

Fair Awards News Report

Fair: Mercer Science and Engineering Fair 2025

Grand Prize from Mercer Science and Engineering Club
Senior Division 2025

Category: **Software and Embedded Systems**

Design an Ankle Exoskeleton for Rehabilitation After Injury

Wenjing Mao
Grade: 11

1st Runner Up from Mercer Science and Engineering Club
Senior Division 2025

Category: **Biochemistry, Biology and Medical**

An End-to-End AI Hardware Solution for Ophthalmic Diagnostics: Retinal Vessels as a Morphological Target for Segmentation and Ea

ZiXuan Xin
Grade: 11

Thermo Fisher Junior Innovators Challenge from Society for Science
Junior Division 2025

Category: **General Science**

FungalShield: A Comprehensive Strategy for Superficial Fungal Infection Prevention and Treatment

Brian Suk
Grade: 8

Investigating the Impact of Polystyrene Microplastic Pollution on Early Plant Growth in a Hydroponic System

Matthew Dodd-Nickles
Grade: 8

First Place from Mercer Science and Engineering Club
Junior Division 2025

Category: **General Science**

FungalShield: A Comprehensive Strategy for Superficial Fungal Infection Prevention and Treatment

Brian Suk
Grade: 8

Investigating the Impact of Polystyrene Microplastic Pollution on Early Plant Growth in a Hydroponic System

Matthew Dodd-Nickles
Grade: 8

Senior Division 2025

Category: **Animal Science**

Farmheart

Saurish Kapoor
Grade: 11

Category: **Biochemistry, Biology and Medical**

An End-to-End AI Hardware Solution for Ophthalmic Diagnostics: Retinal Vessels as a Morphological Target for Segmentation and Ea

ZiXuan Xin
Grade: 11

RNA Structural Geometry with GVP and Transformers: A Novel Deep Framework for Sequence-Structure Co-Design

Annabelle Yao
Grade: 11

THE SILENT CATALYST: CHRONIC STRESS-INDUCED SEROTONIN SIGNALING AS A NOVEL DRIVER OF BRAIN METASTASIS IN TNBC

Dhairya Mathur
Grade: 11

A macrophages-targeting and ROS-responsive iron-based T1 magnetic resonance imaging contrast agent for inflammation imaging

Yucheng Li
Grade: 11

Category: **Chemistry and Materials**

Magic paper: programmable magnetic origami robot for medical applications

Xinyu Ye
Grade: 10

Category: **Environmental Science and Engineering**

Advancing Phytoremediation of PFAS in Biosolids: Soil Condition Optimization and Nutrient Preservation

Qiuen Yu
Grade: 11

Category: **General Engineering**

Mouse Inspired Crawler

Amanda Lee
Grade: 11

Category: **Mathematics, Physics and Astronomy**

Proof of the Spherical Isoperimetric Inequality via Inverse Curve Shortening Flow

Yuchen Xu
Grade: 11

Category: **Plant Science**

Can Plants Talk? Unlocking Ultrasound's Power for Plant Communication and Precision Irrigation

David Hsu
Grade: 10

Category: **Software and Embedded Systems**

Design an Ankle Exoskeleton for Rehabilitation After Injury

Wenqing Mao
Grade: 11

Second Place *from Mercer Science and Engineering Club*
Junior Division 2025

Category: **General Science**

Inheritance of Fingerprint Patterns: A Family Study

Aalaap Pailoor
Grade: 6

Kombucha: The Drink That's Alive (Literally)

Derek Makkay
Grade: 7

Senior Division 2025

Category: **Behavioral and Social Science**

TalkMotion

Faraz Tamboli
Grade: 11

Quantitative Assessment on the Impact of Music on Athletic Performance: A Correlation between Music and performance confidence

Angela Du
Grade: 11

Category: **Biochemistry, Biology and Medical**

Deep Generative De Novo Design of High-Affinity Antibodies Targeting Ovarian Cancer Antigens: Adipsin and IGFBP2

Akshat Santhana Gopalan
Grade: 11

Investigating Axonal Guidance in Neural Organoids As a Model for Brain Development and Neurodegeneration

Ethan Zhu
Grade: 11

Comparative Analysis of Artificial Sunrise Alarms and Red-Tinted Blue-Light Glasses at Reducing Sleep Inertia

Priyanka Sirikonda
Grade: 12

Digoxigenin Binders: Computationally Designed Protein Backbones for Digoxigenin Binding using Machine Learning Software

Arnav Chhajed
Grade: 11

Category: **Chemistry and Materials**

Silky Signals: Decoding the Electrical Response of Spider Silk to Humidity Changes

Isis Hsu
Grade: 11

Category: **Environmental Science and Engineering**

Advancing Earthquake Aftershock Prediction: Integrating Physics-Informed Neural Networks with Finite-Fault Stress Modeling

Aldric Benalan
Grade: 11

Category: **General Engineering**

Conquer the Peddie Lake-Dual-Tail Robotic Fish for Stable Data Collection in Complex Waters

Iris Lin
Grade: 11

SelenRover: A Multi-Wheeled Modular Robot for Planetary Terrain Exploration

Kaibo Wang
Grade: 11

Category: **Mathematics, Physics and Astronomy**

Explicit Algebraic Numbers whose Integer Parts of Powers are always Composite

Ganghun Kim
Grade: 10

Honeycomb-Filled Eggshell Fuel Tank Protection Structure: Enhancing Safety in Racing Cars

Yunlu Shang
Grade: 11

Category: **Plant Science**

The Effect of Textile Dyes on the Growth and Physiological Response of Model Organism Arabidopsis thaliana

Nabilah Nisar
Grade: 12

Category: **Software and Embedded Systems**

AI-Driven Visual Assistance System for the Blind: Depth Estimation and Object Localization

Maggie Rao
Grade: 10

AlzLume: Delivering Multi-sensory Stimulation in Video Apps to Enhance Alzheimer's Patient Adherence

Anya Gruteser
Grade: 11

Third Place from Mercer Science and Engineering Club
Junior Division 2025

Category: **General Science**

Using Household Aluminum Foil to Reduce Radiofrequency Radiation from Cell Phones When in Use

Owen Berness
Grade: 6

Senior Division 2025

Category: **Biochemistry, Biology and Medical**

Decoding Alzheimer's: Leveraging EEGs for Early Diagnosis

Sophia Zhang
Grade: 11

Rutin attenuates distraction spinal cord injury through inhibiting inflammation by downregulating P38 MAPK/NF- κ B/STAT3 pathway

Junrui Jonathan Hai
Grade: 12

Manipulating Calcium Binding Sites In Calmodulin and Calcineurin B

Olivia Swarup
Grade: 10

The Effect of the L92A variant on the structure and function of HBB

Saniya Williams
Grade: 12

Anti-Cancer Potential of Apigenin and Epigallocatechin Gallate: Dose-Dependent Growth Inhibition in Prostate Cancer Cells

Nikita Goyal
Grade: 11

Category: **Environmental Science and Engineering**

Unraveling the Genetic Impact of Pollution on Plants

Mahitha Koppella
Grade: 9

Recompose: Cognitive Composting – A Depth-Vision Method for Food Waste Weight and Emission Data for Real-Time Behavioral Shaping

Umang Sharma
Grade: 11

Category: **General Engineering**

Developing a 3RPS Parallel Manipulation Control System and 3D Printed Receiver System for 3m Radio Telescope

Shuai Liu
Grade: 12

Category: **Plant Science**

The Effect of Numbing Spray on Plant Growth

Ziya Kartar Sangha
Grade: 11

Category: **Software and Embedded Systems**

Data-Driven Hybrid Control: Integrating Classical Control Algorithms with Adaptive AlgorithmsZirui Wang
Grade: 11**Graph-Based AI Model for Fake Health News Identification Using Propagation Patterns**Yiheng Wang
Grade: 10**Honorable Mention** from Mercer Science and Engineering Club
Junior Division 2025Category: **General Science****Automated Water Quality Classification Using Dissolved Solids and Chemical Composition**Aarav Balaji
Grade: 7**Senior Division 2025**Category: **Biochemistry, Biology and Medical****Reorganization of Memory and Cognition in Patients with Epilepsy Treated with Long Term Intracranial Electrical Stimulation: A S**Gianna Antony
Grade: 10**Classifying Brain Scans for Parkinson's Disease using a Novel Ensemble Model**Arjun Avineni
Grade: 11**Investigating Optimal Methodology for Pseudomonas fluorescens Biofilm Inhibition**Darshana Senthilkumar
Grade: 12**Evaluating the Antimicrobial Efficacy of Lactobacillus acidophilus Probiotic Strains Against Pathogenic Escherichia coli**Anya Kawlekar
Grade: 12**A Caenorhabditis Elegans Model Challenges Meclizine Potential as a Lifespan-Extending mTORC1 Inhibitor**Aradhya Vijay
Grade: 11**Pavlov's Zap: Classically conditioning Bacillus coagulans to increase the efficiency of its endospore reactivation mechanism**Anamitra Kugapalan
Grade: 12**The case for Restricted Access to GLP-1 Agonists**Shivansh Pandey
Grade: 9Category: **Environmental Science and Engineering****A Spherical Morpho-Functional Aquatic Robot with Context-Adaptive Visual Intelligence for Real-Time Coral Bleaching Monitoring**Ziyi Yang
Grade: 10Category: **General Engineering****Leveraging Machine Learning and ChemBERTa for Efficient Identification of CB1 Receptor-Active Compounds**Shloak Vatsyayan
Grade: 9Category: **Software and Embedded Systems****SNN-LLM: An Efficient Spiking Neural Network Architecture for Large Language Models**Eva Zhu
Grade: 11

Algorithmic Implementation of Habituation Learning in Artificial Neural Networks

Samhita Shiriram
Grade: 9

Novel Multilayered Quantum, Classical and Hybrid Algorithms for Adaptive Real-Time Autonomous Navigation Frameworks

Devi Prasad Kanumilli
Grade: 9

Best Use of Photography *from* New Jersey Camera & One Hour Photo
Senior Division 2025

Category: **General Engineering**

Mouse Inspired Crawler

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