
Press Room

Intel ISEF

Intel ISEF 2015 Grand Award winners

11:20AM, May 15, 2015

Intel ISEF 2015 Grand Awards Ceremony

May 15, 2015, Pittsburgh, PA – Society for Science & the Public, in partnership with the Intel Foundation, announced Grand Awards of the Intel ISEF 2015. Student winners are ninth through twelfth graders who earned the right to compete at the Intel ISEF 2015 by winning a top prize at a local, regional, state or national science fair.

The Gordon E. Moore Award

The Gordon E. Moore Award recognizes the Best of the Best among the outstanding students from around the world who participate in Intel ISEF. The finalist with the winning project is selected on the basis of outstanding and innovative research, as well as on the potential impact of the work on the field and on the world at large.

Gordon E. Moore Award \$75,000

ENMC043I Aircraft Cabin Airflow: Curbing Disease Transmission

Raymond Wang, 17, St. George's School, Vancouver, Canada

Intel Foundation Young Scientist Award

These finalists were selected for their commitment to innovation in tackling challenging scientific questions, using authentic research practices, and creating solutions to the problems of tomorrow.

Young Scientist Award of \$50,000

BMED082I Low-Cost Disposable Device for Point-of-Care Nucleic Acid Testing of HIV: Sample-to-Answer in 60 Minutes for Less than \$5.00

Nicole Sabina Ticea, 16, York House School, Vancouver, Canada

ENEV073I International Oil Spill Remediation: The Numerical Simulation of an *in-situ* Subsea Separator, Part II

Karan Jerath, 18, Friendswood High School, Friendswood, Texas

Dudley R. Herschbach SIYSS Award

The SIYSS is a multi-disciplinary seminar highlighting some of the most remarkable achievements by young scientists from around the world. The students have the opportunity to visit scientific institutes, attend the Nobel lectures and press conferences, learn more about Sweden and experience the extravagance of the Nobel festivities. Valid passport required for travel.

CHEM016I **Cavity: Analysis and Application of Nanostructures in Aluminumoxide**

Arne Hensel, 18, Bundespräsident Theodor-Heuss-Schule, Homburg/Efze, Germany

MCRO006I **Proteomic Characterization of Mosquito Host Cell Glycoproteins during Dengue Virus Egress**

Carly Elizabeth Crump, 18, Episcopal School of Jacksonville, Jacksonville, Florida

PLNT018I **Efficient Viral-Mediated Genome Editing Technique In *Tobacco noctiana* and *Arabidopsis thaliana* Model Plants Using CRISPR/Cas9**

Abdul Jabbar Abdulrazaq Alhamood, 18, Dhahran Schools, Dhahran, Saudi Arabia

Innovation Exploration Award

From the first rocket research in 1936, to the first US satellite in 1958, to the many missions to learn about Venus, Neptune, Jupiter and most recently the Mars Curiosity Lander in 2012, the Jet Propulsion Laboratory, California Institute of Technology (Caltech), is a place where science, technology and engineering intermix. JPL produces iconic robotic space explorers sent to every corner of the solar system, helping us discover how the universe, the solar system, and life formed and evolved. JPL was established in 1944 by Caltech, one of the world's premier scientific and technical universities whose mission is to expand human knowledge and benefit society through research integrated with education.

Innovation Exploration Award, California Institute of Technology

EGPH044I **Application of Tetrahedrite and Magnesium Silicide in a Novel Thermoelectric Unicouple to Generate Electricity from Industrial Waste Heat**

Sriharshita Vani Musunuri, 15, Henry M. Jackson High School, Mill Creek, Washington

MATS012I **In-Fiber Emulsification of Biodegradable Polymers for Drug Delivery, Year Two**

Catherine J. Li, 18, Lake Highland Preparatory School, Orlando, Florida

European Union Contest for Young Scientists

Finalists will receive an all-expense-paid trip that enables attendance at the European Union Contest for Young Scientists, located in a new city each year.

Trip to the EU Contest

ANIM062T **A New Method of Silk Sheath Production Developed from Observation of Spinning Behavior of Silkworms**

Thananon Hiranwanichchakorn, 16, Damrongratsongkroh, Muang, Thailand

Nattapong Chueasiritaworn, 15, Damrongratsongkroh, Muang, Thailand

Sutthiluk Rakdee, 15, Damrongratsongkroh, Muang, Thailand

Intel and Indo-US Science & Technology Forum - Visit to India

Finalists will receive an all-expense paid weeklong scientific and cultural exchange visit to India, where they will showcase their research projects presented at this year's Intel International Science and Engineering Fair. The winning finalists will also receive an opportunity to visit research institutions and universities and interact with the key scientific leaders in India.

Travel to India

BCHM045I Rethinking Drug Discovery: New Algorithms for Virtual Drug Screening
Amol Punjabi, 16, Massachusetts Academy of Math and Science, Worcester, Massachusetts

CBIO027T Combating Liver Cancer with DeepMine, a Novel Deep Learning Algorithm
Michael Retchin, 17, Mills E. Godwin High School, Richmond, Virginia
Matthew Retchin, 17, Mills E. Godwin High School, Richmond, Virginia

CELL056I Directed Differentiation of Human Pluripotent Stem Cells into Functional Kidney Cells that Form Nephrons in Kidney Scaffolds
Demetri Maxim, 17, Gould Academy, Bethel, Maine

ENEV073I International Oil Spill Remediation: The Numerical Simulation of an *in-situ* Subsea Separator, Part II
Karan Jerath, 18, Friendswood High School, Friendswood, Texas

Intel Foundation Cultural and Scientific Visit to China Award

The Intel Foundation believes that cultural experiences can help shape and strengthen scientific research and is partnering with the China Adolescents for Science and Technology Organization to award an 11-day trip to the Chinese cities of Beijing, Chengdu and Hong Kong. The winners will attend the China Adolescent Science and Technology Innovation Contest, the largest national science competition in China. They will also have the opportunity to visit the Chengdu Panda Research Base, other science education institutes, research centers, middle schools and universities in China. Finalists will exchange ideas with Chinese scientists and like-minded peers, gaining a better understanding of China's science programs.

Cultural and Scientific Visit to China Award

BEHA040T The Effect of Shape, Weight, and Diameter on Haptic Perception: An Active Haptic Sensing Study of the Predicted and Actual Grip Forces and their Impacts on Weight Detection Thresholds
Sophia Nicole Korner, 16, DuPont Manual High School, Louisville, Kentucky
Diya Mathur, 16, DuPont Manual High School, Louisville, Kentucky

BMED082I Low-Cost Disposable Device for Point-of-Care Nucleic Acid Testing of HIV: Sample-to-Answer in 60 Minutes for Less than \$5.00
Nicole Sabina Ticea, 16, York House School, Vancouver, Canada

EAEV078I Low-cost Heteronanostructure Semiconductor Uses Visible Light Energy to Efficiently Degrade Toxins Threatening Aquatic Life
Joshua Zhou, 16, East Chapel Hill High School, Chapel Hill, North Carolina

EBED042I Gas Analysis Using Ultrasonic
Niklas Fauth, 17, Friedrich-Schiller-Gymnasium, Marbach am Neckar, Germany

EGCH029I Natural Additive-Enhanced Development of Novel All-Solid-State Batteries for Sustainable

and Scalable Energy Storage

Kathy Liu, 16, West High School, Salt Lake City, Utah

ENMC043I Aircraft Cabin Airflow: Curbing Disease Transmission

Raymond Wang, 17, St. George's School, Vancouver, Canada

London International Youth Science Forum - The Philip V. Streich Memorial Award

The London International Youth Science Forum is a two-week program held annually for 300 young scientists from more than 50 countries. LIYSF offers a unique opportunity to participate in an international event attracting science students from around the world. Philip V. Streich was an alumnus of the Intel International Science and Engineering Fair in 2007, earning an Intel Foundation Young Scientist Award, and in 2008. He also earned third place at the Intel Science Talent Search 2009, both programs of the Society for Science & the Public.

Participation in the London International Youth Science Forum

PHYS032I Physical Simulation Based on Bat's Pinna Structure and Its Deformation Binaural Sound Signal Measurement Experiment of Greater Horseshoe Bat

Ruo Chen Hao, 17, Shandong Experimental High School, Jinan, China

ROBO027I Brain-Actuated Robotics: Controlling and Programming a Humanoid Using Electroencephalography

Ava Carmen Lakmazaheri, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

SOFT031I BitAV: Fast Anti-Malware by Distributed Blockchain Consensus and Feedforward Scanning

Charles Noyes, 16, Villa Park High School, Villa Park, California

ANIMAL SCIENCES

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

ANIM062T A New Method of Silk Sheath Production Developed from Observation of Spinning Behavior of Silkworms

Thananon Hiranwanichchakorn, 16, Damrongratsongkroh, Muang, Thailand

Nattapong Chueasiritaworn, 15, Damrongratsongkroh, Muang, Thailand

Sutthiluk Rakdee, 15, Damrongratsongkroh, Muang, Thailand

First Award of \$3,000

ANIM030I Roles of Tribbles in Tumor Formation in *Drosophila melanogaster*

Alexis Sue Allen, 16, Shawnee Mission West High School, Overland Park, Kansas

ANIM062T A New Method of Silk Sheath Production Developed from Observation of Spinning Behavior of Silkworms

Thananon Hiranwanichchakorn, 16, Damrongratsongkroh, Muang, Thailand

Nattapong Chueasiritaworn, 15, Damrongratsongkroh, Muang, Thailand

Sutthiluk Rakdee, 15, Damrongratsongkroh, Muang, Thailand

Second Award of \$1,500

ANIM018I The Food Preference of the Sri Lankan Weevil, *Myloccerus undecimpustulatus undatus* Marshall (Coleoptera: Curculionidae: Entiminae)

Sana Shareef, 14, Saint Edward's Upper School, Vero Beach, Florida

ANIM052T Electroantennogram Assays to Determine *Megacocta cribraria* Response to [E]-2-hexenal, Tridecane, and [E]-2-decenal

Abigail Anne Williams, 17, Brevard Senior High School, Brevard, North Carolina

Carly Onnink, 17, Brevard Senior High School, Brevard, North Carolina

ANIM065I Computational Analysis of Neuronal Chromatin Structure and Nuclear PARP-1 and PAR Expression Provides Novel Marker for Detecting Learning Associated Changes in Mice

Anmolpreet Singh Kandola, 17, Stuyvesant High School, New York, New York

ANIM068I Multiple Generations Beyond "You Are What You Eat": Transgenerational Inheritance of Nutritional Programming of Longevity and Reproduction after Postnatal Dietary Manipulations

Brian Xia, 15, Canyon Crest Academy, San Diego, California

Third Award of \$1,000

ANIM015I Evolution of Nervous System Function and Behavior in a Micro-Vertebrate, the Brahminy Blindsnake (*Ramphotyphlops brahminus*)

River Connell Grace, 15, West Shore Junior-Senior High School, Melbourne, Florida

ANIM027I Effects of Curcumin and Piperine on Embryological Development in *Danio rerio*

Aishwaryya Arivudainambi, 16, Massachusetts Academy of Math and Science, Worcester, Massachusetts

ANIM029I The Effect of Geographic Distance on the Variation in Vocalizations of the Gentoo Penguin, *Pygoscelis papua*, on the Antarctic Peninsula

Andrea Dahl, 15, Olathe North High School, Olathe, Kansas

ANIM040I Alzheimer's and *Drosophila*: Effect of Age on Efficacy of Treatment in a Model System

Elise Nicole Paietta, 17, Carroll High School, Dayton, Ohio

ANIM042I Miticide Microencapsulation: Evaluating the Effect of Microencapsulation of Thymol Miticide Treatments on Honey Bee [*Apis mellifera*] Colonies

Samuel Burton Gostomski, 18, Bandera High School, Bandera, Texas

ANIM054T Factors that Cause the Dietary Anomaly of a Diamondback Terrapin Population (*Malaclemys terrapin*)

Peter Hyung Jun Yoon, 17, Bergen Catholic High School, Oradell, New Jersey

Chang Won Lee, 19, River Dell Regional High School, Oradell, New Jersey

Fourth Award of \$500

ANIM002I Do Prenatal Vitamins Inhibit Cell Growth? The Effects of Butylated hydroxyanisole and Butylated hydroxytoluene on Blastemal Cell Growth and Development

Madison J. Fish, 16, Rutherford High School, Panama City, Florida

ANIM007T The Future of Agriculture

Kyle Douglas Fox, 16, Villages Charter High School, The Villages, Florida

Hayden Fox Siverson, 16, Villages Charter High School, The Villages, Florida

ANIM019I Slaying the "Destructor": The Effectiveness of Alternative Varroa Mite Treatments

Emily Elizabeth Llaneras, 16, Southwest Virginia Governor's School, Pulaski, Virginia

ANIM022I A Novel Approach to the Characterization of *Toxoplasma gondii* Infected Neurons

Tapasya Bhupendra Trivedi, 17, Academy of Tucson High School, Tucson, Arizona

ANIM023T Mg Ions in the Skin Mucus of Anemone Fish Block Nematocyst Discharge of Sea Anemone to Its Symbionts

Kaho Shigematsu, 16, Ehime Prefectural Nagahama High School, Ohzu, Japan

Miho Yamamoto, 16, Ehime Prefectural Nagahama High School, Ohzu, Japan

ANIM026I Effects of Treatment of Reduced Glutathione on Budding and Feeding Rates in *Hydra littoralis*

Asmaa Mahoui, 15, Eman Schools, Fishers, Indiana

ANIM063I Studying the Resilience of Ants through the Effects of Food in an Ant Colony's Environment

Robert Donald Phillips, 17, Musselman High School, Inwood, West Virginia

ANIM064I A Novel Procedure to Predict a Hypothetical-Population Growth Using an Evolved Diet Strain of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) and Its Potential Application to Other Pests of Genetically Modified Organisms

Manuela Jojoa-Portilla, 18, Home School, Cleveland, Mississippi

BEHAVIORAL AND SOCIAL SCIENCES

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

BEHA040T The Effect of Shape, Weight, and Diameter on Haptic Perception: An Active Haptic Sensing Study of the Predicted and Actual Grip Forces and their Impacts on Weight Detection Thresholds

Sophia Nicole Korner, 16, DuPont Manual High School, Louisville, Kentucky

Diya Mathur, 16, DuPont Manual High School, Louisville, Kentucky

First Award of \$3,000

BEHA031I The Mapping of Emotional Dimensions: Toward a Neuro-Thermal Biometric System for the Diagnosis of Emotional Flexibility

Michelle Marie Marquez, 16, Mathematics and Science High School at Clover Hill High School, Midlothian, Virginia

BEHA040T The Effect of Shape, Weight, and Diameter on Haptic Perception: An Active Haptic Sensing Study of the Predicted and Actual Grip Forces and their Impacts on Weight Detection Thresholds

Sophia Nicole Korner, 16, DuPont Manual High School, Louisville, Kentucky

Diya Mathur, 16, DuPont Manual High School, Louisville, Kentucky

Second Award of \$1,500

BEHA006I Analysis of Peripheral Vision to Aid the Reading Process in Patients with Macular Degeneration

Noopur Ranganathan, 16, Trinity Preparatory School, Winter Park, Florida

BEHA024I Measuring Passive Smoking Effects on Children through Saliva Samples

Shaima Lutfi Al-Sharif, 15, Dur Al-Manthur, Amman, Jordan

BEHA053I Grid Based Learning Environment: A Tangible User Interface for the Blind and Visually Impaired, Phase Two

Sara Manshad, 16, Arrowhead Park Early College High School, Las Cruces, New Mexico

Third Award of \$1,000

BEHA010T The Effect of Multitasking on Reading Comprehension in Teens

Colter Norick, 17, Columbia Falls High School, Columbia Falls, Montana

Colin Norick, 16, Columbia Falls High School, Columbia Falls, Montana

BEHA013I A Novel Animal Model to Replicate Alcohol-Seeking Behavior in Humans

Ajitha Mallidi, 16, Westview High School, Portland, Oregon

BEHA035I The Correlation Between Level of Self-determination and Severity of Post-traumatic Stress Disorder in Veterans

Dorothy Grace Smith, 17, Spring Valley High School, Columbia, South Carolina

BEHA036I Growing Pains: Long-Term Effects of Physical Activity and Sleep Patterns on Adolescent Health

Grace W. Hwang, 17, Hershey High School, Hershey, Pennsylvania

BEHA038I Nomophobia: Effects of Smartphone Dependence and Separation on Stress, Anxiety, Memory and Cognition in Developing Adolescent Brain

Kashfia Nehrin Rahman, 14, Brookings High School, Brookings, South Dakota

Fourth Award of \$500

BEHA009T Capacity Limits of Working Memory: The Impact of Multitasking on Cognitive Control in Digital Natives and Digital Immigrants

Alexandra Ulmer, 18, Oregon Episcopal School, Portland, Oregon

Sarayu Caulfield, 17, Oregon Episcopal School, Portland, Oregon

BEHA015I Identification of MEG Biomarkers for Schizophrenia and Its Subtypes

Frank Wang, 18, Troy High School, Troy, Michigan

BEHA028I Game Theoretic Model of Genetic Discrimination

Margaret Caroline Steiner, 17, Academy of Science and Technology, The Woodlands, Texas

BEHA039I Is Stress the New Drug? An Analysis on the Effects of Stress on the Prefrontal Cortex and the Addicted Brain

Lila Mish, 16, American Heritage School of Boca Delray, Delray Beach, Florida

BEHA050I A Novel Calculation of Localized US Congressional Shortest Split Line Districts and Its Implications

Jack Tyler Robbins, 17, Syosset High School, Syosset, New York

BEHA054I The Effect of Bilingualism on the Multitasking Ability of Adolescents

Sarah Emma Vicol, 16, High Technology High School, Lincroft, New Jersey

BEHA058I Craniometrix: Using Sensory Dissonance to Identify Cognitive Decline, Year Three

Nikhil Sanjay Patel, 15, Oviedo High School, Oviedo, Florida

BIOCHEMISTRY

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

BCHM045I Rethinking Drug Discovery: New Algorithms for Virtual Drug Screening
Amol Punjabi, 16, Massachusetts Academy of Math and Science, Worcester, Massachusetts

First Award of \$3,000

BCHM045I Rethinking Drug Discovery: New Algorithms for Virtual Drug Screening
Amol Punjabi, 16, Massachusetts Academy of Math and Science, Worcester, Massachusetts

Second Award of \$1,500

BCHM014T Counteracting Pb²⁺ Induced Neurodegeneration: A Chemical and Genetic Approach towards Enhanced Synaptic Plasticity

Jason Christopher Fiacco, 17, Manhasset High School, Manhasset, New York
Kevin Sadhu, 17, Manhasset High School, Manhasset, New York

BCHM031I The Role of Extracellular Nuclear Factor-Erythroid Derived Protein 2 (NF-E2) as a Danger Associated Molecular Pattern (DAMP) Released during Acrolein Induced Renal Fibrosis

Sanjana J. Rane, 17, DuPont Manual High School, Louisville, Kentucky

BCHM032I Toward a Novel Treatment for Corneal Scarring: Establishing the Roles of TRPV1 and TGF- β 1 in the Fibroblast-to-Myofibroblast Differentiation

Abrar Ali Nadroo, 17, Syosset High School, Syosset, New York

Third Award of \$1,000

BCHM018I Treating Alzheimer's Disease: New Proposal for Grayanotoxin Ligand Binding to the Carbonic Anhydrase I Receptor

Nandini Tondamantham Naidu, 14, Valley Catholic High School, Beaverton, Oregon

BCHM021I Investigating the Protective Effects of Interleukin 22 on Intestinal Epithelium: Potential Graft-versus-Host Disease Treatment

Juliet Adela Ivanov, 17, Ossining High School, Ossining, New York

BCHM036I Naturalistic Painkillers: Design, Synthesis, and Biological Evaluation of Novel Fatty Acid Binding Protein Inhibitors

Glenn Yu, 17, Hunter College High School, New York, New York

BCHM038I A Novel Peptide Alters the Alzheimer's Beta-amyloid Equilibrium to Protect Against AB Oligomer Neurotoxicity

Yinge Zhao, 17, The Dalton School, New York, New York

Fourth Award of \$500

BCHM015I Elucidating the Molecular Mechanisms of Arrhythmogenesis

Kushal Tushar Kadakia, 18, Clear Lake High School, Houston, Texas

BCHM016I Competitive Inhibition of DNA Polymerase by XNA Nucleosides

Edward Sangyoon Kim, 15, Midway High School, Waco, Texas

BCHM020I Interrogating Ras Function with Protein Mimetics

Rebecca Natasha Freed, 17, Governor Thomas Johnson High School, Frederick, Maryland

BCHM024I Squashing the Superbug: Discovery of Irreversible SrtA Inhibitors as Potential Antibacterial Drugs using a Novel Computational Drug Design Workflow

David M. Lu, 17, Mills E. Godwin High School, Henrico, Virginia

BCHM047T Investigating Agar Extraction as a Method of *Gracilaria salicornia* Eradication

Amber Kukuileiwilimomi Afelin, 16, Molokai High School, Ho'olehua, Hawaii

Keaaokahonua Davis, 16, Molokai High School, Ho'olehua, Hawaii

Alexandria H Simon, 16, Molokai High School, Ho'olehua, Hawaii

BIOMEDICAL AND HEALTH SCIENCES

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

BMED082I Low-Cost Disposable Device for Point-of-Care Nucleic Acid Testing of HIV: Sample-to-Answer in 60 Minutes for Less than \$5.00

Nicole Sabina Ticea, 16, York House School, Vancouver, Canada

First Award of \$3,000

BMED041I A Novel Synergistic Approach for Enhancing Immunotherapy in the Treatment of Melanoma

Emily Lorin Ashkin, 17, Providence Day School, Charlotte, North Carolina

BMED055I Temperature-Independent, Portable, and Rapid Field Detection of Ebola via a Silk-Derived Lateral-Flow System

Olivia Anne Hallisey, 16, Greenwich High School, Greenwich, Connecticut

BMED072I Development of a Novel Oncolytic Virus for Cancer Treatment and Diagnosis

Aditya Anand Mohan, 18, Colonel By Secondary School, Ottawa, Canada

BMED082I Low-Cost Disposable Device for Point-of-Care Nucleic Acid Testing of HIV: Sample-to-Answer in 60 Minutes for Less than \$5.00

Nicole Sabina Ticea, 16, York House School, Vancouver, Canada

Second Award of \$1,500

BMED048I Identification and Characterization of a Rare Subpopulation with Cancer Stem Cell Properties in Lung Cancer

Joy Qiu Jin, 17, Henry M. Gunn High School, Palo Alto, California

BMED054I Chocolate's Theobromine, and Not Caffeine, Significantly Reduces Sleep in *Drosophila*
Reid W. Radulovacki, 16, Greenwich High School, Greenwich, Connecticut

BMED059I The Ebola Epidemic in West Africa: Developing a Transmission Model to Compare the Effectiveness of Interventions

Jeremy Philip D'Silva, 16, Father Gabriel Richard High School, Ann Arbor, Michigan

BMED074I Development of a Nanoparticle for Targeted Antigen Delivery as a Therapeutic Vaccination Platform

Amit Scheer, 16, Colonel By Secondary School, Ottawa, Canada

BMED094I Identification of DDR2 as a Critical Molecule in Breast Cancer Stem Cells

Jason Wu, 15, Cranbrook Kingswood School, Bloomfield Hills, Michigan

BMED108I Novel Treatment Strategy for Chronic Lymphocytic Leukemia: Malignant B1 Cell Depletion via Siglec-10 Stimulation

Jaison Jain, 16, Hunter College High School, New York, New York

BMED109I Myocardial Regeneration Potential of Human Induced Pluripotent Stem Cell-Derived Cardiomyocytes

Zheng Yan, 17, Brookfield Central High School, Brookfield, Wisconsin

BMED130I Novel Method of Circulating Prostate Tumor Cell Separation Using Adhesion Rolling in a Micropatterned, Microfluidic Device

Roy Ghosh, 15, Parkland High School, Allentown, Pennsylvania

Third Award of \$1,000

BMED001I Synergetic Action of a Natural Antiviral

Helyson Lucas Bezerra Braz, 19, Instituto Federal de Educacao, Ciencia e Tecnologia do Ceara - Campus Limoeiro do Norte, Limoeiro do Norte, Brazil

BMED038T Pressure and Blood Flow Regulating System Inside an Orthopedic Cast

Betty Shamaev, 17, Ort Greenberg Kiryat Tivon, Kiryat Tivon, Israel

May Shoshan, 17, Ort Greenberg Kiryat Tivon, Kiryat Tivon, Israel

BMED052T Hypoxic-Ischemic Cerebral Cell Deaths & Locomotory-Cognitive Damage Mitigation Using Squid (*Thysanoteuthis rhombus*) Waste Integument Constituent: Simulated Non-Arrhythmia-Inducing Mortal Stroke Evolution Disruption

Kenneth Michael Angelo Natividad Antonio, 14, Bayugan National Comprehensive High School, Bayugan City, Philippines

Marian Romero Cabuntocan, 16, Bayugan National Comprehensive High School, Bayugan City, Philippines

Thea Marie Laquinta Tinaja, 16, Bayugan National Comprehensive High School, Bayugan City, Philippines

BMED062I Using Electromyographic Technology and Voice Control to Create a Cost-Effective Prosthetic Arm

Nilay Mehta, 17, Irvine High School, Irvine, California

BMED067I Tumor Cell Streaming towards Blood Vessels in the Metastatic Cascade Is Mediated by Endothelial Cell-Secreted Hepatocyte Growth Factor

Alice Xue, 16, Pelham Memorial High School, Pelham, New York

BMED081I Stop the Bleeding! Discovery of a Novel Hemostatic Agent

Deena S. Mousa, 16, Emma Willard School, Troy, New York

BMED092I Gold and Silver Nanoparticles for Skin Cancer Chemoprevention and Therapy

Rohan Palanki, 18, WP Davidson High School, Mobile, Alabama

BMED097I A Novel Use of Valeryl Salicylate in the Inhibition of CML Cell Proliferation

Nicole Marie Eskow, 18, Academy for the Advancement of Science and Technology, Hackensack, New Jersey

BMED117I A Handheld Hematology Analyzer Using Acoustic Enhanced Blood Smear Devices

Vick Cheung Liu, 17, Flintridge Preparatory School, La Cañada Flintridge, California

BMED128I Detecting Early Stage Metastatic Breast Cancer: A Novel Approach to the Engineering of a Gold Nanorod Based Point-of-Care Biosensor

Grace Katherine Ranft-Garcia, 16, STEM Academy at Robert E. Lee, San Antonio, Texas

BMED133I WUBEE: An Autism Destroying Avatar

Sapna K. Patel, 14, Oviedo High School, Oviedo, Florida

BMED147I Using the Ketone Body Beta-hydroxybutyrate as a Radiosensitizer for Malignant Glioma Cells

Alex Patrick Rossi, 16, Paradise Valley High School, Phoenix, Arizona

Fourth Award of \$500

BMED007I Clinical Accuracy of Non-Invasive Glucose Monitoring for Ex-Vivo Artificial Pancreas

Maya Miriam Levy, 15, Dr. Michael M. Krop Senior High School, Miami, Florida

BMED027I Gelatin and Hyaluronic Acid Nanoparticle Based Delivery of miR-34a for Treatment of Pancreatic Cancer

Michelle Elisabeth Marie Campeau, 17, Mayo High School, Rochester, Minnesota

BMED031I The Effects of Taurine on Memory Retention in *D. dorotocephala*

Mariam Eman Dogar, 16, Massachusetts Academy of Math and Science, Worcester, Massachusetts

BMED045I Quantitative Usage of a Novel Bioelectronic Chip for Noninvasive, Versatile Cancer Diagnosis

Venkata Viswajit Macha, 17, Loveless Academic Magnet Program High School, Montgomery, Alabama

BMED053I Targeting the MCF-7 Breast Cancer Oestrogen Receptor Cells via Silver Nano-Particle Linked Doxorubicin and Tamoxifen Drugs

Abdulaziz Yahya Alshahrani, 16, Alareen School, Abha, Saudi Arabia

BMED065I It's a Matter of Life and Breath: A Novel Computer Diagnosis Tool for Early Detection of Lung Cancer SPNs towards Big Data Analysis

Aditya Jain, 15, Westview High School, Portland, Oregon

BMED073I miRNAs as Biomarkers of IAPP-induced Inflammation in Type 2 Diabetes

Janice Pang, 17, Pinetree Secondary School, Coquitlam, Canada

BMED085I High Content Analysis and Targeting Cancer-Specific Pathway in Three Dimensional Breast Cancer Tumor Spheroids

Arjun Jay Arora, 17, William G. Enloe High School, Raleigh, North Carolina

BMED090I Artificial Injectable Bone: A Regenerative Stem Cell Treatment for Osteoporosis and Bone Fracture Healing through an Injectable Nanocomposite Orthopedic Implant and Dynamic Ultrasound Radiation

Vaishnavi Shrivastava, 18, Mission San Jose High School, Fremont, California

BMED091I The Metalloprotease Inhibitor, 1, 10 Phenanthroline, as a Lead for Finding Drugs to Kill Brugia pahangi Worms

Matthew Moser, 16, Redwood High School, Larkspur, California

BMED118I Lepto-my-Cells: Effect of Leptomycin-B on Human Embryonic Kidney Cancer Cell (HEK-293) Proliferation Melissa Lu, 15, The Study, Westmount, Canada

BMED120I Characterization of Vascular Responses to Mechanically Induced Continuous Flow Patterns in Bovine Models Sumanth Chennareddy, 17, DuPont Manual High School, Louisville, Kentucky

BMED129I Single Cell Suspension and the Production of Factor VIII and Dilution Viability in Transfected Chinese Hamster Ovarian Cells

Jessica Moore, 15, Union Grove High School, McDonough, Georgia

BMED135I The Pharmacological Potential of Apigenin and Diosmetin as a Novel Treatment for Chronic Lymphedema

Catharine Bowman, 16, St. Mary Secondary School, Hamilton, Canada

BMED143I VH subfamily usage: Identifying a biomarker of autoimmunity in schizophrenia

E. Madeline Rose Fagen, 17, Paul D. Schreiber Senior High School, Port Washington, New York

BMED151I Engineered Intraocular Injection Guide (IIG): Pain Reduction in Ophthalmic Disease Treatment

Vikas Rammohan Maturi, 17, Carmel High School, Carmel, Indiana

CELLULAR AND MOLECULAR BIOLOGY

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

CELL056I Directed Differentiation of Human Pluripotent Stem Cells into Functional Kidney Cells that Form Nephrons in Kidney Scaffolds

Demetri Maxim, 17, Gould Academy, Bethel, Maine

First Award of \$3,000

CELL048I Identification and Characterization of a Novel Immune Response against AIDS Virus

Reesab Pathak, 17, Camas High School, Camas, Washington

CELL056I Directed Differentiation of Human Pluripotent Stem Cells into Functional Kidney Cells that Form Nephrons in Kidney Scaffolds

Demetri Maxim, 17, Gould Academy, Bethel, Maine

Second Award of \$1,500

CELL012I The Importance of Endocytosis to Neuregulin1 Back Signaling: Implications in Neuropsychiatric and Neurodegenerative Disorders

Scott Massa, 17, Commack High School, Commack, New York

CELL023I Zip1 C-terminal Phosphorylation Promotes Zip1-Sgs1 Interaction in Meiotic Cells

Jay Wolf Zussman, 17, William A. Shine Great Neck South High School, Great Neck, New York

CELL049I Examining the Role of IL-2 Receptor Mediated Signaling in *Alopecia areata*

Yi Hua Chen, 16, Bronx High School of Science, Bronx, New York

Third Award of \$1,000

CELL007I High Throughput AD Drug Screening of Alpha-Secretase Activity Modulators as a Novel Model for Alzheimer's Disease

Morni A. Modi, 18, Caddo Parish Magnet High School, Shreveport, Louisiana

CELL019I The Role of Syk Protein Kinase in Stress Granule Dynamics of Cancer Cells

Sarah Elizabeth Cooper, 18, Lafayette Jefferson High School, Lafayette, Indiana

CELL026I Understanding the Effects of siRNA Knockdown of ErbB Receptors on GGF2 Signaling Potency

Evan Lloyd Caracta Cain, 17, Dobbs Ferry High School, Dobbs Ferry, New York

CELL036I Effect of Antioxidant Supplements on Human Cancers: Novel Observation on Expression Profiles of Intronic RNA

Shreya Menon, 17, Skyline High School, Ann Arbor, Michigan

CELL057I Modulation of Macrophage Phenotype Using Nanoparticle-Delivered Gene Therapy for Treatment of Inflammatory Diseases

Ruchir Rastogi, 17, Loveless Academic Magnet Program High School, Montgomery, Alabama

Fourth Award of \$500

CELL003I PEA-15 Regulates Cell Migration in Glioblastoma via Integrin Trafficking

Maveric Abella, 17, Kamehameha Schools Kapalama, Honolulu, Hawaii

CELL008T Using Comparative Genomic Hybridization to Identify Unique Mutation in Duchenne Muscular Dystrophy Patients in Saudi Arabia

Refal Mowaffaq Bougis, 16, The 30th Secondary School, Maakkah, Saudi Arabia

Renad Mowaffaq Bougis, 17, The 30th Secondary School, Makkah, Saudi Arabia

CELL014I Mitochondrial Protein CYP11A1 Changes Mitochondrial Morphology

Siang-Yun Lee, 17, Taipei First Girls' High School, Taipei, Taiwan

CELL031I The Role of Transcription Factor Pax6 in Maintenance of Pancreatic Beta Cell Identity

Noa Eden, 18, Mae Boyer High School, Jerusalem, Israel

CELL032I *Drosophila*: A New Model for Studying Nuclear Actin

Sweta Sudhir, 17, John F. Kennedy High School, Cedar Rapids, Iowa

CELL039I Cloning and Sequencing of the Lacc2 Laccase Gene from the Ligninolytic *Basidiomycete Pleurotus ostreatus*

Srinath Vijay Seshadri, 15, Village Academy, Powell, Ohio

CHEMISTRY

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

CHEM016I Cavity: Analysis and Application of Nanostructures in Aluminumoxide

Arne Hensel, 18, Bundespräsident Theodor-Heuss-Schule, Homburg/Efze, Germany

First Award of \$3,000

CHEM016I Cavity: Analysis and Application of Nanostructures in Aluminumoxide

Arne Hensel, 18, Bundespräsident Theodor-Heuss-Schule, Homburg/Efze, Germany

CHEM031I Synthesizing and Utilizing Difluoromethyl- & Trifluoromethyl- Artemisinin to Interrupt the Life Cycle of Malaria Parasites, Year III

Shreya Sundaresh Ramayya, 17, Palos Verdes Peninsula High School, Rolling Hills Estates, California

Second Award of \$1,500

CHEM021I Formation of Poly(3-hydroxybutyrate) Inclusion Compounds with Urea and Thiourea

Pavithran T. Ravindran, 17, W. Tresper Clarke High School, Westbury, Albania

CHEM037I Comparative Studies of Gold Nanoparticles as Chemical Sensing Materials: Electronic Tongue vs. Electronic Nose, Year Three

Seung Hye (Beatrice) Choi, 16, University High School - Fresno, Fresno, California

CHEM065I Design and Synthesis of a Novel Biosensor Platform for Health Diagnostics

Ruchi Sandeep Pandya, 18, Lynbrook High School, San Jose, California

CHEM073T Development of a Novel Radiation Shielding Material

Seyit Alp Herdem, 19, Isiklar Air Force High School, Bursa, Turkey

Tahsin Elmas, 19, Isiklar Air Force High School, Bursa, Turkey

Third Award of \$1,000

CHEM011I A Novel 3D Polymeric Nanoparticle Network for Detecting and Remediating Trace Level Toxic Free Radicals (Propagators and Precursors of Chronic and Degenerative Diseases)

Arnob Das, 15, Jesuit High School, Portland, Oregon

CHEM024I Color Change of Copper Foil by Oxide Thin Layer Formation

Naohiro Kadoguchi, 16, Miyagi Sendai Daisan High School, Sendai, Japan

CHEM043I Novel Design of Water Soluble Porphyrin Containing Supramolecular Complex Nanoparticles for Enhanced Photodynamic Cancer Therapy

Swetha Vanathy Shutthanandan, 17, Richland High School, Richland, Washington

CHEM046T A Novel Analysis Utilizing Invasive Fermented Macroalgae

Ariana Kim, 17, Saint Andrew's Priory, Honolulu, Hawaii

Sreelakshmi Kutty, 17, Saint Andrew's Priory, Honolulu, Hawaii

CHEM064T Dye-sensitized Chlorophyll Solar Cells Using Crude Chlorophyll Extract Coupled with Natural Cysteine-assisted Ag/Ppy Ion Carriers and Water Electrolyte

Yat Ho Chu, 18, King's College, Central and Western District, China, Hong Kong Special Administrative Region

Tsz Fung Yip, 18, King's College, Central and Western District, China, Hong Kong Special Administrative Region

Shing Huk David Iu, 17, King's College, Hong Kong, China, Hong Kong Special Administrative Region

CHEM075I Reduction of Carbon Dioxide using a Novel Electrochemical Method with Antimony and Lithium Doped Tin Dioxide Nanoparticles

Nikhil Murthy, 15, Catlin Gabel School, Portland, Oregon

Fourth Award of \$500

CHEM002I Engineering an Upconversion Photocatalyst for Energy and Environmental Applications

Vignesh Chandra Bhethanabotla, 16, C. Leon King High School, Tampa, Florida

CHEM008T Obtention of Detergent Solution for Organ's Decellularization Process

Vitoria Muller Gerst, 17, Fundacao Escola Tecnica Liberato Salzano da Cunha, Novo Hamburgo, Brazil

Gabriela Bronca Lopes, 18, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Brazil

CHEM022T Synthesis of Cu₂O/CuO Nanomaterials for Enzymeless Amperometric Detection of Glucose

Lin-Jia Wang, 17, Taipei First Girls High School, Taipei, Taiwan

I-Hsuan Lin, 16, Taipei First Girls High School, Taipei, Taiwan

CHEM033T Measurement of Radon Emanation and Its Correlation with Indoor Radon Levels in Some Areas of Mallow

Caoimhe Marie Cronin, 15, St.Mary's Secondary School, Cork, Ireland

Shauna Murphy, 14, St.Mary's Secondary School, Cork, Ireland

CHEM045I Correlating the Bandgaps of Earth-Abundant Metal Oxides to Photocurrent Generation for Water Splitting Applications

Jennifer Anne McCleary, 18, Arnold O. Beckman High School, Irvine, California

CHEM061I Metal-free "Click" Chemistry for the Development of Peptide-based Biomaterials

Claudia Lee, 18, Raffles Institution, Singapore, Singapore

CHEM068I Poly(oximinoalkyl)amines as a New Type of Ligands for Copper-Accelerated Azide-Alkyne Cycloaddition

Daniil Agababyan, 17, Moscow Chemical Lyceum No. 1303, Moscow, Russian Federation

CHEM074I Photoelectrochemical Properties of 2-D Transition Metal Dichalcogenides(TMDCs) Functionalized with Porphyrins

Arjun Srinivasan Ramani, 16, West Lafayette Junior Senior High School, West Lafayette, Indiana

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS

Intel ISEF Best of Category Award of \$5,000

CBIO027T Combating Liver Cancer with DeepMine, a Novel Deep Learning Algorithm

Michael Retchin, 17, Mills E. Godwin High School, Richmond, Virginia

Matthew Retchin, 17, Mills E. Godwin High School, Richmond, Virginia

First Award of \$3,000

CBIO027T Combating Liver Cancer with DeepMine, a Novel Deep Learning Algorithm

Michael Retchin, 17, Mills E. Godwin High School, Richmond, Virginia

Matthew Retchin, 17, Mills E. Godwin High School, Richmond, Virginia

CBIO034I Enabling Precision Medicine with Big Data: A Cross-Platform Framework to Computationally Characterize Gene Presence and Function

Swetha Revanur, 16, Evergreen Valley High School, San Jose, California

Second Award of \$1,500

CBIO017I An Integrated Electronic Medical Dispensing, Diary and Locator Device to Support Memory Impaired Independent Living

Christopher Carragher, 18, Our Lady's Secondary School Castleblayney, Castleblayney, Ireland

CBIO035T Systematic Rational Identification of Sex-Linked Molecular Alterations and Therapies in Cancer

Sadhika S. Malladi, 17, The Harker School, San Jose, California

Jonathan QuanXuan Ma, 16, The Harker School, San Jose, California

CBIO060I A Novel Computational Method for Subdividing Hepatocellular Carcinoma Patients into Uniquely Treatable Clusters

Axel Stephan Feldmann, 18, Hunter College High School, New York, New York

Third Award of \$1,000

CBIO019I Computer-Aided Diagnosis of Heart Allograft Rejection Using Graph-Based Features

Ian Yiran Huang, 16, International School of Beijing, Beijing, China

CBIO032I Picture This: A Novel Approach to Limb Donor Matching, Prosthetic Design and Bone Allografts

Daniel McInnis, 17, St. Francis Xavier Catholic High School, Ottawa, Canada

CBIO037I Novel Application of Microwave Power Transfer for the Recharging of Batteries in Biomedical Devices

Daniel Lewis Magley, 17, North Carolina School of Science and Mathematics, Durham, North Carolina

CBIO044I Discrete Markov Chains: A Novel Approach to Tumor Angiogenesis

Dibya Jyoti Ghosh, 17, California High School, San Ramon, California

CBIO056I Implementation of a Machine Learning Tool for Better Resistance Prediction in Acute Myeloid Leukemia

Mahalaxmi Elango, 16, Interlake High School, Bellevue, Washington

Fourth Award of \$500

CBIO001I The Effect of Cholesterol on Biological Membranes

Michaela Kajsova, 19, Gymnazium Zlin - Lesni Ctvrt, Zlin, Czech Republic

CBIO006I Computer Input and Therapy for the Physically Impaired

Isaiah James Croatt, 18, Jackson County Central High School, Jackson, Minnesota

CBIO007I A Novel Coevolution Data-based Approach for Computational Drug Design to Target Intrinsically Disordered Proteins

Niranjan Balachandar, 18, Texas Academy of Mathematics and Science, Denton, Texas

CBIO018I Prognostic and Diagnostic Measure for Circuit Disruption in Alzheimer's Disease

Kacey Renay Price, 18, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia

CBIO024I Automatic Detection of Vascular Lesions of the Retina Using a Localized Adaptive

Thresholding Approach

Elina Kapoor, 17, Winston Churchill High School, Potomac, Maryland

CBIO026I Utilizing Cardiac and Pulmonary Function with Piezoelectricity to Power a Cardiac Pacemaker

Isuru Ashan Somawardana, 16, Keystone School, San Antonio, Texas

EARTH AND ENVIRONMENTAL SCIENCES

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

EAEV078I Low-cost Heteronanostructure Semiconductor Uses Visible Light Energy to Efficiently Degrade Toxins Threatening Aquatic Life

Joshua Zhou, 16, East Chapel Hill High School, Chapel Hill, North Carolina

First Award of \$3,000

EAEV009T

March of the Molokai Mangrove: The Socio-Economic and Ecological Impacts of Introduced Red Mangrove (*Rhizophora mangle*) on Molokai, Hawaiian Islands

Sarah 'Alohilani Jenkins, 17, Molokai High School, Ho'olehua, Hawaii

Lily Nalulani Jenkins, 15, Molokai High School, Ho'olehua, Hawaii

EAEV049I Rice Straw Power

YasmineYehya Moustafa, 17, Maadi STEM School for Girls, Zahraa Elmaadi, Egypt

EAEV078I Low-cost Heteronanostructure Semiconductor Uses Visible Light Energy to Efficiently Degrade Toxins Threatening Aquatic Life

Joshua Zhou, 16, East Chapel Hill High School, Chapel Hill, North Carolina

Second Award of \$1,500

EAEV016I Bioassay Determination of Environmentally Safe Levels of Atenolol, Carbamazepine, and Ibuprofen in Waterways

Cassidy Ryan, 18, Notre Dame Academy, Park Hills, Kentucky

EAEV047I A Method for Identifying the Photoproducts, Mechanisms, and Toxicity of Petroleum from the Deepwater Horizon by High-Performance Liquid Chromatography and DNPHi Derivatization

Keiana Ashli Cave, 17, Lusher Charter High School, New Orleans, Louisiana

EAEV052I Combating Jellyfish Blight: A Novel Usage of Chondroitin Sulfate within Trashed Jellyfish to Adsorb Heavy Metal Pollutants

Sun Woo Kang, 17, Cheongshim International Academy, Seoul, South Korea

EAEV068I Improving the Carbon Use Efficiency of Soil Microbial Communities: A Field Testing and Modelling Approach

Jarek Kwiecinski, 15, Albuquerque Institute of Math and Science, Albuquerque, New Mexico

EAEV071I **Instantaneous and Cost-Effective Bacterial Counts using Copper Oxide Nanocomposites**
Maya Rao, 18, Hempfield High School, Landisville, Pennsylvania

Third Award of \$1,000

EAEV008I **Hohonukai: An Environmental Study of Hawaii's Marine Biota Using Underwater Time-Lapse Photography**

Christopher James Lindsay, 16, Iolani School, Honolulu, Hawaii

EAEV019I **Water You Drinking? Development of a Novel Filter Utilizing Nanotechnology and Porous Materials to Remove Bacteria and Heavy Metals from Polluted Water for Third World Country and Military Applications**

Raashi Thakkar, 16, Texas Academy of Mathematics and Science, Denton, Texas

EAEV027I **Design, Construction and Optimization of a Low-Cost Portable Enterococci Test (PET) Kit**

Margaret Parrish, 16, Chamberlain High School, Tampa, Florida

EAEV031T **Comparative Analysis between Carboxymethyl Cellulose and Activated Carbon through Sedimentation and Ultrafiltration for the Removal of Metallic Ions from Industrial Wastewater**

Santiago Maria Calderon Novoa, 17, Escola Americana de Campinas, Campinas, Brazil

Diana Marie Sieh, 16, American School of Campinas, Campinas, Brazil

EAEV032I **Landslide Forecasting: Contour Shape as a Major Factor in Slope Failure**

Ihiro Endo, 17, Miyagi Prefectural Sendai Daini Senior High School, Sendai-city, Japan

EAEV057I **Physiological and Behavioral Impacts of a Neonicotinoid Insecticide and Its Transformation Product on a Non-Target Keystone Species**

Aishah Isabelle Ahmed, 17, Port Huron Northern High School, Port Huron, Michigan

EAEV058I **H₂O_h No: Pharmaceuticals Contaminate Groundwater! Sulfamethazine Adsorption Isotherms and Kinetics with Hypercrosslinked Polymer MN250 at Varying Ionic Strengths**

Maria Elena Grimmatt, 16, Oxbridge Academy of the Palm Beaches, West Palm Beach, Florida

EAEV073I **The Effect of the Atlantic Ocean on Polar Vortex Weakening**

Jesse Tan Zhang, 17, Fairview High School, Boulder, Colorado

Fourth Award of \$500

EAEV001T **SOS Drought: Seeding Life through Low Cost Catchment and Desalination Systems in Semi Arid Region**

Maria Vanessa Oliveira Teodosio, 17, Escola Estadual De Educacao Profissional Julio Franca, Bela Cruz, Brazil

Fatima Natanna de Miranda, 17, Escola Estadual De Educacao Profissional Julio Franca, Bela Cruz, Brazil

EAEV026I **The Viability of a Mixed Bacterial Culture for Bioremediation of Heavy Metals, Poly-Cyclic Hydrocarbons, and Volatile Organic Compounds**

Ambria Benesch, 18, Niles North High School, Skokie, Illinois

EAEV046I **The Effect of Pollution on the Number of Tardigrada in Lichen and Moss**

Sonja Rose Stevenson, 15, Mount Ogden Junior High School, Ogden, Utah

EAEV048I **Patination of Raw Lithic Materials for Analysis of Prehistoric Artifacts**

Emily Cross, 15, Hammarskjold High School, Thunder Bay, Canada

EAEV059I ***Rhizophora Mangle* as a Marker of the Contamination of an Estuary System**

Natalia Angelica Asenjo-Molina, 16, Academia Perpetuo Socorro, San Juan, Puerto Rico

EAEV063I The Effect of an Elevated pCO₂ Level on the Protein Expression of the Pacific Oyster *Crassostrea gigas*

Nidhi Kumar, 16, Science, Math, and Technology Center at Mills E. Godwin High School, Henrico, Virginia

EAEV064I Modeling and Analyzing Melting Arctic Sea Ice with Percolation Theory

Anthony Lu Cheng, 16, Hillcrest High School, Midvale, Utah

EAEV067I Searching for an Ally: Investigating the Effects of Thiamethoxam on *Podisus maculiventris* for Possible Integrated Pest Management, Year Three

Ashley Suzanne Wyrick, 17, Tuscumbia High School, Tuscumbia, Missouri

EAEV074I Identifying and Remediating the Sources of Pollution in Impaired Bangor Streams

Paige Elizabeth Brown, 16, Bangor High School, Bangor, Maine

EAEV083I Can Bacteria Effectively Reduce the Toxicity of Mine Drainage?

Harold Joseph Carrigan, 17, Basha High School, Chandler, Arizona

EMBEDDED SYSTEMS

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

EBED042I Gas Analysis Using Ultrasonic

Niklas Fauth, 17, Friedrich-Schiller-Gymnasium, Marbach am Neckar, Germany

First Award of \$3,000

EBED018I Magnetic Positioning Sphere: A Single-Source 3D Positioning System using Rotating Magnetic Fields

Wei-Tung Chen, 16, Taipei Municipal Jianguo High School, Taipei City, Taiwan

EBED042I Gas Analysis Using Ultrasonic

Niklas Fauth, 17, Friedrich-Schiller-Gymnasium, Marbach am Neckar, Germany

Second Award of \$1,500

EBED026I Design and Construction of a Scalable Active Battery Management System for Electric and Hybrid Electric Vehicles

Drew Andrew Prevost, 17, Covenant Christian Academy, Huntsville, Alabama

EBED044I The Exchange iMproving Unit: An Auditory Device for Directional Filtering

Robert Cole Henning, 17, Mission Hills High School, San Marcos, California

EBED056I Single-Track Gray Codes: An Efficiently Decodable Maximum Period General Construction and Extensions

Georgie Botev, 16, Massachusetts Academy of Math and Science, Worcester, Massachusetts

Third Award of \$1,000

EBED001I Autonomous and Configurable Energy Management System

Armand Duvenage, 17, Hoerskool Garsfontein, Pretoria, South Africa

EBED002I Nefrostat, Portable Diagnostics of Chronic Kidney Disease

Martin Holicky, 18, Skola Pre Mimoriadne Nadane Deti a Gymnazium, Bratislava, Slovakia

EBED011I Car Stabilization System - Modelation of ESP

Martin Ptacek, 18, Gymnazium, trida Kapitana Jarose 14, 658 70 Brno, Brno, Czech Republic

EBED020I TALK - An AAC Device: Converting Breath into Speech for the Disabled

Arsh Shah Dilbagi, 17, DAV Public School, Panipat, India

EBED037I Development of a Ultra Low-Cost Integrated Audiometer and Hearing Aid

Mukund Venkatakishnan, 15, DuPont Manual High School, Louisville, Kentucky

Fourth Award of \$500

EBED010I EyeMove: Using Electrooculography to Provide Mobility for the Disabled

Burzin Poras Balsara, 15, R. C. Clark High School, Plano, Texas

EBED022I AMELIA: Using an IoT-Interfaced Cloud Computing Network to Create a Wireless, Realtime, World-Wide Aircraft Safety Data Monitoring System

Jeremiah Pate, 16, BASIS Oro Valley, Oro Valley, Arizona

EBED032I HaptoTech: Creating Wearable Proximity Warning Devices for the Visually Impaired

Alexander Frederick Wulff, 15, Skaneateles High School, Skaneateles, New York

EBED048I SmartNotes: An Intelligent System that Enhances Efficient Social Communication in Learning Environments

Zeynep Ozgur, 16, Hudson High School, Hudson, Ohio

EBED053I Parallel Implementation of the Convolution Operation in Quotient Polynomial Rings for the NTRU Cryptosystem

Vikul Gupta, 16, Oregon Episcopal School, Portland, Oregon

EBED054I H.E.R.O.: A Novel Geographical Data-based Haptic Environment Response Operator for the Visually Impaired

Wilfred Aldo Mason, 16, Laurier Senior High School, Laval, Canada

ENERGY: CHEMICAL

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

EGCH029I Natural Additive-Enhanced Development of Novel All-Solid-State Batteries for Sustainable and Scalable Energy Storage

Kathy Liu, 16, West High School, Salt Lake City, Utah

First Award of \$3,000

EGCH029I Natural Additive-Enhanced Development of Novel All-Solid-State Batteries for Sustainable and Scalable Energy Storage

Kathy Liu, 16, West High School, Salt Lake City, Utah

Second Award of \$1,500

EGCH005I Employing White-Rot Fungi for Superior Delignification Combined with Fungal Biosynthesis to Produce Biofuels

Jonah Butler, 17, Sibley East High School, Arlington, Minnesota

EGCH015I Landfill to Car Fuel: Using Surfactants to Increase Cellulosic Ethanol Production from Waste Paper

Maxwell Robert Ylitalo, 16, Stillwater Area High School, Stillwater, Minnesota

EGCH043I Modeling Gas Flow in Hydraulically Fractured Shale

Jovan Y. Zhang, 17, Los Alamos High School, Los Alamos, New Mexico

Third Award of \$1,000

EGCH035I Investigation of Natural Dye Influence on Solar Cell

Alec Jason Gayrama, 17, Red Lion Area Senior High School, Red Lion, Pennsylvania

EGCH038T Optimization of Hybrid Capacitors: Role of Electrode Composition and Surface Area

Richard Nipun Gunasena, 16, DuPont Manual High School, Louisville, Kentucky

Madan A. Subheeswar, 16, DuPont Manual High School, Louisville, Kentucky

Matthew Carmel Raj, 15, DuPont Manual High School, Louisville, Kentucky

EGCH040I Geometric Manipulation of Cuprous Oxide Nanocrystal Surface Morphology Enhances Photoelectrochemical Properties and Enables Fabrication of Low-Cost, High Efficiency Photovoltaic Cells

Elizabeth P. Donoway, 17, Pine Crest School, Fort Lauderdale, Florida

EGCH045T The Effect of the Algal Harvesting Method on the Amount of Algal Mass Recovered for Economically Feasible Biofuel Production

Kaitlyn Noel Loop, 17, Arizona College Preparatory-Erie Campus, Chandler, Arizona

McKenna Kristin Loop, 16, Arizona College Preparatory-Erie Campus, Chandler, Arizona

Fourth Award of \$500

EGCH007I Algae....the Greener Fuel, Year Four

Alexandra Katrina Gabrielski, 16, Viera High School, Viera, Florida

EGCH010I Battle of the Diesels: A Comparison of B-10 Diesel vs.B-100 Homemade Biodiesel for Efficiency and Exhaust Analysis

Brian Prchal, 18, New Prague High School, New Prague, Minnesota

EGCH020I 3-Dimensional Microbial Fuel Cell Anode

Diego Aubert Vasquez, 17, Tucson Magnet High School, Tucson, Arizona

EGCH034I **An Investigation into the Improvement of Switchgrass Biofuel Production, Phase II**
Manasa Sai Pagadala, 15, Rivermont Collegiate, Bettendorf, Iowa

EGCH046I **Sustainable Bio-battery Utilizing Extracellular Charge Transfer Mechanism of Dissimilatory Metal-Reducing Bacteria**
Edward Park, 16, Las Cruces High School, Las Cruces, New Mexico

ENERGY: PHYSICAL

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

EGPH044I **Application of Tetrahedrite and Magnesium Silicide in a Novel Thermoelectric Unicouple to Generate Electricity from Industrial Waste Heat**
Sriharshita Vani Musunuri, 15, Henry M. Jackson High School, Mill Creek, Washington

First Award of \$3,000

EGPH023I **Novel Low Grade Waste Heat Recovery System with Simultaneous Electricity Generation, Carbon Sequestration and Urea Production**
Ethan Novek, 16, Greenwich High School, Greenwich, Connecticut

EGPH044I **Application of Tetrahedrite and Magnesium Silicide in a Novel Thermoelectric Unicouple to Generate Electricity from Industrial Waste Heat**
Sriharshita Vani Musunuri, 15, Henry M. Jackson High School, Mill Creek, Washington

Second Award of \$1,500

EGPH001T **Use of Renewable Energy in Huiliches Department (in Neuquen, Patagonia Argentina)**
Agustin Rodriguez Alvarez, 19, Escuela Provincial de Educacion Tecnica No 4, Junin de los Andes, Argentina
Cristian David Polizzi, 19, Escuela Provincial de Educacion Tecnica No 4, Junin de los Andes, Argentina

EGPH004I **Is There a Correlation between Hydropower Efficiency and Flap Arrangement?**
Craig Worley, 17, Luella High School, Locust Grove, Georgia

EGPH045I **Novel Automated Designs and Rapid Multivariate Optimization of Next-Generation Multijunction Quantum Dot Solar Cells Using Monte Carlo Modeling**
Valerie S. Ding, 18, Catlin Gabel School, Portland, Oregon

Third Award of \$1,000

EGPH012I **Fueling the World One Layer at a Time: Improving the Efficiency of the Gratzel Cell with Nanotechnology**
Aidan Rhys Dwyer, 17, Northport High School, Northport, New York

EGPH017I **Utilizing a Piezoelectric Crystal Tree to Harvest Electrical Energy from Rain Water**
Kelly Devens, 17, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia

EGPH021I Multi Purpose Smart Solar Device

Habab Idress, 18, Dewaan Dayaraam Jethmal Sindh Govt Science College, Karachi, Pakistan

EGPH031T Increased Efficiency in Solar Energy for Developing Countries

Matthew Tyler Jackson, 18, Hewitt-Trussville High School, Trussville, Alabama

Austin Lee Norwood, 18, Hewitt-Trussville High School, Trussville, Alabama

EGPH038T Regulation of Radiation Transmittance through Electro-Optic Technologies

Laurentiu Calancea, 17, Theoretical High School " Orizont, Durlesti ", Chisinau, Republic of Moldova

Gleb Vizitiv, 17, Theoretical High School " Orizont, Durlesti ", Chisinau, Republic of Moldova

Fourth Award of \$500

EGPH013I The Investigation of the Evaporation Effect on On-Demand Cooling of Solar Panels

Christopher Rafael Botello, 16, John Jay Science and Engineering Academy, San Antonio, Texas

EGPH015I Riding the Wave: Energy in Motion II

Matthew Caffet, 18, Academy of Science and Technology, The Woodlands, Texas

EGPH022I Development of Non-toxic Photostabilized Phycoerythrin for Application in Dye Sensitized Solar Cells

Eunsun Hong, 17, Bridgeport Regional Aquaculture Science and Technology Education Center, Bridgeport, Connecticut

EGPH046I The e-Drink: Capturing Electricity from Beverages

Ann Makosinski, 17, Saint Michaels University School, Victoria, Canada

EGPH047I Concentrated Solar Power

Oliver Leitner, 15, The Davidson Academy of Nevada, Reno, Nevada

EGPH050I Measuring and GeoMapping Ambient RF Energy for Battery Free Applications

Vikram I. Pandian, 14, Parkland High School, Allentown, Pennsylvania

ENGINEERING MECHANICS

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

ENMC043I Aircraft Cabin Airflow: Curbing Disease Transmission

Raymond Wang, 17, St. George's School, Vancouver, Canada

First Award of \$3,000

ENMC012I An Innovative Method for Protecting Optical and Sensory Devices on NASA's Curiosity Martian Rover and Other Terrestrial Rovers by Using Electrostatic Properties

Ashwin Nivas Datta, 16, Glencoe High School, Hillsboro, Oregon

ENMC043I Aircraft Cabin Airflow: Curbing Disease Transmission
Raymond Wang, 17, St. George's School, Vancouver, Canada

Second Award of \$1,500

ENMC028I Development of Novel Process for Large-Scale Fabrication of High Surface Area MOF (Metal Organic Framework) Membranes for CO₂ and H₂ Capture
Naveena Bontha, 15, Hanford High School, Richland, Washington

ENMC039I The FIRST Frame: Personalized Front Impact Reduction System for Bicycles
Duncan Bayard Stothers, 17, St. George's School, Vancouver, Canada

ENMC040I A Biomimetic Non-Planar Approach to Reducing Induced Drag from Trailing Vortices
Candace Rose Brooks-Da Silva, 15, Academie Ste. Cecile International School, Windsor, Canada

ENMC056T PGG 3-D Rotation Printer
Lukas Hohne, 18, Paul-Gerhardt-Gymnasium, Grafenhainichen, Germany
Lukas Grafner, 17, Paul-Gerhardt-Gymnasium, Grafenhainichen, Germany

Third Award of \$1,000

ENMC011I A Novel Prosthetic Design Utilizing a Unique Sensory Control System, Brushless Motor Drives, and Worm Gear Mechanisms through Rapid Prototyping Techniques
Megan Rose Erdozain, 16, Medical Academy for Science and Technology, Homestead, Florida

ENMC025I Effect of Simulation Covert Feathers on Airfoil Lift and Drag
Jenny Nisha Schlauch, 18, Clear Brook High School, Friendswood, Texas

ENMC029I Robo F-Pads
Alberto Garcia, 18, Shallowater High School, Shallowater, Texas

ENMC050I Algorithms for Prognostication of Electronics Failures in Hybrid and Electric Vehicles
Rahul Lall, 16, Auburn High School, Auburn, Alabama

ENMC052I Airplane Wing Gust Suppression by Active Flow Control
Scott Alexander Bollt, 17, Potsdam High School, Potsdam, New York

ENMC061I Non-planar Slicing for Extrusion-based 3D Printing
Joseph Zhang, 17, Arkansas School for Mathematics, Sciences, and the Arts, Hot Springs, Arkansas

Fourth Award of \$500

ENMC004I Using Nickel Titanium Alloy for Fixing Damaged High Pressure Pipes in Emergency Situations
Nika Alavidze, 18, Physics Mathematics Public School #41 by Andria Razmadze, KUTAISI, Georgia

ENMC015T Increasing Wing Lift for Safer Landing
Viktar Beliautsou, 17, Minsk State Regional Lyceum, Minsk, Belarus
Mikita Syrovatnikau, 17, Minsk State Regional Liceum, Minsk, Belarus
Aleh Karabko, 17, Gymnasia №40, Minsk, Belarus

ENMC021I Supporting Rod to Climb Stair Case for Disable Personnel
Sanju Subodha Sewwandi Kahandugodagam Acharige, 17, Bomiriya Central College, Kaduwela, Sri Lanka

ENMC027I Highly Precise Phase-Locked Loop DC Motor Control System with a Reduced Number of

Parts

Takahiro Ichige, 17, Chiba Municipal Chiba High School, Chiba-city, Japan

ENMC031T Braille Cell & Keyboard Device

Rami Abdelkhaleq Al-Shboul, 16, The Jubilee School, Amman, Jordan

Amer Abdelkhaleq Al-Shaboul, 15, The Jubilee School, Amman, Jordan

ENMC036I A Wing of the Future, Part II

Trevor Jordan, 17, Animas High School, Durango, Colorado

ENMC057I Continuous Reciprocating Air Filter

Matthew Lewis Ardern, 17, Stockport Grammar, Stockport, United Kingdom

ENMC060I The Development and Use of a Gesture-Based Control System

Omkar Kane, 16, Central York High School, York, Pennsylvania

ENVIRONMENTAL ENGINEERING

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

ENEV073I International Oil Spill Remediation: The Numerical Simulation of an *in-situ* Subsea Separator, Part II

Karan Jerath, 18, Friendswood High School, Friendswood, Texas

First Award of \$3,000

ENEV073I International Oil Spill Remediation: The Numerical Simulation of an *in-situ* Subsea Separator, Part II

Karan Jerath, 18, Friendswood High School, Friendswood, Texas

ENEV080T BioDissolve: The Natural Breakdown of Polystyrene Waste through the Application of *Pseudomonas putida* to Produce Usable Byproducts

James Savoldelli, 17, Columbia Grammar and Preparatory School, New York City, New York

Hugh Savoldelli, 17, Columbia Grammar and Preparatory School, New York City, New York

Drew Tomback, 17, Columbia Grammar and Preparatory School, New York City, New York

Second Award of \$1,500

ENEV020I Synthesis of a Novel Metal Organic Framework with a PCU Topology for CO₂ Separation in CCS

Steve Daikai Zheng, 18, Jericho Senior High School, Jericho, New York

ENEV024I Effective Remediation of Air Pollution through an Algal System Integrated with Carbon Mineralization Technology, Phase I: Selection of Algal Strains that Perform Well in a Flue Gas Derived Bicarbonate Environment

Sai Sameer Pusapaty, 16, Liberal Arts and Science Academy, Austin, Texas

ENEV037I Novel Photocatalytic Pervious Composites for Removing Multiple Classes of Toxins from

Water

Deepika Saraswathy Kurup, 17, Nashua High School South, Nashua, New Hampshire

ENEV055I Production of Energy and Fertilizer from Ordinary Waste Materials through Micro-Scale Anaerobic Digestion

Robert Z. Halfon, 16, American Heritage School of Boca Delray, Delray Beach, Florida

ENEV067T Synthesis of Electrospun Nanosilver-Functionalized Nylon 6 Nanofibres for Membrane Water Purification

Yi Zhao Tan, 17, Hwa Chong Institution, Singapore, Singapore

Zheng Theng Lim, 17, Hwa Chong Institution, Singapore, Singapore

Benjamin Kye Jyn Tan, 16, Hwa Chong Institution, Singapore, Singapore

Third Award of \$1,000

ENEV026T A New Design for an Air Conditioner with No Compressors and Cooling Gases and with Negligible Consumption of Electricity

Mohamed Ahmed Alazzeah, 17, Modern Montessori School, Amman, Jordan

Basil Omar Kaissy, 16, Modern Montessori School, Amman, Jordan

ENEV043I Sustainable Water Cleaning System for Point-of-Use Household Application in Developing Countries to Remove Contaminants from Drinking Water

Bluye' DeMessie, 18, William Mason High School, Mason, Ohio

ENEV045T Implementation of a Carbon Dioxide Refrigeration System as a Cogeneration Appliance and Alternative to Halocarbon-based Refrigeration Systems

Sonia Krishna Murthy, 17, Nikola Tesla STEM High School, Redmond, Washington

Ethan Benjamin Perrin, 17, Nikola Tesla STEM High School, Redmond, Washington

Sophia Tevosyan, 17, Nikola Tesla STEM High School, Redmond, Washington

ENEV047I The Development of an Oleophilic and Hydrophobic Polystyrene Synthetic Polymer Coated Cotton for High Efficiency Marine Oil Spill Absorption

Sahil Veeramoney, 15, Oregon Episcopal School, Portland, Oregon

ENEV069T Bio-based Packaging from Lotus Cellulose

Theeraphat Manoi, 17, Suratpittaya School, Surat Thani, Thailand

Yutthasat Sonprasom, 17, Suratpittaya School, Suratthani, Thailand

Rittikun Thorarit, 17, Suratpittaya School, Surat Thani, Thailand

ENEV072I Biosorption of Copper Ions by Schizophyllum Commune

Ondrej Hubalek, 19, Letohradske Soukrome Gymnazium, Letohrad, Czech Republic

ENEV078T Efficient Dry-Cell Batteries Powered by Environmental-Friendly and Low Cost Activated Carbon Derived from Bacterial Cellulose

Orawan Thasanabenjakul, 17, Suratpitthaya School, Suratthani, Thailand

Pannawat Peanjad, 17, Suratpitthaya, Suratthani, Thailand

Fourth Award of \$500

ENEV014I Environmental Monitoring Probe Based on Intel Edison Platform

Ivan Saetchnikov, 17, BSU Lyceum, Minsk, Belarus

ENEV017I Using Novel Nano-Porous Triple-Bore Hollow Fiber Membranes for Air Dehumidification in Greenhouses

Noorah Ziad Alfaddagh, 17, Al-Faisaliah Islamic Schools, Alkhobar, Saudi Arabia

ENEV030T Mobile Device for Radiation Measurements in Big Cities

Alexander Andreyevich Filatkin, 17, University Lyceum No.1511, Moscow, Russian Federation
Vladimir Ivanovich Bocharov, 17, University Lyceum No. 1511, Moscow, Russian Federation

ENEV031T Biodegradable Air Filter and Ionizer Development

Brian O'Rourke, 16, Boston Latin School, Boston, Massachusetts
Allegra Rollo, 15, Boston Latin School, Boston, Massachusetts

ENEV039T Revolutionary Desalination System

Asmaa Atef Sabsouba, 16, Maadi STEM School for Girls, Maadi, Egypt
Noha Shokry Abouqara, 17, Maadi STEM School For Girls, Maadi, Egypt

ENEV053T The Removal of Arsenic (III) from Contaminated Drinking Water using Iron Oxide and 3D Printed Beads

Makenzie Plyman, 18, Hewitt-Trussville High School, Trussville, Alabama
Madison Baylee Plyman, 18, Hewitt-Trussville High School, Trussville, Alabama

ENEV058I Revolutionary Recycled & Reusable Biodegradable Adhesive Tack (3R-BAT)

Hin Fung Chow, 16, Maryknoll Fathers' School, Hong Kong, China, Hong Kong Special Administrative Region

ENEV064T A Green and Novel Technology to Recover Copper and Wood from Treated Wood Waste, Part II

Sharon J. Chen, 16, North Carolina School of Science and Mathematics, Durham, North Carolina
Rohan Patel, 16, Mallard Creek High School, Charlotte, North Carolina

ENEV077I Developing Effective Solar-Powered Agitators for Mosquito Control in Stagnant Water

Ananya Joshi, 17, High Technology High School, Lincroft, New Jersey

MATERIALS SCIENCE

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

MATS012I In-Fiber Emulsification of Biodegradable Polymers for Drug Delivery, Year Two

Catherine J. Li, 18, Lake Highland Preparatory School, Orlando, Florida

First Award of \$3,000

MATS012I In-Fiber Emulsification of Biodegradable Polymers for Drug Delivery, Year Two

Catherine J. Li, 18, Lake Highland Preparatory School, Orlando, Florida

MATS046T Synthesizing an Artificial Biological Leaf Capable of Evolving Oxygen via Photosynthesis

WyattMartin Pontius, 17, Loudoun Academy of Science, Sterling, Virginia
Liam Alexander Wallace, 17, Loudoun Academy of Science, Sterling, Virginia

Second Award of \$1,500

MATS007I A Novel Approach for Tuning Chiral Nematic Structures in Cellulose Nanocrystal Films

Nicky Wojtania, 15, Jasper High School, Plano, Texas

MATS014T Self-sanitizing Door Handle

Sum Ming Simon Wong, 17, The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School, Tuen Mun, China, Hong Kong Special Administrative Region

Kin Pong Michael Li, 17, The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School, Tuen Mun, China, Hong Kong Special Administrative Region

MATS050I Hybridized Manganese Dioxide & Gold-Iron Oxide Nanoparticle Inhibition of Tumor Growth via Radiosensitization and Tumor Microenvironment Control

William Yin, 15, Greenwich High School, Greenwich, Connecticut

Third Award of \$1,000

MATS004I Enhancing Photoexcitation Energy Transfer in a Novel Graphene-Colloidal Quantum Dot Interface

Alexander Li, 18, North Carolina School of Science and Mathematics, Durham, North Carolina

MATS006I Fabrication, Characterization, and Modeling of an RRAM-Based Synapse for Neuromorphic Applications

Vineet Edupuganti, 15, Oregon Episcopal School, Portland, Oregon

MATS008I Improved Efficiency of Seawater Steam Generation Using Carbon Nanoparticles

Carolyn Kay Jons, 17, Eden Prairie High School, Eden Prairie, Minnesota

MATS011I Safe and Sound Housing: A 2nd Year Study Using Rice Byproducts as a Substitute for Adobe in Seismically-Active Regions in Developing Nations

Miriam Terese Demasi, 16, Wheeling Park High School, Wheeling, West Virginia

MATS015I Plumeria Blooms for Organic Electronics!

Ravi Pradip, 17, Dayapuram Residential School, Kozhikode, India

Fourth Award of \$500

MATS019T Packed VolcASH: An Inorganic Nature of Heavy Metals Adsorbent

Luca Cada Lora, 18, Surakarta 1st State Senior High School, Surakarta, Indonesia

Galih Ramadhan, 18, Surakarta 1st State Senior High School, Surakarta, Indonesia

MATS029T Highly Sensitive Nano-Ferrite for Detection of Carbon Monoxide in Air

Aditya Bhargava, 16, Sharada Vidyanikethana Public School, Mangalore, India

Komal S, 16, Sharada Vidyanikethana Public School, Mangalore, India

MATS030I Synthetic Cryolite Nanoparticles: A Potential Rare Earth Doped Host Material Capable of Matching the Refractive Index of Numerous Vascularized-Tumor Fluids

Nikhil Dhawan, 17, Spackenkill High School, Poughkeepsie, New York

MATS042I Advancing Energy Storage Materials through the Development of Quasi-Aligned Graphene Fibers with Enhanced Thermal and Electrical Conductivities

Liana J. He, 17, Half Hollow Hills High School West, Dix Hills, New York

MATS047I An Efficient Computational Model for Metal Nanowire Transparent Conductors

Milind Jagota, 17, Liberty High School, Bethlehem, Pennsylvania

MATS057I Developing an Automatic Nonrigid Image Registration Algorithm for Nanoscience Research

Melissa Amber Yu, 18, Farragut High School, Knoxville, Tennessee

MATHEMATICS

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

MATH039I Preserving Algebraic Structures on Exact Infinity: Categories with the K-theory Functor
Sanath Kumar Devalapurkar, 15, West High School, Torrance, California

First Award of \$3,000

MATH039I Preserving Algebraic Structures on Exact Infinity: Categories with the K-theory Functor
Sanath Kumar Devalapurkar, 15, West High School, Torrance, California

Second Award of \$1,500

MATH035I Boolean AlGenebra: A Nature-Inspired Framework for the Analysis of Cancer Genes
Krithika Iyer, 16, iSchool High STEM Academy, Lewisville, Texas

MATH046I Vector Parking Functions and Tree Inversions
Petar Milkov Gaydarov, 18, Model High School of Mathematics "Akad. Kiril Popov", Plovdiv, Bulgaria

MATH047I The Tie Theorems
Roman Krutovskiy, 17, Gymnasium 1514, Moscow, Russian Federation

Third Award of \$1,000

MATH016I The Game with Stones and "Generalized Fibonacci Sequence"
Kira Kozlova, 17, Lyceum "Vtoraya Shkola", Moscow, Russian Federation

MATH021I Characterizing the Constructible N-Division Points of the Rational C-Hypocycloids through Straightedge and Compass Constructions
Nitya Mani, 17, The Harker School, San Jose, California

MATH032I Approximating the Maximum k-Colorable Subgraph Problem on Dotted Interval Graphs
Alexander Lin, 17, Millburn High School, Millburn, New Jersey

MATH048I Fuzzy Structures with Application to Differential Topology, Manifold Learning, and Specialized Concepts in Mathematics
Jared Anthony Tramontano, 16, Centennial High School, Corona, California

Fourth Award of \$500

MATH018T The Motifs Development of Gringsing Sarong
I Kadek Sudiarsana, 18, SMAN Bali Mandara, Singaraja, Indonesia
I Dewa Gede Ary Palguna, 18, SMAN Bali Mandara, Singaraja, Indonesia

MATH019I Fast Algorithm of Commutator Length Computing in Free Group

Danil Fialkovskiy, 17, School 564, Saint-Petersburg, Russian Federation

MATH022I Mathematical Modeling and Simulation of Cardiac Tissue Electrophysiology: Effect of Cardiac Deformation on Action Potential Duration

Swapnil Pande, 17, Mills E. Godwin High School, Henrico, Virginia

MATH033I Optimizing Sensor Configurations for Ground-level and Aerial Intrusion Detection by Applying the Minimum Vertex Cover Problem

Heather Amelia Newman, 17, Colonia High School, Colonia, New Jersey

MATH042T On the Constructibility of n-Division Points of Certain Polar Curves by Area

Nithin Venkat Kannan, 16, BASIS Scottsdale, Scottsdale, Arizona

Young Han Kim, 16, BASIS Scottsdale, Scottsdale, Arizona

MICROBIOLOGY

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

MCRO006I Proteomic Characterization of Mosquito Host Cell Glycoproteins during Dengue Virus Egress

Carly Elizabeth Crump, 18, Episcopal School of Jacksonville, Jacksonville, Florida

First Award of \$3,000

MCRO006I Proteomic Characterization of Mosquito Host Cell Glycoproteins during Dengue Virus Egress

Carly Elizabeth Crump, 18, Episcopal School of Jacksonville, Jacksonville, Florida

MCRO054I Magneto-Aerotaxis in Bacterial Microbots

Eunice Linh You, 19, Marianopolis College, Westmount, Canada

Second Award of \$1,500

MCRO001I Magnetotactic Bacteria with a Faraday Application

Bernard Adriaan Smit, 18, Hoerskool Waterkloof, Pretoria, South Africa

MCRO009I An RK2 Mediated Bacterial Conjugation Delivery System for Artificial Genes Coding for Antimicrobial Polypeptides: A Novel Synthetic Biology Approach to Antibiotic Resistance

Logan Thrasher Collins, 18, Fairview High School, Boulder, Colorado

MCRO025I Identification of a Crucial Legionnaire's Disease Virulence Factor: The Transmembrane Permease Lpg0730 Is Integral to the Ability of Legionella pneumophila to Infect Protozoan Host Cells

Nicholas P. Miller, 18, West Linn High School, West Linn, Oregon

Third Award of \$1,000

MCRO004T Chytrid Treatments and Their Compatibility with Amphibian Tissue

Lilith Renae South, 18, Rockdale Magnet High School for Science and Technology, Conyers, Georgia
Bhaskar Patel, 17, Rockdale Magnet High School for Science and Technology, Conyers, Georgia

MCRO005I Determination of the Antimicrobial Activity of Heliotropium arborescens in Cultures of Bacteria that Cause Infection in the Respiratory Tract

Jeffrey Nathan Freidenson Bejar, 17, Leon Pinelo, Lima, Peru

MCRO010I Reducing Carcinogenic Toxins in Milk: Examining the Effects of Using Probiotic Bacteria to Bind Aflatoxin M1

Ellen Roufs, 18, Cathedral High School, New Ulm, Minnesota

MCRO015I The Effects of Kojic Acid and PTU on the Synergistic Antimicrobial Properties of S. bullata & S. frugiperda Hemolymph with Gentamycin on E. coli

Lindsay Martin, 17, Seminole High School, Sanford, Florida

MCRO059T Preventing Hospital Acquired Infections Using Permanent Nanostructure Surface Coatings on Invasive Devices

Esteban Luis Abeyta, 18, Los Alamos High School, Los Alamos, New Mexico
Ashvini Rajendra Vaidya, 17, Los Alamos High School, Los Alamos, New Mexico

Fourth Award of \$500

MCRO008I The Battle Against Cystic Fibrosis Complication Continues...

Divya Ravinder, 16, International Baccalaureate School at Bartow High School, Bartow, Florida

MCRO011I NANO Today, HUGE Tomorrow: Improving Antibiotic Drug Delivery with Nanoparticles

Afeefah Fatimah Khazi-Syed, 15, Harmony School of Innovation-Fort Worth, Fort Worth, Texas

MCRO012I Biophysical Characterization of Hydrocarbon Transport Systems as a First Step in Marine Oil-Degradation by Hydrocarbonoclastic Bacteria

Swapnav Deka, 18, Plano East Senior High School, Plano, Texas

MCRO016I Selective Adhesion to Protein-Coated Surfaces for Bacterial Cell Enrichment and Separation

Mashad Arora, 17, Science Academy of South Texas, Mercedes, Texas

MCRO021I Designing a Genetic CRISPR-cas Detection Probe for Adherent Invasive Escherichia coli Utilizing Comparative Genomics

Brian Joseph Righter, 17, Smithtown High School East, Saint James, New York

MCRO038I Study of the Cellular and Molecular Signaling Processes which Influence Algal-Cnidarian Symbiosis and Bleaching

Andrew Aultman, 15, The McCallie School, Chattanooga, Tennessee

MCRO046T Screening of Bacillus Strains Isolated from the Gastrointestinal Tracts of Shrimp to Develop Novel Probiotics for Improving Shrimp Quality and Yield

Nguyen Minh Quang, 17, HUS High School for Gifted Students, Hanoi, Vietnam
Tran Van Anh, 18, HUS High School for Gifted Students, Ha Noi, Vietnam

PHYSICS AND ASTRONOMY

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

PHYS032I Physical Simulation Based on Bat's Pinna Structure and Its Deformation Binaural Sound Signal Measurement Experiment of Greater Horseshoe Bat

Ruo Chen Hao, 17, Shandong Experimental High School, Jinan, China

First Award of \$3,000

PHYS032I Physical Simulation Based on Bat's Pinna Structure and Its Deformation Binaural Sound Signal Measurement Experiment of Greater Horseshoe Bat

Ruo Chen Hao, 17, Shandong Experimental High School, Jinan, China

PHYS051T A Search for Exoplanets in the Open Star Clusters Messier 35 and Kaposov 62 Using A Novel Large-Scale Photometric Algorithm for the "Crippled" Kepler Mission

Shashank Dholakia, 16, Adrian C Wilcox High School, Santa Clara, California

Shishir Dholakia, 16, Adrian C Wilcox High School, Santa Clara, California

Second Award of \$1,500

PHYS004T Vortex Ring State Simulation in a Wind Tunnel: Drone Flight Stability and Rotor Lift

Vivianne Tu, 18, Plano Senior High School, Plano, Texas

Claire Goeckner-Wald, 18, Plano Senior High School, Plano, Texas

PHYS019I Hybrid Graphene-Ferroelectric Devices Utilizing BaTiO₃ - SrTiO₃ Superlattices

Niyati Ketan Desai, 17, Ward Melville High School, East Setauket, New York

PHYS040I Three Dimensional Object Tracking Using a Rapid Scanning Double Droplet System Microscope

John L. Dean, 17, Scotia Glenville High School, Scotia, New York

Third Award of \$1,000

PHYS006I Critical Point Energy Storage

Shixuan Justin Li, 17, Rutherford High School, Panama City, Florida

PHYS029I Characterization of Light-Matter Interactions in Graphene/MoS₂ Photodetectors

Michael Thomas Earle, 17, Ossining High School, Ossining, New York

PHYS039I Coupled Hydrodynamic Ocean and Atmospheric Simulation of El Niño

Coleman J. Kendrick, 17, Los Alamos High School, Los Alamos, New Mexico

PHYS047I Pion Condensates in an External Magnetic Field

Julia Samantha Sakowitz, 16, The Brearley School, New York, New York

PHYS058T Detection of Conductance Quantization and Designing a Simple Biosensor via Gold Wire

Busra Yildirim, 17, Izmir Ozel Fatih Koleji, Izmir, Turkey

Koray Sekerin, 19, Izmir Ozel Fatih Koleji, Izmir, Turkey

Fourth Award of \$500

PHYS001I Analysis of the Liquids Composition by the Sound Produced by Their Heating

Grigori Dobri Matein, 19, 91. German Language High School "Prof. Konstantin Galabov", Sofia, Bulgaria

PHYS016I N-body Simulations Using the GPU

Adrian Lenkeit, 15, St. Michael-Gymnasium, Bad Munstereifel, Germany

PHYS017I Feynmans Inverse Sprinkler

Leonard Bauersfeld, 17, Hans Thoma Gymnasium, Lorrach, Germany

PHYS049T Optical Ion Reflector: Investigating the Elastic Collision Relationship between Ions and the Chamber Walls during Nuclear Fusion in order to Enhance Plasma Density by Focusing a Plasma Beam

Rosemichelle Marzan, 17, Northwest Nuclear Consortium, Federal Way, Washington

Cameron David Beardsley, 17, Northwest Nuclear Consortium, Federal Way, Washington

Hyrum Gordon Bock, 16, Northwest Nuclear Consortium, Federal Way, Washington

PHYS052I Effect of Time-dependent Gain and Loss in a PT-Symmetric Optical Waveguide Array

Sreya Vemuri, 16, Carmel High School, Carmel, Indiana

PHYS055T High Frequency Resonant Transformer

Miha Gulic, 18, Srednja Gradbena Sola in Gimnazija Maribor II Gimnazija Maribor, Maribor, Slovenia

Klemen Ducman, 18, Srednja Gradbena Sola in Gimnazija Maribor, Maribor, Slovenia

PHYS057T Assessing the Photometry of GSC 03144-00595: A Radially Pulsating, Delta Scuti, Triple Mode Variable Star

Grant Hubbard Kresge, 17, Wilsonville High School, Wilsonville, Oregon

Evan Lavery, 17, Oregon Episcopal School, Portland, Oregon

PLANT SCIENCES

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

PLNT018I Efficient Viral-Mediated Genome Editing Technique In *Tobacco noctiana* and *Arabidopsis thaliana* Model Plants Using CRISPR/Cas9

Abdul Jabbar Abdulrazaq Alhamood, 18, Dhahran Schools, Dhahran, Saudi Arabia

First Award of \$3,000

PLNT018I Efficient Viral-Mediated Genome Editing Technique In *Tobacco noctiana* and *Arabidopsis thaliana* Model Plants Using CRISPR/Cas9

Abdul Jabbar Abdulrazaq Alhamood, 18, Dhahran Schools, Dhahran, Saudi Arabia

PLNT069I A Rapid Field Detection of Liberibacter Bacteria using Lateral Flow Technology

Saumya Ramadugu Keremane, 18, Martin Luther King High School, Riverside, California

Second Award of \$1,500

PLNT002I High Protein Fynbos Nuts: A New Superfood

Anna Illing Midgley, 16, Herschel Girl's School, Cape Town, South Africa

PLNT008T Enhanced Hydrogen and Third-Generation Biofuel Production from Modified Algae

Anoop Vemulapalli, 17, Plano West Senior High School, Plano, Texas

Wenjia Dara Li, 17, Plano West Senior High School, Plano, Texas

PLNT016I Aetiology of 'Bleeding Canker' Disease of Horse Chestnut Trees

Anna Maria McEvoy, 18, Our Lady's College, Drogheda, Ireland

PLNT020T Investigating the Phytotoxicity of ZnO Nanoparticles and the Mechanism of Transport in the Prothallial Cells of *Ceratopteris richardii*

Meghan Dong Duo Bialt-DeCelie, 17, George W. Hewlett High School, Hewlett, New York

Benjamin David Golbin, 16, George W. Hewlett High School, Hewlett, New York

Levy Aaron Sominsky, 17, George W. Hewlett High School, Hewlett, New York

Third Award of \$1,000

PLNT013I How Can the Efficacy of Potential Biological Controls against *Mikania micrantha* Be Enhanced? The Role of Adjuvants in Disease Progress

Haniya Shareef, 14, Lincoln Park Academy, Fort Pierce, Florida

PLNT027I Characterization and Utility of Resistance Sources Against Resistance-Breaking *Rhizomania* in Sugar Beet

Kapil Sinha, 15, Salinas High School, Salinas, California

PLNT057T Utilization of crude plant extract of *Imperata cylindrica* as effective bio-insecticide to eradicate brown plant hoppers *Nilaparvata lugens* Stal in rice fields

Vasu Chavanasupitchaya, 16, The Demonstration School of Khonkaen University (Modindang), Khonkaen, Thailand

Natchamukda Paibool, 16, The Demonstration School of Khonkaen University (Modindang), Khonkaen, Thailand

Wanicha Khotwongsa, 16, The Demonstration School of Khonkaen University (Modindang), Khonkaen, Thailand

PLNT063I The Effects of Varying Methods of Gibberellic Acid Exposure on the Growth and Development of Wild-Type and PKL1-1 Mutant *Arabidopsis thaliana*

Rachel Paige Weinstein, 16, Biotechnology High School, Freehold, New Jersey

PLNT064I A Novel Quantification of the Complex Geometries of Low Light Surviving Plants using Fractal Analysis to Investigate a Basis of a New and Unique Allometric Measure of Plants

Chaitanya Dasharathi Karamchedu, 15, Jesuit High School, Portland, Oregon

Fourth Award of \$500

PLNT006I Weed Warfare: Investigating Allelopathy, Year Five

Julia Grace Canady, 16, Lakeland Christian School, Lakeland, Florida

PLNT017I The Effect of Single Wavelength Red and Blue Laser Lights on Growth of the *Arabidopsis thaliana* Plant

Lulwah Ziyad Alshiha, 17, Najd National Schools, Riyadh, Saudi Arabia

PLNT024T *Begonia nepalensis*: An Effective Herbal Ointment against *Enterobiasis*

Mansi Aggarwal, 17, Maharaja Agarsain Public School, Delhi, India

Harshit Jindal, 14, Maharaja Agarsain Public School, Delhi, India

PLNT039I Plant's Immune Response to Communication through Common Mycorrhizal Networks (CMNs)

Huiseon Hwang, 16, Changwon Science High School, Changwon, South Korea

PLNT056I Anthracnose Disease Resistance by Turmeric (Curcuma longa L.) Induced Priming in Chinese Cabbage (Brassica rapa L.)

Charu Joserose, 16, Tafuna High School, Pago Pago, American Samoa

PLNT058I Using Parasitic Fruit Sap to Produce Orchid Adhesion Glue

Wattana Thumkhongdee, 19, Damrongratsongkroh School, Muang, Thailand

PLNT067I Pheromone Aided Trap Cropping of the Harlequin Bug

Emma Marie Thrift, 17, Eleanor Roosevelt High School, Greenbelt, Maryland

ROBOTICS AND INTELLIGENT MACHINES

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

ROBO027I Brain-Actuated Robotics: Controlling and Programming a Humanoid Using Electroencephalography

Ava Carmen Lakmazaheri, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

First Award of \$3,000

ROBO027I Brain-Actuated Robotics: Controlling and Programming a Humanoid Using Electroencephalography

Ava Carmen Lakmazaheri, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

Second Award of \$1,500

ROBO011I Biologically-Inspired Flying Sensor Platform for Autonomous Emergency Response

Mihir Garimella, 15, Fox Chapel Area High School, Pittsburgh, Pennsylvania

ROBO021I A Novel Controller for Soft Robots: An Experimental Usage of Linear Temporal Logic Mission Planning (LTLMoP) with an Optimized Elastomeric Actuator

Simone Braunstein, 17, The Dalton School, New York, New York

Third Award of \$1,000

ROBO010I MyGlove: Assisting Hand Movements, Grip, and Tremor

Surabhi Gopal Mundada, 15, Olympia High School, Olympia, Washington

ROBO014I Automatic Seizure Prediction and Monitoring Algorithms and Evaluation for a Single, Strategically-placed, Bipolar Electroencephalogram

Andrew Ethridge Amini, 16, Yorktown High School, Yorktown Heights, New York

Fourth Award of \$500

ROBO001I The Implantation of the Phototaxic Behavior of Physarum polycephalum in a Decentralized Robotics System

William Henry Langhorne, 17, Pensacola High School, Pensacola, Florida

ROBO016T Gesture Recognition System (GRS)

Dumitru Savva, 18, Orizont Lyceum, Durlesti, Republic of Moldova

Diana Marusic, 17, "Ion Creanga" Theoretical Lyceum, Chisinau, Republic of Moldova

ROBO026I

Object Recognition Based UAV Control

Francisca Vasconcelos, 17, Torrey Pines High School, San Diego, California

SYSTEMS SOFTWARE

Intel will present Best of Category Winners with a \$5,000 award. Additionally, a \$1,000 grant will be given to their school and the Intel ISEF Affiliated Fair they represent.

Intel ISEF Best of Category Award of \$5,000

SOFT031I BitAV: Fast Anti-Malware by Distributed Blockchain Consensus and Feedforward Scanning

Charles Noyes, 16, Villa Park High School, Villa Park, California

First Award of \$3,000

SOFT031I BitAV: Fast Anti-Malware by Distributed Blockchain Consensus and Feedforward Scanning

Charles Noyes, 16, Villa Park High School, Villa Park, California

SOFT063I A Novel Algorithm for #SAT

Elliot Gorokhovskiy, 16, Fairview High School, Boulder, Colorado

Second Award of \$1,500

SOFT008I Developing Mobile Algorithms to Detect Seizures and Falls

Amir Helmy, 14, Eastside High School, Gainesville, Florida

SOFT027I Image Processing Algorithms towards Optical Detection of 2D Nanomaterials

Onkar Singh Gujral, 18, La Martiniere for Boys, Kolkata, Kolkata, India

SOFT039T Generation via Embedding of Quasi-Optimal Networks for Application in High Performance Computing

Sahil Abbi, 16, Herricks High School, New Hyde Park, New York

Arjun Kapoor, 17, The Wheatley School, Old Westbury, New York

Third Award of \$1,000

SOFT004I Computer Vision: Mapping and Orientation in 3-D Space

Daniel Zvara, 18, Gymnazium Velka Okruzna, Zilina, Slovakia

SOFT009I An Atmospheric Visibility Measurement System Using Smartphone

Jianing Lin, 16, The High School Affiliated to Renmin University of China, Beijing, China

SOFT032I The Phoney Lift: Using Accelerometers to Identify People

Yashaswini Makaram, 17, Massachusetts Academy of Math and Science, Worcester, Massachusetts

SOFT050I Developing a Program to Identify Targets for Transit Followup for the Minerva Telescope Array

Kit Belamy Fieldhouse, 16, Hellgate High School, Missoula, Montana

SOFT053T Development of a Rapid, Accurate, and Private Contact Tracing System Utilizing Smartphone Proximities

Clarissa Sophie Scoggins, 16, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

Rohan Suri, 16, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

Fourth Award of \$500

SOFT018I SCC: Reversible Multi-Translation of High-Level Programming Languages and a Platform for Performance-Controlled Execution in Multi-Agent Systems

Danila Alexandrovich Baigushev, 17, Lyceum "Vtoraya Shkola", Moscow, Russian Federation

SOFT020I A Hand-centric Gestural Interface for 3D Navigation and Interaction in Visualization

Justin Barish, 17, Kings Park High School, Kings Park, New York

SOFT048T Recognition of Human Emotions by Biometric Parameters

Nijat Javadov, 17, Republican School in Physics and Math after Zhautykov, Almaty, Kazakhstan

Yesset Zhussupov, 18, Republican School in Physics and Math after Zhautykov, Almaty, Kazakhstan

SOFT051T Automated Illustration of Text to Improve Semantic Comprehension

Konrad Neal Urban, 16, Fox Chapel Area High School, Pittsburgh, Pennsylvania

Suvir Prakash Mirchandani, 16, Fox Chapel Area High School, Pittsburgh, Pennsylvania

SOFT057I Lockino: A Novel Solution for Public Lockers using Bluetooth LE and the Estimote iBeacon Platform

Zachary Scott Rolfness, 15, Westwood High School, Mesa, Arizona

SOFT062I Cyber Automated Report Linker: A Network Approach to Minimizing Expansion of Catastrophic Cyber Infiltrations

Stephen Parish, 19, Home School, Colorado Springs, Colorado

SOFT064T Genetic Algorithms for Foreign Exchange Trading

Vasil Georgiev Vasilev, 18, National High School of Mathematics and Natural Sciences "Acad. Luybomir Chakalov," Sofia, Bulgaria

Marin Blagoev Shalamanov, 18, National High School of Mathematics and Natural Sciences "Acad. Luybomir Chakalov," SOFIA, Bulgaria

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