



## Winner Announcement

**\*\*Strict Embargo: Friday, May 15, 2009, 1:30 p.m. PST\*\***  
**\*\*Do Not Release Until This Time \*\***

# Intel ISEF 2009 Grand Awards Ceremony

**Reno, Nevada, USA** – Society for Science & the Public, in partnership with the Intel Foundation, today presented Grand Awards at the Intel International Science and Engineering Fair 2009. Student winners are ninth through twelfth graders who earned the right to compete by winning a top prize at a local, regional, state or national science fairs. The highlight of the week, the Intel ISEF Grand Awards are valued at nearly \$1 million in scholarships, tuition grants and scientific field trips.

The International Science and Engineering Fair is sponsored by Intel and has been administered by Society for Science & the Public (SSP) since its inception in 1950. SSP is a nonprofit organization dedicated to the public engagement in scientific research and education. SSP's vision is to promote the understanding and appreciation of science and the vital role it plays in human advancement: to inform, educate, inspire.

More information can be found at [www.societyforscience.org](http://www.societyforscience.org).

### Intel Foundation Young Scientist Award

The winners of this award are the top three finalists at the Intel ISEF. Each of these top three finalists receive a scholarship of \$50,000 from the Intel Foundation.

#### A Scholarship of \$50,000

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|-------|--|
| AS023 | <b>Identifying and Classifying Evolutionary Interactions between Sweat Bees and Nematodes</b><br>Tara Anjali Adiseshan, 14, Ramana Academy, Charlottesville, Virginia                                |
| BE037 | <b>How Worms Learn, Part III: Mammalian Gene Expression and Associative Conditioning in <i>Caenorhabditis elegans</i></b><br>Olivia Catherine Schwob, 16, Boston Latin School, Boston, Massachusetts |
| EV029 | <b>The Use of Bioluminescent Bacteria to Detect Environmental Contaminants</b><br>Li Sallou Boynton, 17, Bellaire High School, Bellaire, Texas   |

The scholarship is awarded in eight equal installments to students enrolled at any accredited degree-granting institution of higher education, following their successful completion of high school. Students must provide proof of registration and good academic standing from the school's registrar each semester.

## Seaborg SIYSS Award

All expense-paid trip awarded to two senior finalists to attend the Stockholm International Youth Science Seminar during the Nobel Prize Ceremonies in December.

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.

CH016      **Combating Cancer: Design and Synthesis of Dual-Warhead Tumor-Targeting Drug Conjugates**  
Preya Shah, 17, Ward Melville High School, East Setauket, New York

MA042      **The Classification of Certain Fusion Categories**  
Eric Kerner Larson, 17, South Eugene High School, Eugene, Oregon

The SIYSS will be held in Stockholm, Sweden in December. Students must meet the 18-year age requirement to be considered. The history of SIYSS began as early as 1976 when the first seminar was organized by the Swedish Federation of Young Scientists together with the Nobel Foundation, with inspiration from Society for Science & the Public. This award is named for the late Glenn T. Seaborg, Nobel Laureate in chemistry and Society for Science trustee.

## European Union Contest for Young Scientists

For a top team project, an all-expense paid trip to attend the European Union Contest for Young Scientists this September.

Trip to the EU Contest.

BE306      **ALPHA-Lipoic Acid: Towards a Novel Neuroprotective Treatment for Alzheimer's Associated Cognitive Dysfunction in a *Drosophila* Model**  
Shaunak Krishan Bakshi, 15, Manhasset High School, Manhasset, New York  
Peter Hans Massey, 16, Manhasset High School, Manhasset, New York

The EU Contest for Young Scientists was developed to promote the ideals of co-operation and interchange between young scientists. The Contest is the annual showcase of the best of European student scientific achievement. The team project must pass the EU Contest jury review prior to attending, and must be first time participants in the EU Contest. Valid passport required.

## MIT Lincoln Laboratory

The Massachusetts Institute of Technology's Lincoln Laboratory has partnered with Society for Science to promote science education through a program called the Ceres Connection. This program seeks to name minor planets after students through Society for Science competitions, including the Intel ISEF. First and second place category award winner names will be sent to the International Astronomical Union (IAU) for naming rights of a near earth asteroid. Notification will be sent to the finalists when the name has been accepted and confirmed.

All minor planets named in the Ceres Connection program have been discovered by the Lincoln Near Earth Asteroid Research (LINEAR) program, operated by Lincoln Laboratory.

## European Organization for Nuclear Research-CERN

Intel ISEF finalists winning a "Best of Category" are provided an opportunity to travel to tour CERN, the European Organization for Nuclear Research, the world's leading laboratory for particle physics in Geneva, Switzerland. As many as 12 students will be selected to travel from June 28th-July 2nd, 2009. These eligible

finalists **MUST** be available for travel on these established dates, meet eligibility requirements for travel, and return documentation promptly to be considered. Students who have not won another international trip at the Intel ISEF will be given first priority.

## Animal Sciences - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

AS023      **Identifying and Classifying Evolutionary Interactions between Sweat Bees and Nematodes**  
Tara Anjali Adishesan, 14, Ramana Academy, Charlottesville, Virginia

### First Award of \$3,000

AS023      **Identifying and Classifying Evolutionary Interactions between Sweat Bees and Nematodes**  
Tara Anjali Adishesan, 14, Ramana Academy, Charlottesville, Virginia

AS050      **The Effect of Honey Hydrogen Peroxide Concentration on Small Hive Beetle (*Aethina tumida*) Survival**  
Lydia L McCormick, 16, Jefferson County International Baccalaureate, Birmingham, Alabama

### Second Award of \$1,500

AS003      **Copepods and Cholera: An Assessment of Freshwater Copepods Used for Biological Pest Control as a Reservoir for the Cholera Causing Bacterium *Vibrio cholerae***  
Madeleine Amanda Ball, 16, Ursuline Academy of Dallas, Dallas, Texas

AS035      **The Isolation and Characterization of the Antibiotic Components Extracted from Marine Sponges**  
Bernadette Ann Hritzo, 15, Villa Joseph Marie High School, Holland, Pennsylvania

AS041      **Utilizing Organic Substances to Suppress *Beauveria bassiana* in *Bombyx mori* Larvae**  
Peter Bau, 16, Chamblee Charter High School, Chamblee, Georgia

### Third Award of \$1,000

AS011      **The Effects of Chemicals Pyrethrin and Carbaryl on Crayfish *Procambarus clarkii***  
Shuang Xu, 18, Paul Laurence Dunbar High School, Lexington, Kentucky

AS013      **Biological Control of Stored-Product Pest Mites: A Study on the Application of *Cheyletus malaccensis* to the Suppression of *Tyrophagus putrescentiae***  
Yuting Lin, 17, Fuzhou No.1 Middle School, Fuzhou, Fujian, China

AS028      **Reduction of Inflammation Increases Regeneration Rate in *Lumbriculus variegatus***  
William Marsiglia, 17, Sachem High School East, Farmingville, New York

- AS045      **Cryopreservation of the Microworm, *P.redivivus***  
Boram Lee, 17, The Mississippi School for Mathematics and Science, Columbus,  
Mississippi
- AS049      **The Butterfly Proboscis as a Biomicrofluidic System: A Detailed Analysis of the  
Validity of the Hagan Poisseuille Equation in order to Develop a Medical  
Microprobe**  
Campbell Armstrong Yore, 18, South Carolina Governor's School for Science and  
Mathematics, Hartsville, South Carolina

**Fourth Award of \$500**

- AS008      **Study on the Function of Stabilimentum and Silk in the Egg Sac of *Argiope  
bruennichi***  
Hange Li, 15, Beijing No.2 Middle School, Beijing, China
- AS017      **Anthropogenic Restoration of an Endangered Plant Induced the Initial Sympatric  
Divergence of a Butterfly**  
Wen-Hao Tan, 18, Taipei Municipal Chien-Kuo Senior High School, Taipei City,  
Taiwan, Chinese Taipei
- AS018      **The Effect of the Adipose60 Mutation on the Locomotion of Wild Type and  
Vestigial Winged *Drosophila melanogaster***  
Alyssa Chelsea Ehrlich, 16, South Side High School, Rockville Centre, New York
- AS020      **Differentiation of Bovine Adipose Derived Adult Stem Cells**  
Melissa Severn McDowell, 16, Saint Joseph's Academy, Baton Rouge, Louisiana
- AS022      **Natural Mosquito Control, Year VII: Field Evaluation of Botanical Extract  
Mexican Marigold, *Tagetes minuta lucida*, as a Barrier Spray for Managing  
Mosquitoes**  
Taylor Paige Wood, 16, Sam Houston High School, Lake Charles, Louisiana
- AS056      **Beetle Mania: Does the Health of Tropical Soda Apple Have an Effect on the  
Survival and Reproduction Rate of the *Gratiana boliviana* Beetle?**  
Todd Joseph Condon Jr., 15, Lincoln Park Academy, Fort Pierce, Florida

## Behavioral and Social Sciences - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

- BE037      **How Worms Learn, Part III: Mammalian Gene Expression and Associative  
Conditioning in *Caenorhabditis elegans***  
Olivia Catherine Schwob, 16, Boston Latin School, Boston, Massachusetts

**First Award of \$3,000**

- BE019      **The Effects of Equine Association on the Initial Beneficiary and Benefactor**  
Katlin Jayne Hornig, 17, Sargent High School, Monte Vista, Colorado

BE037 **How Worms Learn, Part III: Mammalian Gene Expression and Associative Conditioning in *Caenorhabditis elegans***  
Olivia Catherine Schwob, 16, Boston Latin School, Boston, Massachusetts

**Second Award of \$1,500**

BE029 **How Harry Potter Can Help You Get a Higher SAT Score: The Effects of Context and Familiarity on Vocabulary Retention in Adolescents**  
Trisha Paige Nussbaum, 17, Roslyn High School, Roslyn Heights, New York

BE031 **Exploring Schizophrenic Logic with Comic Strips**  
Shira Ahissar, 17, Aharon Katzir High School, Rehovot, Israel

BE063 **Associations Between Eye Activity and Impaired Arousal: The Clinical Development of the Sleepiness Assessment System**  
Philippe Klintefelt Collet, 18, Goteborgs Hogre Samskola, Goteborg, Sweden

**Third Award of \$1,000**

BE002 **The Effects of Text Formatting on Comprehension Levels of Struggling and On-Level Readers: A Two-Year Study**  
Lindsey Brooke Saunders, 15, Union County High School, Lake Butler, Florida

BE021 **Efficacy of Peer-Delivered Sleep Hygiene Education on Sleep Hygiene Practices, Sleep Quality, and Mood in Evening-Type Adolescents**  
Elliot E.A. Prince, 15, Wilsonville High School, Wilsonville, Oregon

BE034 **A Comparison of the Effects of Native Language on the Learning Style of Native Chinese and Native English Speakers**  
Ling Chou, 17, Oregon Episcopal School, Portland, Oregon

BE036 **What Is the Impact on Racial Profiling When Presenting Subliminal Images to the Subconscious?**  
Ariel Nicole Wiley, 17, Basha High School, Chandler, Arizona

BE040 **Facial Expression and Its Relationship to Gesture in Western Lowland Gorillas**  
Jennifer Lynn Draiss, 17, Monroe-Woodbury High School, Central Valley, New York

**Fourth Award of \$500**

BE020 **Is the Taste of Coloured Food Drinks Real or Imaginary?**  
Mayokun Oluwagbenga Gogo, 16, Homat Private Schools, Lagos, West Africa, Nigeria

BE026 **How Scary Is Too Scary? The Effect of Fear Appeals in Political Advertising**  
Geetika Rudra, 17, Roslyn High School, Roslyn Heights, New York

BE028 **Examining the Clinical Utility of the RBANS for Spanish Speakers with Epilepsy**  
Gabrielle Alexandra Young, 17, Valley Stream South High School, Valley Stream, New York

BE041 **The Effects of Acetylcholine on Memory**  
Rebekah Lynn Inez Ivie, 17, Trotwood Madison High School, Trotwood, Ohio

- BE051      **The Effect of Learning Mathematical Principles in Various Ways on Transfer and Application to Other Problems**  
Prachi Rajesh Agrawal, 16, William L. Dickinson high school, Jersey City, New Jersey
- BE060      **RoboCare: Enabling People with Complete Paralysis to Control Their Wheel Chairs and Home Appliances Using Their Tongues Muscles**  
Mouth Nabeel Abuaysha, 17, AlDuffi High School, Jubail Industrial, Eastern, Saudi Arabia

## Biochemistry - Presented by Agilent Technologies

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

- BI022      **Curcumin Induces Apoptosis in Cancer Cells by Inhibiting NF-kB**  
Anartya Mandal, 18, Boston Latin School, Boston, Massachusetts

### First Award of \$3,000

- BI022      **Curcumin Induces Apoptosis in Cancer Cells by Inhibiting NF-kB**  
Anartya Mandal, 18, Boston Latin School, Boston, Massachusetts

### Second Award of \$1,500

- BI010      **An Innovative Strategy for the Protection against Chemo-toxicity and Radiation Poisoning**  
Preeti Singhal, 16, Arlington High School, Arlington, Texas

- BI038      **An Investigation into the Folding of Beta Structures in a Class of Pathologically-Relevant Proteins: Computational Prediction of Secondary and Super-Secondary Structure from Primary Amino Acid Sequence**  
Nitish Lakhanpal, 17, University High School, Irvine, California

### Third Award of \$1,000

- BI004      **Characterization of a Biophysics Model to Evaluate Regulation of the p53 Protein**  
Pranali H. Dalvi, 16, International Baccalaureate at Bartow High School, Bartow, Florida

- BI011      **Mechanisms of Tumor Cell Invasion: The Role of Stat3 in Squamous Cell Carcinoma**  
Kendall Marie Hughes, 18, Caddo Parish Magnet High School, Shreveport, Louisiana

- BI026      **Novel Biosensor Utilizing a Quinone Monolayer in Conjunction with Cyclic Voltammetry**  
Joy Elisabeth Lee, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

### Fourth Award of \$500

- BI006      **Red Tide Mitigation: Neutralizing Brevetoxin Using the Amino Acid Derivative, Cysteine Methyl Ester**  
Collin Northcott McAliley, 15, Cocoa Beach Junior/Senior High School, Cocoa Beach, Florida

- BI015      **Exploring the Effects of Nicotine on the Expression of Molecular Compounds Associated with Alzheimer's Disease: A Novel Mechanism in Neuroprotection**  
Steven Ham, 17, Herricks Senior High School, New Hyde Park, New York
- BI016      **Is Autism Both a Genetic and Environmental Disorder?**  
Alexander Scott Caldwell, 16, Saint Pius X High School, Albuquerque, New Mexico
- BI029      **Computational Modeling of the Quantum Mechanical Excitations in a Light Harvesting Complex in Purple Bacteria**  
Michael Kaplan, 18, The Bronx High School of Science, Bronx, New York

## Cellular and Molecular Biology - Presented by Intel

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### Intel ISEF Best of Category Award of \$5,000 for Top First Place Winner

- CB048      **Cell Wall Formation from Marine Diatom Protoplasts: Implications for Novel Transformation and Nanotechnology Techniques**  
Ronit Batya Roth Abramson, 17, Canyon Crest Academy, San Diego, California

### First Award of \$3,000

- CB025      **Investigating the French Paradox: Resveratrol as a Potential Antioxidant in Mesenchymal Stem Cell Differentiation and Genomic Stability**  
Suraj K. Mishra, 17, Mills E. Godwin High School, Richmond, Virginia

- CB048      **Cell Wall Formation from Marine Diatom Protoplasts: Implications for Novel Transformation and Nanotechnology Techniques**  
Ronit Batya Roth Abramson, 17, Canyon Crest Academy, San Diego, California

### Second Award of \$1,500

- CB005      **Enhanced Efficiency of Producing Induced Pluripotent Stem Cells from Human Fibroblasts through Lentiviral Expression of Transcription Factors**  
Kyle Jones, 18, The Villages High School, The Villages, Florida
- CB024      **Pathways of Healing: Discovering Diterpene Synthases in the Mint Family that Produce Promising Drug Candidates**  
Marton Spohn, 19, Fazekas Mihaly Secondary Grammar School, Budapest, Hungary
- CB030      **Creation of a Functional, Genetically-Tagged Androgen Receptor-Enhanced Green Fluorescent Protein Gene to Study Androgen Action in Prostate Cancer Cells**  
Prateek Singh Baghel, 17, Shaker High School, Latham, New York

### Third Award of \$1,000

- CB009      **Role of CD34+ and CD14+ Cells in Diabetic Vascular Disease**  
Sabrina Lakshmi Prabakaran, 18, Home School, Fort Myers, Florida
- CB013      **Targeting Akt3 Signaling Pathway in Cutaneous Melanoma with Isoselenocyanate**  
Natalie D-T Nguyen, 17, Hershey High School, Hershey, Pennsylvania

CB018 **An *in vitro* Method of Sprouting Angiogenesis Reveals a Relaxation for the Requirement of VegfR2 Signaling for the Formation of Endothelial-like, PECAM-Positive Cells**  
Elizabeth Cai, 18, Briarcliff High School, Briarcliff Manor, New York

CB045 **Over-expression of BubR1 Can Produce Aneuploidy in Human Cells**  
Qi Fan Zhang, 18, Stuyvesant High School, New York, New York

CB049 **Restoration of miR-200c: Effect on HEY Cancer Cell Behavior**  
Connie Liu, 15, Cherry Creek High School, Greenwood Village, Colorado

**Fourth Award of \$500**

CB019 **Acetyl Transferase Inhibitors: A New Treatment for Colon and Cervical Cancer?**  
Arun Brendan Dutta, 15, Western Albemarle High School, Crozet, Virginia

CB029 **Spontaneous Renaturation vs. Chaperone Assisted Renaturation of Myoglobin**  
Demetrius Miles Murphy, 16, West Side High School, Gary, Indiana

CB032 **The Effect of Type A Behavior on Telomere Length**  
Annicka Kae Carter, 17, Hillcrest High School, Midvale, Utah

CB033 **Ship as a Target of miR155: A New Model for Leukemiogenesis**  
Aaditya Ganesh Shidham, 18, Upper Arlington High School, Upper Arlington, Ohio

CB039 **Defining Functional Interactions in Naturally Occurring Telomerase Mutants**  
Katherine Taneille Johnson, 16, North Peace Senior Secondary School, Fort St. John, British Columbia, Canada

CB041 **Exploring a Sequencing-based Human Identification Method as a Replacement for Current Fragment Sizing Technology**  
Jennifer Shuen Chen, 15, Lynbrook High School, San Jose, California

## Chemistry - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

CH016 **Combating Cancer: Design and Synthesis of Dual-Warhead Tumor-Targeting Drug Conjugates**  
Preya Shah, 17, Ward Melville High School, East Setauket, New York

**First Award of \$3,000**

CH016 **Combating Cancer: Design and Synthesis of Dual-Warhead Tumor-Targeting Drug Conjugates**  
Preya Shah, 17, Ward Melville High School, East Setauket, New York

**Second Award \$1,500**

CH013 **Synthesis of Oligosaccharide Precursors of Mycobacterial Arabinofuranosides**  
Ksenia G. Fedina, 16, Moscow Chemical Lyceum # 1303, Moscow, Russia

CH022      **Synthesis of Fluorescent Silica Nanoparticles Conjugated with RGD Peptide for Detection of Invasive Human Breast Cancer Cells**  
Shamik Mascharak, 15, Santa Cruz High School, Santa Cruz, California

**Third Award of \$1,000**

CH018      **Grow Your Own Gas: Making Cellulosic Ethanol from Common Biomass**  
Andrew Joseph Rauh, 15, Divine Child High School, Dearborn, Michigan

CH024      **The Nonhomogeneous Intermolecular Bonding Structure of Liquid Water: An X-ray Study**  
Bryce William Cronkite-Ratcliff, 18, Crystal Springs Uplands School, Hillsborough, California

CH027      **Rhodium Complexes of N-Heterocyclic Carbenes: Catalysts for Green Chemistry?**  
Jonathan Edward Rajaseelan, 16, Lancaster Country Day School, Lancaster, Pennsylvania

CH036      **Novel Ru-Polypyridyl Complexes for Electrochemical Carbon Dioxide Reduction**  
Tyler Dane Swenson, 18, Dickinson High School, Dickinson, North Dakota

**Fourth Award of \$500**

CH008      **Synthetic Approaches to Organometallic Complexes for Electronics Applications**  
Ilya Vladimirovich Vinogradov, 17, Paul Laurence Dunbar High School, Lexington, Kentucky

CH015      **Unusual Behavior of Gas Molecules Penetration through Membrane**  
Yu-Hui Lin, 18, Taiwan Provincial Chia-Yi Girls' Senior High School, Chiayi City, Taiwan, Chinese Taipei

CH017      **Combating Cancer: Design and Synthesis of [11C]-DHA-Taxoids for Studies of Drug Pharmacokinetics**  
Re-I Chin, 17, Walter Johnson High School, Bethesda, Maryland

CH038      **Design and Development of Ozone Equivalents for the Oxidative Cleavage of Alkenes**  
Prem P. Thottumkara, 16, Macomb High School, Macomb, Illinois

## Computer Science - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

CS008      **System S: Describing State in Functional Languages**  
Kevin Michael Ellis, 17, Catlin Gabel, Beaverton, Oregon

**First Award of \$3,000**

CS008      **System S: Describing State in Functional Languages**  
Kevin Michael Ellis, 17, Catlin Gabel, Beaverton, Oregon

**Second Award of \$1,500**

- CS021      **Do You 'ear Wha' I 'ear?', II: Lowering Voice Frequencies in Real Time to Revolutionize Hearing Assistance Technology**  
Nicholas Mycroft Christensen, 17, Wetumpka High School, Wetumpka, Alabama
- CS022      **The Application of Artificial Neural Networks to the Heuristic Analysis of Computer Viruses**  
Nelson Zhang, 15, Shanghai American School, Shanghai, China
- CS042      **Applied Digital Cerebrovascular Segmentation**  
Vedant Subramaniam Kumar, 15, duPont Manual Magnet High School, Louisville, Kentucky

**Third Award of \$1,000**

- CS025      **Head-Controlled Computer Interface for the Disabled**  
John B Hinkel, III, 17, Hopkinton High School, Hopkinton, Massachusetts
- CS029      **Creating a Computer System for Simulation-Based Education**  
Bridger James Maxwell, 18, Utah County Academy of Sciences, Orem, Utah
- CS040      **Hybrid Light Rendering**  
Matt Swaner Vitelli, 16, Academy for Math, Engineering, and Science, Salt Lake City, Utah
- CS045      **Complex Evaluation of Danger and Tranquility in Urban Settings: An Immunocomputing Intelligence Approach**  
Lucia Mocz, 18, Mililani High School, Mililani, Hawaii

**Fourth Award of \$500**

- CS006      **Post-Processed Adaptive Optics**  
James Daniel Brandenburg, 17, Cocoa High School, Cocoa, Florida
- CS035      **Semantic Image Retrieval: Learning Gaussian Mixture Models of Semantic Concepts Using Expectation-Maximization**  
David C Liu, 17, Lynbrook High School, San Jose, California
- CS037      **Is that Parking Ticket Warranted?**  
John D. Wu, 16, Princeton High School, Princeton, New Jersey
- CS041      **Interactive Evolutionary Computation: A Comparison of Genetic Algorithms**  
Jesse David Thomason, 18, Arkansas School for Mathematics, Sciences, and the Arts, Hot Springs, Arkansas
- CS047      **Designing an Affordable and Accessible Virtual Reality System**  
Scott Douglas Betz, 18, Bellbrook High School, Bellbrook, Ohio

## Earth & Planetary Sciences - Presented by Shell Oil

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

EA010 **Evaluating Tsunami Risk in Discovery Bay, Washington**  
Marley Elizabeth Iredale, 16, Sequim High School, Sequim, Washington

### First Award of \$3,000

EA010 **Evaluating Tsunami Risk in Discovery Bay, Washington**  
Marley Elizabeth Iredale, 16, Sequim High School, Sequim, Washington

### Second Award of \$1,500

EA007 **Thermal Analysis and Thermogravimetry Techniques to Quantify and Prevent Forest Fires**  
Divya Nag, 18, Mira Loma High School, Sacramento, California

### Third Award of \$1,000

EA005 **Role of Sea Surface Pressure in Determining Possible Recurvature of a Hurricane's Path**  
Sarah Dunn Ditchek, 17, North Shore Hebrew Academy High School, Great Neck, New York

### Fourth Award of \$500

EA002 **Mitigation of Soil Liquefaction with Magnetic Fields**  
Tanya Nicole Petach, 15, Fairview High School, Boulder, Colorado

## Electrical and Mechanical Engineering - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

EE068 **The Underground Radio II**  
Alexander Kent Kendrick, 16, Los Alamos High School, Los Alamos, New Mexico

### First Award of \$3,000

EE027 **Sensor to Detect Liquids**  
Thomas Nesch, 20, Technische Oberschule Stuttgart, Stuttgart, Germany

EE068 **The Underground Radio II**  
Alexander Kent Kendrick, 16, Los Alamos High School, Los Alamos, New Mexico

### Second Award of \$1,500

EE011 **Plasma Propulsion III**  
Jesse Kane Ellison, 17, Bayfield High School, Bayfield, Colorado

- EE028      **Automated Wired Equivalent Privacy and RC4 Encryption Protection Through 802.11 Wireless Packet Injection**  
 Karson M. Miller, 18, John L. Miller-Great Neck North High School,  
 Great Neck, New York
- EE048      **The Effect of Switching on Lifetime and Life Cycle Cost of Compact Fluorescent Lamps and Incandescent Bulbs**  
 Elizabeth Marie Mako, 17, W.T. Woodson High School, Fairfax, Virginia
- EE056      **Voice Activated Navigation for the Blind**  
 Nirusan Jayaranjan, 15, College Sturgeon Heights Collegiate, Winnipeg,  
 Manitoba, Canada
- EE060      **Multi-Touch Table: An Infrared-Based Touch Interface Designed for Collaborative Data Manipulation**  
 Ritik Malhotra, 16, Lynbrook High School, San Jose, California
- Third Award of \$1,000**
- EE012      **Solar Sail**  
 Steven Munn Jeanes, 15, Bradenton Preparatory Academy, Bradenton, Florida
- EE015      **Ultrasonic Sensor Mobility Aids for the Visually Impaired**  
 Thomas Frederick Wilkason, 16, Mount de Sales Academy, Macon, Georgia
- EE018      **Autonomous Human-Seeking Robot**  
 Elizabeth Charlotte Coquillet, 18, Hathaway Brown School, Shaker Heights, Ohio
- EE037      **Mobile Phone Based Microscope**  
 E. Chandula Padmasiri, 16, Ananda College, Colombo 10, Western Region, Sri Lanka
- EE045      **Jet Engine by Compression through Shock Waves and Autonomous Acceleration**  
 Rafael Telis Gazzin Pessoa, 16, Centro Federal de Educacao Tecnologica de Minas Gerais, Belo Horizonte, MG, Brasil
- EE057      **A Compact Miniaturized Meander Antenna for Ultra High Frequency RFID Reader in Mobile Phone: Design and Measurement**  
 Justine Kim, 17, Taejon Christian International School, Daejeon, South Korea
- EE061      **Fine Control of Electromagnetic Levitation, A Second Year Study**  
 Christopher James King, 18, Creek Wood High School, Charlotte, Tennessee
- Fourth Award of \$500**
- EE005      **WireWise**  
 Owen Martin McMeel, 18, St. Mary's Grammar School Magherafelt, Co. Derry, Ireland
- EE006      **Development of Wire Bending Robot**  
 Jan Nezval, 18, Stredni Odborna Skola Prumyslova a Stredni Odborne Uciliste,  
 Prostejov, Czech Republic
- EE007      **Motion Sensor Controls: Advancement in a Higher Application**  
 Cole Eric Kembel, 18, Brush High School, Brush, Colorado

- EE021      **TEMMED: Drug-Timing System**  
 Rolando Alberto Retana-Badilla, 18, Colegio Tecnico Profesional Don Bosco,  
 San Jose, Costa Rica
- EE026      **Preignition Detector**  
 Felipe Gabriel Kuhn Soares, 18, Fundacao Escola Tecnica Liberato Salzano Vieira da  
 Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil
- EE047      **Look at This MES: Mars Environment Simulator III**  
 Julie Emily Walker, 18, Leonardtown High School, Leonardtown, Maryland
- EE050      **Table Tennis Robot: Can a Programmable MCU Utilize Physics to Hit Specific  
 Locations?**  
 Benjamin Allen Meeder, 18, Manheim Township High School, Lancaster, Pennsylvania
- EE058      **Control Innovations for Quadriplegics**  
 Christopher Jozef Chopcian, 13, Northern Collegiate Institute Vocational School, Sarnia,  
 Ontario, Canada
- EE073      **ULF Communications: Reaching the Surface**  
 Sophie Marie Swingle, 17, McCurdy High School, Espanola, New Mexico

## Engineering: Materials and Bioengineering - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

- EN051      **A Study of the Degradation of the Two-way Effect in NiTi**  
 Scott Alexander Skirlo, 18, Thomas Jefferson High School for Science and Technology,  
 Alexandria, Virginia

### First Award of \$3,000

- EN051      **A Study of the Degradation of the Two-way Effect in NiTi**  
 Scott Alexander Skirlo, 18, Thomas Jefferson High School for Science and Technology,  
 Alexandria, Virginia

- EN053      **Graphene: First Practical Production and Applications of the Supermaterial**  
 Philip Vidal Streich, 18, Home School, Platteville, Wisconsin

### Second Award of \$1,500

- EN001      **Striated Skeletal Muscle Analogue: A Design and Analytical Comparison**  
 Aaron Christopher Enten, 17, American Heritage School, Plantation, Florida
- EN014      **Suction Socket Fit Improver: Intelligent Variable Silicone Rubber Pad Technology  
 for Above-Knee Prostheses**  
 Ying Pan, 19, The Affiliated High School of South China Normal University,  
 Guangzhou, Guangdong, China

EN032      **Carbon Nanotube Synthesis and MEMS Fabrication**  
Steven Gary Noyce, 18, American Fork High School, American Fork, Utah

EN043      **Sensor for Organic Residues on Aluminum Surfaces**  
Christoph Wiesinger, 20, HTL Braunau, Braunau/Inn, Austria

**Third Award of \$1,000**

EN012      **Design and Construction of a Silent Magnetohydrodynamic Propulsion System**  
Ethan T. Hahn, 17, The Classical Academy, Colorado Springs, Colorado

EN027      **Optimal Design for Minimizing Structural Wind Loads in Hurricane Prone Regions**  
Kirsten Marie Boardman, 15, Orion Junior High School, Ogden, Utah

EN035      **Phase Separation in Ternary Polymer Blends Confined at Surfaces**  
Jaclyn Schein, 17, Hebrew Academy of the Five Towns and Rockaway, Cedarhurst, New York

EN046      **Integration of CdS-sensitized Nanobelts on a ZnO Nanowire Array in Solar Cells**  
Maryann Chenting Tung, 17, Saint Mary's Academy, Portland, Oregon

EN054      **BridgeTender: An Autonomous System to Monitor the Structural Health of Bridges**  
Evan Bock Clark, 17, West High School, Salt Lake City, Utah

**Fourth Award of \$500**

EN011      **Development of a Novel Antimicrobial Bone Graft Substitute for Cranioplasty**  
Catherine Yang Fan, 17, Tom C. Clark High School, San Antonio, Texas

EN026      **Design and Use of an Impact Response Device to Assess Structural Integrity**  
Devin John Roach, 15, Saint Pius X High School, Albuquerque, New Mexico

EN033      **Therapeutic Computer-Controlled Conditioning**  
Trevor M. Boardman, 16, Delta High School, Delta, Utah

EN037      **Sustainable Insulation & Conservation: Keeping Heat In & Sound Out**  
Raphael James Burne, 16, Maharishi School of the Age of Enlightenment, Fairfield, Iowa

EN038      **The Effect of Gold on the Superconducting Transition Temperature of Lead**  
Rahul Mitra, 15, Corona Del Sol High School, Tempe, Arizona

EN047      **The Secret to a Silicon-Based Supermaterial: Increasing the Economic Viability of Silica Aerogel through Subcritical Drying Processes**  
Justin To, 16, Oak Grove High School, San Jose, California

EN063      **Pain Free Socket**  
Katherine Emily Bomkamp, 17, North Point High School for Science, Technology and Industry, Waldorf, Maryland

## Energy and Transportation - Presented by Shell Oil

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

ET012 **Gone with the Windmills: An Analysis of the Effectiveness of an Oscillating Wind Energy Generator**  
Ryan Cherian Alexander, 16, R. C. Clark High School, Plano, Texas

### First Award of \$3,000

ET012 **Gone with the Windmills: An Analysis of the Effectiveness of an Oscillating Wind Energy Generator**  
Ryan Cherian Alexander, 16, R. C. Clark High School, Plano, Texas

ET029 **Optimizing the Growth of *Nannochloropsis oculata* for Production of BioFuels**  
Akshai Baskaran, 16, Kennewick High School, Kennewick, Washington

### Second Award of \$1,500

ET020 **Harnessing Solar Energy, Year Five: Increasing the Efficiency of a Hybrid Polymer Photovoltaic Cell with Nanofiber Polymer Complexes of Varied Thickness**  
Nathan McKay Monroe, 18, Episcopal High School, Jacksonville, Florida

ET039 **Domestic Wind Turbine**  
Melisa Hincapie, 17, Colegio La Compania de Maria La Ensenanza, Medellin, Antioquia, Colombia

ET048 **A Novel Microbial Fuel Cell Based on Inexpensive Graphite Electrodes**  
Vishnu Jayaprakash, 15, Chettinad Vidyashram, Chennai, Tamil Nadu, India

ET057 **The Effect of Rumble Strip Design on Vehicle Trajectory, a Two Year Study**  
Renee Louise Schaaf, 17, Central High School, Saint Joseph, Missouri

### Third Award of \$1,000

ET038 **Optimizing Biodiesel Fuels: What SHOULD We Be Growing?**  
Jonathan Howard Guinther, 18, Mills E. Godwin High School, Richmond, Virginia

ET042 **Reducing Wing Induced Drag through the Addition of Adaptive Tip Sails**  
Joseph Anthony Gerner, 16, George C. Marshall High School, Falls Church, Virginia

ET046 **Warning about Warming: Innovative Fuel Cells for the 21st Century--A Performance Study of the Proton Exchange Membrane, Reversible, and Direct Methanol Fuel Cells Under Multiple Operating Conditions**  
Pavane Lakshmi Gorrepati, 15, Rivermont Collegiate, Bettendorf, Iowa

ET049 **Sugar Production, Waste Reduction: Turning Wastepaper into Fermentable Sugars for Bioethanol**  
Xingyu Zhou, 16, Walter Murray Collegiate Institute, Saskatoon, Saskatchewan, Canada

- ET050      **The Electromagnetic Vibration Dampening System for Advanced Solid Rocket Fuel Motor Systems**  
Joseph Richard Bussenger, 17, Pennridge High School, Perkasio, Pennsylvania
- ET064      **Charcoal and Methanol Synthesis by the Destructive Distillation of Cellulosic Waste: Chemical Analysis and Environmental Implications**  
David Junzi Wu, 18, Cherry Creek High School, Greenwood Village, Colorado
- Fourth Award of \$500**
- ET030      **Glycerin Additive to Power**  
Shelby Marie Sieren, 18, Keota High School, Keota, Iowa
- ET045      **Optimizing Turbine Blade Efficiency by Manipulating Boundary Layer Separation**  
Andrew Kipling Miller, 18, Western Alamance High School, Elon, North Carolina
- ET051      **Matching Winglet to Wing, Phase Two**  
Ariel Lyn Evans, 17, Sussex Central High School, Georgetown, Delaware
- ET052      **Fourier Transform Infrared Spectroscopy Analysis of Oxidative Degradation of Ethyl Levulinate, A Novel and Promising Non-Food Source Biofuel**  
Andrew Knoller Cohen, 18, Columbia Grammar and Preparatory School, New York, New York
- ET065      **The Efficiency of Various Solar Heating Methods**  
Robert Royce Davis, 18, Westview High School, Martin, Tennessee
- ET066      **Improving Safety of Hydrogen Generation**  
Alexander Sergeevich Gandzyura, 17, Ridgeview High School, Orange Park, Florida
- ET068      **Microbial Conversion of Glucose into Lipids Using Municipal Wastewater Activated Sludge Microflora**  
Courtney Alexandria Ramsey, 18, Mississippi School for Mathematics and Science, Columbus, Mississippi
- ET069      **Solar Acquisition**  
Shyamal Ashwin Patel, 18, Saint Augustine High School, Saint Augustine, Florida

## Environmental Management - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

- EM016      **Shedding Light on Imidacloprid's Role in Colony Collapse Disorder**  
Eliza Helen McNitt, 17, Greenwich High School, Greenwich, Connecticut

**First Award of \$3,000**

- EM016      **Shedding Light on Imidacloprid's Role in Colony Collapse Disorder**  
Eliza Helen McNitt, 17, Greenwich High School, Greenwich, Connecticut

**Second Award of \$1,500**

- EM003      **Use of *Chlorella pyrenoidosa* Microalgae Supplements as a Chelant for Heavy Metal Filtration**  
Vivian Connie Tsang, 17, Sunset High School, Portland, Oregon
- EM024      **Retention of Sorbed Hydrophobic Pollutant by Organoclay in the Presence of Hydrocarbon-Degrading Bacterial Isolates**  
Laurie Ann Rumker, 16, Oregon Episcopal School, Portland, Oregon
- EM037      **Recycled Composite Material Made from Non-recyclable Multilayer Film Plastic Packaging Waste**  
Hetal Kanjibhai Vaishnav, 16, Late Shree S.G Dholakiya Memorial High School, Rajkot, Gujarat, India

**Third Award of \$1,000**

- EM004      **Analysis of the Phytoremediative Capabilities of the *Salix nigra* and *Salix caroliniana* on Trichloroethylene with a Focus on Phytodegradation and Phytovolatilization, Year Two**  
Meredith Celeste Boulos, 17, Episcopal High School, Jacksonville, Florida
- EM027      **The Effects of Pesticides on the Viability of *Artemia franciscana*, Including Verification and Impact of Their Use as an Alternative Nitrogen Source for Composting, Phase II**  
Alexa Anne Lunt, 16, Weber High School, Pleasant View, Utah
- EM038      **In-stream Bioreactors: N<sub>2</sub>O Producers?**  
Zachary Alexander Elgood, 15, Cameron Heights Collegiate Institute, Kitchener, Ontario, Canada
- EM042      **The Effects of Recycled Rubber Mulch on *Phaseolus vulgaris* Plants in a Hydroponics System**  
Michael Tron Sherman, 18, Mansfield High School, Mansfield, Missouri

**Fourth Award of \$500**

- EM010      **A Hairy Situation**  
Sarah Ida Tedesco, 14, Bradenton Preparatory Academy, Bradenton, Florida
- EM014      **The Effects of Prescribed Burning on Environmental Mercury Release during Subsequent Forest Fires**  
Julia Marie Denning, 17, Gold Beach High School, Gold Beach, Oregon
- EM025      **A Novel Synthesis of MFCs on the Reduction of Chemical Oxygen Demand in Wastewater Treatment Plants**  
Vincent Andrew Zampelli, 18, Conrad Weiser Area High School, Robesonia, Pennsylvania
- EM032      **Synthesis of Novel Iron-oxide-silica Hybrid Adsorptive Media for Arsenic Removal**  
Brittany Hsu, 16, Jericho High School, Jericho, New York
- EM046      **Hydrolysis Reaction Rates and Surfactant Functions of Plastics**  
Courtney Gail Reed, 18, Parkview High School, Lilburn, Georgia

## Environmental Sciences - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

EV029      **The Use of Bioluminescent Bacteria to Detect Environmental Contaminants**  
Li Sallou Boynton, 17, Bellaire High School, Bellaire, Texas

### First Award of \$3,000

EV029      **The Use of Bioluminescent Bacteria to Detect Environmental Contaminants**  
Li Sallou Boynton, 17, Bellaire High School, Bellaire, Texas

### Second Award of \$1,500

EV018      **Investigating Epigenetics: Methylation and Pollution-Induced Gene Expression in the Invertebrate *Dugesia tigrina***  
Amy Elizabeth Van Scoyoc, 17, East Hampton High School, East Hampton, New York

EV024      **Implementation of Thermal Plume Rise in SILAM Atmospheric Dispersion Model**  
Riinu Ots, 19, Hugo Treffner Gymnasium, Tartu, Estonia

EV030      **Natural Organics Control Aggregation of Mercury Sulfide Nanoparticles in Freshwater Systems**  
Eileen Kao Jang, 17, North Carolina School of Science and Mathematics, Durham, North Carolina

### Third Award of \$1,000

EV003      **Grape Extracts as Possible Therapeutic Treatments for Plant and Bacterial Toxins**  
Srikar Patlola Reddy, 15, Lake Highland Preparatory School, Orlando, Florida

EV020      **Comparison of the Effectiveness of Formalin, Hydrogen Peroxide, and Ultra Violet Water Purification for the Control of Surface Pathogens on Fathead Minnow Eggs**  
Jay B. Gulshen, 16, Camdenton High School, Camdenton, Missouri

EV026      **The Remediation of Eutrophication with Potassium Salt Targeting *Microcystis spp.***  
Yao Sing Wong, 17, North Quincy High School, Quincy, Massachusetts

EV033      **Sink or Source: The Role of Street Solids in Heavy Metals Contamination of River Water**  
Benjamin Chang Sun, 16, Red River High School, Grand Forks, North Dakota

### Fourth Award of \$500

EV012      **Evaluating Estrogen and Estrogen Mimics in Public Water Sources Using a Yeast Cell-Based Bioassay**  
Kim Mai Tuan Le, 15, duPont Manual High School, Louisville, Kentucky

EV014      **Study on the Absorption of Lead in Soil by *Lantana camara L.* Parasitized by *Cuscuta japonica***  
Jingwen Huang, 18, No.65 High School, Guangzhou, Guangdong, China

- EV025      **Artificial Selection for Polystyrene Degradation in Bacterial Communities**  
Michael Robert Wallace, 18, Tucson High Magnet School, Tucson, Arizona
- EV031      **Effect of Corticosterone on the Expression of Insulin Receptor mRNA in *Xenopus laevis* (African Clawed Frog)**  
Anita Vasudev Saraf, 14, Alfred M. Barbe High School, Lake Charles, Louisiana
- EV041      **Tar Creek: Measuring the Recovery of a Superfund Stream Using Macroinvertebrates**  
Nicholas Lee Shepherd, 16, Miami High School, Miami, Oklahoma

## Mathematical Sciences - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

- MA042      **The Classification of Certain Fusion Categories**  
Eric Kerner Larson, 17, South Eugene High School, Eugene, Oregon

**First Award of \$3,000**

- MA042      **The Classification of Certain Fusion Categories**  
Eric Kerner Larson, 17, South Eugene High School, Eugene, Oregon

**Second Award of \$1,500**

- MA005      **Universal Law for the Distribution of Odd Periodic Cycles within Chaos in Nonlinear Dynamical Systems: An Analysis of Rigid Bifurcation, Year II**  
Almas Abdulla, 15, West Shore Junior/Senior High School, Melbourne, Florida

- MA018      **Forcing a Draw in K-in-a-Row Games**  
Sheng-Hao Chiang, 18, National Experimental High School at Hsinchu Science Park, Hsinchu City, Chinese Taipei

- MA025      **On G-Difference: A Property of Permutations and Words**  
Kristin Rose Cordwell, 18, Manzano High School, Albuquerque, New Mexico

**Third Award of \$1,000**

- MA007      **Sequences of Reducible 0,1 Polynomials**  
Martin Augustine Camacho, 13, Central High School, St Paul, Minnesota

- MA023      **Matching Preclusion for the (n,k)-Bubble-Sort Graphs**  
David Alfred Sherman, 18, Wylie E. Groves High School, Beverly Hills, Michigan

- MA030      **An Analysis of Erdos's Conjecture**  
Matthew Henry Stoffregen, 18, Woodland Hills High School, Pittsburgh, Pennsylvania

- MA043      **Infinite Sums of Zeta Functions and Other Dirichlet Series**  
Andrei Triffo, 17, Synge Street CBS Secondary School, Dublin, Ireland

**Fourth Award of \$500**

- MA022      **An Investigation of the Closure of the Set of Singleton Sets of Natural Numbers under Union, Intersection, Complement, Addition, Multiplication**  
Jason Saul Gross, 17, Commack High School, Commack, New York
- MA029      **Approximation of the Size of Distorted Spherical Objects, and a New Algorithm for Precisely Estimating the Size of Spherical Fullerene Molecules**  
Jun Sup Lee, 15, Langley High School, McLean, Virginia
- MA032      **Parameterizing Knots with Chebyshev Polynomials**  
Jenna Kay Freudenburg, 18, Kalamazoo Area Math and Science Center, Kalamazoo, Michigan
- MA037      **Graph Crossings and Cyclic Permutations: Towards a Proof of Zarankiewicz's Conjecture**  
Joshua Vekhter, 17, Williamsville East High School, East Amherst, New York
- MA040      **microRNA Expression Patterns in Mouse Lung Development and Cancer**  
Kevin Kyle Hawkins, 17, Glen Oak High School, Canton, Ohio

**Medicine and Health Sciences - Presented by National Institutes of Health**

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

- ME052      **Down-regulation of hTERT Sensitizes Chemotherapeutic Effects of Docetaxel in Human Prostate Cancer Cells**  
Ashoka Sanjaya Rajendra, 17, Loudoun County Academy of Science, Sterling, Virginia

**First Award of \$3,000**

- ME015      **Engineering and Validating Predictive Infection Surveillance Strategies for Methicillin-resistant *Staphylococcus aureus***  
Stephen Walter Trusheim, 18, Breck School, Golden Valley, Minnesota
- ME052      **Down-regulation of hTERT Sensitizes Chemotherapeutic Effects of Docetaxel in Human Prostate Cancer Cells**  
Ashoka Sanjaya Rajendra, 17, Loudoun County Academy of Science, Sterling, Virginia
- ME065      **Statins Prevent Breast Cancer Growth and Metastasis, a Third Year Study**  
Nayana Ghosh-Choudhury, 17, Northside Health Careers High School, San Antonio, Texas

**Second Award of \$1,500**

- ME008      **Thermal Ablation of Glioblastoma Tumor Stem Cells Using Gold Nanorods**  
Muna Oli, 16, Eastside High School, Gainesville, Florida

- ME010      **Why Your Arteries Care About PAPP-A: PAPP-A Enhances Smooth Muscle Cell Hyperplasia**  
Catherine Elizabeth Ishitani, 17, Mayo High School, Rochester, Minnesota
- ME017      **CD11B+ Monocyte Infiltration into CNS Following M1 Activation**  
Bahar Bipin Shah, 18, Canterbury School, Fort Myers, Florida
- ME050      **Synthesis of Cathepsin B Degradable Peptidic Dendrimers**  
Sneha Trichy Kannan, 17, Montgomery Blair High School, Silver Spring, Maryland
- ME075      **Comparing Survival of PUMA-deficient & Wildtype MSCs to Apoptotic Stimuli for Augmented Regeneration**  
Ratna Varma, 16, A. B. Lucas Secondary School, London, Ontario, Canada

**Third Award of \$1,000**

- ME005      **Stealthy Iron Oxide Nanoparticles: Towards the Identification and Eradication of Cancer Cells**  
Philip S. Schlenoff, 16, Maclay School, Tallahassee, Florida
- ME032      **Aquaporin-4 Channels Regulate CA1 Hippocampal Long-Term Potentiation**  
Ian Barry Mathews, 17, Irvington High School, Irvington, New York
- ME043      **Super Oligodendrocytes: Remyelinating MS Lesions Using Laminin and Immunomodulators**  
Jourdan Brandt Urbach, 17, Roslyn High School, Roslyn Heights, New York
- ME044      **The Novel Property of the Circulating Hormone AM and Its Binding Protein: Neuroprotection in Hypoxia**  
Stephanie Mian Wang, 17, Roslyn High School, Roslyn Heights, New York
- ME046      **Does Red Wine Every Day Keep the Grey Hair Away?**  
Ashley Marie Thelen, 17, Mitchell Senior High, Mitchell, South Dakota
- ME071      **Cracking Cancer with CRK: Determining the Effects of SHRNA CRK in the Metastatic & Cellular Functioning of MDA-MB-231 Breast Adenocarcinoma**  
Abicumaran Uthamacumar, 15, Marymount Academy, Montreal, QC, Quebec, Canada
- ME091      **Neural Stem Cell Migration and Remyelination in Response to Chemokines**  
Julianne Marie Golinski, 18, Hathaway Brown School, Shaker Heights, Ohio
- ME095      **The Dissolution of Various OTC Medicines Under Different Physiological pH Conditions**  
Marisha N. Wickremsinhe, 15, Brebeuf Jesuit Preparatory School, Indianapolis, Indiana

**Fourth Award of \$500**

- ME002      **Extraction of Phenolics in Honey for Antibacterial Analysis, Phase III**  
Bora Kang, 18, Union Grove High School, McDonough, Georgia
- ME020      **Identification and Prevention of MRSA Transferred between Community and Medical Settings on Mobile Phones**  
Karen Ashley Kruzer, 17, West Geauga High School, Chesterland, Ohio

- ME047      **Erythropoietin: Friend or Foe to Breast Cancer Cell Lines?**  
Joy Ebinoluwa Obayemi, 16, Academy of Medical Science Technology,  
Hackensack, New Jersey
- ME049      **The Role of Regulatory T Cells in Experimental Autoimmune Encephalomyelitis**  
Connie M. Fu, 17, Detroit Country Day School, Beverly Hills, Michigan
- ME057      **Prevalence of Human Papilloma Virus in Young Vermont Women: Implications for the HPV Vaccine**  
Caroline Alexandra Weaver, 17, South Burlington High School, 6 Iris Lane, Vermont
- ME063      **A Solution for Post-Surgical Pain Control: A Novel Sustained-Release Local Anesthetic Composed of Hyaluronan, Fibrinogen, and Marcaine**  
David C Evans, 17, Hillcrest High School, Midvale, Utah
- ME066      **White Coats: Boon or Bane?**  
Ariel Lynne Schroeder, 17, Saint Joseph High School, Natrona Heights, Pennsylvania
- ME072      **Polymer Surface Modulation of Fibrinogen Fibril Self Assembly: Applications in Late Stent Thrombosis**  
Pooja Rambhia, 16, Jericho High School, Jericho, New York
- ME089      **Adenosine 2b Receptor: A Novel Therapeutic Target for Irritable Bowel Syndrome**  
Zinan Zhang, 16, Chamblee Charter High School, Chamblee, Georgia
- ME097      **The Effects of Stimulants on Muscle Tissue Augmented with Bodybuilding Supplements**  
Zachary Douglas Schmidt, 18, Northwestern High School, Kokomo, Indiana

## Microbiology - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

- MI020      **A Styrofoam-Decomposing Bacterium from Mealworms**  
I-Ching Tseng, 16, National Taichung Girl's Senior High School, Taichung, Taiwan,  
Chinese Taipei

### First Award of \$3,000

- MI020      **A Styrofoam-Decomposing Bacterium from Mealworms**  
I-Ching Tseng, 16, National Taichung Girl's Senior High School, Taichung, Taiwan,  
Chinese Taipei

- MI023      **Identification of Genes in *C. albicans* that Contribute to Antifungal Resistance**  
Shubhangi Arora, 15, Novi High School, Novi, Michigan

**Second Award of \$1,500**

- MI036      **Antibiotics from Eggs of the Spider *Phoneutria nigriventer***  
Ivan Lavander Candido Ferreira, 18, Colegio Guilherme Dumont Villares,  
Sao Paulo, SP, Brasil
- MI049      **Combination of Ultrasound and Antibiotic's Synergy on Bacteria Viability**  
Mayank Tahilramani, 17, Peachtree Ridge High School, Suwanee, Georgia
- MI057      **Confirmation of Biological Activity in Tn5 Mutagenesis of *Burkholderia pyrrocinia* (FL728) Biological Control Agents**  
Stephanie Page Hoskins, 16, Lincoln Park Academy, Fort Pierce, Florida

**Third Award of \$1,000**

- MI004      **Can It Change? Characterizing *Pseudomonas aeruginosa* Morphology Variants and Reducing Bacterial Virulence with a Biofilm Inhibitor**  
Jeremy C. Hsiang, 16, Niceville High School, Niceville, Florida
- MI011      **The Effect of Ibudilast on Tat-induced TNF-alpha Production**  
Divya Seth, 16, Brighton High School, Rochester, New York
- MI028      **Growth of the Amphibian Pathogen *Batrachochytrium dendrobatidis* in Response to the Chemical Properties of Aquatic Environments**  
Scott Paul Boisvert, 15, Basha High School, Chandler, Arizona
- MI048      **Changes in Specific Cell Surface Proteins of *Azospirillum brasilense* and Consequences on Bacterial Development**  
Taylor Wesley Jones, 16, Alcoa High School, Alcoa, Tennessee
- MI051      **Irradiation Extermination: A Portable System to Eliminate Water-Borne Microorganisms**  
Kelli Ann Lynch, 15, Blevins Junior High, Fort Collins, Colorado

**Fourth Award of \$500**

- MI003      **Possible Therapeutic Treatments to Block the Action of Plant and Bacterial Toxins, Year Two**  
Mansfield Nello Burlingame, 18, Lake Brantley High School, Altamonte Springs, Florida
- MI014      **Isolating a Novel Antibiotic from *Bacillus flexus*, a Bacterium Found in the Human Microbiome**  
Andrew James Macgregor, 16, Butte High School, Butte, Montana
- MI015      **The Effectiveness of S2 Pyocins and Oxidative Stress in Combating *Pseudomonas aeruginosa* Biofilm Development**  
Lindsey Elizabeth Hastings, 17, duPont Manual Magnet High School,  
Louisville, Kentucky
- MI041      **POEA in the Environment, Year III: Toxic Effects of POEA Surfactant on and Identification of Bacteria on *Eisenia foetida* and Surrounding Soil**  
Jayton Lewis Rainey, 15, Slaton High School, Slaton, Texas
- MI044      **Correlating Genetic Signatures with Surface Sugar Expression in *Vibrio vulnificus***  
Shilpa Pramod Argade, 17, Scripps Ranch High School, San Diego, California

MI052

**Probiotic Bacteria: Medical Applications of *Lactobacillus acidophilus***

Emily Anne Schubert, 17, Northwestern High School, Kokomo, Indiana

## Physics and Astronomy - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner**

PH034

**A Relativistic Generalization of the Navier-Stokes Equations to Quark-Gluon Plasmas**

Nilesh Tripuraneni, 18, Clovis West High School, Fresno, California

**First Award of \$3,000**

PH006

**A Quantum Algorithm for Molecular Dynamics Simulation**

Yale Wang Fan, 17, The Catlin Gabel School, Portland, Oregon

PH034

**A Relativistic Generalization of the Navier-Stokes Equations to Quark-Gluon Plasmas**

Nilesh Tripuraneni, 18, Clovis West High School, Fresno, California

**Second Award of \$1,500**

PH015

**Can a Polymer Be Made to Act Like a Metal and Exhibit Magnetic Properties?**

Michael Vincent Di Mascio, 17, Waynesville High School, Waynesville, Ohio

PH019

**Determining the Orbital Elements of Minor Planet 23265**

Caroline Julia von Wurden, 17, Los Alamos High School, Los Alamos, New Mexico

PH049

**Star in a Jar: Operating Parameter Relationships in an Inertial Electrostatic Confinement Fusion Reactor**

Eric A. Foss, 17, Kentwood High School, Covington, Washington

PH054

**Simulation of a Spin-Stabilized Magnetic Top in a Magnetic Gradient Trap**

Benjamin Lee Nosarzewski, 18, Paul Laurence Dunbar High School, Lexington, Kentucky

**Third Award of \$1,000**

PH005

**A Novel Method to Determine the Mechanism Behind DNA-DNA Interactions Using Optical Tweezers**

Sujay Tyle, 15, Pittsford Mendon High School, Pittsford, New York

PH017

**A Study on the Relationship Between Reynolds Number, Polygonal Vortices, and Saturn's Polar Hexagon, A Third Year Study**

Aaron Mitchell Stecker, 17, Ridgeview High School, Orange Park, Florida

PH018

**A Novel Method for Measuring Sonoluminescent Spectra**

Lyric Elizabeth Gillett, 17, Cornerstone High Homeschool, Houston, Texas

PH033

**Fast Low-Cost Bisphenol-A (BPA) Detector**

Harikrishna Rallapalli, 17, Amador Valley High School, Pleasanton, California

- PH039      **Versatile Wind Velocity and Direction Transducer**  
Olexandr Olenyev, 16, Bahatoprofilnyj Litsey #99, Zaporizhzhya, Ukraine
- Fourth Award of \$500**
- PH008      **Optical Detection of Hazardous Materials for Homeland Security, Phase III**  
Michael A. Gord, 16, Dayton Christian High School, Miamisburg, Ohio
- PH016      **Laser Induced Microfluidic Motion of a Liquid-Liquid Interface**  
William Cummings Newberry, 17, Greenwich High School, Greenwich, Connecticut
- PH021      **Optimization of CCD Parameters for High Resolution Lunar Imaging**  
Michelle Dawn Wenz, 17, Red Lion Area Senior High School, Red Lion, Pennsylvania
- PH028      **Hey, Can You Hear Me? Using Isobel Contour Mapping to Determine Acoustically Optimum Seating Positions in a Given Classroom**  
Chaneg Torres, 15, Redeemer Baptist School, North Parramatta, New South Wales, Australia
- PH036      **Identifying T-Tauri Stars Using Small-Scale Optical Telescopes**  
Jennifer Lynn Butchart, 17, Oil City Area Senior High School, Oil City, Pennsylvania
- PH048      **Subcritical Neutron Multiplication in a 2.5 MeV Neutron Flux**  
Taylor Ramon Wilson, 14, The Davidson Academy of Nevada, Reno, Nevada
- PH062      **Transport Studies of Magnetism in Individual Gold Nanoparticles**  
Austin Evanne Coye, 15, Lake Highland Preparatory School, Orlando, Florida

## Plant Sciences - Presented by Intel

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winner

- PS027      **Phylogeny of the Taxaceae Inferred from Phytochrome Sequences**  
Mark Adrian Chonofsky, 17, Lexington High School, Lexington, Massachusetts

### First Award of \$3,000

- PS027      **Phylogeny of the Taxaceae Inferred from Phytochrome Sequences**  
Mark Adrian Chonofsky, 17, Lexington High School, Lexington, Massachusetts

### Second Award of \$1,500

- PS021      **The Identification of Enzymes Used in *Salvia divinorum* to Produce Salvinorin A**  
Angela Marie Schlegel, 18, Tucson High Magnet School, Tucson, Arizona
- PS036      **Using a Genetic Screen, Homozygous Knockouts, and an Auxin Concentration Curve to Explore the Role of Glutamate Receptors in the Morphology and Signaling Pathways of *Arabidopsis thaliana***  
April S. Lee, 18, Stuyvesant High School, New York, New York

PS051 **Interpreting the Hydrological History of the Everglades through Microscopic Characterization of Phytoliths**  
Christopher Allen Sanchez, 16, Felix Varela Senior High School, Miami, Florida

**Third Award of \$1,000**

PS004 **Plant Communities in Response to Anthropogenic Disturbance Regimes on Arthropod Communities, Year III**  
Logan Allan Kostroun, 18, C.H. Yoe High School, Cameron, Texas

PS011 **Using Yeast Two Hybrid System to Identify the Protein-Protein Interaction between Rxo1 and Xoc-AvrRxo1**  
Tian Zhou, 18, Blacksburg High School, Blacksburg, Virginia

PS035 **Attack of the Native: Evaluating How the Expanding *Smilax Rotundifolia* Affects a Grassland Microbial Soil Community as Measured by the Growth of *Schizachyrium scoparium***  
Rachel Elizabeth Newmiller, 18, Upper Dublin High School, Fort Washington, Pennsylvania

PS039 **Food or Fuel? Creating Alternative Uses for Soybeans**  
Logan James Metzen, 17, Hankinson High School, Hankinson, North Dakota

**Fourth Award of \$500**

PS022 **Sonoran Solar Solution**  
Ebaa Al-Obeidi, 17, Canyon Del Oro High School, Oro Valley, Arizona

PS033 **The Effect of Selected Weeds Extracts on the Immunity of Pinto Beans Using a Tobacco Mosaic Virus Assay**  
Misha Ann Kearns, 17, North Toole County High School-Sunburst, Sunburst, Montana

PS040 **The Effect of Gathering Bark from Wiigwaasi-mitig (Paper Birch)**  
Joseph L. DePerry, 17, Bayfield High School, Bayfield, Wisconsin

PS042 **The Phytochemical Activity of *Camellia sinensis* on Wheat**  
Megan Marie Meyer, 18, Hankinson High School, Hankinson, North Dakota

PS044 **Investigating Soybean Traits and How They Relate to the Yield**  
Jackson Henry Troxel, 18, LaCrosse High School, LaCrosse, Indiana

## Team Projects - Presented by *Science News*

Intel will present Best of Category Winners with a \$5,000 award and a new laptop powered by an Intel® Core™2 Duo processor. 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 for Top First Place Winners**

BE306 **ALPHA-Lipoic Acid: Towards a Novel Neuroprotective Treatment for Alzheimer's Associated Cognitive Dysfunction in a *Drosophila* Model**  
Shaunak Krishan Bakshi, 15, Manhasset High School, Manhasset, New York  
Peter Hans Massey, 16, Manhasset High School, Manhasset, New York

PH313 **A Novel Approach to Asteroid Identification Using Image Processing of Existing Data**  
Erika Alden DeBenedictis, 17, Albuquerque Academy, Albuquerque, New Mexico  
Haochen Hong, 16, La Cueva High School, Albuquerque, New Mexico  
Duanni Huang, 18, La Cueva High School, Albuquerque, New Mexico

**First Award of \$3,000**

BE306 **ALPHA-Lipoic Acid: Towards a Novel Neuroprotective Treatment for Alzheimer's Associated Cognitive Dysfunction in a *Drosophila* Model**  
Shaunak Krishan Bakshi, 15, Manhasset High School, Manhasset, New York  
Peter Hans Massey, 16, Manhasset High School, Manhasset, New York

CS309 **Heuristical Multitouch Interface Data Transfer**  
Lai Xue, 16, Chengdu International School, Chengdu, Sichuan, China  
Darren Lim, 15, Chengdu International School, Chengdu, Sichuan, China  
Hyun Ki Lee, 17, Chengdu International School, Chengdu, Si Chuan, China

EE302 **The EiMSARobot**  
Petr Bubenicek, 18, Gymnasium Aloise Jiraska, Litomysl, Czech Republic  
Marek Votroubek, 18, Gymnazium Aloise Jiraska, Litomysl, Czech Republic  
Jan Kral, 19, Gymnazium Aloise Jiraska, Litomysl, Czech Republic

EM315 **The Impact of Abscisic Acid on the Sequestration of Metals by *Euglena gracilis***  
Jacqueline B Bokor, 15, Long Beach High School, Lido Beach, New York  
Hannah M Berkowitz, 15, Long Beach High School, Lido Beach, New York

ET317 **Novel Water Lens for Cost-Effective Electricity Generation**  
Siheng S. You, 17, Sunset High School, Portland, Oregon  
Ashutosh Patra, 17, Sunset High School, Portland, Oregon

ME319 **Development of a Urine Test for the Early Detection of Cancer**  
Janet Song, 17, Methacton High School, Eagleville, Pennsylvania  
Benjamin Paul Song, 15, Methacton High School, Eagleville, Pennsylvania

PH313 **A Novel Approach to Asteroid Identification Using Image Processing of Existing Data**  
Erika Alden DeBenedictis, 17, Albuquerque Academy, Albuquerque, New Mexico  
Haochen Hong, 16, La Cueva High School, Albuquerque, New Mexico  
Duanni Huang, 18, La Cueva High School, Albuquerque, New Mexico

PS315 **Transforming *Ipomoea batatas* via Direct Inoculation with *Agrobacterium rhizogenes*, a Continuation**  
Randall Scott Ray, 18, Emil E. Holt Wentzville Holt High School, Wentzville, Missouri  
Leslie Marie Young, 17, Emil E. Holt Wentzville High School, Wentzville, Missouri

**Second Award of \$1,500**

BI303 **The Effects of Pepper Juice (Capsaicin) as a Daily Supplement on Human Health**  
Heather Lynne Nielsen, 16, The Villages High School, The Villages, Florida  
Alex Keeler, 14, The Villages High School, The Villages, Florida  
Savannah Shaw, 16, The Villages Charter High School, The Villages, Florida

- CH304      **Can Mass Spectra Be Obtained Directly from a TLC Separation of Lipids from *Mycobacterium avium*?**  
Caitlyn Elizabeth Koscielski, 17, Marian High School, Mishawaka, Indiana  
Caroline June Trippel, 18, Marian High School, Mishawaka, Indiana
- CS306      **Stylometric "Fingerprinting": A Computerized Approach to Author Identification**  
Ashley Kate Vechinski, 14, Life Christian Academy, Harvest, Alabama  
Bethany Lynne Johnson, 15, Life Christian Academy, Harvest, Alabama
- EA301      **Field and Statistical Analysis of Landslide Propensity: Using Study Sites from Oregon City, Oregon**  
Evan George Marshall, 16, Westview High School, Portland, Oregon  
Sandeep Mallidi, 17, Westview High School, Portland, Oregon
- EE308      **Optimization of a Machine for the Production of Carbon Nanotubes through an Arc Discharge at a Low Frequency**  
Mabellin Fallas-Quesada, 18, Colegio Tecnico Profesional San Sebastian, San Jose, Costa Rica  
Fabiola Bogantes-Jimenez, 18, Colegio Tecnico Profesional de San Sebastian, San Jose, Costa Rica  
Yaoska Lucia Hernandez-Duarte, 16, Colegio Tecnico Profesional de San Sebastian, San Jose, Costa Rica
- EE315      **Clamped Bottle Cap: A Novel Tamper-proof Bottle Cap Design**  
Debarghya Sarkar, 17, South Point High School, Kolkata, West Bengal, India  
Anish Mukherjee, 17, South Point High School, Kolkata, West Bengal, India
- EM301      **Turning the Ocean Upside Down: A Study in Trends of Coastal Upwelling Along the Pacific Coast**  
Harish Srikar Vemuri, 17, Westview High School, Portland, Oregon  
Maanas Tripathi, 17, Westview High School, Portland, Oregon  
Peter Chal Landgren, 18, Westview High School, Portland, Oregon
- EN313      **Engineering Thermoreversible Hydrogels for Controlled Drug Delivery**  
Elias Lebovits, 18, Ramaz Upper School, New York, New York  
Daniel Y. Peng, 17, Monta Vista High School, Cupertino, California  
Naveen Murali, 16, Staples High School, Westport, Connecticut
- ME305      **Histone Deacetylase (HDAC) Inhibition: A Potential Therapy for Binge Alcohol Toxicity**  
Shilpa Mokshagundam, 16, duPont Manual Magnet High School, Prospect, Kentucky  
Vishnu Kiran Kadiyala, 17, duPont Manual Magnet High School, Louisville, Kentucky
- ME318      **A Functional Genomic Framework for Chemotherapeutic Drug Improvement and Identification**  
Sajith M Wickramasekara, 18, North Carolina School of Science and Mathematics, Durham, North Carolina  
Andrew Yi Guo, 18, North Carolina School of Science and Mathematics, Durham, North Carolina

- MI312      **From Sequence to Structure: Linking Genomic and Biochemical Information to Identify and Optimize Cellulolytic Bacteria**  
Katherine Shaohua Xue, 17, Oak Ridge High School, Oak Ridge, Tennessee  
Alborz Bejnood, 16, Oak Ridge High School, Oak Ridge, Tennessee
- PH316      **Energy from Spark Discharges: Amazing Overunity or Experimental Error?**  
Walter Preston Hansen, 17, Bingham High School, South Jordan, Utah  
Riley Taylor Densley, 17, Bingham High School, South Jordan, Utah
- PH321      **Magnetosphere Particle Interaction**  
Brandon Tyler Ramirez, 17, McCurdy High School, Espanola, New Mexico  
Francisco Martin Vigil, 18, McCurdy High School, Espanola, New Mexico  
Dennis Paul Trujillo, 16, McCurdy High School, Espanola, New Mexico
- PS304      **Effects of No-tillage on Broccoli Growth and Ecosystem of Soil**  
Haoyu Wang, 16, Beijing 101 Middle School, Beijing, China  
Manqiang Wang, 17, The No.80 High School of Beijing, Beijing, China
- PS308      **Discovery of an Anti-Brown-Planthopper (*Nilaparvata lugens Stal*) Rice and Its Wonderful Mechanism for Repelling the Insects**  
Haoxi Chai, 18, No.1 High School Attached to Central China Normal University, Wuhan, Hubei, China  
Ke Sun, 17, The No.1 Middle School Attached To Central China Normal University, Wuhan, Hubei, China  
Siyang Lu, 17, The No.1 Middle School Attached To Central China Normal University, Wuhan, Hubei, China
- Third Award of \$1,000**
- AS301      **Specific Treatment and Control of Parasites on Game**  
Barend Johannes de Beer, 17, Waterkloof High School, Pretoria, Gauteng, South Africa  
Jason Dixon, 17, Waterkloof High School, Pretoria, Gauteng, South Africa
- AS307      **The Effect of Pre-Birth Learning on Cuttlefish**  
Timothy Joseph Higgins, 18, South County Secondary School, Lorton, Virginia  
Eric David Morris, 17, South County Secondary School, Lorton, Virginia
- BI306      **Sunscreen: A Catch 22- Blocking of the Photocatalytic Activity of Titanium Dioxide Nanoparticles by Polymer Coating**  
Samantha B. Larsen, 17, Long Beach High School, Lido Beach, New York  
Cole J Blum, 16, Long Beach High School, Long Beach, New York
- BI308      **Effect of the Plant *Graptophyllum pictum* on the Haemostasia Process of *Lumbricus terrestris***  
William Pagan -Palermo, 14, Blanca Malaret, Sabana Grande, Sabana Grande, Puerto Rico  
Stephanie N. Rivera-Santiago, 14, Blanca Malaret Junior High School, Sabana Grande, Puerto Rico
- CB307      **MicroRNAs: A Possible Treatment for Prostate Cancer**  
Rebecca Alexzandria Evelyn Abrams, 17, Harmony Science Academy, Houston, Texas  
Fatma Tanis, 16, Harmony Science Academy, Houston, Texas

- CS301      **An Innovative Open-Source Reporting Solution to Combat AIDS/HIV**  
Zueber Juma, 16, Lake Highland Preparatory School, Orlando, Florida  
Tej Diptesh Amin, 16, Lake Highland Preparatory School, Orlando, Florida
- EE307      **A Mechanical Mentor: Developing an Assistive Aid for Therapeutic Applications**  
Mohit Tiwari, 17, Yorktown High School, Yorktown Heights, New York  
Kyle Wells McCann, 18, Yorktown High School, Yorktown Heights, New York
- EE317      **Improvement of Motion Systems by Using Nickel-Titanium Alloy**  
Erdem Basegmez, 18, Istanbul High School, Istanbul, Turkey  
Murat Aslan, 18, Istanbul High School, Istanbul, Turkey
- EE319      **Low Resistance Magnetic Coils for Plasma Confinement**  
Oliver Chan, 17, Stuyvesant High School, New York, New York  
James Leung, 17, Stuyvesant High School, New York, New York  
Cheryl Wu, 17, Stuyvesant High School, New York, New York
- EN307      **Engineering a Chip Based Biosensor for Proteins and Phosphates**  
Daniel Eric Younger, 18, North Shore Hebrew Academy High School,  
Great Neck, New York  
Megan Elizabeth Garber, 17, North Shore Hebrew Academy High School,  
Great Neck, New York  
Ashley Khalili, 17, North Shore Hebrew Academy High School,  
Great Neck, New York
- ET315      **Making Green Petrol Greener**  
Alexander Andersen, 20, Roskilde Technical High School, Roskilde, Denmark  
Gorm Galster, 19, Roskilde Technical High School, Roskilde, Denmark
- ET316      **The Effect of Variable Microorganisms and pH on the Efficiency  
of a Microbial Fuel Cell**  
Cheng Cheng, 16, Lynbrook High School, San Jose, California  
Aakriti Jain, 16, Lynbrook High School, San Jose, California
- EV306      **Investigation and Handling Proposals of Microbial Contamination in Public  
Transportation Vehicles in Shanghai**  
Qing Xu, 16, Shanghai Yangpu Senior High School, Shanghai, China  
Ao Yang, 17, Shanghai Luwan High School, Shanghai, China  
Haijun Guo, 18, Shanghai Luwan Senior High School, Shanghai, China
- EV313      **A Comparison of the Effects of Added Urban Stresses on Native and Non-Native  
Soil Microbial Communities**  
Alice Rose Glasser, 18, Tucson High Magnet School, Tucson, Arizona  
Emily Katelin Derks, 17, Tucson High Magnet School, Tucson, Arizona
- EV320      **Analysis of Net Potential Methane Fluxes in Vernal Pool Ecosystems: Revealing  
Biogeochemical Greenhouse Gas Production and Emission**  
Larry Paul Beaver, 18, Louisville High School, Louisville, Ohio  
Michael Graham Baker, 18, Louisville High School, Louisville, Ohio

- MA305      **Estimation Theorem of McMahon on Indexes of Permutations**  
 Nazerke Bakytzhan, 18, The Republican Specialised in Physics and Math School, Almaty City, Kazakhstan  
 Altynay Jumadildayeva, 18, The Republican Specialised in Physics and Math School, Almaty City, Kazakhstan
- MA308      **Uncovering Interneuronal Genetic Pathways through Partial Correlation Network Analysis**  
 Jason Rudin, 17, Half Hollow Hills High School West, Dix Hills, New York  
 Lennie Han Zhu, 16, Half Hollow Hills High School West, Dix Hills, New York
- ME301      **Boron Neutron Capture Therapy: A Novel Approach for Increasing Boron Uptake via Vasodilatation**  
 David H. Drew, 17, Episcopal High School, Jacksonville, Florida  
 Satchel Armand Siegel, 15, Episcopal High School, Jacksonville, Florida
- ME306      **The Internal Battle with Melanoma: Triggering an Immune Response Using Toll Ligands**  
 Antonina Alexia Pavlenko, 15, Palmer High School, Colorado Springs, Colorado  
 Laura Katherine Gudvangen, 15, Palmer High School, Colorado Springs, Colorado
- ME308      **Comparison of Gadolinium and Manganese Molecular Imaging Probes for the Detection of Atherosclerotic Plaque by Magnetic Resonance Imaging**  
 Alexander Marshall Saeboe, 17, Somers High School, Lincolndale, New York  
 Eugenia Rafaela Volkova, 17, John Jay Senior High School, Cross River, New York
- MI309      **Repression of Tumor Suppressor Genes Expression by Hepatitis C Virus Core Protein via Promoter DNA Methylation**  
 Dongchan Kim, 16, Korea Science Academy, Busan, South Korea  
 GiSeok Choi, 17, Korea Science Academy, Busan, South Korea
- PH303      **Engineering a System to Record Head Related Transfer Functions of Sounds from Various Directions**  
 Jordan David Zesch, 17, Keystone School, San Antonio, Texas  
 Angad Jolly, 17, Keystone School, San Antonio, Texas
- PS311      **Inoculation of *Rubus armeniacus* Cultures *in vitro*, Year Two**  
 Haley Kae Epperly, 16, West Linn High School, West Linn, Oregon  
 Ann Christine Bernert, 16, West Linn High School, West Linn, Oregon
- Fourth Award of \$500**
- AS305      **Differences in Condition of Overwintering Coho Salmon (*Oncorhynchus kisutch*) from Two Different Streams in Southeast Alaska**  
 Nicholas Wolf Parker, 16, Juneau Douglas High School, Juneau, Alaska  
 Robin Lucien Woodby, 17, Juneau Douglas High School, Juneau, Alaska
- BE304      **Degree of Lateralization as a Predictor of Performance**  
 Joanne Chou, 17, Lake Brantley High School, Altamonte Springs, Florida  
 Andrea Michelle Clark, 17, Lake Brantley High School, Altamonte Springs, Florida

- BE317            **Burnout Syndrome at School**  
 Estefania Aranda, 16, Escuela de Comercio No. 2 "Gral M.M. de Guemes,"  
 Concordia, Entre Rios, Argentina  
 Cristhian Emmanuel Fink, 17, Escuela de Comercio No 2 "Gral. M. M. de Guemes,"  
 Concordia, Entre Rios, Argentina
- BI310            **SUERAMIX**  
 Maria Leonor Lopez Gutierrez, 17, Colegio de Estudios Cientificos y Tecnologicos del  
 Estado de, Tecamachalco, Mexico  
 Francisco Javier Andrade Gonzalez, 18, Colegio de Estudios Cientificos y Tecnologicos  
 del Estado de, Tecamachalco, Mexico
- CB303            **Examination of the Relationship between Resveratrol Action and Telomerase in  
*Saccharomyces cerevisiae***  
 Hannah Marie Olson, 17, Billings Central Catholic High School, Billings, Montana  
 Edward Joseph Gillig, 17, Billings Central Catholic High School, Billings, Montana
- CH301            **New Chemical Routes to the Cyclopropyl and BETA-perfluoroalkylamino Groups  
 by "One-Pot"-reactions**  
 Aleksandr Ya. Vorontsov, 16, Moscow Chemical Lyceum #1303, Moscow, Russia  
 Mikhail A. Kozlov, 16, Moscow Chemical Lyceum #1303, Moscow, Russia
- CH303            **A Comparison of the Effectiveness of Liquid & Solid Deicers When Applied  
 Independently & Concurrently**  
 Bailie Jo Bryant, 16, Central Lee High School, Donnellson, Iowa  
 Lynnely Greye Parker, 17, Central Lee High School, Donnellson, Iowa
- CS308            **The Decomposition/ Construction of Complex Data Strings or Systems**  
 Daniel Richard Brown, 16, Upper Sandusky High School, Upper Sandusky, Ohio  
 Jacob Wilson Beach, 16, Upper Sandusky High School, Upper Sandusky, Ohio
- EA303            **The Impact of 2008 Tropical Cyclones in the Phytoplankton Community of an  
 Estuarine System, a Second Year Study**  
 Andrea Carolina Monzon, 14, Academia del Perpetuo Socorro, San Juan, Puerto Rico  
 Adriana Cristina Sarro, 15, Academia del Perpetuo Socorro, San Juan, Puerto Rico
- EE301            **Personal Audio Disruption Device**  
 Matthew Taylor Stegall, 17, HBS Academy, Charlotte, North Carolina  
 Grant Matthew Edwards, 14, Edwards Christian Academy, Charlotte, North Carolina
- EE304            **Novel Control Methodologies for Conserving Energy with Electrochromic Windows**  
 Navaneeth Goduwin Ravindranath, 15, R.C. Clark High School, Plano, Texas  
 Amruth Venkatraman, 15, R. C. Clark High School, Plano, Texas
- EM303            **A Design for the Production of Electricity from Exhaust Gases and Scrap Metals**  
 Omar Saeb Khresat, 17, Modern Montessori School, Amman, Jordan  
 Moutaz Ma'an Al-Huneidi, 17, Modern Montessori School, Amman, Jordan
- EM307            **Rescuing Our Natural Waters and Wetlands: Fighting Oil Spills through  
 Bioremediation and Biostimulation, Phase II**  
 Garrett Wade Breaux, 17, Ovey Comeaux High School, Lafayette, Louisiana  
 Cassandra Cheta Okoye, 17, Ovey Comeaux High School, Lafayette, Louisiana

- EM310      **Extraction and Characterization of Hydroxyapatite from Marine By-Products**  
 Yessica Andrea Elizondo-Hidalgo, 16, Colegio Cientifico de Costa Rica,  
 Sede de Puntarenas, Puntarenas, Costa Rica  
 Cynthia Maria Fernandez-Espinoza, 17, Colegio Cientifico de Costa Rica,  
 Sede Puntarenas, Cocal,  
 Edwin Xiao-Cai, 16, Colegios Cientificos de Costa Rica, Sede Puntarenas,  
 Puntarenas, Costa Rica
- EM326      **Artificial Leathers from *Acetobacter xylinum***  
 Arada Sungkanit, 15, Suratpittaya School, Muang Suratthani, Suratthani, Thailand  
 Tanpitcha Phongchaipaiboon, 15, Suratpittaya School, Muang Suratthani,  
 Suratthani, Thailand  
 Pornwasu Pongtheerawan, 14, Suratpittaya School, Muang Suratthani,  
 Suratthani, Thailand
- EN309      **Controlling the Navigation of *Daphnia magna* with the Addition of Magnetic Bacteria and Magnetic Stimuli Through an Artificial Fluid System**  
 Robert Ian Levokove, 17, Long Beach High School, Lido Beach, New York  
 Shane Michael Silpe, 18, Long Beach High School, Lido Beach, New York
- ET305      **Putting Humans to "Work": Generating Usable Electricity from Wasted Energy**  
 Forrest Walter Pieper, 17, Nederland High School, Nederland, Colorado  
 Matthew Storm Bull, 18, Nederland High School, Nederland, Colorado
- ET306      **Production of Ethanol Extracted from Coffee Bean**  
 Cristian David Villegas, 16, Cooperativo San Antonio de Prado, Medellin,  
 Antioquia, Colombia  
 Catherine Restrepo, 15, Cooperativo San Antonio de Prado, Medellin,  
 Antioquia, Colombia
- ET307      **The Comparison of Incandescent and Compact Fluorescent Light Bulbs**  
 Cory Daniel Lovec, 16, Carter County High School, Ekalaka, Montana  
 Rachel Lynne Parry, 18, Carter County High School, Ekalaka, Montana
- ET309      **When Pigs Fly: A Study of Lift without Drag**  
 Alexander Dean Kaplan, 17, Lake Braddock Secondary School, Burke, Virginia  
 Noelle Vinas, 17, Lake Braddock Secondary School, Burke, Virginia
- EV301      **The Influence of Temperature Differentiation on Embryo Female-to-Male Sex Reversal in Medaka Fish, *Oryzias latipes***  
 Benedict Leo Scheuer, 16, Cloquet Senior High School, Cloquet, Minnesota  
 Bethany Judith Rosemore, 15, Cloquet Senior High School, Cloquet, Minnesota
- EV307      **Evaluating the Effects of Environmental Toxin 4-Nonylphenol and Estrogen on U937 Human Immune Cells Using Microarray Analysis**  
 Celline Kim, 16, Manhasset High School, Manhasset, New York  
 Esop Baek, 17, Manhasset High School, Manhasset, New York
- EV309      **Removal of Lead from Water Using Aquatic Plants and Microwave Oven**  
 Yadid Menhem Algavi, 17, Amit Gush Dan, Givat Shmuel, Israel  
 Shahar Gvirtz, 16, Amit Gush Dan, Givat Shmuel, Israel

- EV323      **Lichen as Indicators of Human Impact**  
Christian Thomas Burleson, 15, Fernley High School, Fernley, Nevada  
Amberleigh Dawn Thompson, 17, Fernley High School, Fernley, Nevada
- MA302      **Cohomologies of the Dihedral Group over Arbitrary Ring**  
Andrey A. Gorshkov, 16, Center of Mathematical Education, Saint-Petersburg, Russia  
Igor A. Pechko, 16, Center of Mathematical Education, Saint-Petersburg, Russia
- MA312      **Fibonacci Numbers in the Music of Classical Compositions**  
Qiuzi Zhu, 15, Hilton Head Preparatory, Hilton Head Island, South Carolina  
Cara Marie Borelli, 15, Hilton Head Preparatory, Hilton Head Island, South Carolina
- ME312      **Neutralization of Harmful LPS on Mouse Macrophages Using ASS  
and Anti-LPS IgG**  
Gabriel Enrique Molina, 15, Oak Hall Private School, Gainesville, Florida  
Alvin Wang, 15, Oak Hall Private School, Gainesville, Florida
- MI311      **Screening for Quorum Sensing Inhibitors from Surface-Associated Bacteria of  
*Halymenia durvillaei***  
Kevin Jer Ven David, 16, Philippine Science High School - Main Campus, Quezon City,  
Metro Manila, Philippines  
Orven Jules Ramirez Dumaoang, 16, Philippine Science High School - Main Campus,  
Quezon City, Metro Manila, Philippines
- PS310      **The Effects of Pulsating Sub-Lethal Levels of Electric Shock on the Biosynthesis of  
Pisatin(+) in *Pisum sativum L.***  
Jonathan Edmond Gillis, 16, Manhasset High School, Manhasset, New York  
Taryn Leigh Wassmer, 17, Manhasset High School, Manhasset, New York
- PS318      **Total Polyphenolic Contents in Relation to Its Chemopreventive Properties in  
Turmeric Rhizomes**  
Intisar Islam, 16, Little Rock Central High School, Little Rock, Arkansas  
Hamza Arshad, 17, Little Rock Central High School, Little Rock, Arkansas