

This year, 510 high school students from around New York City submitted 352 applications to present their research projects at the 2024 Terra NYC STEM Fair Preliminary Round. The Preliminary Round was held virtually from Feb. 12 – March 3.

Congratulations to the 156 students whose 114 projects have qualified to present their exceptional research to judges in the Finals Round on Saturday, March 23 at the NYU Tandon School of Engineering. For further details, please contact [tNYCFair@terraed.org](mailto:tNYCFair@terraed.org).

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## **ANIMAL SCIENCES**

**Euan Oscar Villanueva**, ANIM-089, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The Effects of the Urbanization Gradient on the Morphology and Performance of Spotted Lanternflies in New York City*

**Audrey Yong**, ANIM-101, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Fish tapping: How the placement of a fish's tap may reveal more about their ability to make decisions*

**Elisa Chang**, ANIM-109, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Feline Catitude: Analyzing the signs of neuroticism in feral cats during the day time and night time in New York*

**Fouzia Alam**, ANIM-157, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The effect of fish-oil (Omega-3 polyunsaturated fatty acids) supplementation on alleviating Parkinson's disease symptoms in *Caenorhabditis elegans**

**Kayla Thompson**, ANIM-157, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The effect of fish-oil (Omega-3 polyunsaturated fatty acids) supplementation on alleviating Parkinson's disease symptoms in *Caenorhabditis elegans**

**Victoria Zinczuk**, ANIM-157, FRANCIS LEWIS HIGH SCHOOL

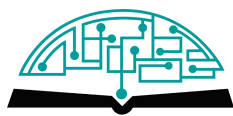
*Project Title: The effect of fish-oil (Omega-3 polyunsaturated fatty acids) supplementation on alleviating Parkinson's disease symptoms in *Caenorhabditis elegans**

**Angel Huang**, ANIM-167, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Home Ranges of Urban-Breeding Grassland Birds*

**Erica Yu**, ANIM-167, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Home Ranges of Urban-Breeding Grassland Birds*



**Diyorabonu Erfan-Mamedkhanova**, ANIM-176, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Black Pepper on Alzheimer's Disease Related Behavior in C. elegans*

**Emily Liu**, ANIM-176, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Black Pepper on Alzheimer's Disease Related Behavior in C. elegans*

**Maggie Chen**, ANIM-176, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Black Pepper on Alzheimer's Disease Related Behavior in C. elegans*

**Desiree Yang**, ANIM-210, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Using SLEAP AI to Quantify Octopus Eating Habits*

**Mariel Silber**, ANIM-210, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Using SLEAP AI to Quantify Octopus Eating Habits*

**Tasnim Ghoniem**, ANIM-210, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Using SLEAP AI to Quantify Octopus Eating Habits*

**Vicky Lin**, ANIM-231, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Salvia miltiorrhiza on the Memory of Dugesia dorotocephala*

**Frida Ziu**, ANIM-448, FOREST HILLS HIGH SCHOOL

*Project Title: The Remedial Potential of Fish Scale-Derived Collagen: A Sustainable Approach to Wound Care and Environmental Conservation*

**Vanessa Leung**, ANIM-448, FOREST HILLS HIGH SCHOOL

*Project Title: The Remedial Potential of Fish Scale-Derived Collagen: A Sustainable Approach to Wound Care and Environmental Conservation*

## **BIOCHEMISTRY & CHEMISTRY**

**Nazira Rahman**, BCHM-127, THE BRONX HIGH SCHOOL OF SCIENCE

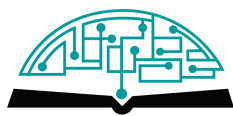
*Project Title: The Development of Fluorescent Beads For Pollution Detection*

**Owen Lee**, BCHM-249, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: How the Variability of coronavirus epitopes influences MHC conformation*

**Manuel Ramos**, BCHM-388, EDWARD R MURROW HIGH SCHOOL

*Project Title: Phytoremediation of Manganese and Chromium Ions From Contaminated Water Using Azolla Inoculated With Mycorrhizal Fungi*



**Michael Giacoppo**, BCHM-388, EDWARD R MURROW HIGH SCHOOL

*Project Title: Phytoremediation of Manganese and Chromium Ions From Contaminated Water Using Azolla Inoculated With Mycorrhizal Fungi*

**Sophie O'Brien**, BCHM-414, HUNTER COLLEGE CAMPUS SCHOOLS

*Project Title: Bioinspired Approaches to the Design of Ferroelectric Polymers*

**Chloe Gillant-Hanusa**, BCHM-431, FOREST HILLS HIGH SCHOOL

*Project Title: Evaluating how the production of p-diphenol:dioxygen oxidoreductase of multicopper proteins in combinations of Aspergillus niger impacts the efficacy of rare earth metal bioleaching in Waste Printed Circuit Boards*

**Katie Chen**, BCHM-431, FOREST HILLS HIGH SCHOOL

*Project Title: Evaluating how the production of p-diphenol:dioxygen oxidoreductase of multicopper proteins in combinations of Aspergillus niger impacts the efficacy of rare earth metal bioleaching in Waste Printed Circuit Boards*

**Nevena Glisic**, BCHM-473, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Selection of oligonucleotides candidates and preparation of Aptamer-based biosensor to monitor the daily status of Leucine in patients with Maple syrup urine disease*

**Aiden Hightower**, BCHM-476, THE BRONX HIGH SCHOOL OF SCIENCE

*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*

**Kamya Parikh**, BCHM-488, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Applications of Click Chemistry to visualize the epichaperome complex*

## **BEHAVIORAL NEUROSCIENCE**

**Uyen Pham**, BESN-096, THE BRONX HIGH SCHOOL OF SCIENCE

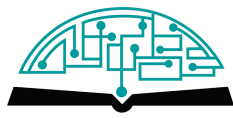
*Project Title: Examining Speech Disfluencies in an Individual with Mild Primary Progressive Aphasia: A Longitudinal Case Study*

**Raquel Andon**, BESN-103, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Investigating potential morphological differences in two subcategories of the small ganglionic cell of the Mormyrid Fish Gnathonemus petersii*

**Durjoy Bhadra**, BESN-104, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The Effects of Caffeine on the Behavior of C. elegans*



**Lucy Ansley**, BESN-104, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The Effects of Caffeine on the Behavior of C. elegans*

**Mir Ahmed**, BESN-104, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The Effects of Caffeine on the Behavior of C. elegans*

**Owen Lin**, BESN-160, PELHAM LAB HIGH SCHOOL

*Project Title: Analysis Of Neural Activity From Multiple Levels Of The Visual System*

**Jessica Singh**, BESN-221, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The Use of Rhythmic Light Therapy to Entrain Gamma Oscillations and the Circadian System in Patients with Alzheimer's Disease and Related Dementias (ADRD)*

**Jessica Singh**, BESN-221, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The Use of Rhythmic Light Therapy to Entrain Gamma Oscillations and the Circadian System in Patients with Alzheimer's Disease and Related Dementias (ADRD)*

**Veerika Dube**, BESN-374, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Impact of Nutrition on White Matter in Females with Anorexia Nervosa and Atypical Anorexia*

**Mia GRASSO**, BESN-399, COLUMBIA GRAMMAR PREPARATORY SCHOOL

*Project Title: Discovering the Causal Variants in Dyslexia through Combining Genetic and Neuroscience Studies*

**Veronica Nerone**, BESN-481, ARCHBISHOP MOLLOY HIGH SCHOOL

*Project Title: Which musical intervals trigger emotional responses in children?*

## **BEHAVIORAL & SOCIAL SCIENCES- PSYCHOLOGY/SOCIOLOGY**

**Aanya Gupta**, BESP-006, HORACE MANN UPPER SCHOOL

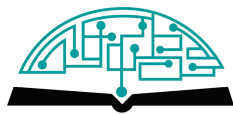
*Project Title: The Recursive Relationship Between Personalized Music Choice and Adolescent Mental Wellness: An Empirical Study*

**Ella Chen**, BESP-025, FRANCIS LEWIS HIGH SCHOOL

*Project Title: How to Effectively Reduce Food Waste at NYC High Schools.*

**Jiayi Feng**, BESP-025, FRANCIS LEWIS HIGH SCHOOL

*Project Title: How to Effectively Reduce Food Waste at NYC High Schools.*



**Joy Lee**, BESP-025, FRANCIS LEWIS HIGH SCHOOL

*Project Title: How to Effectively Reduce Food Waste at NYC High Schools.*

**Diana Chen Feng**, BESP-051, MIDWOOD HIGH SCHOOL

*Project Title: The Effect of Thermal Stimulation on Body Ownership*

**Jennifer Fan**, BESP-051, MIDWOOD HIGH SCHOOL

*Project Title: The Effect of Thermal Stimulation on Body Ownership*

**Fiona He**, BESP-202, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: "Who Is That?!": Using Content Analysis to Identify Implicit Bias in genAI Image Tools*

**Rebecca Li**, BESP-202, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: "Who Is That?!": Using Content Analysis to Identify Implicit Bias in genAI Image Tools*

**Samantha Zaino**, BESP-205, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Following the Herd: WallStreetBets Sentiment Predicts the Stock Market*

**Rachel Wu**, BESP-305, THE BRONX HIGH SCHOOL OF SCIENCE

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

**Matthew Greenspun**, BESP-307, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Novel Computational Linguistics Approach to Political Bias Detection and its Implications*

**Matthew Cho**, BESP-355, THE BRONX HIGH SCHOOL OF SCIENCE

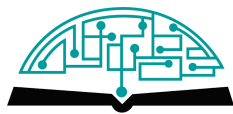
*Project Title: Exploring the Impact of Different Sources of Aid on Amount Paid by Individual for Pharm. Drugs*

**William Zhu**, BESP-427, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Tweets, Trends, and Teen Vaping: Exploring the NYTS Dataset to Investigate Social Media's Role on Vaping and Curiosity as a Factor of Initiation*

**Melanie Santos Gallagher**, BESP-512, Saint Francis Preparatory School

*Project Title: The Prevalence of Poor Mental Health Among Adolescents During the COVID-19 Pandemic: School and Virtual Connectedness Identified as Protective Factors*



## **CELLULAR & MOLECULAR BIOLOGY**

**Sylvia Chan**, CELL-172, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The Suppression of Adipocyte Lipolysis by IL10 under Adrenergic and Cancer Cachexic Conditions*

**Nicole Zhu**, CELL-192, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Developing a dTAG system to deplete endogenous PNUTS*

**Jonathan Lin**, CELL-213, THE BRONX HIGH SCHOOL OF SCIENCE

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

**Melody Jiang**, CELL-218, THE BRONX HIGH SCHOOL OF SCIENCE

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

**Sarah Chen**, CELL-248, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The Effect of XIST KO on B-cell Differentiation*

**Ryan Kim**, CELL-358, THE BRONX HIGH SCHOOL OF SCIENCE

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

**Myles Coven**, CELL-410, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Novel Regulation of Low-Density Lipoprotein Receptor (LDLR) by UBOX5*

**Rafan Sarker**, CELL-436, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: ADAR1 Regulation of Mitochondrial RNA and its Impact on Immune Response*

**Angela Wang**, CELL-518, HUNTER COLLEGE CAMPUS SCHOOLS

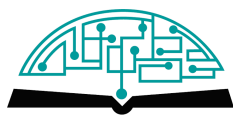
*Project Title: Drosophila Discovery Platforms to Treat Lung Cancer Drug Resistance: Identifying Resistance Mechanisms Driven by KIF5B-RET-G810R and Reversing It via Multikinase Inhibitor Treatment*

## **COMPUTATIONAL BIOLOGY & BIOINFORMATICS**

**Andrew Yarilin**, CBIO-080, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Alternative Splicing Changes the Splice-ome to Regulate Female and Male Germ Cell Development at Transition Points in Sex Determination, Differentiation, and Meiosis*

**Daniel Li**, CBIO-175, HORACE MANN UPPER SCHOOL



*Project Title: Wavelet Transforms of scRNA-seq Data Enhance Early-Stage Lung Adenocarcinoma Separation in Lung Tumor Microenvironment Ecotyping Analysis*

**Luke Peng**, CBIO-175, HORACE MANN UPPER SCHOOL

*Project Title: Wavelet Transforms of scRNA-seq Data Enhance Early-Stage Lung Adenocarcinoma Separation in Lung Tumor Microenvironment Ecotyping Analysis*

**Margaux Vasilescu**, CBIO-222, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Creating A Mathematical Framework and New Algorithms To Three Dimensionally Plot Attention Weights For AI Biological Machine Learning Models: Helping Scientists To Get Closer To Solve Diseases Such as Cancer and Autism*

**Jessica Chen**, CBIO-227, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Identification of Candidate Genes In Dermal Fibroblasts and Disease-Specific Similarities Across Five Inflammatory Skin Conditions*

**Haorun Li**, CBIO-302, HORACE MANN SCHOOL

*Project Title: MGS: Drug Multi-relational Prediction via Deep Multimodal Graph and Structural Learning*

**Taj Chhabra**, CBIO-464, HUNTER COLLEGE CAMPUS SCHOOLS

*Project Title: 3-dimensional visualization of cell behavior and movement in tissue*

**Andy Lam**, CBIO-477, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: An in silico Study to Untangle the Role of Nucleolin and BRCA1 in Dysregulated DNA Repair in Breast Cancer.*

## **EARTH & ENVIRONMENTAL SCIENCES**

**Katelyn Martinez**, EAEV-048, MIDWOOD HIGH SCHOOL

*Project Title: Analyzation of PM2.5 Chemical Compositions in Classrooms Using X-ray Fluorescence*

**Magaly Mendoza**, EAEV-048, MIDWOOD HIGH SCHOOL

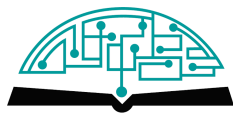
*Project Title: Analyzation of PM2.5 Chemical Compositions in Classrooms Using X-ray Fluorescence*

**Alice Chen**, EAEV-107, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: How can garden cress be used as a bioindicator of metal content in water?*

**Fiona Gao**, EAEV-107, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: How can garden cress be used as a bioindicator of metal content in water?*



**Vigneshwari Sivakumar**, EAEV-152, FRANCIS LEWIS HIGH SCHOOL

*Project Title: Calibration in Neighborhood Level Pollution Trends Using Low-Cost PM2.5 Sensors in Kolkata, India*

**Auden Sorensen**, EAEV-180, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Precipitation and Filtration of Synthetic Indigo Dye with Plant Biomass Riccia Fluitans*

**Jessy Liu**, EAEV-191, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: California Wildfire Ignition Causes from 1980 to 2019*

**Miranda Zhao**, EAEV-278, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Coupled Model of Stratospheric Aerosol Geoengineering Effects on Agriculture*

**Joseph Jeong**, EAEV-496, FOREST HILLS HIGH SCHOOL

*Project Title: Algae as a Resource for Bioplastic Production: Evaluating Species-Specific Characteristics Biodegradability of Closterium, Chlorella, Scenedesmus, Volvox, Spirogyra, Sugar Kelp, Alaria*

**Madison Bennett**, EAEV-496, FOREST HILLS HIGH SCHOOL

*Project Title: Algae as a Resource for Bioplastic Production: Evaluating Species-Specific Characteristics Biodegradability of Closterium, Chlorella, Scenedesmus, Volvox, Spirogyra, Sugar Kelp, Alaria*

**Pretom Chowdhury**, EAEV-496, FOREST HILLS HIGH SCHOOL

*Project Title: Algae as a Resource for Bioplastic Production: Evaluating Species-Specific Characteristics Biodegradability of Closterium, Chlorella, Scenedesmus, Volvox, Spirogyra, Sugar Kelp, Alaria*

**Sophia Lande**, EAEV-501, AVENUES NEW YORK LLC

*Project Title: Ant Biodiversity Along an Urban Gradient in New York City*

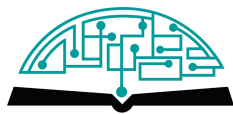
**Owen Xu**, EAEV-502, FOREST HILLS HIGH SCHOOL

*Project Title: Advancements in Urban Sustainability: Evaluating the Efficacy of Amine Functionalized Silica Gel-Based Artificial Trees in Mitigating Climate Change and Enhancing Urban Environments*

**Kyle Kaplan**, EAEV-528, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: An Investigation into Sodium Rhodizonate and Luminescent Lead Testing: Commercializing the Testing of Lead in Soil and Water*





## **ENGINEERING**

**Sophie D'Halleweyn**, ENGN-091, THE BRONX HIGH SCHOOL OF SCIENCE

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

**Victoria Przydanek**, ENGN-108, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The potential for wearable temperature sensors to aid medical care workers in the healthcare industry*

**Jiawen Zhang**, ENGN-134, HORACE MANN SCHOOL

*Project Title: Enhancing Mobility Assistance: A Point Cloud and IMU-Based Terrain-Adaptive Lower Extremity Exoskeleton Design*

**Jacob Yee**, ENGN-140, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Transport Properties of Chemically Cross-linked Pectin Hydrogel Electrolytes as Bifunctional Separator-Mediators*

**Masha Efimovich**, ENGN-140, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Transport Properties of Chemically Cross-linked Pectin Hydrogel Electrolytes as Bifunctional Separator-Mediators*

**Alyssa Kang**, ENGN-179, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Modeling Stormwater Management to Mitigate Pluvial Flooding in Sunset Park, Brooklyn*

**Yuki Chen**, ENGN-179, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Modeling Stormwater Management to Mitigate Pluvial Flooding in Sunset Park, Brooklyn*

**Enyu Zhu**, ENGN-293, STATEN ISLAND TECHNICAL HIGH SCHOOL

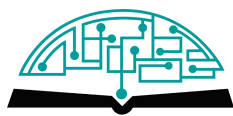
*Project Title: Analyzing New York City Metropolitan Transportation Authority Bus Services' Equitability and Neighborhood Accessibility*

**Mai Tran**, ENGN-301, STUYVESANT HIGH SCHOOL

*Project Title: An Organic, Sustainable Gel Polymer Electrolyte for Flexible Energy Storage Applications*

**Selena Zou**, ENGN-317, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The Development and Testing of an Anguilliform Swimmer Actuated by Pneumatic Artificial Muscles and Biomechanical Swim Bladder*



**Max Lee**, ENGN-369, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Predicting Ultra-Low Cement Concrete Formulae to Reduce Carbon Emissions*

**Enzo Schulze**, ENGN-500, TOWNSEND HARRIS HIGH SCHOOL

*Project Title: Analyzing Low-Earth Orbit and Environmental Characteristics in Satellite-to-Mobile Communication in MATLAB*

## MATHEMATICS

**Evelina Dubovski**, MATH-174, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Divisor Functions: Train-like Structure and Density Properties*

**Aaron Kim**, MATH-203, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The Classification and Hilbert Polynomials of the Colorings of Quandles with Size 6*

**Charlotte Zhou**, MATH-246, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Income vs. Wealth: The Correlation between a Household's Net Wealth, Net Adjustable Disposable Income, and Years of Education in OECD Countries*

**Oceana Zhu**, MATH-247, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Hot Deck Imputation's Biases in the U. S. Census*

**Benjamin Owens**, MATH-306, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: The Repeated Sum of the Factors Function*

## MICROBIOLOGY

**Denis Meylikhov**, MCRO-002, BROOKLYN TECHNICAL HIGH SCHOOL

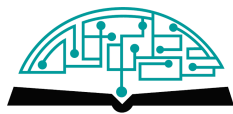
*Project Title: Impact of dietary supplements on cardiovascular health through gut microbiome production of trimethylamine-N-oxide*

**Elya Meylikhov**, MCRO-002, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Impact of dietary supplements on cardiovascular health through gut microbiome production of trimethylamine-N-oxide*

**Ariana Yim**, MCRO-113, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effects of Creatine (Carbamimidoylamino acetic acid) on Alzheimer Inflicted Caenorhabditis elegans.*



**Daniela Brillon**, MCRO-113, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effects of Creatine (Carbamimidoylamino acetic acid) on Alzheimer Inflicted Caenorhabditis elegans.*

**Maggie Lin**, MCRO-113, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effects of Creatine (Carbamimidoylamino acetic acid) on Alzheimer Inflicted Caenorhabditis elegans.*

**Edalene Epelman**, MCRO-166, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Genetic Footprints: Uncovering How Urbanization Affects Soil Fungi*

**Sameeha Saleem**, MCRO-166, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Genetic Footprints: Uncovering How Urbanization Affects Soil Fungi*

**Maya Wong**, MCRO-173, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The Effect of Temperature on the Effectiveness of P. Polycephalum's Extracellular Secretions*

**Nathaniel Zampitelli**, MCRO-173, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: The Effect of Temperature on the Effectiveness of P. Polycephalum's Extracellular Secretions*

**Steven Mao**, MCRO-296, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: The effects of cytokine on fungal uptake and killing in immortalized macrophages*

**Stephy Chen**, MCRO-465, QUEENS METROPOLITAN HIGH SCHOOL

*Project Title: What impact does the interplay between environmental factors and microorganisms have on the health of aquatic environments?*

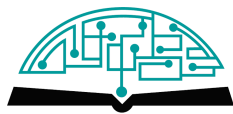
**Elise Boisson**, MCRO-482, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Biochemical characterization of qDEL UNC10118 resistant mutant 4'-Phosphopantetheinyl Transferase enzyme*

## **MEDICINE & HEALTH SCIENCES**

**Karley Ko**, MEDH-139, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Sleep Deprivation as a Treatment for Depression*



**Tzipora Guttman**, MEDH-139, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Sleep Deprivation as a Treatment for Depression*

**Kate Bondarenko**, MEDH-185, STUYVESANT HIGH SCHOOL

*Project Title: Human Hepatic Liver Stellate Cells and Hepatocytes: Their Relationships with Retinoic Acid, Lipid Accumulation, and Fibrosis through Gene Expression Testing*

**Pierce Wright**, MEDH-310, BROWNING SCHOOL (THE)

*Project Title: Utilizing AI to Optimize EMS Response to Acute Mental Illness and Resulting ER Resource Allocation*

**Nicole Datikash**, MEDH-375, QUEENS METROPOLITAN HIGH SCHOOL

*Project Title: In Vitro Model of Elastic Fiber Injury in Chronic Obstructive Pulmonary Disease*

**Caitlin Trinh**, MEDH-407, ARCHBISHOP MOLLOY HIGH SCHOOL

*Project Title: Assessing Baseline Knowledge on Menstruation in Female Adolescents*

**Raehyun Kim**, MEDH-409, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Investigating a Calcium Alginate-Xylitol Coating Methodology for Controlled Release Profiles of Multivitamin Tablet as a Model Drug*

**Kayla Hernandez-Zirofsky**, MEDH-428, PACKER COLLEGIATE INSTITUTE

*Project Title: Evaluating the mechanism responsible for radiation-induced lipid metabolism in glioblastoma*

**Tanya Verma**, MEDH-456, RIVERDALE COUNTRY SCHOOL

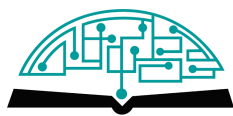
*Project Title: Smoking Causes Inflammation and Reduced Stem Cell Capacity*

**Katherine Lu**, MEDH-535, RIVERDALE COUNTRY SCHOOL

*Project Title: Evaluation of Epigallocatechin-3-gallate's Cytotoxic Effects on the Safety of Public Health*

**Kun-Hyung Roh**, MEDH-537, THE BRONX HIGH SCHOOL OF SCIENCE

*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*



## **PHYSICS & SPACE SCIENCE**

**Alejandro Velazquez**, PHYS-063, MIDWOOD HIGH SCHOOL

*Project Title: Investigation of physical properties of a novel zinc chloride-butylamide deep eutectic solvent*

**Darren Chen**, PHYS-063, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Investigation of physical properties of a novel zinc chloride-butylamide deep eutectic solvent*

**Michael Shor**, PHYS-315, COLUMBIA GRAMMAR PREPARATORY SCHOOL

*Project Title: Fast and Efficient Ion Transport in a Trapped Ion Quantum Computer through Low-Pass Filter Design*

**Thales Protopapas**, PHYS-360, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Use of Readily Available Components to Demonstrate the Wave-Particle Duality of Light*

**Daniel Amoils**, PHYS-415, COLUMBIA GRAMMAR PREPARATORY SCHOOL

*Project Title: Testing General Relativity with the stellar-mass black hole in MAXI J1820+070 using X-ray reflection spectroscopy.*

**Ellen Wang**, PHYS-432, HORACE MANN SCHOOL

*Project Title: Deep Learning on a Novel Ising Model to Study Arctic Sea Ice Dynamics*

**Kira Lewis**, PHYS-479, HORACE MANN SCHOOL

*Project Title: Statistical Thermodynamics to Assess Probability of Water Channel Formation in Membrane*

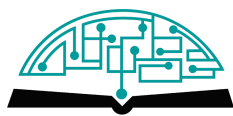
## **PLANT SCIENCE**

**Matthew Tom**, PLNT-029, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effects of Photoperiod on The Growth and Nutrient Removal Efficiency of Duckweed (Lemna minor)*

**Nathan Yuen**, PLNT-029, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effects of Photoperiod on The Growth and Nutrient Removal Efficiency of Duckweed (Lemna minor)*



**Wesley Chen**, PLNT-029, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effects of Photoperiod on The Growth and Nutrient Removal Efficiency of Duckweed (Lemna minor)*

**Ashley** , PLNT-032, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The effects of nitrate (NO<sub>3</sub>-) on the growth of phyllanthus fluitans compared to ammonium (NH<sub>4</sub><sup>+</sup>).*

**Nathalie Zhang**, PLNT-032, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The effects of nitrate (NO<sub>3</sub>-) on the growth of phyllanthus fluitans compared to ammonium (NH<sub>4</sub><sup>+</sup>).*

**Tian Jin**, PLNT-032, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The effects of nitrate (NO<sub>3</sub>-) on the growth of phyllanthus fluitans compared to ammonium (NH<sub>4</sub><sup>+</sup>).*

**Joshua Coleman**, PLNT-069, MIDWOOD HIGH SCHOOL

*Project Title: Animal fertilizer helps plants grow faster than normal fertilizer*

**ISABEL YANG**, PLNT-077, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Foliar Application on Hydroponic Versus Conventional Cultivation of Baby Bok Choy (Brassica rapa L. subsp. chinensis)*

**Isabelle Yung**, PLNT-077, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Foliar Application on Hydroponic Versus Conventional Cultivation of Baby Bok Choy (Brassica rapa L. subsp. chinensis)*

**Eva Uddin**, PLNT-125, THE BRONX HIGH SCHOOL OF SCIENCE

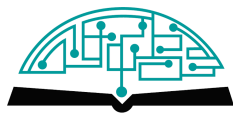
*Project Title: The role of TALE Homeodomain proteins in the haploid to diploid transition of the fern Ceratopteris richardii*

**Betty Li**, PLNT-132, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Comparative Analysis of the Effect of Varying Strengths of Magnetic Fields on Lepidium Sativum Experiencing Environmental Stress*

**Fiona Li**, PLNT-132, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Comparative Analysis of the Effect of Varying Strengths of Magnetic Fields on Lepidium Sativum Experiencing Environmental Stress*



**Angelina Li**, PLNT-142, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Evaluation of Nitrate Content in Composts and its Effect on Kale Growth*

**Kristina Kong**, PLNT-142, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Evaluation of Nitrate Content in Composts and its Effect on Kale Growth*

**Madison Koo**, PLNT-142, STATEN ISLAND TECHNICAL HIGH SCHOOL

*Project Title: Evaluation of Nitrate Content in Composts and its Effect on Kale Growth*

**Gianna Larida**, PLNT-244, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Non-Nano Zinc Oxide on the Rate of Sun Scalding in Malus domestica*

**Hilary**, PLNT-244, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Non-Nano Zinc Oxide on the Rate of Sun Scalding in Malus domestica*

**Yeon Su Oh**, PLNT-244, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Non-Nano Zinc Oxide on the Rate of Sun Scalding in Malus domestica*

**Elif Basaran**, PLNT-279, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Honey on Eichhornia crassipes' Ability to Absorb Copper Sulfate From Water.*

**Johnny Chen**, PLNT-279, FRANCIS LEWIS HIGH SCHOOL

*Project Title: The Effect of Honey on Eichhornia crassipes' Ability to Absorb Copper Sulfate From Water.*

## **SOFTWARE & ROBOTICS**

**Kiera Chan**, SORO-158, STATEN ISLAND TECHNICAL HIGH SCHOOL

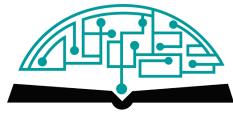
*Project Title: Novel Eigenmode-Based Feature Engineering for Efficient and Interpretable Image Classification: Application to Handwritten Digits*

**Elizabeth Segal**, SORO-200, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: Leveraging Machine Learning for Microplastic Particle Pollution Monitoring*

**Anna Thomas**, SORO-211, BROOKLYN TECHNICAL HIGH SCHOOL

*Project Title: A Deep Convolutional Neural Network for Manchu Script Recognition*



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# Finals Round 2024

**Ashish Verma**, SORO-304, THE BRONX HIGH SCHOOL OF SCIENCE

*Project Title: Optimizing TCP/IP Server Load with an Intelligent Adaptive Middleware for Dynamic Blocking and Non-blocking Modes*

**Gavin Ye**, SORO-319, COLUMBIA GRAMMAR PREPARATORY SCHOOL

*Project Title: De Novo Drug Design as GPT Language Modeling: Large Chemistry Models with Supervised and Reinforcement Learning*

**Aashna Hari**, SORO-460, HORACE MANN SCHOOL

*Project Title: Comparing Transformer and RNN Models in BCIs for Handwritten Text Decoding via Neural Signals*