

## **2025 Regeneron ISEF awards**

### **American Mathematical Society**

The American Mathematical Society was founded in 1888, to further the interests of mathematical research & scholarship, as well as to serve the national/international community through its publications, meetings, advocacy & other programs. Friends and family of the late mathematician, Karl Menger, contribute to a fund in his memory, to be distributed by the AMS for annual awards at the Regeneron International Science and Engineering Fair.

#### **Third Award of \$500**

MATH007 — *Combinatorial Invariants of Stable Curve in Genus 4: Classification and Computation*

- Frank Kan, Oregon Episcopal School, Portland, OR, United States of America

**One-Year Membership to American Mathematical Society to each winner (7 winning projects, up to 3 team members per project)**

MATH007 — *Combinatorial Invariants of Stable Curve in Genus 4: Classification and Computation*

- Frank Kan, Oregon Episcopal School, Portland, OR, United States of America

MATH019 — *Quantum-Sound Factorization: On the Distribution and Structure of Irreducible Sets*

- Anay Aggarwal, Westview High School, Portland, OR, United States of America

### **Association for the Advancement of Artificial Intelligence**

AAAI is a scientific society devoted to advancing the scientific understanding of the mechanisms underlying thought and intelligent behavior and their embodiment in machines. AAAI promotes research in, and responsible use of, artificial intelligence, as well as public understanding of artificial intelligence. AAAI also strives to improve the teaching and training of AI practitioners and

provide guidance on the importance and potential of current AI developments and future directions.

**Winners receive a student-level membership. AAAI Membership for the School Libraries of All 8 Winners (in-kind award / part of 1st-3rd prize and honorable mentions' prize)**

### **Honorable Mention**

ROBO066T — *IntelliCane: An Agentic Approach to Real-Time Obstacle Avoidance and Intelligent Decision-Making for the Visually Impaired Through a Monocular Servo-Guided Cane Using Deep Learning-Based Environmental Mapping*

- Akash Ragam, Jesuit High School, Portland, OR, United States of America
- Tanay Chitlur, Westview High School, Portland, OR, United States of America

### **International Council on Systems Engineering – INCOSE**

The International Council on Systems Engineering (INCOSE) is a not-for-profit membership organization founded to develop and disseminate the interdisciplinary principles and practices that enable the realization of successful systems. The INCOSE Best Use of Systems Engineering awards are awarded to the best interdisciplinary projects that can produce technologically appropriate solutions that meet societal needs. There will be a first and second place Best Use of Systems Engineering and a INCOSE Bill Ewald Socio-Technical Systems Engineering Award.

**Certificate of Honorable Mention, a 1-year free student membership to the INCOSE, and free virtual admission to the 2025 International Symposium of the INCOSE**

ENBM019 — *An Ingestible, Self-Propelling, Electroceutical Device With Electroenterogram and Electrical Stimulation Capabilities for Noninvasive Management of Small Intestinal Dysmotility*

- Akash Ashish Pai, Sunset High School, Portland, OR, United States of America

### **Mu Alpha Theta, National High School and Two-Year College Mathematics Honor Society**

Mu Alpha Theta, the National High School and Two-Year College Mathematics Honor Society, strives to promote the enjoyment and scholarship of mathematics. The Mu Alpha Theta Award is given to the most challenging, thorough, and creative investigation of a problem involving mathematics accessible to high school students. Components of the investigation often include mathematical proof, mathematical modeling, statistical analysis, visualization, simulation, and approximation.

### **First Award of \$ 1,500**

MATH019 — *Quantum-Sound Factorization: On the Distribution and Structure of Irreducible Sets*

- Anay Aggarwal, Westview High School, Portland, OR, United States of America

Winning students will receive a certificate and a cash award.

### **Westlake University**

Established in 2018, Westlake University is a leading research university with a strong emphasis on fundamental scientific research and cutting-edge technological innovation in Hangzhou, China. Our university is making pioneering research breakthroughs and advancing the frontiers of knowledge by inspiring the next generation of leaders in science and engineering from diverse cultures through world-class research, international collaboration, and academic programs taught in English.

**Westlake University is awarding Pre-college Summer Program Scholarships, covering the program fee, lodging, food, insurance, round-trip international airfare, and excursions in Hangzhou & Shanghai this summer, to up to five finalists. Outstanding students will be given priority with full scholarships for four years of undergraduate admissions, applicable to any major, at Westlake University.**

MCRO039 — *Leveraging Microbiome Data and Machine Learning for the Identification of Novel Biomarkers in Early Detection and Classification of Pancreatic Cancer*

- Vrushab Karthik, Jesuit High School, Portland, OR, United States of America

Each winning student will receive an award including pre-college program scholarships that cover the program fee, lodging, food, insurance, round-trip international airfare, and excursions in Hangzhou and Shanghai during the summer of 2025, and full-tuition scholarships for undergrad studies at Westlake University, applicable to any major.

### **BIOMEDICAL ENGINEERING, sponsored by Regeneron**

#### **Third Award of \$1,200**

ENBM019 — *An Ingestible, Self-Propelling, Electroceutical Device With Electroenterogram and Electrical Stimulation Capabilities for Noninvasive Management of Small Intestinal Dysmotility*

- Akash Pai, Sunset High School, OR, United States of America

### **COMPUTATIONAL BIOLOGY AND BIOINFORMATICS, sponsored by Regeneron**

#### **Third Award of \$1,200**

CBIO037 — *Spatial Transcriptomics and Adaptive Multi-Modal Encoding: A Novel Approach to Early Metastasis Profiling and Therapeutic Targeting Treatment*

- Nidhi Yadalam, Jesuit High School, OR, United States of America

### **EARTH AND ENVIRONMENTAL SCIENCES, sponsored by Society for Science**

#### **Fourth Award of \$600**

EAEV070 — *A Multilayer Perceptron Based Neural Network Model to Identify Optimal Camera Locations for Early Detection of Wildfires*

- Sohan Govindaraju, Jesuit High School, OR, United States of America

### **MATHEMATICS, sponsored by Akamai Foundation**

#### **Second Award of \$2,400**

MATH019 — *Quantum-Sound Factorization: On the Distribution and Structure of Irreducible Sets*

- Anay Aggarwal, Westview High School, OR, United States of America

## **MICROBIOLOGY, sponsored by Schattner Foundation**

### **Fourth Award of \$600**

MCRO019 — *AAVehicle: Novel Assembly Activating Protein Domain Shuffling for Enhanced Adeno-Associated Virus Capsid Formation and Gene Therapy as Treatment for Genetic Disorders*

- Suhaani Garg, West Linn High School, OR, United States of America

MCRO039 — *Leveraging Microbiome Data and Machine Learning for the Identification of Novel Biomarkers in Early Detection and Classification of Pancreatic Cancer*

- Vrushab Karthik, Jesuit High School, OR, United States of America

## **ROBOTICS AND INTELLIGENT MACHINES, sponsored by Liquid AI**

### **Third Award of \$1,200**

ROBO066T — *IntelliCane: An Agentic Approach to Real-Time Obstacle Avoidance and Intelligent Decision-Making for the Visually Impaired Through a Monocular Servo-Guided Cane Using Deep Learning-Based Environmental Mapping*

- Akash Ragam, Jesuit High School, OR, United States of America
- Tanay Chitlur, Westview High School, OR, United States of America

## **SYSTEMS SOFTWARE, Sponsored by Microsoft**

### **Third Award of \$1,200**

SOFT015 — *The Forensic Potential of MacOS Spotlight PSID.DB: Tracking Illicit Storage Drive Activity Through Artifact Reverse Engineering, Scripting and Analysis*

- Ethan Hale, South Eugene High School, OR, United States of America