

2021 Regeneron International Science and Engineering Fair Awards for North Carolina Students

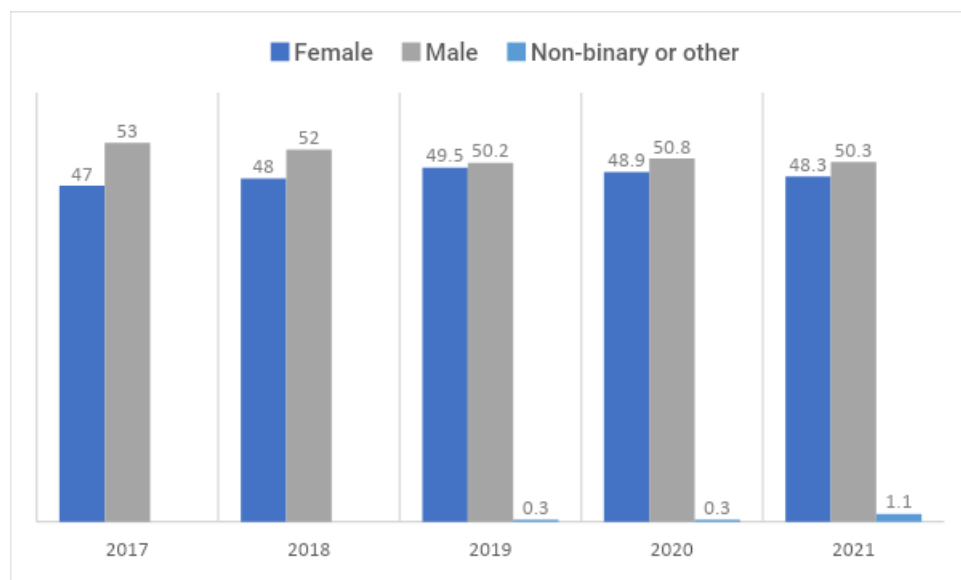
North Carolina students have been awarded a **record number of awards** at the 2021 Regeneron International Science and Engineering Fair! North Carolina students were selected from the State NC Science and Engineering Fair (12 projects), the Central Region 3A NC Science and Engineering Fair (1 project), the NCSSM Region 3B Science and Engineering Fair (2 projects), and the UNC-Charlotte Region 6 NC Science and Engineering Fair (2 projects) for a total of 17 projects and 19 students. Students were judged virtually May 3-6, 2021 with the Regeneron ISEF Student Events on May 16-21, 2021.

ISEF Background

From May 16 to May 21, 2021, nearly 2,000 young scientists, engineers, entrepreneurs and inventors will convene virtually for a week of connecting with their peers and global STEM leaders, events, and \$5 million in awards and prizes. It will be the first time in the Fair's history that the event will be held virtually. The finalists, selected from nearly 400 affiliate fairs in 64 countries, regions and territories, have all completed exemplary research projects and earned the right to compete at Regeneron ISEF by winning at a Society-affiliated local, regional, state or national science fair.

Regeneron ISEF 2021 Key Statistics

- Total number of finalists: 1,833
- Number of finalists from the U.S. and U.S. territories: 1,092
- Number of finalists outside of U.S.: 747
- Number of countries, regions and territories: 64
- Non-U.S. country with the most finalists: South Korea, 65
- Percent finalists by gender:



Regeneron ISEF 2021 Awards

Grand Awards are presented in each of the 21 ISEF categories:

- 1st Award: \$5,000
- 2nd Award: \$2,000
- 3rd Award: \$1,000
- 4th Award: \$500

Additionally, winners of the **Top Awards** are selected from among the 1st Award recipients:

- [George D. Yancopoulos Innovator Award](#) of \$75,000
- [Regeneron Young Scientist Awards](#) (2) of \$50,000 each
- [The Gordon E. Moore Award](#) for Positive Outcomes for Future Generations of \$50,000
- Craig R. Barrett Award for Innovation of \$10,000
- H. Robert Horvitz Prize for Fundamental Research of \$10,000
- Peggy Scripps Award for Science Communication of \$10,000

For more information about Grand Awards and Top Awards, please visit <https://www.societyforscience.org/isef/grand-awards/>. In addition, dozens of corporate, academic, government, and scientific organizations give Special Awards. For more information, please visit <https://www.societyforscience.org/isef/special-award-organizations/>.

Regeneron Young Scientist Grand Award for NC Student

Regeneron Young Scientist Awards (\$50,000 each) – These finalists are selected for their commitment to innovation in tackling challenging scientific questions, using authentic research practices and creating solutions to the problems of tomorrow.

SOFT012 — *Development of an AI-Powered Powered Facial-cue Control Module*

- Daniel Shen, William G. Enloe High School; Raleigh, NC, United States of America

2021 Regeneron ISEF Grand Awards for North Carolina Students:

Biomedical Engineering - Second Award of \$2,000

ENBM001T — *ARTHETA-0: An Innovative, Affordable Approach to the Onsite, Rapid 3D Printing of Artery Stents, Parameterized to Fit Individual Patients' Needs*

- Connor Mitchell, North Carolina School of Science and Mathematics, Raleigh, NC; United States of America
- Prabhuddha Ghosh Dastidar, North Carolina School of Science and Mathematics, Waxhaw, NC; United States of America

CHEMISTRY - Fourth Award of \$500

CHEM036 — *Rare-Earth-Free Silicon-Based Organic Molecules for Solid-State Lighting Applications*

- Lisa Zhang, Providence High School; Charlotte, NC; United States of America

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS - Fourth Award of \$500

CBIO068 — *A Versatile Population Dynamics Model of Bacterial Resistance, Tolerance, and Persistence*

- Melissa Du, North Carolina School of Science and Mathematics; Durham, NC; United States of America

EARTH AND ENVIRONMENTAL SCIENCES - Fourth Award of \$500

EAEV064 — *Assessing and Predicting Wildfire Severity in California Based on Relationships Between Wildfires and Drought Using Machine Learning*

- Angela Chen, William G. Enloe High School; Raleigh, NC, United States of America

ENERGY: SUSTAINABLE MATERIALS AND DESIGN - Third Award of \$1,000

EGSD027 — *The Computational and Experimental Study of Cellulose in Ionic Liquids and Water for Finding an Optimal Solvent for Biofuel Production*

- Nicholas Boyer, North Carolina School of Science and Mathematics, Horse Shoe, NC; United States of America

ENVIRONMENTAL ENGINEERING - First Award of \$5,000

ENEV048 — *Identifying Natural Flocculating Proteins for Affordable Anti-Microbial Sand Filters*

- Sahil Azad, North Carolina School of Science and Mathematics, Charlotte, NC; United States of America

MATHEMATICS - Third Award of \$1,000

MATH002 — Novel Methods for Shape Classification, Analysis, and Synthesis Using the Isoperimetric Profile and Mathematical Morphology

- Dev Chheda, Ardrey Kell High School; Charlotte, NC, United States of America

PLANT SCIENCES - Second Award of \$2,000

PLNT036 — Tropicalization of Temperate Ecosystems: How Climate Change Can Influence

- Regan Williams, John T Hoggard High School; Wilmington, NC, United States of America

ROBOTICS AND INTELLIGENT MACHINES - Second Award of \$2,000

ROBO075 — CoMET: A Novel Graph-based Machine Learning System for Predicting Topological Features of Dynamic Covert Networks with Applications in Counterterrorism

- Paarth Tara, North Carolina School of Science and Mathematics, Mebane, NC; United States of America

ROBOTICS AND INTELLIGENT MACHINES - Third Award of \$1,000

ROBO044 — BrCaVision: Predicting Breast Cancer Prognosis by Detecting Mitosis, Identifying Histological Tumor Subtypes, and Scoring HER2 in Whole Slide Tissue Images Using Deep Learning

- Dheepthi Mohanraj, North Carolina School of Science and Mathematics, Chapel Hill, NC; United States of America

SYSTEMS SOFTWARE - First Award of \$5,000

SOFT012 — Development of an AI-Powered Facial-cue Control Module

- Daniel Shen, William G. Enloe High School; Raleigh, NC, United States of America

2021 Regeneron ISEF Special Awards for NC Students:

Air Force Research Laboratory on behalf of the United States Air Force

The Air Force Research Laboratory is a global technical enterprise, boasting some of the best and brightest leaders in the world. We are Revolutionary, Relevant, and Responsive to the Warfighter. We defend America by unleashing the unconquerable power of scientific and technical innovation. Our mission is leading the discovery, development, and integration of affordable warfighting technologies for our air, space, and cyberspace force.

First Award of \$750

EAEV002 — Rethinking Our Roads: The Ability of Porous Concrete to Reduce Surface Runoff of Tire Wear Particles (TWP)

- Mason Brandt Sufnarski, Marvin Ridge High School, Waxhaw, NC, United States of America

MATH002 — Novel Methods for Shape Classification, Analysis, and Synthesis Using the Isoperimetric Profile and Mathematical Morphology

- Dev Mayur Chheda, Ardrey Kell High School, Charlotte, NC, United States of America

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.

Certificate of Honorable Mention

MATH002 — Novel Methods for Shape Classification, Analysis, and Synthesis Using the Isoperimetric Profile and Mathematical Morphology

- Dev Mayur Chheda, Ardrey Kell High School, Charlotte, NC, United States of America

American Statistical Association

The American Statistical Association is the world's largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical and data science through meetings, publications, membership services, education, accreditation, and advocacy. Our members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare.

Certificate of Honorable Mention

ROBO075 — CoMET: A Novel Graph-based Machine Learning System for Predicting Topological Features of Dynamic Covert Networks with Applications in Counterterrorism

- Paarth Tara, North Carolina School of Science and Mathematics, Mebane, NC; United States of America

Arizona State University

Arizona State University is pleased to offer a scholarship combining a monetary award and an environment focusing on knowledge, learning and research. The New American University ISEF Scholarship is renewable for four years. Individuals and teams will be considered for these awards.

Arizona State University ISEF Scholarship

ENEV052T — Designing a Bioplastic Material to Replace Polystyrene and Polypropylene in Single-Use Hard Plastics that Rapidly Degrades in Landfill, Freshwater, and Saltwater Environments

- Kaitlyn Lee Zuravel, Terry Sanford High School, Fayetteville, NC, United States of America
- Lauren Gail Zuravel, Terry Sanford High School, Fayetteville, NC, United States of America

Association for Computing Machinery

ACM is widely recognized as the premier membership organization for computing professionals, delivering resources that advance computing as a science and a profession; enable professional development; and promote policies and research that benefit society. ACM hosts the computing industry's leading Digital Library and serves its global members and the computing profession with journals and magazines, conferences, workshops, electronic forums, and Learning Center.

Third Award of \$1,500

SOFT012 — Development of an AI-Powered Powered Facial-cue Control Module

- Daniel Shen, William G. Enloe High School, Cary, NC, 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.

Honorable Mention

SOFT012 — Development of an AI-Powered Powered Facial-cue Control Module

- Daniel Shen, William G. Enloe High School, Cary, NC, United States of America

China Association for Science and Technology (CAST)

China Association for Science and Technology (CAST) is the largest organization of scientists and technologists in China. One of its missions is to promote public understanding of science. Having developed science education programs, CAST supports youth and adolescents in becoming citizens with high scientific literacy. CAST awards are given to the projects that best reflect the originality and innovation of the students' work in all scientific disciplines.

Award of \$1,200

EAEV002 — Rethinking Our Roads: The Ability of Porous Concrete to Reduce Surface Runoff of Tire Wear Particles (TWP)

- Mason Brandt Sufnarski, Marvin Ridge High School, Waxhaw, NC, United States of America

National Oceanic and Atmospheric Administration – NOAA

The National Oceanic and Atmospheric Administration (NOAA) is the United States government agency with a mission of science, service, and stewardship. Its mission touches the lives of every American, protecting life and property and conserving and protecting natural resources. NOAA's "Taking the Pulse of the Planet" awards recognize outstanding projects in ocean, coastal, Great Lakes, weather, and climate sciences with cash awards and a first prize summer internship.

Second Award of \$500

EAEV064 — Assessing and Predicting Wildfire Severity in California Based on Relationships Between Wildfires and Drought Using Machine Learning

- Angela Chen, William G. Enloe High School, Cary, NC, United States of America

NC State College of Engineering

NC State is home to one of the world's finest colleges of engineering and computer science. NC State Engineering integrates classroom learning, research, and hands-on experience, and our graduates emerge with the skills they need to succeed. Award winners will take part in a week-long pre-selected summer camp, completing hands-on engineering challenges, exploring solutions, and sharing achievements along with other aspiring engineers.

Award to attend NC State Engineering Summer Camp

ENEV052T — Designing a Bioplastic Material to Replace Polystyrene and Polypropylene in Single-Use Hard Plastics that Rapidly Degrades in Landfill, Freshwater, and Saltwater Environments

- Kaitlyn Lee Zuravel, Terry Sanford High School, Fayetteville, NC, United States of America
- Lauren Gail Zuravel, Terry Sanford High School, Fayetteville, NC, United States of America

Office of Naval Research on behalf of the United States Navy and Marine Corps

The Naval Science Awards Program (NSAP) is a U.S. Navy and Marine Corps program that encourages our nation's students to develop and retain an interest in science and engineering. NSAP recognizes the accomplishments of eligible students at regional and state science and engineering fairs, as well as the Regeneron International Science and Engineering Fair (ISEF) in producing and presenting quality science and engineering projects.

The Chief of Naval Research Scholarship Award of \$15,000

EGSD027 — The Computational and Experimental Study of Cellulose in Ionic Liquids and Water for Finding an Optimal Solvent for Biofuel Production

- Nicholas Boyer, North Carolina School of Science and Mathematics, Horse Shoe, NC; United States of America

Sigma Xi, The Scientific Research Honor Society

Founded in 1886, Sigma Xi is the international honor society of research scientists and engineers, with a distinguished history of service to science and society. This multi-disciplinary society includes members who were elected based on their research achievements or potential, and historically, more than 200 members have won the Nobel Prize. The Society is pleased to offer awards for the best demonstration of interdisciplinary research.

First Physical Science Award of \$2,000

ENEV052T — Designing a Bioplastic Material to Replace Polystyrene and Polypropylene in Single-Use Hard Plastics that Rapidly Degrades in Landfill, Freshwater, and Saltwater Environments

- Kaitlyn Lee Zuravel, Terry Sanford High School, Fayetteville, NC, United States of America
- Lauren Gail Zuravel, Terry Sanford High School, Fayetteville, NC, United States of America

Second Physical Science Award of \$1,000

ENBM001T — ARTHETA-0: An Innovative, Affordable Approach to the Onsite, Rapid 3D Printing of Artery Stents, Parameterized to Fit Individual Patients' Needs

- Connor Brannon Mitchell, North Carolina School of Science and Mathematics, Raleigh, NC; United States of America
- Prabuddha Ghosh Dastidar, North Carolina School of Science and Mathematics, Waxhaw, NC; United States of America

Susie and Gideon Yu Awards for Innovation in Sustainability

The Susie and Gideon Yu Awards for Innovation in Sustainability recognizes students whose innovative project focuses on conservation of natural resources and sustainability. It is supported by the Susie and Gideon Yu Foundation. Mr. Gideon Yu of Hillsborough, CA, a 1989 ISEF Grand Award winner in Environmental Sciences. Mr. Yu is a co-owner and former President of the San Francisco 49ers. Mr. Yu is a Trustee of the Monterey Bay Aquarium, and he and his wife Susie are generous donors to anti-poverty programs and scholarship programs.

First Award of \$25,000

PLNT036 — Tropicalization of Temperate Ecosystems: How Climate Change Can Influence

- Regan Williams, John T Hoggard High School, Wilmington, NC, United States of America

Eligible students will not only have completed a well-developed project that is unique and clearly charts new territory, but will also be exceptional at communicating the research and its future implications to judges and to the public.

