

Paul D. Schreiber High School, NY

Project Title: Christian Nationalism, Antisemitism and Attitudes Toward the War in Ukraine

Harrison Roth, Age: 17

Paul D. Schreiber High School, NY

Project Title: Quantitative Implications of Nesting in State Legislatures

Aadita Roy, Age: 17

Pelham Memorial High School, NY

Project Title: Pro-Inflammatory Macrophages Induce Pyroptotic Death of β -Cell; Modeling Macrophage-Mediated Pancreatic Endocrine β -Cell Damage Using Human Pluripotent Stem Cell-Derived Vascularized Macrophage-Islet Organoids

Arjun Saha Choudhury, Age: 18

Millburn High School, NJ

Project Title: MELODY: Exploring the Characteristics of Music That Helps Relieve Stress

Amrita Saini, Age: 18

Peak to Peak Charter School, CO

Project Title: Investigating Hydrogels To Sustain *Pyrocystis fusiformis* for Natural Lighting and Carbon Dioxide Removal

Rohan Sampath, Age: 17

Geffen Academy at UCLA, CA

Project Title: Synthesis and Characterization of PEDOT:AlgS — Biomacromolecules for Boosting Hydrogel Conductivity

Luigi J. Sartori, Age: 17

Mineola High School, NY

Project Title: A Proposed Method for Measurement of Oil Spill Bioremediation Enhancement

Krrishika Saxena, Age: 17

Eleanor Roosevelt High School, CA

Project Title: Development of a Simple, Affordable Zinc Oxide-Zeolite Chemiresistor VOC Sensor To Detect Colorectal Cancer From the Exhaled Breath: A Solution for the Underserved Communities

Claire Schwartz, Age: 17

John F. Kennedy High School, NY

Project Title: The Administration of Sulforaphane via Broccoli Sprouts Ameliorates Parkinson's Disease Phenotypes in a *Drosophila melanogaster* Model

Aryan Nirav Shah, Age: 17

Syosset High School, NY

Project Title: Analyzing the Effects of Different Types of Gerrymandering on Congressional Representation Across the 2010 Redistricting Cycle

Shae R. Shandroff, Age: 17

Ossining High School, NY

Project Title: The Short- and Long-Term Migratory Patterns of Young-of-Year Shortfin Mako Sharks (*Isurus oxyrinchus*) in the Western North Atlantic With Implications for a Localized Nursery Area

Kishan Shanmuganathan, Age: 17

Herricks High School, NY

Project Title: Investigating the MSI2 Germline Variance Effects on Clonal Hematopoiesis of Indeterminate Potential (CHIP)

Rishit Arnav Shaquib, Age: 17

Vanguard High School, FL

Project Title: Bi-Directional Hygiene: Evaluating the Use of Artificial Microbiomes of Commensal Bacteria To Combat Nosocomial Infection

Cayden Shen, Age: 17

Roslyn High School, NY

Project Title: Using an Inexpensive Night Vision Camera as a Novel Detector in NIR Spectroscopy

Dylan Jinhong Shen, Age: 17

Smithtown High School East, NY

Project Title: A Novel Algorithm for Measuring Forest Incursions Using Pixelated Remote Sensing Data

Lauren Shen, Age: 18

Morgantown High School, WV

Project Title: Two-Step X-Ray Transit Identification: Bayesian Block Simplification and Sequential Machine Learning Techniques

Kemmora Simmons, Age: 17

Walter G. O'Connell Copiague High School, NY

Project Title: The Effect of the Endocrine-Disrupting Chemical Soy on the Psychological Stress Levels of Neonatal *Drosophila melanogaster*

Harsh Singh, Age: 17

Edward S. Marcus High School, TX

Project Title: TNF Ligand Promotes Angiogenesis in Triple Negative Breast Cancer Through Activation of Inflammatory Regulatory Networks

Sanskriti Singh, Age: 17

BASIS Independent Silicon Valley, CA

Project Title: CheX-Nomaly: Segmenting Lung Abnormalities From Chest Radiographs Using Machine Learning

Bliss Singhal, Age: 17

Issaquah High School, WA

Project Title: Unveiling Intractable Epileptogenic Brain Networks With Deep Learning Algorithms: A Novel and Comprehensive Framework for Scalable Seizure Prediction With Unimodal Neuroimaging Data in Pediatric Patients

Ishaan Sinha, Age: 17

South Brunswick High School, NJ

Project Title: Characterizing West Nile Virus Dynamics With Explainable Machine Learning

Noah Gabriel Sodickson, Age: 17

Mamaroneck High School, NY

Project Title: In Search of Decay: An Analysis of the Transit Times of Hot Jupiters

Joanna Sohn, Age: 17

Keystone School, TX

Project Title: Investigating the Link Between Visual Impairment and Ischemia-Reperfusion Injury: Potential Interventions To Mitigate Damage

Alan Song, Age: 18

Wellesley High School, MA

Project Title: Reinforcement Learning-Based Horizontal Scaling for Serverless Systems

Eric Ruike Song, Age: 17

Yorktown High School, NY

Project Title: A Framework for Ransomware Detection and Mitigation

Aarohi Sonputri, Age: 18

Arkansas School for Mathematics, Sciences & the Arts, AR

Project Title: Small Molecule Stabilization of the *CARD11* G-quadruplex Represses Transcription: Developing a Therapeutic Target for Diffuse Large B-Cell Lymphoma

Chloe Sow, Age: 18

The Downtown School: A Lakeside School, WA

Project Title: Escaping Synthetic Carcinogens: An Integration of Chemically-Based Testing Methods in a Comprehensive, Multi-Use Origami Paper-Based Microfluidic Device (μ PAD) for Detecting Carcinogens and Other Harmful Substances in Personal Care and Cosmetic Products

Hari Srikanth, Age: 18

Mira Loma High School, CA

Project Title: Multimodal Computer Vision and Novel Reinforcement Learning for Robot Navigation in Fires

Maya Gabrielle Aler Srinivasan, Age: 18

Notre Dame High School, CA

Project Title: Optogenetically Examining Channelrhodopsin and CsChrimson-Stimulated Locomotive Behavior To Classify "Moonwalker" Stalling in *Drosophila melanogaster***Milo Stammers**, Age: 18

Poolesville High School, MD

Project Title: On Elementary Generation of SL2 Over Integer Rings of Imaginary Function Fields

Samantha Ashley Stewart, Age: 17

Mineola High School, NY

Project Title: The Use of Perfluorooctyl Bromide as an Oxygen Diffuser To Treat Chronic Lung Diseases

Lana L. Stout, Age: 17

Satellite High School, FL

Project Title: Accelerating Carbon Sequestration Through Olivine Using Direct Mineral Carbonation With Carbonic Acid

Katie Sun, Age: 18

Crystal Springs Uplands School, CA

Project Title: Designing a Novel Primer Blocker Using Bioconjugation of Single-Stranded Binding Protein and Oligonucleotides for Improved KRAS Mutation Detection

Arjun Praphulla Suryawanshi, Age: 17

Unionville High School, PA

Project Title: ArmLev — A Low-Cost, Wearable and Dual-Mechanism Arm-Stabilizing Device Aimed To Mitigate Tremors

Victoria Tan, Age: 17

Jericho Senior High School, NY

Project Title: Frontiers in Exoplanetary Science: Novel Approaches to Temperature Prediction and Habitability Assessment

Eric Tang, Age: 17

River Hill High School, MD

Project Title: Building Redundancy for Resilient Distributed Optimization

Helen Tang, Age: 18

William A. Shine Great Neck South High School, NY

Project Title: Impact of Unmet Social Needs on Acute and Long-Term Outcomes in COVID-19 Patients

Linus Tang, Age: 17

Davidson Academy Online, NV

Project Title: Extremal Bounds on Peripherality Measures

Claire Tao, Age: 17

North Shore High School, NY

Project Title: TIGIT is Highly Expressed Across Various Types of Immunosuppressive Myeloid Cells Induced by Glioblastoma Extracellular Vesicles

Edmund Tsou, Age: 17

Briarcliff High School, NY

Project Title: Language Models as Catalysts in EEG-Based BCI Speller Systems: A Low-Cost Solution for Paralyzed Patients

Riya Tyagi, Age: 16

Phillips Exeter Academy, NH

Project Title: Using Computer Vision To Disentangle Features Enabling AI To Learn Self-Reported Race and Ethnicity From Medical Images

Kosha Upadhyay, Age: 17

Bellevue High School, WA

Project Title: MemSpark: Artificially Intelligent Virtual Reality System for Non-Intrusive Therapy and Evaluation of Dementia

Maruthi Mukhesh Vemula, Age: 17

North Carolina School of Science and Mathematics, NC

Project Title: Mitigating Information Asymmetry in Governmental Policies: An AI-Driven Approach

Srilakshmi Venkatesan, Age: 17

Hopkinton High School, MA

Project Title: Utilizing Hypermagnesemia To Understand the Impact of Neuromuscular Blocking Agents on *Caenorhabditis elegans*: A Safe Novel Model for Paralytic Drug Testing

Avi Verma, Age: 17

Palo Alto High School, CA

Project Title: Novel Neural Network Models for Predicting Mental Health Outcomes in the U.S. Youth Population

Srikara Vishnubhatla, Age: 18

Math and Science Academy, MN

Project Title: An Exploratory Analysis of Mosaic Chromosomal Aberrations in the Canine Genome: Toward a Comparative Genomics Model

Jack Voelker, Age: 17

Manhasset High School, NY

Project Title: The Effect of Anthropogenic Sound on the Reproductive Success of *Tigriopus californicus*

Joseph Amichai Vulakh, Age: 17

Paul Laurence Dunbar High School, KY

Project Title: Positive Traces on Deformations of Kleinian Singularities of Type D

Aidan Wang, Age: 18

University School of Milwaukee, WI

Project Title: A Novel Alignment-Free Method for Genome Sequence Comparative Analysis Using Dinucleotides-Based Discrete Fourier Transform

Angelika Wang, Age: 17

Cary Academy, NC

Project Title: Construction of Modified Speckle Optical Tweezers for Horizontal Particle Trapping in Air

Grant Wang, Age: 17

Williamsville East High School, NY

Project Title: MLOffense: Multilingual Offensive Language Detection and Target Identification on Social Media Using Graph Attention Transformer

Katherine Huaizhen Wang, Age: 18

Developing Virtue Secondary School, CA

Project Title: Whole-Genome Variant Detection in Long-Read Sequencing Data From Ultra-Low Input Tumor Samples

Miranda Wang, Age: 17

Kent Place School, NJ

Project Title: A Machine Learning Study of Shoreline Change Prediction for United States Coasts

Cole Wasserman, Age: 18

John F. Kennedy High School, NY

Project Title: APC-Mediated Expansion of hPSC-Derived Natural Killer Cells

Michelle Wei, Age: 17

The Harker School, CA

Project Title: Solving Second-Order Cone Programs Deterministically in Matrix Multiplication Time

Nathan Wei, Age: 17

Buchholz High School, FL

Project Title: Novel Elastomeric Polystyrene via Photopolymerization and Post-Functionalization of Durable Ultra-High Molecular Weight Perfluorostyrene Copolymers

Joseph Jai Weitzen, Age: 18

Sleepy Hollow High School, NY

Project Title: Discovery and Validation of Tumor-Specific and Tumor-Associated HLA-Presented Peptides in Glioblastoma for Use in Immunotherapeutics

Richard Austin Wong, Age: 18

Plainview-Old Bethpage John F. Kennedy High School, NY

Project Title: Temporal Phage Therapy: A Strategy for Managing MRSA Resistance Utilizing Bacteriophage Sb-1

Angela Yue Wu, Age: 18

Montgomery Blair High School, MD

Project Title: Calcium-Induced Mitochondrial Sorcin Aggregation: A Model System for Investigating Chaperone Suppression of Protein Aggregation

Evan Wu, Age: 18

Memphis University School, TN

Project Title: Conserved Spatiotemporal Expression Landscape of Dominant tRNA Genes in Human and Mouse

Isabella Wu, Age: 17

Choate Rosemary Hall, CT

Project Title: ST-TopoCAN: A Novel Histopathological System for Clinical Prediction With Topology- and Spatial Genome-Informed Deep Learning

Julianne Wu, Age: 17

University High School, CA

Project Title: Sex-Related Signaling of the Angiotensin II Pathway in Primary Aortic Smooth Muscle Cells

Maggie Wu, Age: 18

William A. Shine Great Neck South High School, NY

Project Title: Effects of Dissolved Oxygen Levels on the Greenhouse Gas Emissions and Denitrification Performance of Woodchip Bioreactors Treating Onsite Wastewater

Rachel Marie Wu, Age: 17

Bronx High School of Science, NY

Project Title: Detecting the Effect of Textual Features in Social Media Using an Innovative Machine Learning Approach With Applications for Managing Public Opinion

Richard Wu, Age: 17

Dublin High School, CA

Project Title: BiblioBERT: Sentence Transformer-Based Semantic Recommendation Engine Using Large Language Model-Enhanced Query Segmentation for Personalized Bibliotherapy Recommendations

Samantha Wu, Age: 18

Valley Christian High School, CA

Project Title: Effect of Storage Conditions on Small Noncoding RNA Concentrations in Human Milk Using the Size Exclusion Chromatography Method for Extracellular Vesicle Isolation

Steven XiPeng Xiang, Age: 17

Bancroft School, MA

Project Title: DDR2 and Substrate Stiffness Regulate Cancer Cell Proliferation Through Metabolic Reprogramming

Justin Xie, Age: 18

Westview High School, OR

Project Title: Emotion and Sentiment-Guided Paraphrasing

Alexander Yaokun Xu, Age: 18

William A. Shine Great Neck South High School, NY

Project Title: CARE-BERT: BERT-Powered Graph Augmentation for Context-Aware Radiology Report Retrieval

Anthony Xu, Age: 16

Allen High School, TX

Project Title: A Low-Cost, Low-Power, Long-Range Location Tracking System Using Helium Network

Linda Xue, Age: 17

North Carolina School of Science and Mathematics, NC

Project Title: Social Isolation on Behavior and Physiology in the Model *Gromphadorhina portentosa*

Andy Yang, Age: 17

Dutch Fork High School, SC

Project Title: CRFNN: Contextual Reasoning-Based Fuzzy Neural Networks for the Uncertainty Output in Object Recognition

Matt Yang, Age: 17

Wellington C. Mepham High School, NY

Project Title: MultiFormer: Single-Cell ATAC to RNA Prediction Framework

Michael Yang, Age: 18

The Lakeside School, WA

Project Title: Rigidity and Rank of Group-Circulant Matrices

Sydney Josephine Yeboah, Age: 17

North Carolina School of Science and Mathematics, NC

Project Title: A Docking Study and Modification of Eugenol To Increase Selectivity in Acetylcholinesterase Inhibition

Ella Yee, Age: 18

The Harker School, CA

Project Title: Identification of Circadian Regulator ARNTL2 and Associated Genes as Novel Biomarkers for Cancer Progression

Carey Huang Yi, Age: 17

Columbus Academy, OH

Project Title: Predictive Models and Impact of Interfacial Contacts and Amino Acids on Protein-Protein Binding Affinity

Adrian Yin, Age: 18

Brookfield Academy, WI

Project Title: The Impact of the Community Reinvestment Act on the Local Economy

Sunny You, Age: 17

Miami Palmetto Senior High School, FL

Project Title: Predicting Future Tropical Cyclone Intensity Using a Convolutional Neural Network and 20 Years of IMERG Satellite Rainfall Data

Michelle Yu, Age: 17

North Shore High School, NY

Project Title: *Salvia hispanica* L. Ameliorates the Effects of Alzheimer's Disease in *Drosophila melanogaster*

Max Zeldes, Age: 17

The Potomac School, VA

Project Title: Improvement to Electroencephalography-Based Imagined Speech Brain-Computer Interfaces Using a Targeted, Dense Array of Electrodes With Scalp Current Density Calculations

Eric Zhan, Age: 17

Mountain View High School, WA

Project Title: On Nontrivial Winning and Losing Parameters of Schmidt Games

Colin Zhang, Age: 17

Carlmont High School, CA

Project Title: Complete Molecular Structure Prediction From Infrared Spectroscopy Using Deep Learning

Jocelyn Zhang, Age: 18

Del Norte High School, CA

Project Title: Novel Photoluminescence Recovery Method of Porous Silicon Quantum Dots for Bioimaging Application

Jonathan Zhang, Age: 18

Commack High School, NY

Project Title: Efficient Differentiation of Sleep-Related Hypermotor Epilepsy and REM-Sleep Behavior Disorder via Neural Aperiodic Components

Lilly Zhang, Age: 17

Unionville High School, PA

Project Title: Urban Heat Island Mitigation With Aerogel Composites

Maureen Zhang, Age: 16

Pittsford Sutherland High School, NY

Project Title: A Semi-Supervised Approach To Determine the Number of Exoplanets in a Given Planetary System Based on NASA Exoplanet Archive Data

Ryan Ruien Zhang, Age: 18

The Harker School, CA

Project Title: PEDS-AI: A Deep Learning-Based UAV System for In-Field Insect Species Identification and Pest Early Detection

Selina Zhang, Age: 18

North Hunterdon High School, NJ

Project Title: ArTreeficial: A Novel AI-Integrated Solution to Reducing Invasive Spotted Lanternfly Populations

Tiffany Zhang, Age: 17

William A. Shine Great Neck South High School, NY

Project Title: Resolving the Constraints Imposed by Chiral Effective Field Theory and Perturbative Quantum Chromodynamics on the Neutron Star Equation of State

William Zhang, Age: 18

The Harker School, CA

Project Title: A ChatGPT-Based System With Semi-Closed Domain as an Automatic Online Teaching Assistant in Math Education

William Zhang, Age: 17

Thomas Jefferson High School for Science and Technology, VA

Project Title: Synchronization-Free Light Sheet Microscopy for 3-Dimensional Tissue Imaging

Christina Zhao, Age: 17

North Carolina School of Science and Mathematics, NC

Project Title: Rational Design and Synthesis of a PHD2 Inhibitor for Oral Treatment of Chronic Kidney Disease-Induced Anemia

Jason Ziren Zhao, Age: 17

Marquette High School, MO

Project Title: A Machine-Learning Based Approach to Monitoring Carpal Tunnel Risk Factors in High Schoolers Using Desktop Computers in an Office-Like Environment

Alex Zheng, Age: 16

Plano West Senior High School, TX

Project Title: Dissecting Bias of ChatGPT in College Major Recommendations

Shayla Zheng, Age: 17

Roslyn High School, NY

Project Title: Cell Fusion as a Novel Mechanism Behind JQ1 Resistance in Triple Negative Breast Cancer

Brian Lee Zhou, Age: 17

Thomas Jefferson High School for Science and Technology, VA

Project Title: Novel Data-Driven and Constraint-Guided Deep Learning Models
Optimize a Multi-Objective Flapping Fin Unmanned Underwater Vehicle Control
System

Cyrus Ma Zhou, Age: 16

Innovation Academy, GA

Project Title: An Acoustic Noise Reduction Hood for Infant MRI

Maggie Zhou, Age: 18

Bergen County Academies, NJ

Project Title: The Effect of Calpastatin on an In Vitro Model of Parkinson's Disease

Anthony Zhu, Age: 17

Barrington Community High School, IL

Project Title: Detection of COVID-19 Through a Heptanal Biomarker Using Transition
Metal-Doped Graphene

Christopher Zorn, Age: 17

Irvington High School, NY

Project Title: The Role of MYC in *RET* Fusion Tumorigenesis and RET Inhibitor
Resistance

Charisse Zou, Age: 17

Dougherty Valley High School, CA

Project Title: The Development of a Free-Flying Method To Study the Effect of
Neonicotinoids on the Positive Transfer of Learning in the Visual Domain of
Honeybees