

# The Pittsburgh Regional Science and Engineering Fair (PRSEF)

On April 2, 2025, students from North Allegheny presented projects at the Carnegie Science Center. Competitors shared the research, experimental methods, and conclusions relating to the projects they have been working on for the past 6 or more months. The following are awards presented to North Allegheny Students. More information about the awards can be found at <https://carnegiesciencecenter.org/groups-and-schools/stemcenter-science-fair-sponsors-and-awards/>.

## Nominations to ISEF

Special congratulations are due to the following students who were selected to represent our region at the Regeneron International Science and Engineering Fair (ISEF). This event was held in Columbus, OH in May. Additional information can be found at <https://www.societyforscience.org/isef/>.

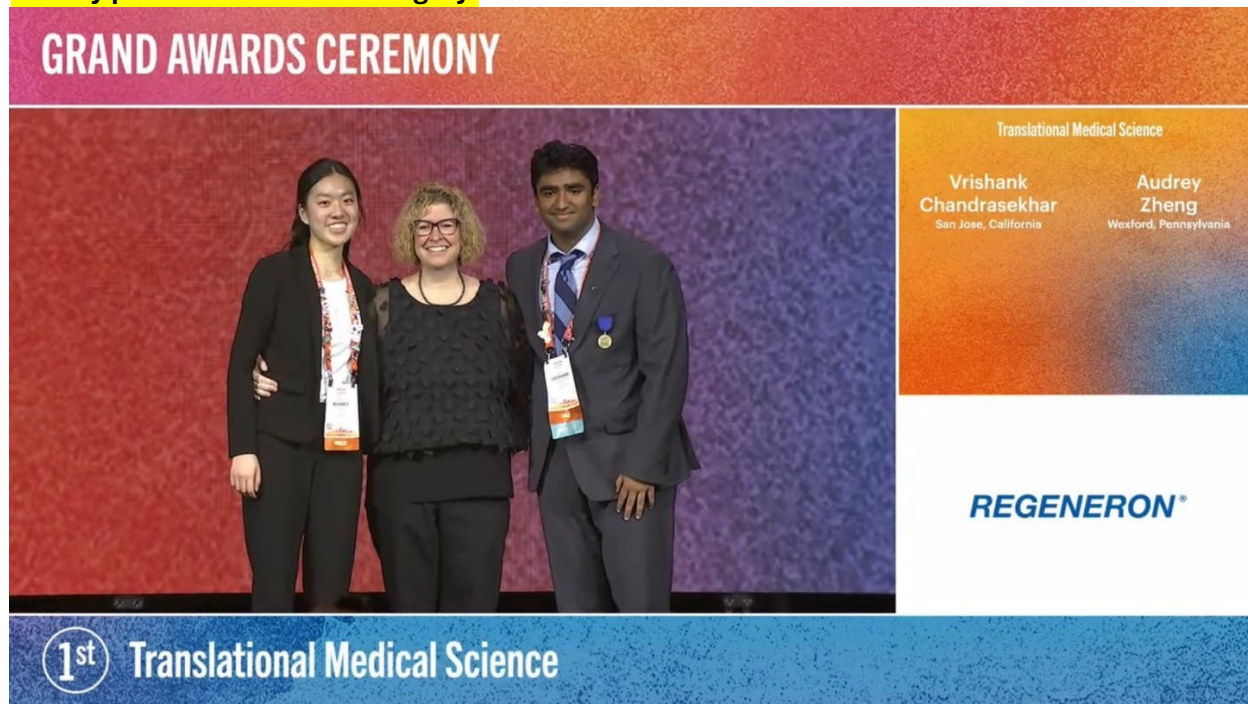
**Avyukt Iyer (11)** “Adaptive Robotic Exoskeleton Regarding Physical and Cognitive Rehabilitation to Reduce Energy Expenditure and Injury”

**James Xiao (11)** “QuanTear: A Tear Test for Stroke Detection and Monitoring”

**James placed second in his category!**

**Audrey Zheng (11)** “Dethroning the King of Cancers: Pancreatic Cancer Diagnosis from Blood Enabled by a Cocktail of Antibody-Magnetic Nanospheres”

**Audrey placed first in her Category!**



## Category Awards

**James Xiao (11)** “QuanTear: A Tear Test for Stroke Detection and Monitoring”

- *First Place in Medicine/Health/Microbiology*

**Misaki Qian (9)** “The Intersection between the Digital World and Philanthropy”

- *First Place in Behavioral & Social Sciences*

**Justin Chen (11) & Kevin Chen (11)** “Development of Automatic, Cost Efficient Optomotor Reflex Stimulation and Analyzation Device for Mice using Deep Learning”

- *First Place in Computer Science/Math*

**Mehar Jain (9)** “AlgaBot: An Arduino Device To Measure Factors Affecting Algal Growth”

- *First Place in Earth & Environment*

**Shivum Telang (10)** “RetGEN: A Predictive Analysis Framework Applying Fundus and OCT Images Towards Assessing Risk Progression and Interpretable Classification of Diabetic Retinopathy”

- *Second Place in Computer Science/Math*

**Avyukt Iyer (11)** “Adaptive Robotic Exoskeleton Regarding Physical and Cognitive Rehabilitation to Reduce Energy Expenditure and Injury”

- *Second Place in Engineering/Robotics*

**Arya Prasad (10)** “Optimization of Ferrofluid Formulation for Microplastic Extraction”

- *Second Place in Chemistry*

**Lucas Pu (12)** “Mutual Awareness-Driven Adaptive Generative Network: A Novel Generalizable Framework for Few-Shot Segmentation of Bronchopulmonary Segments”

- *Second Place in Computer Science/Math*

**Andrew Li (12)** “Diversity and Meta-Analysis of Microbial Differential Abundance in Nasal Metatranscriptomic Profiles of Asthma”

- *Second Place in Medicine/Health/Microbiology*

**Kavin Puri (10)** “An AI-Based Analysis for Cancer Detection: A Low-Cost MOS Sensor Approach”

- *Second Place in Medicine/Health/Microbiology*

**Ayana Singh (9)** “Leveraging fMRI and Machine Learning to Analyze Gender Disparities in Autism Spectrum Disorder Severity Prediction”

- *Third Place in Computer Science/Math*

**Rebecca Zhao (11)** “The Effect of UV Light Intensity on Photosynthesis Efficiency in Grass”

- *Third Place in Earth & Environment*

**Ishani Aluguvelli (10) & Anika Reddy (10)** “The Effects of Environmental Factors on Plastic Degradation”

- *Third Place in Earth & Environment*

**James McManus (11)** “Silent Killers in Your Backyard - Where is the best place to find Phage that can infect Bacillus Toyensis?”

- *Third Place in Medicine/Health/Microbiology*

**Angela Wei (11)** “Effects of Sugar Substitutes on Bacterial Growth”

- *Third Place in Medicine/Health/Microbiology*

**Alexander Du (10)** “Active Seismic P-Waves and Computational Modeling for Martian Subsurface Resource Identification”

- *Third Place in Physics & Astronomy*

**Sritej Padmanabhan (11)** “NeMoS: A Novel Symbolic Continual-Learning Model for Efficient and Scalable Data Retrieval”

- *Fourth Place in Computer Science/Math*

**Mikaela Dassanaik-Perera (12)** “Adrenal Insufficiency after Adrenalectomy for Cortisol Autonomy”

- *Fourth Place in Medicine/Health/Microbiology*

## Sponsor/Affiliated Sponsor Awards

**Avyukt Iyer (11)** “Adaptive Robotic Exoskeleton Regarding Physical and Cognitive Rehabilitation to Reduce Energy Expenditure and Injury” (Engineering/Robotics)

- [Award from Aerotech, Inc.](#)
- [Award from Clinical Research Strategies](#)
- [Award from Vesuvius](#)
- [Award from Webb](#)

**Arya Prasad (9)** “Optimization of Ferrofluid Formulation for Microplastic Extraction” (Chemistry)

- [Award from the American Chemical Society, Pittsburgh Section](#)
- [Award from US Stockholm](#)
- [Award from PPG](#)

**Shivum Telang (10)** “RetGEN: A Predictive Analysis Framework Applying Fundus and OCT Images Towards Assessing Risk Progression and Interpretable Classification of Diabetic Retinopathy” (Computer Science/Math)

- [Award from the American Statistical Association, Pittsburgh Chapter](#)
- [Award from the CMU Gelfand Center](#)

**Lauren Hwang (11)** “Super Slippery Surfaces that Repel Marine Organisms” (Biology)

- [Award from the CMU Department of Biological Sciences](#)

**Samuel Xiao (11) & Lucian Mikush (Mt. Lebanon)** “Using Rising Water as a Dielectric: A Novel Approach to Tidal Power” (Engineering/Robotics)

- [Award from Westinghouse](#)

**Ashley Shim (11)** “Quantifying Oxytocin Receptor (OXTR) Activation Using a Tango Assay: A Novel Approach for Targeting Autism Spectrum Disorder (ASD) Social Deficits” (Biology)

- [Award from the Spectroscopy Society](#)

**Ayana Singh (9)** “Leveraging fMRI and Machine Learning to Analyze Gender Disparities in Autism Spectrum Disorder Severity Prediction” (Computer Science/Math)

- [Award from the Pittsburgh Intellectual Property Association](#)

**Yashas Singh (11)** “Prosthetic Arm Control using EMG Sensors and Machine Learning” (Engineering/Robotics)

- [Award from the Pittsburgh Intellectual Property Association](#)

# The PA Junior Academy of Science (PJAS) – Regional Meeting

On Saturday, February 8<sup>th</sup>, 2025 at the Regional Meeting of the Pennsylvania Junior Academy of Science, students from Allegheny and Westmoreland Counties met to present the research, experimental methods, and conclusions that they had been working on since the start of the school year. The following awards were presented to North Allegheny Students:

## 1<sup>st</sup> Award (Eligible to Compete at the State Meet for PJAS in May)

**James Xiao (11) and Lucas Pu (12)** – 1<sup>st</sup> Award and PERFECT SCORE in Biology

**Tai Luangkesorn (9)** – 1<sup>st</sup> Award and PERFECT SCORE in Computer Science

**Audrey Zheng (11)** – 1<sup>st</sup> Award in Biochemistry

**Misaki Qian (9)** – 1<sup>st</sup> Award in Behavioral Science

**Lauren Hwang (11) and Mikaela Dassanaik-Perera (12)** – 1<sup>st</sup> Award in Biology

**Arrya Prasad (10)** – 1<sup>st</sup> Award in Chemistry

**Junseo Lee (10), Kaartic Muralidharan (10), Ayush Srivastava (10),  
and Shivum Telang (10)** – 1<sup>st</sup> Award in Computer Science

**Rebecca Zhao (11) and Aayushi Vardhan (10)** – 1<sup>st</sup> Award in Ecology

**Pranav Bandi (11), Shuchir Jain (11), Avyukt Iyer (11), and Havisha Kalpatthi (11)** – 1<sup>st</sup> Award in Engineering

**Medha Thirumala (9), Samhitha Bhonagiri (10), and Dylan Pak (10)** – 1<sup>st</sup> Award in Microbiology

## 2<sup>nd</sup> Award

**Kavin Puri (10)** – 2<sup>nd</sup> Award in Computer Science

**Yashas Singh (11)** – 2<sup>nd</sup> Award in Engineering

**Claire Bacu (11)** – 2<sup>nd</sup> Award in Math

**James McManus (11) and Angela Wei (11)** – 2<sup>nd</sup> Award in Microbiology

## 3<sup>rd</sup> Award

**Ashley Shim (11)** – 3<sup>rd</sup> Award in Biochemistry

## Special Awards

**Medha Thirumala** was presented the Duane Keenan Award.

**Havisha Kalpatthi** was presented the Society of Women Engineers Award.

**Shuchir Jam** was presented the American Vacuum Society Award.

**Tai Luangkesorn** was presented the Director's Award for Mathematics.

**Audrey Zheng** was presented the Director's Award for Biochemistry.

**Kavin Puri** was presented the Director's Award for Computer Science.

**Dylan Pak** was presented the Director's Award for Microbiology.

**Lucas Pu** was presented a Perseverance Award as a 12<sup>th</sup> grade student participating at PJAS for 3 years.

# The PA Junior Academy of Science (PJAS) – State Meeting

On Monday, May 19<sup>th</sup>, 2025 at the State Meeting of the Pennsylvania Junior Academy of Science, students from Pennsylvania who earned a first award at their respective regional meeting presented their projects on the campus of Penn State University. The following awards were presented to North Allegheny Students:

## 1<sup>st</sup> Award

**Audrey Zheng (11)** – 1<sup>st</sup> Award and PERFECT SCORE in Biochemistry  
**James Xiao (11)** – 1<sup>st</sup> Award and PERFECT SCORE in Biology  
**Ayush Srivastava (10)** – 1<sup>st</sup> Award and PERFECT SCORE in Computer Science  
**Dylan Pak (10)** – 1<sup>st</sup> Award and PERFECT SCORE in Microbiology  
**Misaki Qian (9)** – 1<sup>st</sup> Award in Behavioral Science  
**Lauren Hwang (11)** – 1<sup>st</sup> Award in Biology  
**Arrya Prasad (10)** – 1<sup>st</sup> Award in Chemistry  
**Tai Luangkesorn (9), and Shivum Telang (10)** – 1<sup>st</sup> Award in Computer Science  
**Rebecca Zhao (11) and Aayushi Vardhan (10)** – 1<sup>st</sup> Award in Ecology  
**Shuchir Jain (11) and Avyukt Iyer (11)** – 1<sup>st</sup> Award in Engineering  
**Medha Thirumala (9)** – 1<sup>st</sup> Award in Microbiology

## 2<sup>nd</sup> Award

**Samhitha Bhonagiri (10)** – 2<sup>nd</sup> Award in Microbiology  
**Junseo Lee (10) and Kaartic Muralidharan (10)** – 2<sup>nd</sup> Award in Computer Science

## Special Awards & Scholarships

**James Xiao** was presented with the Excellence Award for Biology.

**James Xiao** was awarded a scholarship to the Eberly College of Science and the College of Agricultural Sciences.

**Rebecca Zhao** was awarded a scholarship to the College of Earth and Mineral Sciences.

**James Xiao** and **Rebecca Zhao** were presented with Perseverance Awards as 11<sup>th</sup> grade students for participating at PJAS for 4 years.



