



**\*\* Press Release \*\***

**Strict Embargo: Friday, May 12, 2006, 3:30 P.M. Eastern Standard Time  
Do not release until this time.**

**Grand Awards presented to Finalists of the  
Intel International Science and Engineering Fair 2006 Presented by Agilent Technologies**

**Indianapolis, Indiana, USA** - Science Service, in partnership with the Intel Foundation, today presented Grand Awards at the Intel International Science and Engineering Fair. 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 fair. 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 Science Service since its inception in 1950. Science Service is a non-profit organization dedicated to advancing the understanding and appreciation of science among people of all ages.

This information will be posted on the Science Service website at [www.sciserv.org/isef](http://www.sciserv.org/isef) immediately following the ceremony.

**Intel Foundation Young Scientist Award**

**The winners of this award are the top three students at the Intel ISEF. They each receive a \$50,000 scholarship.**

**A Scholarship of \$50,000.**

EA016

**Sleuthing Epicenter Direction from Seismites, Cretaceous Wahweap Formation,  
Cockscomb Area, Grand Staircase-Escalante National Monument, Utah  
Hannah Louise Wolf, 16, Parkland High School, Allentown, Pennsylvania**

ME013      **Engineering of a Novel Inhibitor of Biofilm-Encapsulated Pathogens**  
Madhavi Pulakat Gavini, 16, Mississippi School for Mathematics & Science, Columbus,  
Mississippi

PH026      **Cracking the Brazil Nut Effect**  
Meredith Ann MacGregor, 17, Fairview High School, Boulder, Colorado

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 three 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.

EN075      **Development of Fixed and Flapping-wing Surveillance Micro Air Vehicles**  
John Pease Moore, IV, 18, Dayton Christian High School, Miamisburg, Ohio

EV085      **Deadly Waters: A Twelve Month Water Quality Study of a Newly Erupted Sulfur Spring and Its Longitudinal Effect on Diamond Fork Creek, Phase IV**  
Shannon L. Babb, 18, American Fork High School, American Fork, Utah

ZO020      **A Versatile Hunter: Giant Wood Spider Adjusts Web Structure and Silk Properties When Encountering Different Prey**  
Yi-Chi Chao, 18, The Affiliated Senior High School of NTNU, Taipei, Taiwan, Chinese Taipei

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 Science Service. The award is named for the late Glenn T. Seaborg, Nobel Laureate in chemistry and Science Service 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 held in Stockholm, Sweden in September 2006.

### Trip to the EU Contest

BE318      **The Effects of CNS Stimulants and SSRIs on the Formation of Conditioned Long Term Memory and Learning Behaviors in Sleep Deprived Wildtype *Drosophila melanogaster***  
Mary Martha Ferrari Douglas, 17, Manhasset High School, Manhasset, New York  
Alison W. Liu, 16, Manhasset High School, Manhasset, New York

The EU Contest for Young Scientists was begun 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.)

## MILSET

For a top team project, a trip to the European Youth Science Exhibition ESE 2006 to be held in Tarragona Spain, July 17-23.

### **Trip to European Youth Science Exhibition "ESE 2006"**

CS316

#### **Paladin: A New Fast and Secure Symmetric Block Cipher**

Victor Andrew Shia, 17, Monta Vista High School, Cupertino, California

George Chen, 17, Monta Vista High School, Cupertino, California

Frank Fu-Han Chuang, 17, Monta Vista High School, Cupertino, California

International Movement for Leisure in Science and Technology (MILSET) was founded in 1987 in Quebec. MILSET unites youth organizations, research associations and clubs from more than 60 countries. Expo-Science Exhibition is a non-political event, contributing to peace, respect and better knowledge of all people.

## Wolfram Research, Inc.

Through innovation and progressive growth Wolfram Research continues to thrive as the world's leading technical software company. Wolfram Research products maintain a reputation for innovation, power, quality, and elegance. The company's aim can be summarized: **Pushing the Envelope of Technical Computing.** Wolfram Research is pleased to support the Intel International Science and Engineering Fair by presenting all first-placed category winners with their own copy of Mathematica 5.2 Software for students. Mathematica integrates a numeric and symbolic computational engine, graphics system, programming language, documentation system, and advanced connectivity to other applications. It is this range of Capabilities that makes Mathematica uniquely capable as a "one stop shop" for technical computing.

Mathematica software package for all Intel Grand award first place winners.

## MIT Lincoln Laboratory

The Massachusetts Institute of Technology's Lincoln Laboratory has partnered with Science Service to promote science education through a program called the Ceres Connection. This program seeks to name minor planets after students through Science Service 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 Intel ISEF first place and second place category winners will receive a minor planet.

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.

## Behavioral and Social Sciences - Presented by Intel Foundation

Intel will present Best of Category Winners with a \$5,000 award and Intel® Centrino™ mobile technology-based notebook computer. 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**

BE040

#### **Atypical Visual Behaviors as Early Indicators of Autism in Children**

Maya Nina Wolpert, 18, Hathaway Brown School, Shaker Heights, Ohio

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

BE024      **Sounds into Syllables™ II Windows to the World of Childhood Autism**  
Kayla Cornale, 16, Assumption Roman Catholic Secondary School, Burlington,  
Ontario, Canada

BE040      **Atypical Visual Behaviors as Early Indicators of Autism in Children**  
Maya Nina Wolpert, 18, Hathaway Brown School, Shaker Heights, Ohio

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

BE030      **Attention in the Brain: A Study of Cognitive Control Using Functional Magnetic  
Resonance Imaging**  
Maggie Delano, 17, Ossining High School, Ossining, New York

BE035      **The Wishing Tree: A Six-Year Analysis of Human Desire**  
Elizabeth Anne Baker, 17, University High School, Tucson, Arizona

BE045      **Sponj: The Educational Software Suite for CP Children**  
Sinchan Banerjee, 16, Clear Lake High School, Houston, Texas

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

BE009      **The Impact of Work Force Migration on the Psychological and Social Development  
of Children**  
Sorina Codrea, 17, "Emil Racovita" National College, Iasi, Romania

BE020      **The Context Effect of Sense Stimuli on Declarative Memory**  
Samuel Jang, 16, Nicolet High School, Glendale, Wisconsin

BE036      **Social Disorder Cures on the Horizon? A Study of the Effects of Oxytocin and  
Vasopressin on Social Memory**  
Katie Lane Patterson, 18, Miller County R-III High School, Tuscumbia, Missouri

BE041      **The Impact of Attack Ads on Public Perceptions During the  
2000 Presidential Campaign**  
Michael Brett Katz, 17, John F. Kennedy High School, Bellmore, New York

BE043      **Is Math Just for Boys? Gender Differences in Dropout Rates and Attitudes of  
Advanced High School Mathematics Students**  
Christina Chung-May Tu, 17, Roslyn High School, Roslyn Heights, New York

**Fourth Award of \$500**

BE003      **Comparing the Benefits of a Tactile Manipulative vs. a Visual and/or Auditory  
Stimulus on Cognitive Recall, Through Experimentation and Analysis**  
Jessica Caroline Stanton, 16, Columbia High School, Lake City, Florida

BE017      **The Effect of Information Organization on Memory Recall**  
Alexander Cary Wilkerson, 16, Chantilly High School, Chantilly, Virginia

BE031      **Visual Illusions as Tools in Schizophrenia Research**  
Esther Pustil'nik, 18, Israeli Arts and Sciences Academy, Jerusalem, Israel

- BE042      **The Cognitive and Emotional Factors that Impact an Individual's Likelihood to Use Alternative Energy**  
Allison Erica Dender, 17, Plainview Old-Bethpage John F. Kennedy High School, Plainview, New York
- BE044      **The Effect of Framing and Described Task Difficulty on Expectations and Performance**  
Michael Elliot Hofer, 17, Roslyn High School, Roslyn Heights, New York
- BE047      **Picture This, That, and the Other: The Post Traumatic Effects of Concussion on the Processing Visual Stimuli, Three Year Study**  
Johnathan Arnold Schoenhals, 18, Miami High School, Miami, Oklahoma

## Biochemistry - Presented by Agilent Technologies

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- BI046      **Design and Development of a Novel Biosensor for the Efficient Detection of Infectious Pathogens and Environmental Invaders**  
Adrian Veres, 16, College Jean-de-Brebeuf, Montreal, Quebec, Canada

### First Award of \$3,000

- BI002      **Lead to Gold...Plants to Plastics: Which Agricultural Resource Will Satisfy the 'Triple Bottom Line'?**  
Casey Jo Freeman, 18, Mid-Buchanan High School, Faucett, Missouri
- BI046      **Design and Development of a Novel Biosensor for the Efficient Detection of Infectious Pathogens and Environmental Invaders**  
Adrian Veres, 16, College Jean-de-Brebeuf, Montreal, Quebec, Canada

### Second Award of \$1,500

- BI022      **Characterization of the *Arabidopsis thaliana* plsp1-1 and plsp1-2 Lines: Toc75 Suggests a Novel Protein Targeting Pathway**  
Vinay Tripuraneni, 17, Clovis West High School, Fresno, California
- BI036      **Ethanol Production in Bluestem Grass**  
Allison Ruth Wilson, 17, West Central Valley High School, Stuart, Iowa
- BI050      **Tumor Suppressor Gene DBC2 Plays an Important Role in Protein Transport**  
Faith Kan Chang, 18, Syosset High School, Syosset, New York
- BI063      **A Novel Role for Telomerase in Stem Cell Differentiation**  
Anneke Ellen Schwob, 17, Boston Latin School, Boston, Massachusetts
- BI078      **Novel Algorithms for Automated SNP Genotyping**  
Albert David Shieh, 16, Chaparral High School, Scottsdale, Arizona

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

- BI003      **Oligomer Base Adduction and Cleavage After Epoxide Treatment**  
Lindsey Marie Hubley, 17, Woods Cross High School, Woods Cross, Utah
- BI008      **The Autocatalytic Assembly of Azoarcus Ribozyme and the Recombination of RNA in a Compartmentalized System: An Origin-of-Life Study**  
Sergio-Francis Mellejor Zenisek, 17, Oregon Episcopal School, Portland, Oregon
- BI011      **Glucose Uptake Inhibitors and T-Cell Survival: A Second Year Study in Autoimmunity**  
Rebecca Joy Vitale, 17, duPont Manual Magnet High School, Louisville, Kentucky
- BI025      **Gene-Induced Biosynthesis of a Cancer Therapeutic Derived from the p53 Amino Terminus Elicits Tumor Selective Apoptotic Death of Human Pancreatic Cancer Cells**  
Michael Vishnevetsky, 17, Midwood High School, Brooklyn, New York
- BI056      **Building and Testing a Prototype Gene Gun**  
Joseph Kruse Brogie, 18, Lakeview High School, Columbus, Nebraska
- BI068      **Desaturase Gene Expression in the Human Meibomian Gland of the Eyelid: Implications for Ocular Surface Disease**  
Eric William Prouty, 16, Central Bucks High School West, Doylestown, Pennsylvania
- BI079      **Protein Analysis of Primary and Recurrent Human Malignant Gliomas**  
Michael R. Mitchell, 18, Brophy College Preparatory School, Phoenix, Arizona

**Fourth Award of \$500**

- BI009      **The Function of a Novel Apoptosis Regulating Protein, XAF-1C, in Breast Cancer Cells**  
Charles William Dyer, 17, Caddo Parish Magnet High School, Shreveport, Louisiana
- BI028      **A Potential New Approach to Chemotherapy in Brain Tumours: Disruption of Connexin 43 Particle Arrangement to Cause Cell Death in Malignant Glioma**  
Yale Stern Michaels, 14, Grant Park High School, Winnipeg, Manitoba, Canada
- BI041      **Genetic Control of the Eye: Quantitative Genetic Modulation of Photoreceptor Density in the Mouse**  
Congcong Guo, 16, White Station High School, Memphis, Tennessee
- BI051      **Investigating the Role of Nup98/96 in Drosophila Spermatogenesis**  
Yuting Patrick Chiang, 18, The Wheatley School, Old Westbury, New York
- BI059      **Investigation of Homopolymeric Runs in C. elegans Genome with Novel Model for Control Sequences**  
Hann-Shuin Yew, 17, The Harker School, San Jose, California
- BI065      **A New Spin on Wound Healing Scaffolds: Physical and Molecular Optimization**  
Amardeep Singh Grewal, 17, Detroit Country Day School, Beverly Hills, Michigan

- BI071      **X-Ray Crystallographic Investigation of RNA Pseudoknots as a Mechanism for Developing New Anti-viral Agents**  
Natalie Yang-Yang Zhang, 18, North London Collegiate School, London, United Kingdom
- BI074      **Improving the Stability of Novel Calcium-Binding Proteins**  
Lev A. Shaket, 17, Chamblee Charter High School, Chamblee, Georgia
- BI080      **Understanding the Molecular Causes of Cancer: The Role of MMSET in the Pathogenesis of Multiple Myeloma**  
Kristie Mercedes Charoen, 17, Yorktown High School, Yorktown Heights, New York

## Botany - Presented by Intel Foundation

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- BO042      **Design of a Novel Wave Reactor for *in situ* Culturing of *Chlamydomonas reinhardtii*, Phase I: Effect of Wave Mixing**  
Caroline Janet Lang, 14, Independence Home School, Yardley, Pennsylvania

### First Award of \$3,000

- BO037      **Production of Interleukin-13 (IL-13) in Transgenic Plants for Immunotherapy of Type 1 Diabetes**  
David Jueyu Wang, 17, A.B. Lucas Secondary School, London, Ontario, Canada

- BO042      **Design of a Novel Wave Reactor for *in situ* Culturing of *Chlamydomonas reinhardtii*, Phase I: Effect of Wave Mixing**  
Caroline Janet Lang, 14, Independence Home School, Yardley, Pennsylvania

### Second Award of \$1,500

- BO013      **Monitoring the Expression of AVP1 in *Arabidopsis thaliana* Tissue**  
Pratistha Koirala, 17, Edwin O. Smith High School, Storrs Mansfield, Connecticut

- BO025      **Effect of Ultramicro-active Calcium Fertilizer on Tomato Growth and Physio-Biochemical Characteristics**  
Yuechen Zhong, 17, Beijing No.101 Middle School, Beijing, China

- BO041      ***Arabidopsis* Phospholipase A1's: Novel Sequence Analysis and Steps Toward Functional Characterization**  
David Andrew Levary, 16, Parkway Central High School, Chesterfield, Missouri

### Third Award of \$1,000

- BO008      **Investigating Bio-Conservational Techniques as Solutions for Decreasing Economic Productivity, Phase II: The Effects of Tillage Reduction on Sugarcane Yields**  
Tate Benton-Michael Guillotte, 18, Catholic High School, New Iberia, Louisiana

- BO009      **Biosuppression of Phytopathogens and Analyzation of Rhizosphere Interactions**  
Chris Chaeha Lim, 17, John B. Connally High School, Austin, Texas

BO022 ***M. sativa*, a Sustainable and Natural Technique for the Remediation of Heavy Metal Contamination**  
Keely Ann Goodgame, 17, San Jon High School, San Jon, New Mexico

BO040 **Ohelo, Phase II: Identify BioActive Compound**  
Jessie Ann Ka'iulani Pa'ahana, 17, Kamehameha Schools, Kapalama Campus, Honolulu, Hawaii

BO050 **In Search of a Natural Treatment for *Puccinia hemerocallidis*, Phase III**  
Kyle James Yawn, 16, Warner Robins High School, Warner Robins, Georgia

**Fourth Award of \$500**

BO002 ***Acer palmatum in vitro*, Year Two**  
Michael James Bernert, 16, West Linn High School, West Linn, Oregon

BO014 **Mycoremediation of Heating Oil Contaminated Soil by Pearl Oyster Mushrooms (*Pleurotus ostreatus*) to Allow Plant Growth**  
Cailey Ann Neary, 15, Juneau-Douglas High School, Juneau, Alaska

BO015 **The Positive Identification of Mutant and Wild Type Cytoskeletal Components in *Ceratopteris richardii* Through Fluorescent and Histological Staining**  
Anna Pilishvili, 17, Forest Hills High School, Forest Hills, New York

BO028 **Free Radical Inhibition and Alleviation by Antioxidants to Prevent Agricultural Devastation from Unfavorable Environmental Conditions with the *Lycopersicon esculentuma***  
Justin Andrew Townley, 17, Okaloosa-Walton College Collegiate High School, Niceville, Florida

BO031 **One "Mite"y Mission: Biological Compensation Suppression of *Convolvulus arvensis* Implementing Host-Specific *Aceria malherbae*, Phase Two**  
Kaitlyn Jeanne Lingus, 16, Branson High School, Branson, Colorado

BO045 **The Investigation of Natural Alternatives for *Phaseolus vulgaris* Production**  
Michael Louis Ginsbach, 18, Hankinson High School, Hankinson, North Dakota

## Chemistry - Presented by Lucent Technologies

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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 **Optimizing a Catalyst for Elimination of Carbon Monoxide Exhausted from Gas Water Heater**  
Chen Wei Tsai, 16, The Affiliated Senior High School of NKNU, Kaohsiung, Taiwan, Chinese Taipei



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

- CH011 **Dynamics of Polyampholytes in Solution: Development of Novel Equations to Predict the Behavior of Charged Polymers**  
Michael J. Pizer, 17, University School of Milwaukee, Milwaukee, Wisconsin
- CH016 **Optimizing a Catalyst for Elimination of Carbon Monoxide Exhausted from Gas Water Heater**  
Chen Wei Tsai, 16, The Affiliated Senior High School of NKNU, Kaohsiung, Taiwan, Chinese Taipei

**Second Award \$1,500**

- CH012 **Identification of the Determinants of Antimalarial Drug Action**  
Smita Mascharak, 16, Santa Cruz High School, Santa Cruz, California
- CH018 **The Mechanisms of Proton Transport Through One-dimensional Water Chain Stabilized by Imidazole Channels**  
Yin Yin Wu, 17, J.M. Atherton High School, Louisville, Kentucky
- CH025 **A Novel Chlorophyll-based Nanocrystalline Photoelectrochemical Cell: A Promising Approach to Hydrogen Production via the Light-driven Redox of Seawater**  
Nilesh Tripuraneni, 15, Clovis West High School, Fresno, California
- CH037 **Is Pea Flour an Effective Bio-Insecticide Against the Stored Grain Pests?**  
Hamza Sheikh, 15, Head Start School, Islamabad, Punjab, Pakistan

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

- CH010 **Synthesis and Characterization of Novel Polynuclear Manganese Complexes Functioning as Single-Molecule Magnets**  
Sarah Hyunee Nam, 18, Saint Petersburg Senior High School, Saint Petersburg, Florida
- CH051 **DNA Electrophoresis on Nanopore-sized Polyethersulfone Membrane Surfaces**  
Michael Ding, 16, Glen Cove High School, Glen Cove, New York
- CH052 **Grass as Fuel**  
Jeff K. Bean, 17, American Fork High School, American Fork, Utah
- CH059 **The Elimination of Volatile Organic Compounds Through the Use of Polyethyleneimine Nanofibers**  
James Zhen Wang, 18, Hoover High School, North Canton, Ohio
- CH064 **Meth Busters: An *in situ* Test for Determining Methamphetamine History in Homes**  
Jia Jennifer Wu, 18, Arkansas School for Mathematics, Sciences, & the Arts, Hot Springs, Arkansas
- CH067 **Nano Electrochemical Sensor Fabrication Using Conical Carbon Nanopipettes**  
Suhail Malhotra, 16, duPont Manual Magnet High School, Louisville, Kentucky

**Fourth Award of \$500**

- CH007 **Electrochemical Generation of Nickel Hydroxide as an Active Mass of Alkaline Batteries**  
Daniil Mykhailovich Monosov, 17, Chemical Ecological Lyceum, Dnipropetrovsk, Ukraine

- CH019      **Reactive Molten Metal Flow Over Grooved and Flat Surfaces**  
Alexander Danilo Zbrozek, 18, Paul Laurence Dunbar High School, Lexington, Kentucky
- CH023      **Using Nanoceramic Spheres to Purify Distilled Spirits**  
Yin Liang, 17, Affiliated School of South China Normal University, Guangzhou, China
- CH031      **A Concept of Remote Group Participation Illustrated by Glycosylations  
with 6-chloro-6-deoxy-glucoyl Donors**  
Andrey M. Tsedilin, 16, Moscow Chemical Lyceum #1303, Moscow, Russia
- CH034      **Inhibiting Corrosion Using a Self-Assembled Monolayer**  
Samantha Kay Lawrence, 17, Christian Heritage High School, Riverdale, Utah
- CH047      **Date Rape Drugs: Can They Be Detected?**  
Anne Marie Larissa Child, 15, Westdale Secondary School, Hamilton, Ontario, Canada
- CH053      **Non-fluid Gel Electrolyte Manufacturing of Boron Minerals and Optimization of  
Gelation Conditions**  
Ayse Zehra Karakoc, 14, Izmir Fatih Private Science High School, Izmir, Turkey
- CH057      **The Influence of Reference Power on Calorimetrically Determined Thermodynamic  
Parameters**  
Sara D. Niedbalski, 17, Marian High School, Mishawaka, Indiana

## Computer Science - Presented by Intel Foundation

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- CS033      **Deyabu: Reading and Writing Interface for the Blind**  
Maria Estela Godinez, 16, CBTis No.139, San Francisco del Rincon, Guanajuato, Mexico

### First Award of \$3,000

- CS033      **Deyabu: Reading and Writing Interface for the Blind**  
Maria Estela Godinez, 16, CBTis No.139, San Francisco del Rincon, Guanajuato, Mexico

### Second Award of \$1,500

- CS028      **A Novel Approach to the Automatic Recognition of Emotions in Natural Speech**  
Caroline Elizabeth Pietsch, 17, Ossining High School, Ossining, New York
- CS030      **Two Eyes Vision Motion Detection: Tracking and 3D Positioning of an Intruder**  
Raphael Ouzan, 18, Boys Town Jerusalem, Jerusalem, Israel
- CS041      **Three-dimensional Face Recognition from Video: Facial Surface Reconstruction  
and Analysis Using Tensor Algebra and Differential Geometry**  
Justin Moore Solomon, 18, Thomas Jefferson High School for Science and Technology,  
Alexandria, Virginia

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

- CS017      **Building a Power-Optimized MIPS Pipeline**  
Vidya Ganapati, 18, Sunset High School, Portland, Oregon
- CS018      **Compiler Design**  
Kristopher Kyle Micinski, 15, Decatur High School, Decatur, Texas
- CS019      **Java Based Algorithm Automated Prescription Reminder and Renewal**  
Nadia N. Naja, 17, Dearborn Center for Math, Science & Technology, Dearborn Heights, Michigan
- CS032      **A Study on the Design and Implementation of an Artificially Intelligent Control System**  
Sagar Indurkha, 16, North Carolina School of Science and Mathematics, Durham, North Carolina

**Fourth Award of \$500**

- CS006      **Back-In-Time Debugger**  
Vasily Dyachenko, 17, Centre of Mathematical Education, Saint-Petersburg, Russia
- CS011      **Modeling Wave Characteristics**  
James Daniel Brandenburg, 14, Cocoa High School, Cocoa, Florida
- CS016      **An Excel-lent Test Analyzer**  
Kelley Marie Fleming, 16, Dove Science Academy, Tulsa, Oklahoma
- CS020      **Viability of an Alternative Linking Algorithm**  
Jonathan J. Pezzino, 17, Nicolet High School, Glendale, Wisconsin
- CS024      **Statistical-based Adaptive Binarization for Document Imaging**  
Nat Piyapramote, 17, Sarasit Phithayalai School, Banpong, Ratchaburi, Thailand

**Earth Science - Presented by Shell Oil**

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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**

- EA016      **Sleuthing Epicenter Direction from Seismites, Cretaceous Wahweap Formation, Cockscomb Area, Grand Staircase-Escalante National Monument, Utah**  
Hannah Louise Wolf, 16, Parkland High School, Allentown, Pennsylvania

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

- EA016      **Sleuthing Epicenter Direction from Seismites, Cretaceous Wahweap Formation, Cockscomb Area, Grand Staircase-Escalante National Monument, Utah**  
Hannah Louise Wolf, 16, Parkland High School, Allentown, Pennsylvania

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

EA004      **ENSO Dampening of Atlantic Tropical Cyclone Activity via Thermal Wind**  
Alexander Abram Robel, 17, Maritime and Science Technology Academy,  
Miami, Florida

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

EA008      **The Effects of Oil and Gas Development on Flood Plains, Northwest New Mexico**  
Shandiin Chanel Copeland, 15, Kirtland Central High School, Kirtland, New Mexico

EA010      **Measuring Long Term Trends in the San Francisco Bay Delta Using  
Satellite Imagery**  
Mina Renee Bionta, 18, Livermore High School, Livermore, California

**Fourth Award of \$500**

EA003      **Breakthrough Substitutions of Synthetic Polymers with Natural Chitosan for the  
Prevention of Soil Erosion**  
Dhanur Damodar, 15, duPont Manual Magnet High School, Louisville, Kentucky

EA011      **An Estimation of Heavy Metal Contamination in Soil Using Reflectance  
Spectroscopy and Partial Least Squares Regression**  
Caaminee Mayank Pandit, 18, Noblesville High School, Noblesville, Indiana

## Engineering - Presented by Intel Foundation

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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**

EN075      **Development of Fixed and Flapping-wing Surveillance Micro Air Vehicles**  
John Pease Moore, IV, 18, Dayton Christian High School, Miamisburg, Ohio

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

EN017      **Designing an Optical Sensor to Easily Decipher the Relative Longevity of a High  
Pressure Sodium Light Through Spectral Analysis**  
Carl Anthony Turner, 16, New Prague Senior High School, New Prague, Minnesota

EN055      **Optimizing Ethanol Production Efficiency**  
Jessica Lynn Laviolette, 18, Brandon High School, Ortonville, Michigan

EN075      **Development of Fixed and Flapping-wing Surveillance Micro Air Vehicles**  
John Pease Moore, IV, 18, Dayton Christian High School, Miamisburg, Ohio

EN151      **Operator Injury Mitigation Using Electronic Sensing, Mechanical Braking, and  
Decoupling Devices in Hand-held Circular Saws**  
Erin F. Eppard, 17, Thunderbird High School, Phoenix, Arizona

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

EN021      **Point and Click, Literally, Phase II**  
Christopher D. Messick, 16, Sargent High School, Monte Vista, Colorado

- EN040      **Tracking the Sound: A Second Year Study on an Ultrasonic Train Wreck Avoidance System**  
Courtney Anne Rafes, 18, Northwest High School, Justin, Texas
- EN067      **Telescopic Morphing Wings: Design-Build-Fly**  
Stephen Gerald Warrenner, 18, East Noble High School, Kendallville, Indiana
- EN082      **A New Technology for Portable Constructional Beams and a Process for Their Production and Use with Application to Third World and Displaced Population**  
Micah Lathaniel Toll, 17, Cedar Crest High School, Lebanon, Pennsylvania
- EN091      **Balancing Robot**  
Matthew Scott Rosoff, 18, Bergen County Academies, Hackensack, New Jersey
- EN122      **Chording Glove: A Novel Alternative to Text Entry in Bluetooth Enabled Peripheral Devices**  
Evan Takashi Morikawa, 18, High Technology High School, San Diego, California
- EN130      **An Experimental Analysis of the Thrust Produced by an Ornithopter at Low Reynolds Numbers**  
Anjaney Pramod Kottapalli, 16, Lynbrook High School, San Jose, California
- EN133      **Development of a Planar Perfused Tumor Bioreactor**  
Lucas Hudson Hofmeister, 17, Martin Luther King, Jr. Magnet School, Nashville, Tennessee
- EN134      **Preparation and Characterization of a Superparamagnetic Polymer Nanocomposite for Biomedical Applications**  
Nicole Rachelle Brenner, 18, Lawrence High School, Cedarhurst, New York
- Third Award of \$1,000**
- EN001      **Robotics Surveillance System**  
Joey Lee Edgar, 19, Jensen Beach High School, Jensen Beach, Florida
- EN009      **What Effects Do Leading Edge Tubercles Have on Hydrofoil Characteristics?**  
Mark Richard Fleming, 15, Loyola High School, Mankato, Minnesota
- EN010      **Water-Based Rapid Prototyping and Tooling System**  
Ka Yi Ding, 17, Shun Tak Fraternal Association Yung Yau College, Hong Kong, Region of China
- EN011      **New Generation Artificial Leg: A New Hope for the Disabled to Walk Again for a Lower Price**  
Yin Fan Denis Huen, 18, La Salle College, Hong Kong, Region of China
- EN023      **Design and Construction of a Dynamic Artificial Neural Network**  
Forrest Quinn Friesen, 16, Palmer High School, Colorado Springs, Colorado
- EN029      **Acoustic Localization, Detection, and Identification**  
Joseph Anthony Crivello, 18, University School of Milwaukee, Milwaukee, Wisconsin

- EN039      **Determining the Effects of Flow Circulation and the Kutta Condition in Flight**  
Garrett Darl Lewis, 16, Sandia Preparatory School, Albuquerque, New Mexico
- EN048      **Nanoengineering Aerogel for Insulin Insulation**  
Alex Nathan Capecelatro, 18, Brewster High School, Brewster, New York
- EN069      **Cornboard**  
Philip John Schmidt, 18, Fenelon Falls Secondary School, Fenelon Falls, Ontario, Canada
- EN078      **Glabenator: An Advanced Alternative and Augmentative Communication Device**  
Apurv Mishra, 16, Dayanand Anglo Vedic Public School, Bhubaneswar, Orissa, India
- EN084      **LISSA: Light Intensity and Sonar Sensing Assistant**  
Sophia Alexandra Goreczky, 16, Shepton High School, Plano, Texas
- EN095      **The Development of Gradient-based Computational Fluid Dynamics Applications**  
Robert Michael Parrish, 16, Chamberlain High School, Tampa, Florida
- EN112      **An *in vitro* Study of Aerosol Delivery Using Carina Models**  
Abhiram Ramaswamy Bhashyam, 17, Bethel Park Senior High School, Bethel Park, Pennsylvania

**Fourth Award of \$500**

- EN006      **Touch-based Navigation Aid for the Blind and Visually Impaired**  
William Decker Neiswanger, 15, School of Science and Technology, Beaverton, Oregon
- EN030      **Indoor Firefighter Location**  
Matthew Zubieli, 15, Lewis-Palmer High School, Monument, Colorado
- EN031      **Streamlining Pickup Trucks, Part II**  
John Christopher Tarleton, 17, Union Grove High School, McDonough, Georgia
- EN036      **Low Cost Nanowire-based Gas Sensor Test Platform for Military and Civilian Applications**  
Trevor Elliot Powers, 19, Christian Academy of Louisville, Louisville, Kentucky
- EN046      **Milk Pasteurizer II**  
Hugo Gualterio Chiardola, 20, Technical School NO 139 "De Produccion Agro-Ind.", Viale, Entre Rios, Argentina
- EN047      **High Speed Size-exclusion Chromatography Using Spherical Meso-structured Cellular Foam**  
Shu Ren Sarah Ong, 18, Raffles Junior College, Singapore, Singapore
- EN050      **Development of an Optical and Electrical Automobile Crash Avoidance System**  
Diana Christine Burk, 17, West Potomac High School, Alexandria, Virginia
- EN060      **Enhanced Maneuverability of Rocket Torpedos Using a Porous Plate Design**  
Robert Francis Minehart, 17, Dominion High School, Sterling, Virginia

- EN071      **Economical Wifi Rover with GPS Automation and Telepresent Operation**  
Kenneth Iven Aycock, 17, Skyview High School, Billings, Montana
- EN090      **The Design and Optimization of a Pitch Elevator and It's Effect on the Oscillation Frequencies of a Membraphone**  
Sarah Narceille Vaden, 16, Staunton River High School/Roanoke Valley Governor, Moneta, Virginia
- EN096      **Hypo Hoist**  
Tanya Louise Budd, 18, Waingels College, Reading, Berkshire, United Kingdom
- EN105      **The Nautical Ramjet: An Alternative Approach to Torpedo Propulsion**  
Jason Arel Strauss, 16, North Shore Hebrew Academy High School, Great Neck, New York
- EN111      **Smart Seat: A Safer Child's Car Seat**  
Jordan Michael Krell, 15, Plankinton High School, Plankinton, South Dakota
- EN120      **Self-assembling Microcontainers for On-demand Release of Chemical Agents**  
Emma Kathryn Call, 17, Baltimore Polytechnic Institute, Baltimore, Maryland
- EN132      **Developing Atmospheric Responsiveness for a Robotic Hot Air Balloon**  
Gabriel Carson Elder, 17, Highland High School, Albuquerque, New Mexico
- EN143      **A Novel Valveless Piezoelectric Micropump and Its Characteristics**  
Yichi Zhang, 18, Dunlap High School, Dunlap, Illinois
- EN144      **Development of a Human Exoskeleton, Phase II**  
Ian Michael Bouligny, 15, Catholic High School, New Iberia, Louisiana

## Environmental Sciences - Presented by Ricoh

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- EV019      **Boards and Branches, Year Five: A Continued Multivariable Study of Snow Interception for Water Conservation**  
Erica Elizabeth David, 16, Pinedale High School, Pinedale, Wyoming

### First Award of \$3,000

- EV019      **Boards and Branches, Year Five: A Continued Multivariable Study of Snow Interception for Water Conservation**  
Erica Elizabeth David, 16, Pinedale High School, Pinedale, Wyoming

- EV081      **Bioelectromagnetism II: Optimization of Conditions for Sustainable Current and Power Output in a Microbial Generator Using Magnetospirillum MS-1**  
Kartik Madiraju, 16, Centennial Regional High School, Greenfield Park, Quebec, Canada

- EV085      **Deadly Waters: A Twelve Month Water Quality Study of a Newly Erupted Sulfur Spring and Its Longitudinal Effect on Diamond Fork Creek, Phase IV**  
Shannon L. Babb, 18, American Fork High School, American Fork, Utah
- EV115      **Effectiveness of Strobe Lights, Sound Frequency, and Lasers in Reducing Salmon Entrapment Through Hydropower Turbines**  
Alexa A. Carey, 17, Gold Beach High School, Gold Beach, Oregon
- Second Award of \$1,500**
- EV021      **The Effect of Pollution from Agricultural Burning on the Surface Tension of Water Droplets in Clouds**  
Danyelle Lee Evans, 14, James Bowie High School, Austin, Texas
- EV023      **Studies on Environmental Indication and Ecological Function of Bryophytes in Shanghai City, China**  
Zhirui Zhu, 18, Shanghai Luwan High School, Shanghai, China
- EV067      **Removal of Estrogenic Compounds in Dairy Waste Lagoons by Ferrate(VI): Oxidation/Coagulation**  
Jarrett Renn Remsberg, 16, Middletown Senior High School, Middletown, Maryland
- EV106      **Biological Implications of Sediment Concentrations of Mercury Near Olin Chlor-alkali Facility, Phase Three: Savannah River**  
Lauren Wooten Smith, 17, John S. Davidson Fine Arts School, Augusta, Georgia
- EV114      **Rescuing Our Natural Waters: Fighting Eutrophication Globally Through the Electrical Attraction of Nitrate and Phosphate**  
Miguel Angel Bustos, 18, Uniondale High School, Uniondale, New York
- EV119      **Pyrethroids as Endocrine Disruptors: The Effect of Residual Pyrethroid Levels as Found in *L. esculentum* (Tomatoes) on the Abnormal Proliferation of MCF-7 Human Breast Cells**  
Graham William Wakefield Van Schaik, 16, Spring Valley High School, Columbia, South Carolina
- EV125      **Toxicity and Ecological Implications of Nanomaterials to Phytoplankton**  
Jingyuan Luo, 17, Hamilton High School, Chandler, Arizona
- Third Award of \$1,000**
- EV007      **Evaluating the Synergistic Effects of Lead, Cadmium, Zinc, and Manganese on Selected Cellular Models**  
Kristen Elaine Fenska, 18, Miami High School, Miami, Oklahoma
- EV032      **Air Quality Inside Air-Conditioned Buses in Guangzhou**  
Mao Jing Fu, 18, Affiliated School of South China Normal University, Guangzhou, Guangdong, China
- EV041      **The Effects of D-limonene on *Solenopsis invicta***  
Amarette Hope Aube, 17, Seminary Attendance Center, Seminary, Mississippi
- EV045      **Gaseous Emissions from Agricultural Waste, Phase II**  
Tara Ellen Gloyna, 16, Temple High School, Temple, Texas



- EV048      **Effects of Salicylic Acid on Fertilizer-Induced Eutrophication**  
Rachel Beth Cohn, 17, Niles North High School, Skokie, Illinois
- EV053      **Management of Aphid Pest of Cowpea by a Bio-Pesticide *Fusarium pallidroseum***  
Swathi Soman, 14, Christ Nagar Senior Secondary School, Trivandrum, Kerala, India
- EV058      **Multi-Tiered Wetlands: A Technique for Improving the Effectiveness of Constructed Wetlands**  
Andrew James Stewart, 18, Karabar Distance Education Centre, Queanbeyan, New South Wales, Australia
- EV059      **"Don't Drink That!" Environmental Sensitivity of Coliform and *Enterococcus* Bacteria**  
Rachel Elizabeth Pian, 17, Yorktown High School, Yorktown Heights, New York
- EV060      **The Design and Development of an Underwater System in Quarter Master Harbor to Analyze the Effectiveness of Aeration in Plankton Germination Traps**  
Meghan Elizabeth Gavin, 18, Bellarmine Preparatory School, Tacoma, Washington
- EV074      **Evaluating the Impact of Trivalent Arsenicals on Selenium Metabolism Using *E. coli* as a Model System**  
Daniel Kenneth Cook, 16, Lake Highland Preparatory School, Orlando, Florida
- EV082      **Examining the Feasibility of Utilizing Dinoflagellates *Pyrocystis fusiformis* as a Bioassay to Test Metal Toxicity Levels**  
Nicole Khezri, 17, John L. Miller Great Neck North High School, Great Neck, New York
- Fourth Award of \$500**
- EV001      **Impact of Water Reclamation: An Analysis of Water Quality and the Growth, Development, and Propagation of *Brassica rapa***  
Yun Li, 16, Stanton College Preparatory High School, Jacksonville, Florida
- EV008      **A Device to Minimize the Percentage of Acidic Gases in Diesel Exhaust**  
Dana Jamal Abdul-Jaleel, 16, Modern Montessori School, Amman, Jordan
- EV026      **The Environmentally-Safe Eradication of *Reticulitermes flavipes* Through the Utilization of Amoxicillin and *Aspergillus niger***  
Ramsey Harbi Shadfán, 15, Keystone School, San Antonio, Texas
- EV037      **Removal of Arsenic from Drinking Water by Water Hyacinths (*Eichhornia crassipes*), Year II**  
Kathryn VanderWeele Snyder, 16, Oregon Episcopal School, Portland, Oregon
- EV042      **Behavioral Effects of the Herbicide Metolachlor on the Perception of Chemical Stimuli and Winner-effect in Environments with and without Plants**  
Matthew Brian Newcomb, 18, Peachtree Ridge High School, Suwanee, Georgia
- EV052      **An Investigation of the Removal of Heavy Metal Ions Using Titanium Dioxide and Ultra Violet in a Flowing Photocatalytic Reduction Apparatus**  
Megan Moulding, 15, Fremont High School, Plain City, Utah

- EV054      **Effect of Salinity on Population Density and Diversity of Benthic *Foraminifera* in the Indian River Lagoon, Year Two**  
Phaedra Calista Tinder, 17, Sebastian River High School, Sebastian, Florida
- EV073      **Earthworm-produced Humus Accelerates the Growth of Coffee Plants Under Laboratory Conditions**  
Abdiel Jose Ortiz, 15, Colegio Radians, Cayey, Puerto Rico
- EV084      **Making Methane**  
Elizabeth Louise Bosworth, 16, White Lake High School, White Lake, South Dakota
- EV086      **The Biodegradation of Crude Oil by a Novel Marine Bacterial Community**  
Jordan Russell Singer, 18, Ephrata Senior High School, Ephrata, Pennsylvania
- EV100      **A Sphagnum Solution for Safe Water**  
Arielle Katherine Garrett, 15, Stellys Secondary School, Saanichton, British Columbia, Canada
- EV101      **The Effects of Nutrient Enrichment (N and P) on the Cyanobacteria Genus, *Anabaena***  
Nicole Christina Corbett, 15, Abington High School, Abington, Massachusetts
- EV105      **The Effect of Particle Size on Cellulose Conversion Rates**  
Manraj Singh Rangi, 17, duPont Manual Magnet High School, Louisville, Kentucky
- EV108      **A Polymeric Treatment for Removal of Heavy Metal Contaminates from Water**  
Tyler Matthew Keck, 18, Monte Vista High School, Monte Vista, Colorado

## Mathematics - Presented by Lucent Technologies

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- MA036      **The Solution of the Dirichlet Problem with Rational Boundary Data**  
Michael Anthony Viscardi, 17, Josan Academy, San Diego, California

### First Award of \$3,000

- MA036      **The Solution of the Dirichlet Problem with Rational Boundary Data**  
Michael Anthony Viscardi, 17, Josan Academy, San Diego, California

### Second Award of \$1,500

- MA002      **Novel Method of Computing Jacobi Symbols for Mersenne Numbers: Allowing for Generation of S Values for the Lucas-Lehmer Primality Test**  
Anarghya A. Vardhana, 17, Jesuit High School, Portland, Oregon
- MA018      **A Fully Combinatorial Proof of the Chan-Robbins-Yuen Theorem**  
Daniel Abraham Litt, 17, Orange High School, Pepper Pike, Ohio

MA032      **On the Reducibility of Cyclotomic Polynomials Over Finite Fields**  
Brett Alexander Harrison, 17, Half Hollow Hills High School West, Dix Hills, New York

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

MA015      **Extended Fault Tolerance of Hyper-star Graphs**  
Meelap Vijay Shah, 17, Stoney Creek High School, Rochester Hills, Michigan

MA023      **Kepler's Quest - Isoperimetric Biogeometry**  
Daniel Karoly Bezdek, 16, Father Lacombe High School, Calgary, Alberta, Canada

MA026      **Discrete Dynamical Systems in Directed Graphs**  
Jeff D. Nanney, 17, Plano East Senior High School, Plano, Texas

MA034      **Closed Forms for Quadratic Recursions**  
Aleksandr Arkhipov, 17, Dr. Ronald E. McNair Academic High School, Jersey City, New Jersey

**Fourth Award of \$500**

MA009      **Some Topological Properties of a Fault-Tolerant Design**  
Po-Chun Kuo, 18, National Hsinchu Senior High School, Hsinchu, Taiwan, Chinese Taipei

MA016      **Tilings on a Square Stripe**  
Maxim A. Ulanov, 16, Advanced Education and Science Centre of MSU, Moscow, Russia

MA019      **Reinterpretation of the Theory of Graph Minors and the Study of a Special Case of Hadwiger's Conjecture**  
Manuel Luis Rivera-Morales, 17, Colegio San Ignacio de Loyola, San Juan, Puerto Rico

MA031      **A New Algorithm for Constructing a Prime List by Twin Primes**  
Yujing Wang, 18, High School of Peking University, Beijing, China

MA037      **Generalized  $3x+1$  Dynamical Systems Under Semi-group Action**  
Daniel Zi Wang, 16, Plano Senior High School, Plano, Texas

## Medicine and Health - Presented by Merck Research Laboratories

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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**

ME013      **Engineering of a Novel Inhibitor of Biofilm-Encapsulated Pathogens**  
Madhavi Pulakat Gavini, 16, Mississippi School for Mathematics & Science, Columbus, Mississippi

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

- ME010      **Stevia Induction of DNA Repair Mechanisms: A Study of Induced DNA Damage and Genetic Expression**  
Kaleb Markus Naegeli, 18, Northwestern High School, Kokomo, Indiana
- ME013      **Engineering of a Novel Inhibitor of Biofilm-Encapsulated Pathogens**  
Madhavi Pulakat Gavini, 16, Mississippi School for Mathematics & Science, Columbus, Mississippi
- ME060      **Frankincense Oil as a Novel Cancer Therapeutic Agent: Results of a Clinical Trial in Equine Melanoma, a Third Year Study**  
Carrie Elizabeth Shaw, 18, Career Center High School, Winston-Salem, North Carolina

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

- ME009      **Chloroplast Genetic Engineering: A Novel Method to Produce Therapeutic Proteins**  
Shiv Mukesh Gaglani, 17, West Shore High School, Melbourne, Florida
- ME024      **Development of a System for the Local Prevention of Catheter Associated Urinary Tract Infections**  
Silvana Konermann, 17, Saechsisches Landesgymnasium St. Afra, Meissen, Germany
- ME036      **Modeling Auditory Attention by Implementing IHC Movement into Frequency Selectivity of the Inner Ear: A Novel Approach to Stimuli Separation**  
Jonathan Blake Sellon, 18, Staples High School, Westport, Connecticut
- ME037      **A Novel Non-invasive Method for the Early Detection of Malignant Melanoma**  
Jason Bernard Clain, 16, Greenwich High School, Greenwich, Connecticut
- ME047      **Pharmacological Study of Dopamine Transmission in the Rat Nucleus Accumbens**  
Michelle Andrea Nguyen-McCarty, 17, Academy of the Holy Names, Albany, New York

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

- ME007      **Mathematical Modeling of Smoking Effect on Down Syndrome**  
Daniel Zheng, 16, Saint Paul Academy and Summit School, Saint Paul, Minnesota
- ME030      **Cell Survival, Genomic Instability, and Bystander Effects Induced by Ionizing Radiation**  
Danna Elisabeth Thomas, 16, Broadneck Senior High School, Annapolis, Maryland
- ME035      **A Novel Function of Lactate Transporter MCT1 in Gastric Restitution**  
Lisa Madeleine Marrone, 18, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia
- ME038      **Micro-pathology Lab Chip for Detecting Molecular Lesions of Glioblastoma**  
Carol Yoon Joo Suh, 17, Palos Verdes Peninsula High School, Rolling Hills Estates, California
- ME084      **Silencing of Gene Expression in *Neurospora crassa* Through Targeted mRNA Cleavage**  
Srikanth Kodali, 16, John B. Connally High School, Austin, Texas

- ME087      **The Antimicrobial Properties of *Curcuma longa* and Its Growth Impediment Effects on *Saccharomyces cerevisiae* and *Escherichia coli***  
Nhila Jagadeesan, 16, Lake Central High School, St. John, Indiana
- ME091      **Discovery of a Gene that Blocks Breast Cancer Cell Metastasis**  
Tejal Ulhas Naik, 16, The Charter School of Wilmington, Wilmington, Delaware
- ME096      **Thwarting the Pandemic: Targeted Social Distancing Strategies**  
Laura McBride Glass, 15, Albuquerque High School, Albuquerque, New Mexico
- Fourth Award of \$500**
- ME034      **MAM and the Development of Cerebellar Granule Cells**  
Fei Chen, 16, School of Science and Technology, Beaverton, Oregon
- ME041      **Detecting Novel Submicroscopic Chromosomal Abnormalities in Autism**  
Maryam Ibrahim Sultan, 18, Townsend Harris High School, Flushing, New York
- ME045      **An Examination of the Metal Contamination of Donated Blood to Be Used in Neonatal Blood Transfusions**  
Allison Michelle Blatz, 18, Mentor High School, Mentor, Ohio
- ME048      **Cellular and Molecular Mechanisms of Nicotine's Pro-angiogenesis Activity: Potential Impact on Different Disease Processes**  
Sarah S. Mousa, 18, Columbia High School, East Greenbush, New York
- ME057      **T Cell Signaling in Disease Settings Following Allogeneic Bone Marrow Transplantation**  
Melanie Yan-Yan Chow, 17, Rye High School, Rye, New York
- ME069      **Functional Conservation of Telomerase from Fish to Humans: Implications for Novel Models of Aging and Cancer**  
Sohini Sircar, 17, Maggie L. Walker Governor's School, Richmond, Virginia
- ME072      **Incorporation and Maximization of Synthetic Penicillin Production in Transgenic *Lemna minor***  
Zachary Scott Solomon, 17, Long Beach High School, Lido Beach, New York
- ME080      **Finding a Link Among Ca<sup>2+</sup> Signaling, Apoptosis and Neurodegenerative Diseases to Develop Novel Treatments**  
Eric Nelson Delgado, 16, Bayonne High School, Bayonne, New Jersey
- ME088      **Shake and Bake: It's Not Just for Dinner Anymore. The Effects of SV40 Large T-Antigen on Skin Phenotype in VDR-null Mice**  
Elizabeth Blair Laing, 17, Lakeshore High School, Stevensville, Michigan
- ME090      **That Little Voice Inside Your Head**  
Erin Marie Fischell, 18, High Technology High School, Lincroft, New Jersey

## Microbiology - Presented by Intel Foundation

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

MI007      **Synthesis of RC-101 Resistant HIV-1: Investigating HIV-1 Methods of Peptide Evasion**  
Andrew David Warren, 16, Lake Highland Preparatory School, Orlando, Florida

### First Award of \$3,000

MI007      **Synthesis of RC-101 Resistant HIV-1: Investigating HIV-1 Methods of Peptide Evasion**  
Andrew David Warren, 16, Lake Highland Preparatory School, Orlando, Florida

### Second Award of \$1,500

MI033      **Gene Clone and Secondary Structure Analysis of Mulberry Mosaic Wither Viroid**  
RuoChen Zhu, 18, The High School Attached to Tsing Hua University, Beijing, China

MI043      **Photoenzymatic Repair: The Effect of UV-A and UV-B Radiation on Ciliates**  
Eric Alan Sherman, 12, Ephrata Senior High School, Ephrata, Pennsylvania

MI050      **Use of GFP to Analyze *Pseudomonas syringae* pv. *phaseolicola* 1448A in Plant Cells**  
Daniel Abraham Blumenthal, 18, Jones College Preparatory School, Chicago, Illinois

### Third Award of \$1,000

MI005      **CPLD Prevention in Cystic Fibrosis: Reduction of *Pseudomonas aeruginosa* Biofilm and Virulence by *Punica granatum***  
Maryam Khadijah Mohammed, 15, Niceville Senior High School, Niceville, Florida

MI015      **Investigation of an Antimicrobial Efflux Pump-Encoding Gene with an Environmental Health Perspective**  
Jennifer Ann Taylor, 18, Florence High School, Florence, Alabama

MI026      **The Relative Sensitivity of Fungal Mycelium to Allelopathic Chemicals Produced by Noxious Weeds**  
Angela Roberta Tomscheck, 17, North Toole County High School, Sunburst, Montana

MI041      **Functional Characterization of the *Legionella* Vip Proteins**  
Jennifer Michelle Schindler, 17, Oceanside High School, Oceanside, New York

MI048      **Search for Methane-oxidizing Archaeons**  
Maxwell S. Mann, 16, Falmouth Academy, Falmouth, Massachusetts

### Fourth Award of \$500

MI001      **Entry of Plasmid-Encoded Toxin into the Eukaryotic Cell**  
Kaitlin Elizabeth Burlingame, 16, Lake Brantley High School, Altamonte Springs, Florida

- MI016      **Comprehensive Bacterial Identification and Analysis Software: Protecting the Armed Forces and Improving Health Care Worldwide**  
Benjamin Albert Schwank, 18, James Madison High School, Vienna, Virginia
- MI021      **Inhibiting *Clostridium perfringens* in Poultry via Extract Usage, Phase II**  
Joseph Robert Stunzi, 16, Clarke Central High School, Athens, Georgia
- MI029      **Adaptive Resistance of *E. coli* to Triclosan and Cross-resistance to Antibiotics**  
Steven Konstantin Lisica, 16, Bergen County Academies, Hackensack, New Jersey
- MI037      **The Effects of *Allium sativum* and *Melaleuca alternifolia* on *Fusobacterium necrophorum***  
Jessica Rae Parries, 18, Estacada High School, Estacada, Oregon
- MI042      **The Effect of Ultraviolet Light and Microgravity on Growth Patterns of *Bacillus subtilis***  
Ragini Annesha Basu, 17, Roanoke Valley Governor's School, Roanoke, Virginia

## Physics - Presented by Lawrence Livermore Laboratory

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- PH026      **Cracking the Brazil Nut Effect**  
Meredith Ann MacGregor, 17, Fairview High School, Boulder, Colorado

### First Award of \$3,000

- PH020      **Development of an Inexpensive Raman System and a Littrow Spectrograph**  
Mary Masterman, 16, Westmoore High School, Oklahoma City, Oklahoma

- PH026      **Cracking the Brazil Nut Effect**  
Meredith Ann MacGregor, 17, Fairview High School, Boulder, Colorado

### Second Award of \$1,500

- PH019      **Detection of Metal Fatigue and Defects by Electron Work Function Topography and Gradient**  
Geoffrey Hubert Woo, 17, Palos Verdes Peninsula High School, Rolling Hills Estates, California

- PH031      **Physics of a Simple Prototype for Static Magnetic Levitation**  
Hamsa Padmanabhan, 16, Kendriya Vidyalaya Ganeshkhind, Pune, Maharashtra, India

- PH050      **A General Model for Three Way Neutrino Oscillations**  
Renaldo Michael Webb, 17, Louisiana School for Math Science and the Arts, Natchitoches, Louisiana

### Third Award of \$1,000

- PH001      **SMA: The Shape of Things to Come, Year Two**  
Mario Charles Mistretta, Jr., 17, Satellite High School, Satellite Beach, Florida

- PH002      **A Compact Approach for the Real-time 3D Localization of Sounds**  
David S. Holz, 17, Monarch High School, Coconut Creek, Florida
- PH015      **Synthetic Depth of Focus**  
Holly Kristine Zelnio, 18, Chaminade Julianne High School, Dayton, Ohio
- PH022      **Angular Transfer Dynamics of a Momentum eXchange/Electrodynamic-Reboost (MXER), Space Tether**  
Adam Matthew Fuhrmann, 16, Heritage High School, Leesburg, Virginia
- PH048      **Sensitivity of 1/f Noise to Chemical Constitutents: A Study of Pentacene and Its Oxidative Impurity in Thin-Film Transistors**  
Winston Xia Yan, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

**Fourth Award of \$500**

- PH010      **Propellantless Propulsion: The Role of Drift Transport in Asymmetrical Capacitor Thrust Production**  
Stephen Jerome Trettel, 16, New Prague Senior High School, New Prague, Minnesota
- PH013      **Cartesian Diver, Interfacial Phenomena, and the Cheerios Effect**  
Sung-Kai Kao, 17, National Chai-Yi Senior High School, Chia-Yi City, Taiwan, Chinese Taipei
- PH018      **Coil Gunnery**  
John Robert Krause, 17, Centreville High School, Clifton, Virginia
- PH029      **Nanoscale Displacement Metrology of Piezoelectric Elements with Optical Fiber Interferometry**  
Christian Damon Lobo, 17, Westview High School, Portland, Oregon
- PH039      **Optical, Acoustic, and Mechanical Properties of StealthWear: Third Year Study of a Novel Material**  
Graham Edward Gintz, 15, Hilton Head Preparatory School, Hilton Head Island, South Carolina
- PH044      **Detection and Analysis of Capacitance Variations Produced by Moving Objects, Phase III**  
Sean Thomas Malone, 17, Malone Homeschool, Edgewood, New Mexico

**Space Science - Sponsored by Los Alamos National Laboratory**

Intel will present Best of Category Winners with a \$5,000 award and Intel® Centrino™ mobile technology-based notebook computer. 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 \$5000 for Top Place Winner**

- SP017      **Investigating the Chemical Signatures of Meteorite Impacts**  
Terik Daly, 16, Oak Grove High School, San Jose, California



**First Award of \$3000**

SP017

**Investigating the Chemical Signatures of Meteorite Impacts**

Terik Daly, 16, Oak Grove High School, San Jose, California

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

SP008

**The Titan Blimp**

John Thomas Hagen, 18, Ayersville High School, Defiance, Ohio

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

SP014

**Radio Interferometry Using 2 NASA RadioJOVEs at 20.1 MHz with Software Implementation in Java**

Hieu Huu Tran, 16, Southside High School, Greenville, South Carolina

SP016

**Variations in Muon Density: The Examination of Cosmic Rays Through Muon Detection**

Thomas Anthony Catanach, 16, Bishop Lynch High School, Dallas, Texas

**Forth Award of \$500**

SP006

**Dust Adhesion Minimization of the Mars Exploration Rover Calibration Target Through Thin Metal Film Technology**

Jessica Andrea Barreto, 16, Maritime and Science Technology Academy, Miami, Florida

SP007

**Magic Mirror for Galaxy Clusters**

Hsin-Yu Chen, 18, Taipei First Girl High School, Taipei, Taiwan, Chinese Taipei

## Zoology - Presented by Intel Foundation

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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**

ZO020

**A Versatile Hunter: Giant Wood Spider Adjusts Web Structure and Silk Properties When Encountering Different Prey**

Yi-Chi Chao, 18, The Affiliated Senior High School of NTNU, Taipei, Taiwan, Chinese Taipei

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

ZO020

**A Versatile Hunter: Giant Wood Spider Adjusts Web Structure and Silk Properties When Encountering Different Prey**

Yi-Chi Chao, 18, The Affiliated Senior High School of NTNU, Taipei, Taiwan, Chinese Taipei

ZO033

**Glycogen Induces Extension of Pharynx During Feeding in Planarians**

Seira Shimoyama, 17, Urawa Daiichi Girls High School, Urawa-City, Saitama Prefecture, Japan

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

ZO003

**Biological Control of a Common Corn Criminal, Phase Three: The Effects of Entomogenous Nematodes on the *Carpophilus dimidiatus*, Corn Sap Beetle**

Douglas Ray Horton, 17, Hotchkiss High School, Hotchkiss, Colorado

- ZO031      **Overwintering Adaptations of *Cucujus clavipes***  
Kennan L. Jeannet, 17, Jeannet Homeschool, Fairbanks, Alaska
- ZO047      **Regeneration Anomalies in Planaria Subjected to Various Phthalate Esters**  
Jessica Leann Baker, 18, Seneca High School, Seneca, Missouri
- ZO057      **The Effects of *A. planipennis* Habitat Destruction on the Populations of Limno-Terrestrial Tardigrades Residing on the Lichens of *F. pennsylvanica***  
Ana Marie Lyons, 16, Mecosta Osceola Math, Science & Technology Center, Big Rapids, Michigan
- Third Award of \$1,000**
- ZO017      **Biofuel and Soaps from Janitor Fish (*Pterygoplichthys pardalis*) Oil**  
Raymond Joseph Sarmiento Amurao, 16, Marikina Science High School, Marikina City, Philippines
- ZO018      **Analysis of Cotton Bollworm Response to Gossypol**  
Yuqian Jiang, 17, Shanghai Weiyu High School, Shanghai, China
- ZO022      **A Device for Determining the Gender of Salmon Using Morphological Characteristics, Phase Four: Age & Morphological Differences Between Male & Female Kokanee Salmon**  
Susannah Lee Clary, 14, Los Lunas High School, Los Lunas, New Mexico
- ZO028      **Mollusks in Decline: An Ecological Study of a Rare Freshwater Mussel (*Margaritifera falcata*)**  
Emily Sarah Munday, 16, Butte High School, Butte, Montana
- ZO034      **Coral Bleaching Adaptation**  
Malcolm Bruce Young, 17, Centraurus High School, Lafayette, Colorado
- ZO040      **Trouble in Paradise? Assessment of Interannual and Spatial Variability on a Red Sea Fringing Coral Reef**  
Zaki Daniel Moustafa, 15, A.W. Dreyfoos High School of the Arts, West Palm Beach, Florida
- Fourth Award of \$500**
- ZO010      **Examination of Long-Term Memory in Heterozygous Mindbomb Mutant Zebrafish**  
Beatrice Smith Parker, 16, Bethesda-Chevy Chase High School, Bethesda, Maryland
- ZO015      **Gametic Compatibility of Conspecific Sea Urchins, *Arbacia punctulata***  
Hillary Ann Futch, 16, Paxon School for Advanced Studies, Jacksonville, Florida
- ZO019      **Mode of Inheritance of Spinosad-Resistance in *Liriomyza trifolii***  
Emily Victoria Schock, 16, Lake Highland Preparatory School, Orlando, Florida
- ZO029      **Utilizing Science to Promote Sustainable Economic Development in Our Tribal Community: Protein Metabolism in Tilapia Fish for Optimal Growth, Year Three (*Oreochromis* Hybrids)**  
Annette Joy Mendivil, 17, Casa Grande Union High School, Casa Grande, Arizona

- ZO054      **The Correlation of Back Fat on Swine Carcass Quality**  
Emily Katherine Arkfeld, 16, Lourdes Central High School, Nebraska City, Nebraska
- ZO058      **For the Birds: Testing the Efficacy of Sonic and Ultrasonic Bird Deterrent Devices**  
Joanna Christine Guy, 14, Southern Garrett High School, Oakland, Maryland
- ZO069      **An Analysis of the Effects of Growth Enhancers on *Sus scrofa***  
Adam Lee Hubrig, 17, Hankinson High School, Hankinson, North Dakota
- ZO070      **Cell Proliferation Is Episodic and Pulsatile During Growth of Zebrafish Fins**  
Isha Himani Jain, 15, Freedom High School, Bethlehem, Pennsylvania

## Team Projects - Presented by Science News

Intel will present Best of Category Winners with a \$5,000 award and an Intel® Centrino™ mobile technology-based notebook computer. 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

- BE318      **The Effects of CNS Stimulants and SSRIs on the Formation of Conditioned Long Term Memory and Learning Behaviors in Sleep Deprived Wildtype *Drosophila melanogaster***  
Mary Martha Ferrari Douglas, 17, Manhasset High School, Manhasset, New York  
Alison W. Liu, 16, Manhasset High School, Manhasset, New York

### First Award of \$3,000

- BE318      **The Effects of CNS Stimulants and SSRIs on the Formation of Conditioned Long Term Memory and Learning Behaviors in Sleep Deprived Wildtype *Drosophila melanogaster***  
Mary Martha Ferrari Douglas, 17, Manhasset High School, Manhasset, New York  
Alison W. Liu, 16, Manhasset High School, Manhasset, New York
- CS316      **Paladin: A New Fast and Secure Symmetric Block Cipher**  
Victor Andrew Shia, 17, Monta Vista High School, Cupertino, California  
George Chen, 17, Monta Vista High School, Cupertino, California  
Frank Fu-Han Chuang, 17, Monta Vista High School, Cupertino, California
- EA302      **Tracing Early Hominid Migrations in India: ESR Dating at Hathnora and Devni-Khadri**  
Maysun Mazhar Hasan, 17, Francis Lewis High School, Fresh Meadows, New York  
Hermain Suhail Khan, 16, Staten Island Technical High School, Staten Island, New York
- EN314      **Innovative Thickness Measurement of Biological Tissue by Using Maximum Bubble Pressure Method**  
Yung-Chieh Chen, 18, Taipei Municipal LiShan High School, Taipei, Taiwan, Chinese Taipei  
Chao-Hsi Lee, 18, Taipei Municipal LiShan High School, Taipei, Taiwan, Chinese Taipei
- EV329      **Effect of Land Use on Water Chemistry and Macroinvertebrates in Three Watersheds**  
Richard C Lee, 14, Cookeville High School, Cookeville, Tennessee  
Christine Weizer Li, 18, Cookeville High School, Cookeville, Tennessee

- ME305      **The Effects of Gene Suppression and Exposure to MPTP on Dopamine Neurons of *C. elegans* as a Model for Parkinson's Disease**  
Marilynn Tedja, 17, Keystone School, San Antonio, Texas  
Elise Marie Adcock, 17, Keystone School, San Antonio, Texas  
Elizabeth Nicole Monier, 17, Keystone School, San Antonio, Texas
- PH306      **Development of Multipass Pulse Cleaner for Ultrafast High-power Lasers**  
Alexander Chernyak, 18, International Academy, Bloomfield Hills, Michigan  
Pavel V. Chvykov, 15, Lincoln Consolidated High School, Ypsilanti, Michigan
- Second Award of \$1,500**
- BE312      **Difference in Behavior of Lake Apopka Area Children Whose Parents Were Directly or Indirectly Exposed to Pesticides**  
Grant Fabian Chernoby, 17, Lake Brantley High School, Altamonte Springs, Florida  
Shahin Pourkaviani, 16, Lake Brantley High School, Altamonte Springs, Florida
- BI304      **Levodopa's Effect on Endogenous Morphine Production and the Mu3 Opiate Receptor in SH-SY5Y Cells**  
Kamalakar Atluri, 18, Herricks Senior High School, New Hyde Park, New York  
Dhruv Vasishtha, 16, Roslyn High School, Roslyn Heights, New York
- BO303      **Understanding Leucine-rich Repeats and Their Roles in Gene Families Through the Study of Genes At1g68780, At1g13230, and At4g28560 in *Arabidopsis thaliana* Development**  
John James Hutchison, 16, Lake Highland Preparatory School, Orlando, Florida  
Varun Rajendra Hippalgaonkar, 16, Lake Highland Preparatory School, Orlando, Florida
- BO310      **Dehiscence and Dispersal of the Popping Pod *Ruellia tuberosa* L.**  
Krongrath Suwanasri, 18, Triam Udom Suksa School, Bangkok, Thailand  
Tanongsak Chinaroonchai, 18, Triam Udom Suksa School, Bangkok, Thailand  
Suksun Itthipanyanan, 18, Triam Udom Suksa School, Bangkok, Thailand
- CH308      **The Effects of Supercritical Carbon Dioxide on the Compatibilization and Crystallinity of Polymer Thin Films**  
Christopher Donald Pynn, 17, Half Hollow Hills High School West, Dix Hills, New York  
Zimra Payvand Ahdout, 17, Roslyn High School, Roslyn Heights, New York
- CS318      **A New Algorithm to Minimize Factory Inefficiency Through Penalty Reduction**  
Andrew David Gamalski, 17, Hamilton High School, Chandler, Arizona  
Vinayak Muralidhar, 16, Corona del Sol High School, Tempe, Arizona
- EN331      **Polycaprolactone-Chitosan Nanocomposite Biomaterials for Wound Healing and Tissue Engineering**  
Wilfred Chung-Him Wong, 17, Herricks Senior High School, New Hyde Park, New York  
Ashish Mohan Bakshi, 17, Manhasset High School, Manhasset, New York
- EN339      **Collapsible Wheelchair, Year Two**  
William Caleb Rodgers, 18, Hiram High School, Hiram, Georgia  
Joshua Robert Turner, 18, Paulding County High School, Dallas, Georgia

- EN349      **The Effects of Supercritical Carbon Dioxide (scCO<sub>2</sub>) on the Segregation of POSS Nanoparticles and on the Metallization of PS and PMMA Thin Films**  
Brienne Ashley Kugler, 17, Jericho High School, Jericho, New York  
Jamie Erin Rosengard, 17, Half Hollow Hills High School West, Dix Hills, New York
- EV323      **A Reversal of PhosFATE: Safely Reintroducing Phosphates into Cleaning Agents**  
Maureen Anne Williams, 16, Bishop Moore Catholic High School, Orlando, Florida  
Joseph Kent Henry, 17, Bishop Moore Catholic High School, Orlando, Florida
- ME326      **Dystrophic Skeletal Muscle Cell Membranes Patched by Ploxamer 407**  
Lalith Kumar Polepeddi, 17, Cherry Creek High School, Greenwood Village, Colorado  
Michael McCord Polmear, 18, Cherry Creek High School, Greenwood Village, Colorado
- MI302      **Decreasing the Microbial Contamination of an Oak Wine Barrel by Improving the Sanitation of *Brettanomyces bruxellensis* Using 254nm Ultraviolet Light and an Ultrasonic Bath**  
Arnaud Georges Sillis, 17, Oregon Episcopal School, Portland, Oregon  
Brian Furness Siperstein, 17, Oregon Episcopal School, Portland, Oregon  
Keenan Joseph Ferar, 17, Oregon Episcopal School, Portland, Oregon
- ZO315      **Genetic Diversity of Rocky Mountain Goats (*Oreamnos americanus*) Through Noninvasive Microsatellite Genotyping**  
Jeremy Rosendo Reynoso, 17, Corvallis High School, Corvallis, Montana  
Forrest Connell Jessop, 17, Corvallis High School, Corvallis, Montana  
Alissa Raenelle Schlecht, 16, Corvallis High School, Corvallis, Montana
- Third Award of \$1,000**
- BE301      **Determination of Gender and Age by Thumbprints, Year Two**  
Meryl Adelman Hulteng, 15, Wilsonville High School, Wilsonville, Oregon  
Shannon Marie Cassidy, 16, Wilsonville High School, Wilsonville, Oregon
- BI309      **A Screen for Mutants in *Drosophila melanogaster* Which Affects Triglyceride Levels**  
Daniel Yeh, 18, Alhambra High School, Alhambra, California  
Ryan Wai Tam, 16, Alhambra High School, Alhambra, California
- BO302      **Direct Evidence of the Symplastic Pathway in the Trap of the Bladderwort, *Utricularia gibba***  
Tanya Chun-Chiao Juang, 17, Saint Dominic High School, Kaohsiung, Taiwan, Chinese Taipei  
Sonya Di-Chiao Juang, 15, Wu Fu Junior High School, Kaohsiung, Taiwan, Chinese Taipei
- BO305      **The Effect of Nitrate Concentration on the Growth of Algae Blooms and Epiphytes in Correlation to the Health of Aquatic Life Indigenous to the Chesapeake Bay**  
Gabrielle Marie Strike, 16, York High School, Yorktown, Virginia  
Anup Myneni, 15, York High School, Yorktown, Virginia
- CH310      **Return of the Rings: The Investigation of Multiple Systems of Liesegang Rings and Bifurcations, Two Year Study**  
Skylar Davis Williams, 18, Miami High School, Miami, Oklahoma  
Aaron Mark Weaver, 16, Miami High School, Miami, Oklahoma

- CS307      **Neural Network Security System**  
David Nicholaas de Klerk, 18, Die Afrikaanse Hoër Seunskool, Pretoria, Gauteng, South Africa  
Dirk Johannes Jacobus Oosthuizen, 18, Die Afrikaanse Hoër Seunskool, Pretoria, Gauteng, South Africa
- CS314      **AI: Natural Language Processing**  
Xavier Jeremy Falco, 16, Hillcrest High School, Midvale, Utah  
Emmanouel Georgiou Liodakis, 16, Hillcrest High School, Midvale, Utah
- EN313      **Novel Classification Algorithm for Augmented Cognition via Discrimination of Multiplex Quantum Cluster Distributions**  
William Fan, 17, School of Science and Technology, Beaverton, Oregon  
Edward Cat Nguyen, 16, School of Science and Technology, Beaverton, Oregon
- EN333      **Phototropic Nanotechnology via Magnetohydrodynamic Propulsion**  
Lai Xue, 16, West High School, Salt Lake City, Utah  
Charles Cumberland McGuire, 17, West High School, Salt Lake City, Utah  
Gleb Kuznetsov, 18, West High School, Salt Lake City, Utah
- EN341      **CSI: Controlled Spherical Intelligence**  
Benjamin Poss Gulak, 16, Hillfield Strathallan College, Hamilton, Ontario, Canada  
Alexander Jason Molloy, 17, Hillfield Strathallan College, Hamilton, Ontario, Canada
- EV313      **A Simulative Study of the Exxon Valdez Oil Spill and Its Detrimental Effects on Marine Organisms as Determined by the Bioluminescent Capabilities of the Dinoflagellate**  
Cole Thomas Streiff, 18, Oregon Episcopal School, Portland, Oregon  
Matthew Aaron McKinney, 18, Oregon Episcopal School, Portland, Oregon
- EV316      **A Novel Bioabsorbent of "Ya-Plong" as an Oil Spill Removal**  
Pirachula Chulanon, 14, Bodindecha (Sing Singhaseni) School, Wangthonglang, Bangkok, Thailand  
Chitsachee Sichanugrist, 14, Bodindecha (Sing Singhaseni) School, Wangthonglang, Bangkok, Thailand  
Takphet Lekavijit, 15, Bodindecha (Sing Singhaseni) School, Wangthonglang, Bangkok, Thailand
- EV324      **Degradation of Compact Disks by the Fungus *Geotrichum candidum***  
Olga Valerievna Yuts, 18, Colegio Cientifico Costarricense San Pedro, San Jose, Costa Rica  
Jose Pablo Jimenez Trigueros, 17, Colegio Cientifico Costarricense San Pedro, San Jose, Costa Rica  
Diego Guillermo Ulate Segura, 17, Colegio Cientifico Costarricense de San Pedro, San Jose, Costa Rica
- ME301      **Alzheimer's Disease Brain Atrophy and Immunohistochemical Detections of Neurofibrillary Tangles Using Multiple Antibodies**  
Ryan Kimlong Huynh, 17, Champlin Park High School, Champlin, Minnesota  
Richie Kimlong Huynh, 17, Champlin Park High School, Champlin, Minnesota

- ME309      **The Effect of Selected Ingested Plasticizers on the Growth and Development of *Drosophila melanogaster***  
 Andrea Inez Simons, 16, North Toole County High School, Sunburst, Montana  
 Jessica Brooke Nagy, 18, North Toole County High School, Sunburst, Montana
- MI304      **Modulation of Quorum Sensing in *Pseudomonas aeruginosa***  
 Kuan Yee Wong, 18, National Junior College, Singapore, Singapore  
 Siew Han Wong, 18, National Junior College, Singapore, Singapore
- PH303      **Elastomeric Grating for Wavelength Switching in Optical Communication Systems**  
 Maria Katrina Derez Guevara, 17, Philippine Science High School - Main Campus,  
 Quezon City, Philippines  
 Ace Fredric Resurreccion Palabrica, 17, Philippine Science High School - Main Campus,  
 Quezon City, Philippines  
 Nicole Andrea San Agustin Yazon, 16, Philippine Science High School - Main Campus,  
 Quezon City, Philippines
- PH313      **Factors Affecting the Tribological Properties of Carbon Nanotubes**  
 Tirth Tarang Patel, 17, Spruce Creek High School, Port Orange, Florida  
 Byron Henry Lowry, 17, Spruce Creek High School, Port Orange, Florida
- ZO312      **Mathematical Analysis of the Web Structures in Orb-Web Building Spiders**  
 Doo Young Lee, 17, Korean Minjok Leadership Academy, Hoengsung-gun,  
 Kangwon-do, South Korea  
 Gil Young Park, 17, Korean Minjok Leadership Academy, Hoengsung-gun,  
 Kangwon, South Korea
- ZO314      **Competition Between Co-Extensive Homologous Efferent Terminals During Synapse Maturation**  
 Rupal Hiren Patel, 17, Kalamazoo Area Mathematics and Science Center,  
 Kalamazoo, Michigan  
 Erin N. McCormick, 17, Kalamazoo Area Mathematics and Science Center,  
 Kalamazoo, Michigan
- Fourth Award of \$500**
- BE320      **Preconceived Stereotypes in School Children**  
 Meghan Sophia Luther, 15, Henry Perrine Baldwin High School, Wailuku, Hawaii  
 Veronika Nicole Biskis, 15, Henry Perrine Baldwin High School, Wailuku, Hawaii
- BO301      **How Much Sap Could a Sapsucker Suck If a Sapsucker Could Suck Sap?**  
 William Colin Read, 17, Jensen Beach High School, Jensen Beach, Florida  
 Lia-Lucine Lara Cary, 17, Jensen Beach High School, Jensen Beach, Florida
- CH302      **Lighting a Fire: A Study of the Fuels Involved in the Hayman Fire**  
 Max Krakauer, 15, Palmer High School, Colorado Springs, Colorado  
 Alex Ruch, 15, Palmer High School, Colorado Springs, Colorado
- CS308      **Geometric Compression System**  
 Giuliano Sider, 18, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil  
 Rodrigo Luger, 18, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil

- CS313      **HumanSIS**  
 Oscar Federico Flores Galvan, 18, CBTis No. 168, Aguascalientes, Aguascalientes, Mexico  
 Jose de Jesus Briones Serna, 17, CBTis No. 168, Aguascalientes, Aguascalientes, Mexico
- CS317      **Intellectual Data-Analytical Forecasting System, UNICUM**  
 Dmitry Purgin, 16, Technical Lyceum #165, Almaty, Kazakhstan  
 Artyom Karelskiy, 17, Technical Lyceum #165, Almaty, Kazakhstan
- EN305      **Comparative Analysis of Yagi Antenna Using Genetic Algorithms and Polynomial Component Optimization**  
 Andrew Joseph Duchi, 17, Upper Arlington High School, Upper Arlington, Ohio  
 James Henry Notwell, 17, Upper Arlington High School, Upper Arlington, Ohio  
 Erich John Kreuzer, 18, Upper Arlington High School, Upper Arlington, Ohio
- EN308      **Head Control Input Device for PC**  
 Desai Chen, 17, High School Affiliated to Fudan University, Shanghai, China  
 Haotian Liu, 18, High School Affiliated to Fudan University, Shanghai, China
- EN323      **Versatile Color Identification and Luminance Contrast Determination Using a Triluminant Source**  
 Ian Preston Cannon, 17, Redeemer Baptist School, North Parramatta, New South Wales, Australia  
 Rickystan Batane Savaiko, 19, Redeemer Baptist School, North Parramatta, New South Wales, Australia
- EN325      **Bacterial Fuel Cells: Utilizing *E. coli*'s Metabolism to Produce Energy**  
 Quinn Alexander Morris, 17, The North Carolina School of Science and Math, Durham, North Carolina  
 Courtney Henrietta Fox, 18, The North Carolina School of Science and Math, Durham, North Carolina  
 May Liu, 17, The North Carolina School of Science and Math, Durham, North Carolina
- EN332      **Revolutionary Plastics: Surfaces that Self-Sterilize**  
 Miki Claire Duruz, 17, Long Beach High School, Lido Beach, New York  
 Kara Allyn Morgenstern, 17, Long Beach High School, Lido Beach, New York
- EN334      **The Detection of Alkaline Phosphatase and C-Reactive Protein Using a Miniaturized Electrochemical Biosensor for Clinical and Future Diagnostic Tests**  
 Joanne Helen Wang, 16, Hathaway Brown School, Shaker Heights, Ohio  
 Benita Tjoe, 17, Hathaway Brown School, Shaker Heights, Ohio
- EN336      **Developing a Control Methodology for Efficient Tinting of Electrochromic Windows: To Squint ... Or to Tint, Year III**  
 Ananth Ram, 16, Clark High School, Plano, Texas  
 Arun Venkatraman, 16, Clark High School, Plano, Texas
- EN344      **Socially Integrated Robots: Sustainable Robotic Cognition in a Socioeconomic Model**  
 Aaron Thomas Maturen, 17, Heritage High School, Saginaw, Michigan  
 Pascal Anthony Carole, 17, Saginaw Arts and Sciences Academy, Saginaw, Michigan  
 Remy Gerard Carole, 17, Saginaw Arts and Sciences Academy, Saginaw, Michigan



- EV301      **Decline of the North American Lesser Scaup, Phase Two: Chromium and Selenium in Foods**  
 Matt Moraco Weegman, 17, Winona Senior High School, Winona, Minnesota  
 Mitch Dale Weegman, 17, Winona Senior High School, Winona, Minnesota
- EV305      **An Environmentally Friendly Cleaning Powder**  
 Kwai-Yan Wong, 18, South Tuen Mun Government Secondary School, Hong Kong, Region of China  
 Chun-Kit Chu, 18, South Tuen Mun Government Secondary School, Hong Kong, Region of China  
 Kwok-Chung Yau, 17, South Tuen Mun Government Secondary School, Hong Kong, Region of China
- MA307      **Extremal Cayley Graphs of Finite Cyclic Groups**  
 Elysia Ja-Zeng Sheu, 17, Lawrence E. Elkins High School, Sugarland, Texas  
 Joseph J. Lee, 18, Hudson High School, Hudson, Ohio
- MA308      **Impossibility of Construction of Triangle by Using Three Bisectors**  
 Lado Meskhishvili, 15, Georgian-American High School, Tbilisi, Georgia Republic  
 Irakli Baiadze, 16, Georgian-American High School, Tbilisi, Georgia Republic
- ME307      **The Cytotoxic Implications of Titanium Dioxide Nanoparticle Penetration into Dermal Fibroblast Cells**  
 Lauren Amanda Sipzner, 17, Yeshiva University High School for Girls, Holliswood, New York  
 Jaimie Stettin, 17, Yeshiva University High School for Girls, Holliswood, New York
- ME325      ***In vitro* Studies on How Properties of *Melastoma sp.* Methanol Extracts Inhibit the Calcium Oxalate Crystals (Kidney Stones) Growth**  
 Fayadh Aiman Fauzi, 17, Sultan Mohamad Jiwa Science Secondary School, Sungai Petani, Kedah, Malaysia  
 Muhd Fakhurrazi Mohd Bakri, 18, Sultan Mohamad Jiwa Science Secondary School, Sungai Petani, Kedah, Malaysia  
 Mohd Irfan Syuhaidi Nasir, 17, Sultan Mohamad Jiwa Science Secondary School, Sungai Petani, Kedah, Malaysia
- ME327      **A Hybrid Reaction-diffusion Cellular Automata Model of Glioblastoma**  
 Hersh Vivek Goel, 17, Gilbert High School, Gilbert, Arizona  
 Corina I. Oprescu, 16, Corona del Sol High School, Tempe, Arizona  
 Michael Allen Fan, 18, Dobson High School, Mesa, Arizona
- MI314      **Fish Mucus: Antibacterial Property Unique to the Hawaiian *Eleotris sandwicensis***  
 Genevieve C. Pang, 17, Henry Perrine Baldwin High School, Wailuku, Hawaii  
 Alayna Rachelle Betsill, 17, Henry Perrine Baldwin High School, Wailuku, Hawaii
- ZO307      **Use of Nile Red in Determining Lipid Accumulation in Daf-2 and Wild Type *C. elegans***  
 Vasudha Gupta, 16, Forest Hills High School, Forest Hills, New York  
 Lana Rachel Tolen, 16, Forest Hills High School, Forest Hills, New York

- ZO309      **Effect of Chinaberry Fruit Extract Oil on Feeding, Growth and Fecundity of *Plutella xylostella***  
Varun Mittal, 15, Sanatan Dharam Public School, Delhi, Pitampura, India  
Kanishka Tiwary, 16, Sanatan Dharam Public School, Delhi, Pitampura, India
- ZO310      **Sexual Selection in *Drosophila*: A Behavioral, Morphological, and Geographic Study**  
Benjamin Alan Pollack, 17, Plainview-Old Bethpage John F. Kennedy High School,  
Plainview, New York  
Abhinav Khanna, 17, Plainview-Old Bethpage John F. Kennedy High School, Plainview,  
New York
- ZO313      **Stochastic/Deterministic Analysis of Arboviral Transovarial Transmission in *Culicidae***  
Gabriel Joel Mendoza, 17, Americas High School, El Paso, Texas  
Fredrick Phillip Rojas, 17, Americas High School, El Paso, Texas