Winner Announcement

****Strict Embargo: Friday, May 14, 2010, 11:00 a.m. PST****
*****Do Not Release Until This Time *****

Intel ISEF 2010 Grand Awards Ceremony

Intel International Science and Engineering Fair, a program of Society for Science & the Public

San Jose, California, USA – Society for Science & the Public, in partnership with the Intel
Foundation, this morning announced awards at the Intel ISEF 2010 Grand Awards Ceremony. Student winners are ninth through twelfth graders who earned the right to compete by winning top prize at a local, regional, state or national science fairs.

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

This information will be posted on the SSP website at www.societyforscience.org immediately following the ceremony.

The Gordon E. Moore Award

The Moore Award recognizes the Best of the Best among the outstanding students from around the world who participate in the Intel ISEF. The winner is selected on the basis of their innovative research, as well as on the potential impact of their work - in their field and on the world stage.

Gordon E. Moore Award $75,000

CH007 **Lights, Quantum Dots, Action!**
Amy Cindy Chyao, 15, Williams High School, Plano, Texas

Intel Foundation Young Scientist Award

The winners of this award were selected for their commitment to innovation in tackling challenging scientific questions, using authentic research practices, and creating solutions to the problems of tomorrow. Each of these top award winners receive a $50,000 award from the Intel Foundation.

Young Scientist Award of $50,000

CS043 **Automatic Parallelization through Dynamic Analysis**
Kevin Michael Ellis, 18, The Catlin Gabel School, Portland, Oregon

PH018 **Adiabatic Quantum Evolution for NP-Complete and Physical Problems**
Yale Wang Fan, 18, The Catlin Gabel School, Portland, Oregon

The award is disbursed in four 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 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.

EE078 **CookerSmart**
James Sinclair Popper, 18, Marlborough College, Marlborough, Wiltshire, United Kingdom

MA023 **Super Kahler-Ricci Flow**
Joshua William Pfeffer, 17, North Shore Hebrew Academy High School, Great Neck, New York

ME041 **Novel Identification/Subjugation of Prostate Cancer Cells' Intrinsic Resistance Mechanism to Cisplatin**
Jong Hyuck Won, 17, Langley High School, McLean, Virginia

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

CS303 **The Classification and Recognition of Emotions in Prerecorded Speech**
Akash Krishnan, 15, Oregon Episcopal School, Portland, Oregon
Matthew Fernandez, 16, Oregon Episcopal School, Portland, Oregon

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 & the Public (SSP) to promote science education through a program called the Ceres Connection. This program seeks to name minor planets after students through SSP 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.

Animal Sciences

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

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

AS044 **Use of Regression Analyses to Build Ecological Models of Poison Dart Frogs in Their Native Habitats**
Gabriel Thailand Joachim, 16, Cibola High School, Albuquerque, New Mexico

First Award of $3,000

AS044 **Use of Regression Analyses to Build Ecological Models of Poison Dart Frogs in Their Native Habitats**
Gabriel Thailand Joachim, 16, Cibola High School, Albuquerque, New Mexico

Second Award of $1,500

AS007 **Study on Biological Control of *Panonychus citri* by Using Fungal Bio-Control Agents**
Qijin Wu, 17, Fuzhou No. 1 Middle School, Fuzhou, Fujian, China

AS015 **Relay Landscape Learning: A New Mode of Learning in Honeybees, *Apis mellifera***
Neil Kondamuri, 17, Munster High School, Munster, Indiana

AS021 **Effects of Starvation on Wild Type and Adipose60 Mutant *Drosophila melanogaster***
Alyssa Chelsea Ehrlich, 17, South Side High School, Rockville Centre, New York

Third Award of $1,000

AS004 **The Effect of Plumage Coloration on Extra-Pair Paternity in the Indigo Bunting**
Eugenia Pushkarskaya, 18, Paul Laurence Dunbar High School, Lexington, Kentucky

AS013 **Why Spiderman Cannot Do without His Silk? Effects of Dragline Silk on Jumping Performance of Jumping Spider (*Hasarius adansoni*)**
Yung-Kang Chen, 16, National Taichung First Senior High School, Taichung City, Taiwan, Chinese Taipei

AS024 **Quantifying the Relative Abundance of Juvenile Atlantic Sturgeon in the Hudson River**
Sean Patrick Maiorano, 18, Ossining High School, Ossining, New York

AS051 **The Answer Is in the Solution**
Emily Ann Schnoor, 18, Sargent Hidh School, Monte Vista, Colorado

Fourth Award of $500

AS011 **Birds of Quail Hollow Ranch: A Study of Avian Diversity**
Alexander M. Rinkert, 17, San Lorenzo Valley High School, Felton, California

AS017 **Iron Concentration of Quagga Mussel Glue and Its Effect on Shipwrecks**
Amanda Grace Savagian, 17, Divine Savior Holy Angels High School, Milwaukee, Wisconsin

AS032 **The Influence of Antiparasitics on Parasite Burden and Immune Response to Viral Vaccination**
Nathan Sven Wilen, 18, Belle Fourche High School, Belle Fourche, South Dakota

AS033 **The Effects of Food Deprivation in Agonistic Contests between Male Juvenile House Crickets, *Acheta domesticus***
Robert Keith Pak, 17, Valley High School, West Des Moines, Iowa

AS049 **The Effect of Honey Hydrogen Peroxide (H202) and Antioxidants on Small Hive Beetle (*Aethina tumida*) Reproduction and Survival**
Lydia Louise McCormick, 17, Jefferson County International Baccalaureate, Birmingham, Alabama

Behavioral and Social Sciences

Intel will present Best of Category Winners with a $5,000. 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

BE010 **Gemara and Gematria: A Case Study on the Effects of the Use of Sociocultural Contextualizing for the Learning of Mathematics**
Tamara Gedankien, 17, Escola Brasileira Israelita Chaim Nachman Bialik, Sao Paulo, SP, Brasil

First Award of $3,000

BE010 **Gemara and Gematria: A Case Study on the Effects of the Use of Sociocultural Contextualizing for the Learning of Mathematics**
Tamara Gedankien, 17, Escola Brasileira Israelita Chaim Nachman Bialik, Sao Paulo, SP, Brasil

Second Award of $1,500

BE004 **Ability to Suppress the Expression of Fear in Human ApoE Mice**
Matthew Samuel Agam, 16, Beaverton High School, Beaverton, Oregon

BE029 **Game Power: A Game Environment for Measuring ICT-enhanced Skills of Young Students**
Abdulaziz Khalid AlGhunaim, 18, Asrary School, Riydah, Central, Saudi Arabia

BE043 **Slow It Down to Speed It Up: Breaking through the Window of Autism**
Adelina Corina Cozma, 14, Bayview Secondary School, Richmond Hill, Ontario, Canada

Third Award of $1,000

BE002 **The Effects of Borderline Hypothyroidism on Quality of Life and Daytime Drowsiness**
Michael Andrew Fairchild Harding, 17, Lake Highland Preparatory School, Orlando, Florida

BE008 **A Comparative Study of Comprehension Differences in Struggling Readers Using Phrase and Character Spaced Models, Year Three**
Lindsey Brooke Saunders, 16, Union County High School, Lake Butler, Florida

BE023 **Understanding the Psychosocial Factors Related to Low Mammography Adherence amongst Low-Income, Urban African Americans**
Kevin Young Xu, 18, Roslyn High School, Roslyn Heights, New York

BE027 **The Investigation of Latin Americanization in the United States: An Interracial Socialization Study of American and Brazilian Pre-Adolescents**
Camila Sorese Linneman, 18, Ossining High School, Ossining, New York

Fourth Award of $500

BE005 **The Impact of a Set of Training Programs on the Serotonin Hormone in a Sample of (8-9) Year-Old Students with Learning Disabilities and Its Correlation to Their Achievement and Behavior (An Experimental Study)**
Mohammad Mesbah Al-Refai, 16, Modern Systems Schools, Amman, Jordan

BE022 **The Effects of Issue-Based and Character-Based Attack Ads on Intent to Vote and Perceptions of Candidates**
Aaron Michael Levine, 17, Roslyn High School, Roslyn Heights, New York

BE025 **Obesity and Depression: Differential Responses to Environmental Stress**
Sarah Averi Albala, 17, John Jay Senior High School, Cross River, New York

BE034 **Pharmaceutical Safety: Risk Perception and Drug Adherence**
Michael Joseph Vredenburgh, 18, Carlsbad High School, Carlsbad, California

BE045 **Voting Systems: An Outcome Analysis, Phase Two**
Vikash Evans Hypio, 16, Hotchkiss High School, Hotchkiss, Colorado

Biochemistry

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

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

BI017 **Ethanol Production Yield Improvement by Sterilization of the Sugar Cane Juice (Garapa) via Microwave**
Alejandro Mariano Scaffa, 17, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil

First Award of $3,000

BI017 **Ethanol Production Yield Improvement by Sterilization of the Sugar Cane Juice (Garapa) via Microwave**
Alejandro Mariano Scaffa, 17, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil

Second Award of $1,500

BI015 **Modification of Fibrinogen Clotting in the Absence of Thrombin: A Novel Surface Chemistry Approach with Biomedical Applications**
Pooja Rambhia, 17, Jericho High School, Jericho, New York

BI021 **Computational Analysis of Cyclin-Dependent Kinase Substrates in *Saccharomyces cerevisiae* Leads to a Novel Computational Identification Mechanism**
Manjinder Singh Kandola, 17, Queens High School for the Sciences at York College, Jamaica, New York

Third Award of $1,000

BI004 **Weaving Health: The Weaving of Antimicrobial Substances from the Ootheca of the Spider, *Phoneutria nigriventer***
Leonardo de Oliveira Bodo, 15, Dante Alighieri, Sao Paulo, Brasil

BI006 **Bioinformatic and Synthetic Approaches to Studying Advanced Glycation End-products in Eukaryotes**
Jason A. Gandelman, 17, Staples High School, Westport, Connecticut

BI022 **Protein Assay Alternatives**
Philippe Alexandre Chlenski, 15, Lincoln Park High School, Chicago, Illinois

BI043 **The Effects of Increased Gravitational Forces on the Crystallization of the Amino Acid Glycine, Year Three**
Kirk John Henf, 18, Sebastian River High School, Sebastian, Florida

Fourth Award of $500

BI002 **Antifreeze Protein vs. Artificial Polymer**
Taylor Christian Velarde, 15, Cornerstone Christian School, San Angelo, Texas

BI019 **Brain Leucine Sensing Modulates the Rate of Hepatic Triglyceride Secretion *in vivo***
Florence Xavia Kuhl, 18, Ossining High School, Ossining, New York

BI029 **Aldehyde Dehydrogenase 7a1 and Its Relationship to Pyridoxine Dependent Epilepsy**
Conor David Freeland, 17, Minerva High School, Minerva, Ohio

BI032 **Heat Stress Reveals Hexose Transport Rates in *Saccharomyces cerevisiae***
Stanley Palasek, 15, Sonoran Science Academy, Tucson, Arizona

Cellular and Molecular Biology

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

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

CB010 **Gene Dosage and Expression in Human Lymphoblastoid Cell Lines**
Nolan Mint Kiyoshi Kamitaki, 17, Waiakea High School, Hilo, Hawaii

First Award of $3,000

CB010 **Gene Dosage and Expression in Human Lymphoblastoid Cell Lines**
Nolan Mint Kiyoshi Kamitaki, 17, Waiakea High School, Hilo, Hawaii

CB033 ***In vitro* Analysis of a Synthetic Protein: A Model for Enzyme Replacement Therapy**
Carolyn Sinow, 18, Palos Verdes Peninsula High School,
Rolling Hills Estates, California

Second Award of $1,500

CB004 **EGCG Mitigates Parkinson's Disease-associated Mutant LRRK2-induced Neurotoxicity via Protein Translation Modulation**
Jingjie Cheng, 16, Raffles Girls' School (Secondary), Singapore, Singapore

CB034 **UVA1 Skin Irradiation Modulates the Migration of Dendritic Cells: A Novel Mechanism for the Potential Beneficial Effects of Phototherapy on Systemic Disease**
Alydaar Rangwala, 17, The Albany Academies, Albany, New York

CB048 **Cancer Immunotherapy Research Vaccine: Mannose Glycoprotein Encapsulated PLGA Fluorescent Nanoparticles Biotinylated for**

Conjugation with CpG Oligodeoxyribonucleotide for Breast Cancer Research
Riley C Ennis, 16, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

Third Award of $1,000

CB009 **Identification of a New Link in Gene Silencing: Acetylation of the Methyl Binding Protein MeCP2**
Stephanie Michelle Axelson, 18, Airline High School, Bossier City, Louisiana

CB030 **Evaluation of Antibacterial and Anticancer Properties of *Capnella imbricata* Extracts**
Katrina Yue Kay Koon, 17, Stuyvesant High School, New York, New York

CB036 **The Role of CDNB in Understanding the Mechanisms of Action of JS-K, a Promising Anti-Leukemia Compound**
Stephen Alexander Lavanier, 17, Governor Thomas Johnson High School, Frederick, Maryland

CB042 **The Effect of Chemotherapeutic Vincristine on Transposon Mobilization-Induced Flanking Sequence Mutation Rates of *Drosophila melanogaster***
Smita Shukla, 17, Massachusetts Academy of Mathematics and Science at WPI, Worcester, Massachusetts

CB050 **Do NMDA Receptors Affect Early Brain Development?**
Claire Louise Edgcumbe, 18, Kitsilano Secondary, Vancouver, Canada

Fourth Award of $500

CB003 **Feeding Studies and Immunofluorescent Analysis of Feeding Circuit in Lean Syndecan-3 Null Mice**
Diana Basali, 18, Hathaway Brown School, Shaker Heights, Ohio

CB008 **Ceramide-Enriched Domains in Mixed Lipid Bilayers: Unraveling the Mystery Behind Demyelination in Multiple Sclerosis (MS)**
Pranali Hemant Dalvi, 17, International Baccalaureate School at Bartow High School, Bartow, Florida

CB021 **A Genetic Investigation of Autism: The Role of Type III Neuregulin-1/ErbB4 Signaling and Contactin4 Expression in Neurodevelopment**
Alexis Eleni Tchaconas, 17, Commack High School, Commack, New York

CB031 **Acidification of Digestive Vacuoles Is Regulated by pH of the Ingested Food in Paramecium**
Hoko Nakada, 17, Urawa Daiichi Girls High School, Saitama-shi, Saitama, Japan

CB039 **Morphological and Functional Characterization of Lower Female Genital Tract Epithelial Cell Cultures in Different Growth Conditions**
Vivian Wingsee Leung, 17, Abbey Park High School, Oakville, Ontario, Canada

CB046 **Multi-Modal Confocal Mosaicing Microscopy for Non-Melanoma Skin Cancer Detection**
Nathaniel Wei-Sen Chen, 16, Merlo Station High School, Beaverton, Oregon

Chemistry

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

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

CH007 **Lights, Quantum Dots, Action!**
Amy Cindy Chyao, 15, Williams High School, Plano, Texas

First Award of $3,000

CH007 **Lights, Quantum Dots, Action!**
Amy Cindy Chyao, 15, Williams High School, Plano, Texas

CH016 **An Investigative Study on Pigmented Gallstones: Is Cu(II)-Induced Oxidation of Bilirubin Responsible for Their Formation?**
Shamik Mascharak, 16, Santa Cruz High School, Santa Cruz, California

Second Award $1,500

CH012 **Millimeter-Wave and Terahertz Radiation for Standoff Chemical Sensing and Threat Detection, Phase IV**
Michael Aaron Gord, 17, Dayton Christian High School, Miamisburg, Ohio

CH014 **Optimalization of the New Synthesis Method of Stobadine Precursors, Respectively Its Analogues**
Marek Buchman, 17, School for Extraordinary Gifted Children, Bratislava, Slovakia

CH033 **Development of a User and Eco-friendly Procedure for the Oxidative Cleavage of Alkenes**
Prem P. Thottumkara, 17, Macomb High School, Macomb, Illinois

Third Award of $1,000

CH002 **Catalytic Decomposition and Oxidation of Propanol Utilizing Size-Selected Platinum Nanoparticles**
Elaine Zhou, 17, Lake Highland Preparatory School, Orlando, Florida

CH003 **Investigating Insulating Compounds for the Optimization of Dye-Sensitized Solar Cells**
Alexander Patrick McCarthy, 18, Liberty High School, Hillsboro, Oregon

CH004 **Synthesis of Silica Aerogels**
Meredith Grace Marks, 17, University School of Milwaukee, Milwaukee, Wisconsin

CH025 **Investigating the Growth and Nucleation Process of C60 Fullerene Nanowhiskers via Formation Structures**
Nicholas Mark Worth Sharp, 18, Dominion High School, Sterling, Virginia

CH046 **Investigating Photo-Induced Proton Transfer in Associated Solutions**
Kaj Andrew Hansen, 16, Carrollton High School, Carrollton, Georgia

Fourth Award of $500

CH008 **Extraction of Zinc through Phytoremediation Using *Brassica juncea***
Haleigh Rae Hitzing, 15, Island Coast High School, Cape Coral, Florida

CH009 **Lichens, Limestone, and Trees: Using X-ray Fluorescence Analysis to Quantify Elements**
Kristen Paige Kirkland, 18, Eastern High School, Pekin, Indiana

CH036 **Mimicking the Lotus Leaf: Employing Natural Processes of Micro- and Nano-texturing to Convert a Hydrophilic Surface into Hydrophobic Based on Cassie-Baxter Wetting**
Saumil Bandyopadhyay, 14, Maggie L. Walker Governor's School for Government and International Studies, Richmond, Virginia

CH038 **The Effect of Curcumin on the Oxidation of N-acetyl-tyrosine in an *in vitro* Cu(II)/H2O2 Model of Alzheimer's Disease**
Chelsea Lynn Massaro, 16, Christian Home & Bible School, Mount Dora, Florida

CH047 **Extraction of Natural Carbonaceous Nanomaterials from Soil Sources: Exploration of Properties and Applications**
Aritra Chowdhury, 17, South Point High School, kolkata, West Bengal, India

CH048 **Species Selective Acetylcholinesterase Inhibitors as Insecticides**
Samantha Sapumalee Nanayakkara, 16, Mississippi School for Mathematics and Science, Columbus, Mississippi

Computer Science

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

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

CS043 **Automatic Parallelization through Dynamic Analysis**
Kevin Michael Ellis, 18, The Catlin Gabel School, Portland, Oregon

First Award of $3,000

CS032 **Novel Computer Controlling Wireless Device for Handicapped People**
Ganindu Nanayakkara, 20, Ananda College, Colombo - 10, Western, Sri Lanka

CS043 **Automatic Parallelization through Dynamic Analysis**
Kevin Michael Ellis, 18, The Catlin Gabel School, Portland, Oregon

Second Award of $1,500

CS001 **Robust Video Tracking through Multiple Occlusions**
Thomas Frederick Wilkason, 17, Mount de Sales Academy, Macon, Georgia

CS019 **A Parallel Computational Framework for Solving Quadratic Assignment Problems Exactly**
Michael Christopher Yurko, 16, Detroit Catholic Central High School, Novi, Michigan

CS034 **Accurate Prediction and Tracking of Lung Cancer**
Vedant S. Kumar, 16, duPont Manual High School, Louisville, Kentucky

Third Award of $1,000

CS003 **Off-line Character Recognition Using Vector Trained Artificial Neural Networks**
Matthew Joseph Chang, 17, Chang Home School, Austin, Texas

CS010 **Matrix Based Discrete Logarithms Public Key System (MBDL) and Its Application in SecurID**
Yang Gao, 18, Northeast Yucai School, Shenyang, Liaoning, China

CS022 **New Morphological Features for Automated Classification of Galaxy Images Obtained in Deep Space Surveys**
Andrei V. Nagornyi, 18, Stuyvesant High School, New York, New York

CS024 **Detection of Prostate Cancer Using Image Analysis**
Saad Syed Nasser, 18, Northside College Preparatory High School, Chicago, Illinois

CS035 **Does Practice Make Perfect? The Role of Training Neural Networks**
Brittany Michelle Wenger, 15, The Out-Of-Door Academy, Sarasota, Florida

Fourth Award of $500

CS011 **X-Finder: The Electronic Guardian Angel**
Maximilian Lukas Reif, 14, Justus-von-Liebig-Gymnasium Neusab, Neusaess, Bavaria, Germany

CS018 **Deterministic Lexical Categorization Using Genetic Algorithms**
Dru Harrington Knox, 18, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia

CS021 **BeatHoven: Identifying and Inventing Solutions to Obstacles Hindering Automatic Transcription of Polyphonic Music of a Single Instrument**
Vighnesh Leonardo Shiv, 16, The Catlin Gabel School, Portland, Oregon

CS036 **A Super-Encryption Standard for Large Data Using Elementary Chaotic Cellular Automata**
Akshay Nathan, 17, Lynbrook High School, San Jose, California

CS040 **Continual Adaptation of Acoustic Models for Domain-Specific Speech Recognition**
David C. Liu, 18, Lynbrook High School, San Jose, California

CS048 **NeurosLab Rapid Application Development for Artificial Intelligence**
Ionut Alexandru Budisteanu, 16, National College "Mircea cel Batran", Ramnicu Valcea, Romania, Romania

Earth & Planetary Sciences

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

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

EA029 **Don't Let It Slide IV: Fire Factor!**
Majdolene Ziad Khweis, 17, Taos High School, Taos, New Mexico

First Award of $3,000

EA029 **Don't Let It Slide IV: Fire Factor!**
Majdolene Ziad Khweis, 17, Taos High School, Taos, New Mexico

Second Award of $1,500

EA005 **Orbit Determination of Near-Earth Asteroids**
Tongji Li, 18, Hershey High School, Hershey, Pennsylvania

EA009 **Colorado River Salinity: Correlation to Geostrata and Mitigation with Carbon Fiber Capacitors**
Tanya Nicole Petach, 16, Fairview High School, Boulder, Colorado

Third Award of $1,000

EA019 **Developing a Process for Seismo-Acoustic Imaging Applied to Humanitarian Demining**
Marian Joan Bechtel, 15, Lancaster Catholic High School, Lancaster

EA020 **Identifying Diagnostic Characters in the Tooth Enamel Microstructure of Dromaeosaurid Dinosaurs**
Emma Justine Hoffman, 17, Rondout Valley High School, Accord, New York

Fourth Award of $500

EA015 **Computational Simulations of Ring Systems around Rhea Using N-Body Integrated Programs**
Ian Alexander Sohl, 15, DaVinci Academy of Science and the Arts, Ogden, Utah

EA016 **Drowning Out Drought: The Effect of Collision and Coalescence on Secondary Ice Multiplication in Mixed-Phase Clouds**
Nicole Sophie Torosin, 17, Niles North High School, Skokie, Illinois

EA022 **The Development and Validation of a Novel, Eco-friendly Calcium *in situ* Precipitation System (ECIPS) for the Mitigation of Liquefaction-Prone Soil**
Evelyn Chang, 17, University High School, Irvine, California

Engineering: Electrical and Mechanical

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

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

EE078 **CookerSmart**
James Sinclair Popper, 18, Marlborough College, Marlborough, Wiltshire, United Kingdom

First Award of $3,000

EE054 **Less Sweat or Less Fatigue? My SmartBike Does the Rest!**
David Andrew Zarrin, 15, Saratoga High School, Saratoga, California

EE078 **CookerSmart**
James Sinclair Popper, 18, Marlborough College, Marlborough, Wiltshire, United Kingdom

Second Award of $1,500

EE025 **Novel Heating Approach in Dynamic Spraying of Nano Particles**
Alice Wei Zhao, 16, Sheboygan North High School, Sheboygan, Wisconsin

EE033 **Next Generation Propulsion: the ALFA markVI**
Jesse Kane Ellison, 18, Bayfield High School, Bayfield, Colorado

EE045 **Demonstration of Terahertz Waveguides Using Structured Metal Films**
Albert Cui, 18, Hillcrest High School, Midvale, Utah

EE049 **VSR-2 Talos: FG, The Final Ultimatum**
Adam Bradley Halverson, 18, Garretson High School, Garretson, South Dakota

Third Award of $1,000

EE021 **Low-Aberration Variable-Focus Liquid Lens**
Eric Chiwei Shiao, 15, Taipei Municipal Chien-Kuo Senior High School, Taipei, Taiwan (R.O.C), Chinese Taipei

EE022 **Underground Imaging**
Alexander Kent Kendrick, 17, Los Alamos High School, Los Alamos, New Mexico

EE026 **The Design and Development of an Experimental Piston-less Rotary Engine for Improved Thermal Efficiency: Sustainable Engineering for the Transition to Alternative Fuels**
Eric Lau, 15, Savannah Arts Academy, Savannah, Georgia

EE028 **Lighting the Future: The Power Output of Titanium Dioxide Solar Cells Using Various Dyes**
Chaimaa Makoudi, 18, General Douglas MacArthur High School, Levittown, New York

EE052 **Distributed Learning for Dynamic Spectrum Sharing in Cognitive Radio Networks:**
A Decision Theoretic Approach
Angela Yu-Yun Yeung, 18, Davis Senior High School, Davis, California

EE057 **Synthesis of Ternary Semiconductor Nanocrystals (CuInSe2 CuGaSe2, Cu(InGa)Se2) as New Generation Solar Cell**
Idil Ozdamar, 15, Izmir Private Fatih Science High School, Izmir, Turkey

EE069 **2 for 1 Wheelchair: Improving Autonomy through the Development of Multi-Functional Mobility Aids**
Gary Stanley Kurek, 18, Bonnyville Centralized High School, Bonnyville, Alberta, Canada

Fourth Award of $500

EE003 **An Efficiency Study of a Head Controlled Computer Interface Using Embedded Circuitry**
Gavin Grant Ovsak, 15, Eden Prairie High School, Eden Prairie, Minnesota

EE010 **The Development of Recyclable Gliding Sonde**
Yuqing Huang, 16, Beijing 101 Middle School, Beijing, Beijing, China

EE015 **Stair Climbing Stability, Year Three**
Zachary Harrison Melnik, 16, Viera High School, Viera, Florida

EE020 **Closer to Where It Wasn't: Estimation and Tracking Using Adaptive Filtering**
John Tilla Parish IV, 17, Home School, Colorado Springs, Colorado

EE030 **A New Approach to Encryption: Modification of Rossler's Chaotic Equations to Create a Encrypted Communication System with Signal Masking and Automatic Self Synchronizing Decryption**
Curtis Adrian Khol, 17, James Madison High School, Vienna, Virginia

EE046 **Using Environmental Temperature Gradients to Produce Continuous Energy Outputs**
Ellenore Isobel Forrester, 15, Redeemer Baptist School, North Parramatta, New South Wales, Australia

EE061 **Can the Concept of Stereo Vision Be Applied in Robotics?**
Arjun Aggarwal, 15, Lexington High School, Lexington, South Carolina

EE070 **Robust Displacement Estimation Employing Inexpensive Webcam Based Optical Flow**
Christopher Stephan Nielsen, 16, Home School, Calgary, Alberta, Canada

Engineering: Materials and Bioengineering

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

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

EN049 **A Study on Eco-Friendly Utilization of *Typha orientalis* Fruits for Insulation and Wallpaper**
Kay Hyun Joo, 17, Changduk Girls High School, Seoul, South Korea

First Award of $3,000

EN013 **Diatom-CdS Nanostructures as a Method to Enhance the Efficiency of a Dye-Sensitized Solar Cell**
William Cummings Newberry, 18, Greenwich High School, Greenwich, Connecticut

EN049 **A Study on Eco-Friendly Utilization of *Typha orientalis* Fruits for Insulation and Wallpaper**
Kay Hyun Joo, 17, Changduk Girls High School, Seoul, South Korea

Second Award of $1,500

EN019 **Viability of a Photoinduced Electron Spin Alignment Creating a Magnetic Event in a Polymer**
Michael Vincent Di Mascio, 18, Waynesville High School, Waynesville, Ohio

EN024 **Refinement of Solar Cell Morphology in Bulk Heterojunction Nanoparticle Polymer Composites**
Mubarrat Nuvid Bhuiyan, 17, Jericho Senior High School, Jericho, New York

EN025 **A Molecular Automaton with Built-in Visual Display for Filovirus Identification**
Julia Elizabeth Poje, 17, Valley Stream South High School, Valley Stream, New York

Third Award of $1,000

EN001 **Prospective Thermoelectric Tellurides**
Patrik Cermak, 19, SPSE a VOS, Pardubice, Pardubice, Czech Republic

EN005 **Novel Thermogelling Dispersions of Polymer Nanoparticles for Controlled Drug Delivery**
Peter D. Hu, 18, Texas Academy of Mathematics and Science, Denton, Texas

EN017 **ENERGIZE: Optimization of a Process to Determine Algal Species Present in a Sample Prior to Fermentation through Single-Strand Conformational Polymorphism**
Charlotte Sophia Kirk, 17, Westville High School, Westville, Oklahoma

EN037 **Development of a Low-cost EMG-based Human Interface Device and Associated Applications**
Jun Nishida, 18, Nara Women's University Secondary School, Nara, Nara, Japan

EN050 **Eco-concrete: A Good Use for the Rice Husk**
Werner Nicolai Wasen, 17, Liceo Dr. Anibal Acosta Estape, Rio Branco, Cerro Largo, Uruguay

Fourth Award of $500

EN011 **Development of an Antimicrobial Acrylic Resin, Year Two**
Catherine Yang Fan, 18, Tom C. Clark High School, San Antonio, Texas

EN027 **Can Recycled Plastics Be Used to Reduce Landfill Waste, Help Improve the Infrastructure of Buildings, Roads, Highways and Bridges and Reduce Greenhouse Gas?**
John Charles Boykin, 15, St. Peter Chanel High School, Bedford, Ohio

EN029 **Analyzing the NCI-60 Cancer Cell Lines Using Data Obtained from Genome-Wide ChIP-X Experiments**
Jayanth Krishnan, 16, Mahopac High School, Mahopac, New York

EN036 **Biomechanically Assisting the STS Movement**
Spencer R Wilson, 17, Colquitt County High School, Moultrie, Georgia

EN038 **The Effect of Helium Ion Irradiation on the Tunneling Behavior in Aluminum/Aluminum Oxide/Lead Junctions**
Rahul Mitra, 16, Corona Del Sol, Tempe, Arizona

EN044 **Innovative Use of Anaerobic Effective Microorganisms for Natural Rubber Latex Coagulation**
Suppachai Nindum, 17, Khunhanwittayasan School, Khunhan, Sisaket, Thailand

Energy and Transportation

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

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

ET035 **"Green" Synthesis of Nanowires on FTO Substrates for Organic Dye-based Solar Cells: Analysis with New Rapid D-SCOPE 2.0**
Shyamal Buch, 14, Vista del Lago High School, Folsom, California

First Award of $3,000

ET035 **"Green" Synthesis of Nanowires on FTO Substrates for Organic Dye-based Solar Cells: Analysis with New Rapid D-SCOPE 2.0**
Shyamal Buch, 14, Vista del Lago High School, Folsom, California

ET041 **Maximizing Hybrid Rocket Motor Efficiency for Evaluating Recycled Fuels**
Megan Lynn Perkins, 15, duPont Manual High School, Louisville, Kentucky

Second Award of $1,500

ET037 **Levoglucohol: Engineering Ethanologenic *E. coli* for Levoglucosan Utilization**
Avanthi Sai Ajjarapu, 16, Ames High School, Ames, Iowa

ET050 **Bio-Inspired Photonic Fuel Cell**
Dheevesh Arulmani, 14, Gordon Graydon Memorial Secondary School, Mississauga, Ontario, Canada

ET058 **Ethanol Production: Determining the Optimal Conditions for the Saccharification of Sugar Beet Pulp**
Anna Maria Joykutty, 16, American Heritage School, Plantation, Florida

Third Award of $1,000

ET008 **Coal from Cane**
Cole William Bergeron, 15, Houma Junior High School, Houma, Louisiana

ET024 **Reducing Wing Induced Drag through the Addition of Adaptive Tip Sails - Part II**
Joseph Anthony Gerner, 17, George Marshall High School, Falls Church, Virginia

ET029 **A Simulation using C++ to Evaluate the Performance of the Columbia University Non-Neutral Torus Stellarator Based on a Pedersen Model for Optimization**
Soo Kyoung Kim, 18, Bronx High School of Science, Bronx, New York

ET054 **Optimization of a Novel High Efficiency Photo-Thermovoltaic Concentrator Solar Cell: A Second Year Study**
Rounok Joardar, 16, Plano West Senior High, Plano, Texas

ET055 **Synthesizing Hydrocarbon Derivatives as an Alternative Fuel Source Using Natural Coal (Anthracite) and Hydrogen in a Cobalt Molybdenum Hydrodesulphurization Process**
Justin Kenrick Ramsaran, 16, Palm Bay High School, Melbourne, Florida

Fourth Award of $500

ET003 **The Application of an Electromagnetic Induction Coil Input Frequency Gradient to Conjoin the Lift and Propulsion Systems of an Electromagnetic Suspension Vehicle**
Christopher Joseph Davlantes, 17, Bishop Kenny High School, Jacksonville, Florida

ET013 **Decomposing Energy**
Max Aaron Keller, 17, Alden-Conger High School, Alden, Minnesota

ET014 **Improving Cathode Kinetics and the Rate of Reaction in a Direct Methanol Fuel Cell**
Jeffrey Donald Martin, 17, John Adams High School, South Bend, Indiana

ET016 **Enhancing Algae Biofuels: The Effects of Nitrogen Limitation and Carbon Dioxide Infusion on the Oil Yields of *Nannochloropsis oculata***
Sara Ellen Volz, 14, Cheyenne Mountain High School, Colorado Springs, Colorado

ET022 **Novel Method: Detecting High Energies in Sonoluminescence**
Lyric Elizabeth Gillett, 18, Cornerstone High Home School, Houston, Texas

ET056 **Alarmed and Heated Fuel Tanks Suitable for Retro-fitting and Available for All Commercial Vehicles**
Simon David Brookes, 18, Balcarras School, Cheltenham, Gloucestershire, United Kingdom

Environmental Management

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

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

EM024 **Design, Fabrication, and Evaluation of a Deployable *in situ* Nitrate Sensor for Real-Time Analysis of Sediments**
Avilash Kalpathy Cramer, 17, West Linn High School, West Linn, Oregon

First Award of $3,000

EM024 **Design, Fabrication, and Evaluation of a Deployable *in situ* Nitrate Sensor for Real-Time Analysis of Sediments**
Avilash Kalpathy Cramer, 17, West Linn High School, West Linn, Oregon

EM029 **Toxicity of Surrogate Organoclay Surfactant to Straight-Chain Hydrocarbon-Degraders and Potential for Organoclay Biodegradation**
Laurie Ann Rumker, 17, Oregon Episcopal School, Portland, Oregon

Second Award of $1,500

EM005 **Improving Mine Reclamation Outcomes with Soil Amendment Variations**
Travis Cole Sylvester, 16, Greybull High School, Greybull, Wyoming

EM031 **Pore Size Reduction of Electrospun Polyacrylonitrile (PAN) Scaffolds for High Performance Microfiltration**
Brandon Li, 17, Jericho Senior High School, Jericho, New York

EM038 **Design and Development of a Portable Light Trap for Sampling Brachyuran Crab Larvae**
Heather Marie Eberhart, 18, Bellarmine Preparatory School, Tacoma, Washington

EM040 **The "Green" Way of Layered-Double Nickel Hydroxide: From Waste to Electric Energy**
Olexandr Tokarev, 16, Chemical Ecological Lyceum, Dnipropetrovsk, Ukraine

Third Award of $1,000

EM022 **Construction of a Continuous Flow SODIS System with PET Bottles Integrated to a Water and Waste-Water Treatment System**
Karoline Elis Lopes Martins, 18, Centro Federal de Educacao Tecnologica de Minas Gerais, Belo Horizonte, SP, Brasil

EM039 **Foundry Sand: Waste or Beneficial, Year Three**
Kayleigh Sue Warner, 17, DeKalb High School, Waterloo, Indiana

EM052 **Developing an Attractant for Mass Trapping the Invasive Coconut Rhinoceros Beetle**
Anran Li, 16, St. John's School, Tumon Bay, Guam

EM058 **Grasping Water: Exploring a Novel Method of Inducing Precipitation**
Yiyue Zhao, 18, Sir Winston Churchill High School, Vancouver, British Columbia, Canada

EM060 **The Preference in Predation of the Native Aquatic Bug, *Anisops nasutus*, on the Larvae of Four Mosquito Species Found in American Samoa**
Faaloloi Teo, 16, Tafuna High School, Pago Pago, American Samoa

Fourth Award of $500

EM006 **The Feasibility of Reinforcing the Mississippi River Embankments with Borrow Harvested via Flocculation**
Alaina Brooke Leggette, 16, Saint Joseph's Academy, Baton Rouge, Louisiana

EM009 **Heavy Metal Bioremediation: Relief for a Ravaged Land**
Paige Hunter Parrack, 16, Southmoore High School, Moore, Oklahoma

EM023 **Rhodamine Dye Retention in Silica Isolated from Diatoms *Cyclotella meneghiniana* and *Thalassiosira sp.***
Kalia S. Bistolas, 17, Wilsonville High School, Wilsonville, Oregon

EM025 **Monitoring Ammonia Oxidizing Bacteria Using Quantitative Polymerase Chain Reactions**
Arezu Hajar Monawer, 18, Madison West High School, Madison, Wisconsin

EM033 **The Effects of Pesticides on the Viability of Macro Invertebrates, Specifically *Artemia franciscana*, Phase III**
Alexa Anne Lunt, 17, Weber High School, Pleasant View, Utah

EM056 **Novel Synthesis: Imidacloprid CYP450 Pesticide Synergist from Dill Lowers Surface Runoff Toxicity**
Emma Jean Graham, 16, Lisgar Collegiate Institute, Ottawa, Ontario, Canada

EM059 **The Effect of Biomass Type on Hydrothermally Carbonized Biochar as a Soil Supplement and Energy Source**
Afia Zarrin Khan, 15, Spring Valley High School, Columbia, South Carolina

Environmental Sciences

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

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

EV027 **Environmental Toxin 4-Nonylphenol and Autoimmune Diseases: Using DNA Microarray to Examine Genetic Markers of Cytokine Activity**
Celline Kim, 17, Manhasset High School, Manhasset, New York

First Award of $3,000

EV027 **Environmental Toxin 4-Nonylphenol and Autoimmune Diseases: Using DNA Microarray to Examine Genetic Markers of Cytokine Activity**
Celline Kim, 17, Manhasset High School, Manhasset, New York

Second Award of $1,500

EV001 **The Pyrolytic Synthesis of Biocchar and Biofuel from Biowaste: An Analysis of Its Potential to Amend Fuel Crisis and Food Security**
Andrea Aleah Pugh, 15, Saginaw High School/Saginaw Arts and Sciences Academy, Saginaw, Michigan

EV035 **An Innovative Method to Evaluate the Effects of the Aquatic Environment on the Chemotaxis of the Amphibian Pathogen *Batrachochytrium dendrobatidis***
Scott Paul Boisvert, 16, Basha High School, Chandler, Arizona

EV048 **Get the Lead Out: The Removal of Lead from Water Using Common Seashells**
Madeline Maley Landon, 16, Friendswood High School, Friendswood, Texas

Third Award of $1,000

EV019 **The Uptake of Endocrine Disrupting Chemicals**
Benjamin Waring Armstrong, 17, Monte Vista Senior High School, Monte Vista, Colorado

EV029 **Chemical and Environmental Degradation of Oseltamivir Phosphate**
Ashley Marie Thelen, 18, Mitchell High School, Mitchell, South Dakota

EV034 **Sources of Sedimentary Organic Matter in NY, Jamaica Bay Region**
Elaine Gomez, 18, Union City High School, Union City, New Jersey

EV037 **Environmental Effects of Carbon Nanotubes as Shown via the Indicator Organism *Triops longicaudatus***
Gabriel Scott Stephens, 17, East Noble High School, Kendallville, Indiana

Fourth Award of $500

EV009 **Acid Mine Drainage Remediation: A Novel Approach, Phase II**
John Tyler Barnes, 16, Northwestern High School, Kokomo, Indiana

EV016 **Determining the Effects of Greywater on the Efficiency of Nitrogen Removal in Septic Systems**
Mary Maxine Luber, 16, Camdenton R-3 High School, Camdenton, Missouri

EV021 **Phytoremediation of Heavy Metal Contamination: Utilizing Freshwater Aquatic Plants to Remove Lead, Cadmium, and Zinc**
Lacey Taylor Jobe, 16, Grove High School, Grove, Oklahoma

EV024 **Getting Carried Away IV: Investigating Environmental Consequences of Soil Treated with Polyacrylamide and Polyvinyl Alcohol**
Cameron Bradley Strong, 18, The Woodlands College Park High School, The Woodlands, Texas

EV033 **Does T.F. Green Airport's De-Icing Affect Water Quality?**
Nathan Edward Andrews, 16, Bishop Thomas F. Hendricken High School, Warwick, Rhode Island

Mathematical Sciences

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

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

MA023 **Super Kohler-Ricci Flow**
Joshua William Pfeffer, 17, North Shore Hebrew Academy High School, Great Neck, New York

First Award of $3,000

MA001 **On the Lattice Representations and Linear Extensions of Series-Parallel and (m+n)-free Posets**
Martin Ayalde Camacho, 14, Central High School, Saint Paul, Minnesota

MA023 **Super Kohler-Ricci Flow**
Joshua William Pfeffer, 17, North Shore Hebrew Academy High School, Great Neck, New York

Second Award of $1,500

MA005 **Creating and Deducing Structure Using Domination Numbers in Permutation Graphs**
Maxim Ilya Wimberley, 17, Liberal Arts and Science Academy, Austin, Texas

MA010 **Universal Law for the Distribution of Odd Periodic Cycles within Chaos in Nonlinear Dynamical Systems: A Fine Classification of Odd Cycles (Year III)**
Almas Abdulla, 16, West Shore Junior Senior High School, Melbourne, Florida

MA047 **On the Lower Central Series Quotients of a Graded Associative Algebra**
Anirudha Balasubramanian, 17, Saint Albans School, Washington, District of Columbia

Third Award of $1,000

MA014 **Analysis of Single-Elimination Tournaments**
Chi-Hua Wang, 18, National Pingtung Senior High School, Pingtung, Chinese Taipei

MA024 **Deligne Categories and Representation Theory in Complex Rank**
Akhil Mathew, 18, Madison High School, Madison, New Jersey

MA050 **Fractals and Fugues: Analyzing Music with Math**
Rachel Danielle Perfecto, 16, Roy C. Ketcham High School, Wappingers Falls, New York

MA052 **Constructing Inverse Limits with Upper Semi-Continuous Functions**
Yong Zhi Zhou, 17, Pinetree Secondary School, Coquitlam, British Columbia, Canada

MA054 **Hyperbolic Triangles of the Maximum Area and Two Fixed Sides**
Evgeniia Iskanderovna Alekseeva, 16, GOU Lyceum "Vtoraiia Shkola", Moscow, Russia

Fourth Award of $500

MA003 **Grids and Greenery: Mathematical Models of Invasive Species**
Cathryn Margaret Manduca, 18, Century High School, Rochester, Minnesota

MA026 **Decycling Densities of Tessellations**
Jacob Benjamin Hurwitz, 17, Montgomery Blair High School, Silver Spring, Maryland

MA027 **On the Construction of an Uncountable Class of Transcendental Numbers**
Yevgeniy Rudoy, 18, Stuyvesant High School, New York, New York

MA031 **Barycentric Coordinates and their Applications**
Bayram Safa Cicek, 17, Ankara Fen Lisesi, Ankara, Turkey

MA035 **Crank 0 Partitions and the Parity of the Partition Function**
Kaavya Niveda Jayram, 11, Sravani Academy, Morgan Hill, California

MA053 **Six Lines Passing through Feuerbach Point**
Fedor A. Ivlev, 17, Kolmogorov's Spesialized Educational Scientific Center of MS, Moscow, Russia

Medicine and Health Sciences

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

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

ME041 **Novel Identification/Subjugation of Prostate Cancer Cells' Intrinsic Resistance Mechanism to Cisplatin**
Jong Hyuck Won, 17, Langley High School, McLean, Virginia

First Award of $3,000

ME041 **Novel Identification/Subjugation of Prostate Cancer Cells' Intrinsic Resistance Mechanism to Cisplatin**
Jong Hyuck Won, 17, Langley High School, McLean, Virginia

ME043 **High Cholesterol Impairs Water and Gas Transport in Red Blood Cells and Is Ameliorated by the PLA2 Inhibitor ONO-RS-082**
Siddhartha Gautama Jena, 16, International Academy, Bloomfield Hills, Michigan

ME065 **Piece de Resistance: The Synthesis of Complex Dimeric Pyrrole-Imidazole Alkaloid Natural Product Derivatives and their Efficacy in Inhibiting and Dispersing *Pseudomonas aeruginosa* Biofilms**
Justin To, 17, Oak Grove High School, San Jose, California

Second Award of $1,500

ME006 **Antibody-Coated Magnetic Nanoparticles: Targeting and Treating Cancer in a Dynamic Environment**
Philip Samuel Schlenoff, 18, Maclay School, Tallahassee, Florida

ME011 **A Study of Types I and II Diabetes Using Insulin Gene Microsatellites**
Amy Elizabeth Meyer, 17, Oakville Senior High School, St. Louis, Missouri

ME012 **Treatment of Diabetic Vascular Disease by Targeting TGF-β1 Gene**
Samantha Renae Prabakaran, 14, Fort Myers High School, Fort Myers, Florida

ME031 **Novel Role of PARP-4 as a Potential Target in Breast Cancer**
Olga Y. Skirda, 17, Health Careers High School, San Antonio, Texas

ME037 **Expression Profiling of Putative microRNA in Epithelial Ovarian Cancer**
Samantha Brooke Halpern, 17, Roslyn High School, Roslyn Heights, New York

ME084 **Glucosaminyl (N-acetyl) Transferase 2 (GCNT2) Gene Expression Highly Influences Breast Cancer Metastasis and Promotes an Epithelial-Mesenchymal Transition (EMT)**
Sherwin Zhang Wu, 17, Detroit Country Day School, Beverly Hills, Michigan

Third Award of $1,000

ME026 **Identification of Biological Insect-larvicides**
Joao Batista de Castro David Junior, 17, Colegio Estadual Liceu de Maracanau, Maracanau, CE, Brasil

ME034 **The Novel Use of Fluorescence Resonance Energy Transfer (FRET) to Observe Apoptosis in Oligodendrocytes**
Pragya Kakani, 18, Jericho Senior High School, Jericho, New York

ME035 **Inhibition of Vascular Cell Migration by Bisdemethoxycurcumin: A Bioinformatics Based Approach to Identify Target Genes**
Shalini Ramanan, 16, Hanford High School, Richland, Washington

ME036 **Sequence Similarity between Rotavirus and Insulin-Regulating Genes**
Mary Olivia Richardson, 15, duPont Manual High School, Louisville, Kentucky

ME046 **Critical Role of TGFb1/Smad3 Signaling in Hepatic Metabolism: A Novel Therapeutic Target for Metabolic Syndrome**
Samirkumar S. Devalaraja, 17, Thomas Sprigg Wootton High School, Rockville, Maryland

ME059 **Microfluidic Device for Quantitative Single-Cell Profiling of Human Pluripotent Stem Cells, Year Two**
Jane Yoonhae Suh, 18, Palos Verdes Peninsula High School, Rolling Hills Estates, California

ME075 **Identification of a Novel Signal Pathway and Its Therapeutic Targets for Tobacco Promotion of Lung Cancer**
Angela Zhang, 15, Monta Vista High School, Cupertino, California

ME093 **Aptamer-conjugated Gold Nanorods for Personalized Detection and Nanothermal Treatment of Glioblastoma Cancer Cells**
Muna Oli, 17, Eastside High School, Gainesville, Florida

Fourth Award of $500

ME001 **Food Additive or Carcinogen? Carrageenan Inhibits ASB Activity and Induces Cell Invasion Involving RhoA Activation and MMP-9 Secretion**
Prithwis Kumar Mukhopadhyay, 17, Woodbury High School, Woodbury, Minnesota

ME003 **The Synergistic Effects of Tolfenamic Acid and Radiation on Sp1 and Survivin in Head and Neck Cancer**
Shannon Somer Stockton, 16, Lake Highland Preparatory School, Orlando, Florida

ME010 **A Comparison of the Efficacy of Alternative Therapeutic Agents against Colon, Pancreatic, and Urinary Bladder Cancer Cell Proliferation*, in vitro***
Christopher Daniel Louviere, 16, Ridgeview High School, Orange Park, Florida

ME025 **YWHAZ (14-3-3zeta) Involved in the Metastasis of Lung Adenocarcinoma through Wnt Signaling Pathway**
Tsung-Han Chan, 17, National Taichung First Senior High School, Taichung City, Taiwan, Chinese Taipei

ME033 **The Effects of Epoxyeicosatrienoic Acids and their Metabolites on Myocardial Function and Perfusion during Acute Myocardial Ischemia**
Matthew A. Nugent, 16, Oregon Episcopal School, Portland, Oregon

ME044 **Improving Stethoscope Hygiene at Two Community Hospitals**
Ariel Lynne Schroeder, 18, Saint Joseph High School, Natrona Heights, Pennsylvania

ME045 **Factors Affecting the Prescription Volume (V100) of the Tandem/Ring HDR Applicator**
Anirudh Krishna, 16, Solon High School, Solon, Ohio

ME063 **Role of TSPYL1, FGIF, and MTF-1 in Gamma-globin Gene Activation for Treatment of Hemoglobinopathies: A Tissue Study in Novel Binary Transgenic Mouse Models**
Prarthana Jignesh Dalal, 16, Shawnee Mission East High School, Prairie Village, Kansas

ME080 **Prostate Cancer Diagnosis Using Metabolomic Fingerprints**
Rahul Ananth Doraiswami, 16, Foothill High School, Pleasanton, California

ME083 **A Miraculous Cost-Effective Natural Dietary Intervention that Reverses an Epidemic of Obesity, Diabetes, Hypertension, & Arthritis in the Mississippi Delta: The Effects of Organic Safflower Oil and Flax Seed Oil with Vitamin D and a Multivitamin**
Ericka Maxine Wheeler, 16, Greenwood High School, Greenwood, Mississippi

ME095 **Regulation of the Latent-Lytic Switch of Epstein-Barr Virus by MiRNAs and TGF-beta**
Iris J. Xu, 18, James Madison Memorial High School, Madison, Wisconsin

Microbiology

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

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

MI027 **Altering Lentiviral Tropism by Pseudotyping with Specific Receptor-Mediated Proteins**
Thomas Scott Silver, 16, Bergen Academy for Medical Science and Technology, Hackensack, New Jersey

First Award of $3,000

MI026 **Attachment Factor Secretion in Uropathogenic *E. coli* Bacteria**
Erica Brooke Portnoy, 16, Commack High School, Commack, New York

MI027 **Altering Lentiviral Tropism by Pseudotyping with Specific Receptor-Mediated Proteins**
Thomas Scott Silver, 16, Bergen Academy for Medical Science and Technology, Hackensack, New Jersey

Second Award of $1,500

MI011 **Utilization of the Fungus *Aspergillus niger* on Wastewater Treatment II**
William Lopes, 20, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil

MI037 **Development and Application of Novel Screen for Detecting Biofilm-Inhibiting Metabolites in Four Bacteria Strains: *E. coli*, *B. subtilis*, *A. tumefaciens* and *P. aeruginosa***
Christina Kun Wang, 17, Shanghai American School, Shanghai, Shanghai, China

MI045 **Watch H2Out!**
Augusto German Niez Gay, 17, Instituto San Jose Adoratrices, Concordia, Entre Rios, Entre Rios, Argentina

Third Award of $1,000

MI004 **Evaluation of *Burkholderia pyrrocinia* (FL728) and *Paenibacillus lentimorbus* (FL92) for the Presence of Genes Encoding the Biosynthesis of Pyrrolnitrin, Pyoluteorin, Phenazine, and 2,4-diacetylphloroglucinol Antibiotics**
Stephanie Page Hoskins, 17, Lincoln Park Academy, Fort Pierce, Florida

MI025 **The Effects of Grazer Exclusion on the Colonization of Hard Substrates by Microbial Communities**
Joshua Andrew Lewin-Jacus, 18, Lynbrook Senior High School, Lynbrook, New York

MI031 **pVISIA, Vaccine Vector for Antigen Presentation**
Vishwajith Sridharan, 18, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

MI041 **Antifungal Effects and Identification of *Eisenia foetida* Bacteria on *Batrachochytrium dendrobatidis* (Bd), an Amphibian Pathogenic Fungus, Year II**
Jayton Lewis Rainey, 16, Slaton High School, Slaton, Texas

MI057 **Irradiation Extermination, Part II: A Portable System to Eliminate Water-Borne Microorganisms**
Kelli Ann Lynch, 16, Rocky Mountain High School, Fort Collins, Colorado

Fourth Award of $500

MI009 **Vitis labrusca Anthocyanin Identification and Their Antibacterial Effects on *Capra hircus* Hoof Rot Bacteria**
Sarah Marie Cox, 15, Zane Trace Local Schools, Chillicothe, Ohio

MI016 **The Effect of Different Inocula and Media on the Power Output of Microbial Biobatteries**
Sarah Katherine Hooper, 17, Charlottesville High School, Charlottesville, Virginia

MI020 **Antimicrobial Activity of a Phenolic Compound Extracted from the Rind of *Punica granatum* against *Klebsiella pneumonia*, *Haemophilus influenzae* and Acinetobacter Species**
Ghayda Ismat Alhawamdeh, 15, Jumana Secondary School for Girls, Ramtha, Irbid, Jordan

MI033 **A Solution to the Worldwide Malaria Epidemic: A Comprehensive Study of Iron and Nitric Oxide's Effect on the Growth and Survival of *Toxoplasma gondii***
Matthew Karmen McIntyre, 17, Yorktown High School, Yorktown Heights, New York

MI056 **Microbial Inhibitory Activities of Extracts from Seven Philippine Seaweeds**
Marc Arthur Jordan Irlandez Limpiado, 16, Philippine Science High School-Eastern Visayas Campus, Tacloban City, Leyte, Philippines

MI062 **A Multipronged Investigation of the Amphibian Pathogen *Batrachochytrium dendrobatidis***
Madeline Berit Sides, 17, Davis Senior High School, Davis, California

Physics and Astronomy

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

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

PH018 **Adiabatic Quantum Evolution for NP-Complete and Physical Problems**
Yale Wang Fan, 18, The Catlin Gabel School, Portland, Oregon

First Award of $3,000

PH018 **Adiabatic Quantum Evolution for NP-Complete and Physical Problems**
Yale Wang Fan, 18, The Catlin Gabel School, Portland, Oregon

PH026 **Traveling the Interplanetary Superhighway: An Autonomous Spacecraft Navigation System**
Erika Alden DeBenedictis, 18, Albuquerque Academy, Albuquerque, New Mexico

Second Award of $1,500

PH023 **Reducing the Computation Time of a N-Body Galactic Simulation**
Evan Haley Fletcher, 17, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan

PH025 **The First Electronic Structure Calculations and Determination of Related Properties for Radium**
Aryan Iden Khojandi, 18, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

PH045 **Hidden Sounds: Harmonic Symmetry of Human Voices, Continuation Year Two**
Ellen Marie Price, 17, Jefferson County International Baccalaureate School, Birmingham, Alabama

Third Award of $1,000

PH015 **Nonlinear Diffusion Dynamics Measured by Using a Simple Light-Transmission Method**
Yu-Sheng Huang, 17, National Chia-yi Senior High School, Chaiyi City, Chinese Taipei

PH019 **Experimental Study of Viscosity Using Stokes' Law: Examining and Correcting Stokes' Law's Limitations in Viscometry**
Katrina Lynn Hui, 15, Richland High School, Richland, Washington

PH032 **Fission Vision: The Detection of Prompt and Delayed Induced Fission Gamma Radiation, and the Application to the Detection of Proliferated Nuclear Materials**
Taylor Ramon Wilson, 15, The Davidson Academy of Nevada, Reno, Nevada

PH036 **An Improved Metric for Visual Differentiation Using Colour-Modified Clinical Eye Charts**
Jonathan David Sapolinski, 16, Redeemer Baptist School, North Paramatta, New South Wales, Australia

PH047 **Satellite Constellations: A New Way for Determining Atmospheric Densities**
Cayley Erin Dymond, 14, North Point High School for Science, Technology, and Industry, Waldorf, Maryland

Fourth Award of $500

PH013 **Sandstorm in a Teacup: Patterns in a Vibrated Granular Layer**
Ivan Alexandrovich Lazarevich, 16, Lyceum # 40, Nizhny Novgorod, Nizhegorodskaya, Russia

PH020 **Assessing Changes in Collagen Levels of Prostate Tissue from Castrated Rats Using Non-linear Optics**
Bruna Favetta, 16, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil

PH030 **Efficiency of Thermoelectric Power Conversion in Bi2Te3**
Daniela Jane Flax, 15, Lincoln Park High School, Chicago, Illinois

PH031 **Study of Magnetic Properties for Nanocrystalline Materials**
Daniel Neimark, 17, Religious Comprehensive "AMIT" High School, Beer Sheva, Israel

PH033 **Finding the Minimum Energy Conformation of Protein-like Heteropolymers by Greedy Neighborhood Search**
Joon Suk Huh, 18, Home School, Yongin-si, Gyeonggi-do, South Korea

PH039 **The Efficiency of a Small Particle Accelerator at Irradiating Various Targets and Producing Radiation**
Adam Joseph Bowman, 14, Montgomery Bell Academy, Nashville, Tennessee

Plant Sciences

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

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

PS037 **The Potential Allelopathic Suppression of Kudzu (*Pueraria montana*)**
Mason Cole McFarland, 18, Jefferson County International Baccalaureate School, Birmingham, Alabama

First Award of $3,000

PS037 **The Potential Allelopathic Suppression of Kudzu (*Pueraria montana*)**
Mason Cole McFarland, 18, Jefferson County International Baccalaureate School, Birmingham, Alabama

Second Award of $1,500

PS008 **Algae—the Green Fuel: Optimizing Growth and Lipid Composition in Algae through Environmental Stress**
Wenxi Li, 16, Thomas Chilton Jasper High School, Plano, Texas

PS009 ***Impatiens shimianensis sp. nov (Balsaminaceae):* A New Species from Southwest China Based on Morphological and Molecular Evidence**
Gechen Zhang, 17, Rockwood Summit High School, Fenton, Missouri

PS042 **Growth Form in Intertidal Lichen Zonation**
Luizetta Vadimovna Navrazhnykh, 16, Florida Atlantic University High School, Boca Raton, Florida

Third Award of $1,000

PS015 **Antimicrobial Effect of *Cuminum cyminum* Fruit Extract and Isolation of Its Active Components**
Fangzhou Xiao, 17, No. 2 Secondary School Attached to East China Normal University, Shanghai, China

PS044 **Investigation of Antimicrobial Property of *Ervatamia coronaria* Flower**
Kaushik Srivatsan Krishna Swamy, 16, Jawahar Navodaya Vidyalaya, Mandya District, Karnataka, India

PS045 **Leaf Extracts of Euphorbiaceae Can Eradicate the Field Crab, *Somanniathelphusa sexpucntata***
Malinee Meeta, 16, Phanomsarakam Phanomadunwitthaya, Chachoengsao, Chachoengsao, Thailand

PS052 **Aspen in a State of SADness: A Statistical Analysis of the Decline of *Populus tremuloides*, Phase II**
Nikki Taylor Buhrdorf, 16, Hotchkiss High School, Hotchkiss, Colorado

Fourth Award of $500

PS003 **Analysis of Plant Promoter Expression Abilities as an Alternative to Viral Promoters in Transgenic Produce**
Stephen Taylor Bethel, 17, Lake Brantley High School, Altamonte Springs, Florida

PS012 **Aqueous Extract of Lemon Leaves as a Novel Powerful Insecticide against *Trialeurodes vaporariorum* (Whitefly)**
Xiangbo Meng, 17, Beijing 101 Middle School, Beijing, China

PS031 **Conservation of an Endangered Plant, *Nymphoides indica*, by a Simple and Novel Method**
Noriaki Namba, 17, Niigata Prifectural Kashiwazaki Shoyo Secondary Education School, Kashiwazaki-shi, Niigata, Japan

PS033 **Does *Azadirachta indica* Affect the Motility and Life Cycle of *Meloidogyne inconita*?**
Swetha Krishna Doppalapudi, 15, Morgantown High School, Morgantown, West Virginia

PS050 **Diversity of Foliar Fungal Endophytes in Wild and Cultured *Metrosideros polymorpha* Inferred from Environmental PCR and ITS Sequence Data**
Mali'o Wanda Kodis, 18, Waiakea High School, Hilo, Hawaii

Team Projects

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

Intel ISEF Best of Category Award of $5,000 for Top First Place Winners

AS303 **Determining the Optimal Scaffold for Three-Dimensional Bone Formation Using Bovine Adipose-Derived Adult Stem Cells**
Melissa Severn McDowell, 17, Saint Joseph's Academy, Baton Rouge, Louisiana
Michael Charles McDowell, 15, Catholic High School, Baton Rouge, Louisiana

CS303 **The Classification and Recognition of Emotions in Prerecorded Speech**
Akash Krishnan, 15, Oregon Episcopal School, Portland, Oregon
Matthew Fernandez, 16, Oregon Episcopal School, Portland, Oregon

First Award of $3,000

AS303 **Determining the Optimal Scaffold for Three-Dimensional Bone Formation Using Bovine Adipose-Derived Adult Stem Cells**
Melissa Severn McDowell, 17, Saint Joseph's Academy, Baton Rouge, Louisiana
Michael Charles McDowell, 15, Catholic High School, Baton Rouge, Louisiana

CB306 **High Glucose Levels Alter Morphine Signaling Systems: A Novel Pathway for Sugar Addiction**
Jan Gong, 17, Garden City High School, Garden City, New York
Charles Cheng Yu, 16, The Wheatley School, Old Westbury, New York

CH303 **Synthesis and Analysis of the New Superconducting Material - FeSe Nanocrystals**
Chi-Chieh Lin, 18, Taipei Municipal First Girls' Senior High School, Taipei City, Taiwan (R.O.C.), Chinese Taipei
Jacqueline Hung, 18, Taipei Municipal First Girls' Senior High School, Taipei, Taiwan (R.O.C.), Chinese Taipei

CS303 **The Classification and Recognition of Emotions in Prerecorded Speech**
Akash Krishnan, 15, Oregon Episcopal School, Portland, Oregon
Matthew Fernandez, 16, Oregon Episcopal School, Portland, Oregon

EA302 **The Domino Effect of Global Warming: An Experimental Study of the Positive Feedback Mechanism (PFM) due to Global Warming on Methane Emissions and a Model to Quantify Its Worldwide Effect in the 21st Century from Anthropogenic and Natural Wetlands**
Naomi C Shah, 14, Sunset High School, Portland, Oregon
Priyam C Shah, 17, Sunset High School, Portland, Oregon

EE325 **A New Approach to Accident Prevention Systems: Designing a Low-cost Driver Assistance System to Prevent Traffic Collision**
Cristian Emilian Rosu, 18, "Emanui Gojdu" National College, Oradea, Bihor, Romania
Paul Stelian Sucala, 18, Silvania National College, Zalau, Bihor, Romania

EN301 **The Use of an Electroless Intermetallic Coating to Reduce Infrared Emissivity and Temperature Oscillation in Metal Alloy Saw Blades**
Gennifer Reid Rubin, 17, Lake Highland Preparatory School, Orlando, Florida
Audrey Christine Leasure, 17, Lake Highland Preparatory School, Orlando, Florida

EV311 **Health Effects of Metal Nanoparticles: The Role of Hypoxia Inducible Factor-1α in MMP-2 and MMP-9 Production by Human Monocytes Exposed to Nickel Nanoparticles**
Yixin Li, 17, Ballard High School, Louisville, Kentucky
Yihua Li, 17, Ballard High School, Louisville, Kentucky

Second Award of $1,500

BE307 **Analysis of the Effects of Sleep Deprivation on Learning Behavior and Cognitive Deficit in a Drosophila Model: A Potential Target for Neuroprotective Pharmacotherapy**
Shaunak Krishan Bakshi, 16, Manhasset Senior High School, Manhasset, New York
Peter Hans Massey, 17, Manhasset High School, Manhasset, New York

BI302 **Effect of Environmental Factors on Tanshinone Content and Related Synthesis Gene Expression of *Salvia miltiorrhiza* Bunge**
Wenqi Lu, 17, No. 7 High School of Chengdu City, Chengdu, Sichuan, China
Xinyan Yang, 17, No. 7 High School of Chengdu City, Chengdu, Sichuan, China
Junjun Wu, 17, No. 7 High School of Chengdu City, Chengdu, Sichuan, China

BI304 **A New Spin on Green Energy: Increasing Hydrogen Evolution in a Spirulina Derived Photobiological System**
Megan M. Kurohara, 16, Hilo High School, Hilo, Hawaii
Hannah Rojeski, 16, Hilo High School, Hilo, Hawaii

CB301 **RNAi as a Safe Method of Insect Population Control**
Joseph Corbett Ferguson, 17, Paul Laurence Dunbar High School, Lexington, Kentucky
Roshan Palli, 16, Paul Laurence Dunbar High School, Lexington, Kentucky

CH312 **Research on the Usability of Low-cost Materials in Dye Sensitized Solar Cells**
Andreas Wagner, 19, HTL Braunau am Inn, Braunau am Inn, Upper Austria, Austria
Juergen Koechl, 19, HTL Braunau am Inn, Braunau am Inn, Upper Austria, Austria

CS307 **Synchronous Tangible Augmented Reality**
Lai Xue, 17, Chengdu International School, Chengdu, Sichuan, China
Darren Lim, 16, Chengdu International School, Chengdu, Sichuan, China
Hyun Ki Lee, 18, Chengdu International School, Cheng Du, Si Chuan, China

EA305 **A Study on the Features of Gudul Used for Korean Heating System (Ondol)**
Subin Shin, 19, Damyang High School, Damyang-gun, Jeollanam-do, South Korea
Hyeon-A Choi, 19, Damyang High School, Damyang-gun, Jeollanam-do, South Korea

EE301 **Bring to Light: The Development of a Novel PFO Inverse Organic Light Emitting Diode**
Elisa Bisi Lin, 18, Plano West Senior High School, Plano, Texas
Ian Chan, 18, Plano East Senior High School, Plano, Texas

EE324 **Processor Cooling Engine**
Krisztina Sugar, 18, Szent Margit Secondary School, Budapest, Hungary
David Szabolcs Simon, 18, Szent Margit Secondary School, Budapest, Hungary

EM303 **Enhanced Sprinkling System with Energy-Efficient Applications at Stevenson School**
Michael Lin, 16, Robert Louis Stevenson Upper School, Pebble Beach, California
Jimmy Lin, 15, Robert Louis Stevenson Upper School, Pebble Beach, California

EN314 **REVO FOOT: Low Cost Orthopedic Prosthesis to Lower Limb Amputations, Produced from Recyclable Materials**
Eduardo Trierweiler Boff, 18, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil
Lucas Strasburg Ferreira, 18, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil

ET306 **Having Our Cake and Eating It Too: Novel Composite Membranes with Low Methanol Permeability and Good Proton Conductivity for Direct Methanol Fuel Cells**
Liang-Bo Shen, 17, Beijing No. 4 High School, China, Beijing, China
Kan-Ran Tan, 17, Beijing No. 4 High School, China, Beijing, China

ET320 **A Novel and Efficient Method of Hydrogen Production: Optimizing the Microbial Electrolysis Cell and Microbial Fuel Cell Coupled System**
Cheng Cheng, 17, Lynbrook High School, San Jose, California
Aakriti Jain, 17, Lynbrook High School, San Jose, California

ME320 **Engineering a Novel Genetics-Based Early Disease Detection Mechanism Designed Using an Ontology-Driven Semantically Annotated Microarray Repository with Thermal Gradient Focusing Mass Spectrometry**
Ritik Malhotra, 17, Lynbrook High School, San Jose, California
Tony Ho, 17, Lynbrook High School, San Jose, California

PH303 **H-α [O III] Photometry of Galactic Plane Candidate Planetary Nebulae**
Laree Danielle Gardner, 18, Grosse Pointe North High School, Grosse Pointe Woods, Michigan
Genevieve Ying Wang, 18, Grosse Pointe South High School, Grosse Pointe Farms, Michigan
Stephen J. Morrison, 16, Grosse Pointe North High School, Grosse Pointe Woods, Michigan

PS304 **Finding a Transcription Factor in *Eucalyptus grandis* that Regulates Wood Formation**
Jason Ye, 16, Cedar Shoals High School, Athens, Georgia
Rebekah Bau, 17, Cedar Shoals High School, Athens, Georgia

Third Award of $1,000

BE308 **Gaining Insight into the Lives of Families that Have a Child with "Special Needs": A Nationwide Study of "Typically Developing" Siblings**
Morgan Bailey Blueglass, 17, Somers High School, Lincolndale, New York
Tyler Hayden Lipperman, 17, Yorktown High School, Yorktown Heights, New York
Elyse Mara Blueglass, 17, Somers High School, Lincolndale, New York

BE316 **A Functional MRI Study of Brain Activation during the Reading of Music**
Timothy A Ochsner, 17, Hilton Head Preparatory School,
Hilton Head Island, South Carolina
Qiuzi Zhu, 16, Hilton Head Preparatory School, Hilton Head Island, South Carolina
Cara Marie Borelli, 16, Hilton Head Preparatory School,
Hilton Head Island, South Carolina

BI308 **Effectiveness of *Plectranthus amboinicus* (Indian borage), *Salvia officinalis* (Sage) and *Ocimum basilicum* (Basil) Plant's Leaves Extracts to Eliminate the *Solepnosis invicta (*Red Fire Ant)**
Jamarys Torres-Diaz, 17, Elvira M. Colon Negron, Santa Isabel, Puerto Rico
Jackeline Torres-Questell, 18, Elvira M. Colon Negron, Santa Isabel, Puerto Rico

CB307 **Characterization of BACE 1 Endocytosis**
Mehal Nilesh Shah, 17, Illinois Mathematics and Science Academy, Aurora, Illinois
Ruchi Aggarwal, 16, Illinois Mathematics and Science Academy, Aurora, Illinois

EA301 **Change We Can Believe In: Evolution of Tidal Constituents in the Pacific Basin**
Hari Ramesh Caushik, 16, Westview High School, Portland, Oregon
Andrei Secasiu, 16, Westview High School, Portland, Oregon
Himanshu Satishchandra Pandey, 17, Westview High School, Portland, Oregon

EA303 **ESR Dating Early Men and Their Tools at Pradayrol, France and Ainikab I, Russia:**
"So Easy a Caveman Can Do It!"
Israt Ahmed, 17, Francis Lewis Highschool, Fresh Meadows, New York
Xiao Y. Zhou, 16, Francis Lewis High School, Fresh Meadows, New York
Stephanie S Chen, 17, Stuyvesant High School, New York, New York

EE306 **New Principle: Vertical Filament Winding Machine for Composite Tubes**
Jan Mares, 19, Gymnazium, Susice, Fr. Prochazky 324, Susice, Czech Republic
Martin Ron, 19, Gymnazium Susice, Fr. Prochazky 324, Susice, Czech Republic
Jan Patak, 20, Gymnazium Susice, Fr. Prochazky 324, Susice, Czech Republic

EE321 **Design of a Novel, Low-cost, Easy to Use, Auto-disposable Syringe**
Manosij Ghosh Dastidar, 17, South Point High School, Kolkata, West Bengal, India
Anarta Roy, 17, South Point High School, Kolkata, West Bengal, India

EE327 **The Design and Construction of a Rugosity Substrate Profile Gauge and Comparison with the *in situ* Chain Method**
Lauren Michelle Farwell, 17, Bellarmine Preparatory School, Tacoma, Washington
Kate Noel Donahue, 18, Bellarmine Preparatory School, Tacoma, Washington

EM313 **Integrating Programmable Thermostats with the National Digital Forecast Database XML Web Service and Web Scheduler to Maximize Energy Efficiency**
Neil Nijhawan, 16, duPont Manual High School, Louisville, Kentucky
Kush Nijhawan, 16, duPont Manual High School, Louisville, Kentucky

EN309 **Comparative Analysis: Sorbothane *versus* Non-Newtonian Fluids**
David Booth, 18, Saint Xavier High School, Louisville, Kentucky
Tyler James Chumbley, 17, Saint Xavier High School, Louisville, Kentucky

EN319 **Applications of Faraday Shielding**
Barron Collins Roberts, 18, Central High School, Saint Joseph, Missouri
Chelsey Maxine Bartlett, 18, Central High School, St. Joseph, Missouri
Sirish Veligati, 17, Saint Joseph Central High School, St. Joseph, Missouri

EN322 **Ultrascale Modeling of Supercapacitors for Electrical Energy Storage**
Linus Hauming Liang, 17, Oak Ridge High School, Oak Ridge, Tennessee
Jonathan Linden Bryan, 18, Oak Ridge High School, Oak Ridge, Tennessee

EN324 **Mini Magnetic Muck Managers**
Vivienne Hui Xian Tam, 17, Waterloo Collegiate Institute, Waterloo, Ontario, Canada
Janelle Hui Min Tam, 14, Waterloo Collegiate Institute, Waterloo, Ontario, Canada

ET317 **Electrochromic Sun-Tracking Windshield**
Aaron V. Schild, 18, The Bishop's School, La Jolla, California
Rafael S. Cosman, 16, La Jolla High School, La Jolla, California

ET318 **PEM Productivity: An Analysis of Efficiency-Affecting Aspects in Polymer Electrolyte Membrane Fuel Cells through Pressure Transducers in a Pressure Decay Model**
Angela Jean Smith, 16, Louisville High School, Louisville, Ohio
Jackson Lee Frazier, 15, Louisville High School, Louisville, Ohio

EV323 **Alkaline Rainfall**
Sol Paskvan, 17, Colegio San Ignacio, Tandil, Buenos Aires, Argentina
Lucas Matias Gille, 17, Colegio San Ignacio, Tandil, Buenos Aires, Argentina

MA303 **Ballot Problem Approached from n-Dimensional Paths**
Te-Wei Hsu, 18, Kaohsiung Municipal Kaohsiung Senior High School, Kaohsiung City, Chinese Taipei
Justin Tony Hou, 18, Kaohsiung Municipal Kaohsiung Senior High School, Kaohsiung City, Chinese Taipei

MA308 **An Improvement of the Hardy Condition**
Bogdan O. Neterebskiy, 17, Center of Mathematical Education, Saint Petersburg, Saint Petersburg, Russia
Konstantin A. Anisimov, 16, Center of Mathematical Education, Saint Petersburg, Saint Petersburg, Russia

ME307 **Mesenchymal Genes Are Upregulated in Putative Murine Mammary Cancer Stem Cells**
Rachel Ann Wilkinson, 15, Nicolet High School, Milwaukee, Wisconsin
Katelynn Connell McShane, 15, Nicolet High School, Glendale, Wisconsin

ME309 **Neutralization of *E. coli* Lipopolysaccharide with a Novel Recombinant ASS Protein Treatment**
Gabriel Molina, 16, Oak Hall School, Gainesville, Florida
Alvin Wang, 16, Oak Hall School, Gainesville, Florida

ME319 **The Effects of Caloric Restriction on the Subsequent Stress Resistance and Chemosensation of *Caenorhabditis elegans***
Sudarshan Bhat, 18, Lynbrook High School, San Jose, California
Priyanka Athavale, 17, Lynbrook High School, San Jose, California

MI307 **Evolution of the H5N1 Virus: A Study of How Single Nucleotide Polymorphisms Affect Host and Regional Variability in the H5N1 Virus**
Boning Han, 18, North Central High School, Indianapolis, Indiana
Lauren Hannah Stephens, 17, North Central High School, Indianapolis, Indiana

PH305 **Validation of Parabolic Ion Trap Geometries for Application within Quantum Computing**
Jennifer Wang, 17, Montgomery Blair High School, Silver Spring, Maryland
Grace Calvert Young, 17, The Potomac School, McLean, Virginia

Fourth Award of $500

BE309 **Examining Top-Down Control in Cognition and Perception**
Charlotte Kleiman, 16, Ossining High School, Ossining, New York
Alina Lesnovskaya, 16, Ossining High School, Ossining, New York

BE310 **The Effects of an Action Video Game on Reducing the Gender Gap in Geometry Scores**
Klaudia Kluzinski, 16, Forest Hills High School, Forest Hills, New York
Angela Lee, 16, Forest Hills High School, Forest Hills, New York

BI303 **The Role of Perspiration Constituents in the Attraction of *Culex pipiens* to Humans**
Ruchi Jayesh Shah, 15, Sachem High School North, Lake Ronkonkoma, New York
Garima Yadav, 15, Sachem High School North, Lake Ronkonkoma, New York

CB308 **Study the Radiosensitivity and Carrier's Frequency of *Ataxia talengectasia*-like Disorder (ATLD)**
Fhad Abdulelah Almusharraf, 18, Riyadh Schools, Riyadh, Saudi Arabia
Abdulaziz Sultan Almugairin, 18, Riyadh Schools, Riyadh, Saudi Arabia
Ahmed Rashed Alhomaid, 18, Riyadh Schools, Riyadh, Saudi Arabia

CH302 **Investigation of Rain-X™ and Sunscreen Coating, Year Three: Protection against Radiation-Induced Oxidative Stress**
Derek Robert Lam, 15, Keystone School, San Antonio, Texas
Brigette Mary Lee, 15, Keystone School, San Antonio, Texas

CH307 **A Combined Approach: Comparing Liquid Runway Deicer Performance Characteristics with Their Impact on Aircraft Corrosion, Catalytic Oxidation, the Environment, and the Economy**
Bailie Jo Bryant, 17, Central Lee High School, Donnellson, Iowa
Lynnely Greye Parker, 18, Central Lee High School, Donnellson, Iowa

CS302 **Making Chemistry Easier with Genii**
Werner van Zyl, 17, Duineveld High School, Upington, Northern Cape, South Africa
Gideon Christiaan Kruger, 17, Duineveld High School, Upington, Northern Cape, South Africa

EA304 **Effect of Solar Exposure on the Atomic Oxygen Erosion of Hubble Space Telescope Bi-Stem Thermal Shield Aluminized-Teflon FEP**
Aobo Guo, 16, Hathaway Brown School, Shaker Heights, Ohio
Claire Ashmead, 16, Hathaway Brown School, Shaker Heights, Ohio

EE303 **Research on a Mechanical Detecting Pipe-Rat with Steerable Double Driving Wheels**
XingYuan Xu, 18, Liaoning Province Shiyan High School, Shenyang, Liaoning, China
XinYi Gong, 18, Liaoning Province Shiyan High School, Shenyang, Liaoning, China
Tian Zhang, 18, Liaoning Province Shiyan High School, Shenyang, Liaoning, China

EE311 **Saving Water through Weather Analysis: Using Precipitation Probabilities and Moisture Sensing in Lawn Irrigation**
Alexander Joseph Mullen, 18, Oxford High School, Oxford, Mississippi
Cathy Hsi Chen, 18, Oxford High School, Oxford, Mississippi

EE312 **Regenerative Braking**
Erick Yiqing Chen, 16, West High School, Salt Lake City, Utah
Delian Tihomirov Asparouhov, 16, West High School, Salt Lake City, Utah

EM308 **Enhancing Biofilters: The Impact of Abscisic Acid on the Sequestration of Heavy Metals by *Euglena gracilis***
Jackie Bokor, 16, Long Beach High School, Lido Beach, New York
Hannah Michele Berkowitz, 16, Long Beach High School, Lido Beach, New York

EN308 **Construction of a Contrast-Enhanced Brain-Mimicking Hydrogel and Simulation of the Mechanical Effects of Implantable Brain Electrodes**
Rohit Anish Ramani, 17, Half Hollow Hills High School East, Dix Hills, New York
Neil Pathak, 17, Herricks High School, New Hyde Park, New York

EN313 **Switchgrass: A Source of Biofuels and Fibers**
Mallory Ruth Busso, 16, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan
Lauren Marie Raycraft, 16, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan

EN321 **Making the Best Better: Optimizing the TiO2 Semiconducting Layer for Applications in Dye-Sensitized Solar Cells**
Amy B.C. Tang, 16, Westview High School, Portland, Oregon
Anjali Jaba Das, 18, Westview High School, Portland, Oregon

ET301 **A Current Event: An Ongoing Study of the Production of Clean Tidal Energy**
Kyle Scott Saleeby, 15, Niceville Senior High School, Niceville, Florida
Katherine Marie Stone, 16, Fort Walton Beach High School, Fort Walton Beach, Florida

ET305 **Cylindrical Organic Solar Cells with Carbon Nanotube Charge Collectors**
Raymond Lou, 16, Texas Academy of Mathematics and Science, Denton, Texas
Dante Zakhidov, 16, Texas Academy of Mathematics and Science, Denton, Texas
Navaneeth Goduwin Ravindranath, 16, Texas Academy of Mathematics and Science, Denton, Texas

EV324 **Study of the Effect of Organic Decomposer on the Incidence of Stable Flies (*Stomoxys calcitrans*) (*L.*) in Pineapple Stubble (*Ananas comosus*) (*L.*) *Merr*.**
Susana Beatriz Garita-Araya, 17, Colegio Cientifico de Costa Rica-Sede San Carlos, Santa Clara de San Carlos, Alajuela, Costa Rica
Alexia Quiros-Rojas, 18, Colegio Cientifico de Costa Rica-Sede San Carlos, Santa Clara de San Carlos, Alajuela, Costa Rica

EV325 **Heavy Metals in Mines**
Saud Dakhel Alharbi, 18, Alhakm Bin Hesham Public School, Mahd Althahab, Saudi Arabia
Rakan Thareeb Almutairi, 16, Alhakm Bin Hesham Public School, Mahd Althahab, Saudi Arabia
Humoud Saleh Almutairi, 16, Alhakm Bin Hesham Public School, Mahd Althahab, Saudi Arabia

EV328 **Use of Natural Flocculants in Mitigating Harmful Algal Blooms (Red Tides)**
Maria Clara Isabel De Los Reyes Sia, 15, Philippine Science High School - Eastern Visayas Campus, Palo, Leyte, Philippines
Marc Abegonia Mapalo, 16, Philippine Science High School - Eastern Visayas Campus, Palo, Leyte, Philippines
Jean Reni Briones De Guzman, 16, Philippine Science High School- Eastern Visayas Campus, Palo, Leyte, Philippines

MA309 **Improviny of Inequalities between Means**
Abylay Galymzhanuly Kuanyshov, 18, High School #134, Almaty, Almaty, Kazakhstan
Assel Almazbekovna Aliyeva, 18, High School 134, Almaty, Almaty, Kazakhstan

ME310 **Internal Combat With Melanoma: Triggering an Immune Response Through the Up-Regulation of FAS Using Toll Ligand Combination Treatments**
Laura Katherine Gudvangen, 16, William J. Palmer High School, Colorado Springs, Colorado
Tonya Alexia Pavlenko, 16, William J. Palmer High School, Colorado Springs, Colorado

ME312 **Generation of a RNA probe for *in situ* Hybridization**
Kelly Kathleen Christensen, 18, Monarch High School, Louisville, Colorado
Molly Alysse McMahon, 17, Monarch High School, Louisville, Colorado

ME313 **A Novel Gallium and Zinc Nitrate Based Intravenous Medicine for the Treatment of *Pseudomonas aeruginosa* Nosocomial Infections**
Aditya Samir Mazmudar, 15, Fairfax High School, Fairfax, Virginia
Atif Javed, 17, Fairfax High School, Fairfax, Virginia

ME318 **Remote Ischemic Preconditioning**
Naman Gupta, 17, Folsom High School, Folsom, California
Anshum Sood, 17, Folsom High School, Folsom, California
Anuhya Venkata Ghorakavi, 17, Folsom High School, Folsom, California

ME321 **Epigenetic Biomarker Assays for Colon Cancer Screening**
Benjamin Paul Song, 16, Methacton High School, Eagleville, Pennsylvania
Quan Chen, 18, Methacton High School, Eagleville, Pennsylvania

MI304 **The Antimicrobial Effects of Commercial Spices and Plant Extracts on *Escherichia coli* O157:H7 in Ground Beef**
Sumedha Ravishankar, 15, Empire High School, Tucson, Arizona
Sirtaj Bir Singh, 15, Empire High School, Tucson, Arizona

MI305 **The Investigation of Antimicrobial Properties of Bark from Selected Local Trees**
Allison Elizabeth Bye, 18, North Toole County High School, Sunburst, Montana
Haeli Elizabeth Turner, 17, North Toole County High School, Sunburst, Montana

PH301 **Research of Atmosphere Influence on Propagation of Electromagnetic Wave**
Lilia Nikolaevna Khrapunova, 16, School # 2 of Dzerzhinsk, Dzerzhinsk, Nizhegorodskaya, Russia
Antonina Mikhailovna Toropkina, 15, School #2 of Dzerzhinsk, Dzerzhinsk, Nizhegorodskaya, Russia
Anastasia Andreevna Shaykina, 15, Lyceum # 40, Nizhny Novgorod, Nizhegorodskaya, Russia

PH311 **Muon Detection at Elevation**
Taylor Tsuyoshi Shong Wong Nakamura, 16, Maui High School, Kahului, Hawaii
Michael Owen Flynn, 17, Maui High School, Kahului, Hawaii

PS303 **Phytochemistry and Antioxidant Activity of Gunnera tinctoria Stem**
Sharon Priscila Castro Perez, 17, Instituto Cristiano Gracia y Paz, Valdivia, De los Rios, Chile
Diego Ignacio Baeza, 17, Instituto Cristiano Gracia y Paz, Valdivia, De los Rios, Chile

PS306 **Modification of Breeding Rice Grains through Artificial Colors, Flavor and Smell Used in Prevention of Grain-Consuming Birds**
Saifon Nopnipa, 17, Phanomsarakham "Phanomadunwitthaya" School, Phanomsarakham, Chachoengsao, Thailand
Aphitchaya Nopphalert, 16, Phanomsarakham "Phanomadunwitthaya" School, Phanomsarakham, Chachoengsao, Thailand