Winner Announcement
Intel ISEF 2011 Grand Awards Ceremony

May 13, 2011, Los Angeles, California, USA – Society for Science & the Public, in partnership with the Intel Foundation, this morning announced awards at the Intel ISEF 2011 Grand Awards Ceremony. Student winners are ninth through twelfth graders who earned the right to compete at the Intel ISEF 2011 by winning top prize at a local, regional, state or national science fairs.

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

Gordon E. Moore Award $75,000
ME316 Treatment of Simulated Cancer Cells with Compton Scattering-Produced Secondary Radiation
Matthew Troy Feddersen, 17, Acalanes High School, Lafayette, California
Blake Marggraff, 18, Acalanes High School, Lafayette, California

Intel Foundation Young Scientist Award
These Finalists were selected for their commitment to innovation in tackling challenging scientific questions, using authentic research practices, and creating solutions to the problems of tomorrow.

Young Scientist Award of $50,000
EM315 Bio-based Packaging Plastics from Fish Scale
Pornwasu Pongtheerawan, 16, Suratpittaya, Maung, Suratthani, Thailand
Tanpitcha Phongchaipaiboon, 17, Suratpittaya School, Meung district, Suratthani, Thailand
Arada Sungkanit, 17, Suratpittaya School, Meung district, Suratthani, Thailand
PH037  Countering Nuclear Terrorism: Novel Active and Passive Techniques 
for Detecting Nuclear Threats 
Taylor Ramon Wilson, 17, The Davidson Academy of Nevada, Reno, Nevada 

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.

Dudley R. Herschbach SIYSS Award
All-expense-paid trip awarded to three Finalists to attend the Stockholm International Youth Science Seminar (SIYSS) (www.fuf.org/siyss/), which includes attendance at the Nobel Prize ceremonies, in Stockholm, Sweden. The Dudley R. Herschbach SIYSS Award is a multi-disciplinary seminar highlighting some of the most remarkable achievements by young scientists from around the world. 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.

BE057  Epigenetic Factors Influence *Drosophila* Brain Function and 
Aggressive Behavior, Phase V 
Andrew Wooyoung Kim, 18, Cedar Shoals High School, Athens, Georgia 

EV323  Mimicking Wetting Behavior of Spider Silk: Studies on 
Water-Harvesting Efficiency According to the Fabrication of the Pattern 
of Wettability Gradient 
Jinyoung Seo, 18, Korea Science Academy of KAIST, Busan, Busan, South Korea 
Dongju Shin, 18, Korea Science Academy of KAIST, Busan, Busan, South Korea 

The SIYSS will be held in Stockholm, Sweden in December. Students must be 18 years old prior to the Nobel ceremony in December 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 Dudley R. Herschbach, Harvard Professor and 1986 Nobel Laureate in chemistry. He is Emeritus Board Chair of Society for Science & the Public.

European Union Contest for Young Scientists
An all-expense-paid trip enables attendance at the European Union Contest for Young Scientists—located in a new city each year.

Trip to the EU Contest
CS030  Efficient Implementation of Tilt Compensated Compass and Depth Camera in 
Interactive Augmented Reality 
Lai Xue, 18, Chengdu International School, Chengdu, Sichuan, China 

EA023  Using Amino Acid Analysis to Distinguish Chondritic Meteorites 
from Rocks Launched into Space from Earth 
Jane M. Cox, 16, Timpview High School, Provo, Utah
MI030  
A Novel Approach to Mapping Protein Interactions during Pilus Biogenesis by Using *in vivo* Photocrosslinking  
Erica Brooke Portnoy, 17, Commack High School, Commack, New York

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

**MIT Lincoln Laboratory**

Lincoln Lab has partnered with SSP and the Intel ISEF to promote science education through the Ceres Connection. The names of first and second place category award winners at Intel ISEF will be submitted to the International Astronomical Union (IAU) for naming of a minor planet. All minor planets in the Ceres Connection have been discovered by the Lincoln Near Earth Asteroid Research (LINEAR) program, operated by MIT’s 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

**AS062**  
Effects of Food Types on Survival and Development of Larval California Spiny Lobsters, *Panulirus interruptus*  
Adrienne Brooke McColl, 18, San Pedro High School, San Pedro, California

First Award of $3,000

**AS023**  
The Effect of Urbanization on Occupancy and Detection Rates of Eastern Screech Owls in Suburban Areas  
Kyle Thomas Bardwell, 17, Ossining High School, Ossining, New York

**AS062**  
Effects of Food Types on Survival and Development of Larval California Spiny Lobsters, *Panulirus interruptus*  
Adrienne Brooke McColl, 18, San Pedro High School, San Pedro, California

Second Award of $1,500

**AS044**  
Extracting Necromone Repellents from Food Oils  
Chase Carter Gross, 15, Solon High School, Solon, Iowa

**AS051**  
Using Ecological Niche Modeling to Predict Current and Future Ranges of Cryptic Phylogeographic Lineages  
Helen Yao, 18, Staten Island Technical High School, Staten Island, New York

**AS056**  
Glial Contributions to Circadian Timekeeping in the *Drosophila* Brain  
Chengzhen Li Dai, 17, Detroit Country Day School, Beverly Hills, Michigan
AS065  Incipient Speciation of the Mustached Bat *Pteronotus parnellii* in the West Indies
Bonnie Lei, 18, Walnut High School, Walnut, California

Third Award of $1,000

AS005  The Effects of Nicotinic Acid, Resveratrol, and Rapamycin on the Life Span, Reproduction, and Ability to Cope with Temperature Stress of *Drosophila melanogaster*
Aaron Samuel Greenfield, 17, Keystone School, San Antonio, Texas

AS014  Seeing What You Want to See: Visual Experience and Top-down Processing in Honeybee
Kevin Sean Chen, 17, The Affiliated Senior High School of National Kaohsiung Norm, Kaohsiung, Chinese Taipei

AS022  Biological Control of Ticks to Prevent Lyme Disease Using Entomopathogenic Nematodes
Ryan Daniel Kerr, 16, Danbury High School, Danbury, Connecticut

AS046  Analysis and Characterization of the Bioactive Antimicrobial Natural Products from Marine Sponges
Bernadette Ann Hritzo, 18, Villa Joseph Marie High School, Holland, Pennsylvania

AS055  Developmental and Behavioral Analysis of Wild and Captive-bred *Tenodera sinensis*
Cameron Michael Jones, 18, Northwest Career and Technical Academy, Las Vegas, Nevada

AS304  Birds of the Santa Cruz Sandhills
Alexander Michael Rinkert, 18, San Lorenzo Valley High School, Felton, California
Connor James Chesus, 19, San Lorenzo Valley High School, Felton, California

Fourth Award of $500

AS010  The Urogenital System of Male Rhyacotritonidae: An Anatomical and Phylogenetic Study
Emily Rachel Wilson, 17, Parkway Central High School, Chesterfield, Missouri

AS021  Copepod Culturing: Conditions for Maximum Yield per Generation
Julian Ohiro Kimura, 17, Palos Verdes Peninsula High School, Rolling Hills Estates, California

AS024  A Continuing Study of Aggression during Shelter Competition between Invasive and Indigenous Species of Crayfish
Vincent Jacob O’Leary, 15, Wheeling Central Catholic High School, Wheeling, West Virginia

AS042  Social Immunity of *Apis mellifera* as an Antimicrobial Indicator of CCD
Ashley Nicole Sowder, 18, Southmoore High School, Moore, Oklahoma
AS045  In Search of the Causative Genetic Element(s) Affecting Entropion Eyelid Development in New-born Lambs: Is It OAR16_14874751?
Aerin Erika Towle, 17, Sumner High School, Sumner, Washington

AS049  Population Census of Land Mollusks in a Xerophytic Forest Ecosystem: The Guanica State Forest in Puerto Rico
Veronica Nieves, 16, Asuncion Rodriguez de Sala, Guayanilla, Puerto Rico

AS306  The Mechanism of Lysophosphatidic Acid-Induced Procoagulation in Human Erythrocytes
An Ji Hun, 17, Korea Science Academy of KAIST, Busan, South Korea
Junha Park, 17, Korea Science Academy of KAIST, Busan, South Korea

AS307  Acmella oleracea: A Naturally Growing Weed as Effective Pest Controller
Akansha Verma, 16, Maharaja Agarsain Public School, Delhi, Delhi, India
Abhishek Khanna, 17, Maharaja Agarsain Public School, Delhi, Delhi, India

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
BE057  Epigenetic Factors Influence *Drosophila* Brain Function and Aggressive Behavior, Phase V
Andrew Wooyoung Kim, 18, Cedar Shoals High School, Athens, Georgia

First Award of $3,000
BE046  GOOPLAY! The Effectiveness of Educational Video Game in Improving Web-Searching Skills for Children
Bayan Mohammed Mashat, 16, Dar Altarbia, Jeddah, Central, Saudi Arabia

BE057  Epigenetic Factors Influence *Drosophila* Brain Function and Aggressive Behavior, Phase V
Andrew Wooyoung Kim, 18, Cedar Shoals High School, Athens, Georgia

Second Award of $1,500
BE007  Epidemiology of Sugar Dependence Amongst Adolescents
Alessio Pio Giuricich, 16, Bishops Diocesan College, Cape Town,

BE011  An Analysis of Listener Perception and Visual Replication of Sonifications: A Third Year Study
Neel Sanjay Patel, 16, Oviedo High School, Oviedo, Florida

BE041  Audio-Visual HIV/AIDS Education in a Tanzanian Adolescent Population
Lori Kim, 18, West High School, Salt Lake City, Utah
**BE310**
The Effects of the Initial Transition from Shod to Barefoot Running on Tibial Shock and Muscle Activation
Evan Daniel Olin, 16, Ossining High School, Ossining, New York
Catherine Marie Conte, 16, Ossining High School, Ossining, New York

**Third Award of $1,000**

**BE012**
A Clinical and Epidemiological Approach to the Relationship between Attention Deficit Hyperactivity Disorder (ADHD) and Sleep/Wake Disorders
Travis Coleman Sigafoos, 17, Champlin Park High School, Champlin, Minnesota

**BE025**
An Investigation of the Economic, Social, and Consequential Factors that Affect Moral Decision-Making
Katherine Michelle Mangialardi, 17, Ossining High School, Ossining

**BE028**
Would You Do It for the Kids? Factors Involved in the Prediction of Intergenerational Preferences
Sarah Susie Pak, 17, Roslyn High School, Roslyn Heights, New York

**BE029**
Strategies Utilized by People with Autism and Neuro-Typical Individuals to Determine Emotion in Faces
Samantha Michelle Phillips, 18, William A. Shine Great Neck South High School, Great Neck, New York

**BE036**
Regulation of Life Span Extension and Varied Muscle Behavior from the Intake of 2-Propylpentanoic Acid through the Dietary Control of Caenorhabditis elegans
Eugene Kim, 15, Lexington High School, Lexington, Massachusetts

**BE048**
Mosquitoes Be Gone!
Ruchi Jayesh Shah, 17, Sachem High School North, Lake Ronkonkoma, New York

**BE050**
Growing Up ‘In Sync’: Connecting a Bridge to an Autistic Mind’s World
Adelina Corina Cozma, 15, Bayview Secondary School, Richmond Hill, Ontario, Canada

**Fourth Award of $500**

**BE002**
Determining the Effect of Distractions Behind the Wheel on Teenagers through the Use of Driving Simulation
Callie Marie Johnson, 15, St. Joseph’s Academy, Baton Rouge, Louisiana

**BE004**
Analyzing the Consistency of the Rorschach and Multiple Intelligences Correlation
Katlyn Marie Firkus, 17, Rockdale Magnet School for Science and Technology, Conyers, Georgia
The Influence of Phrase-Spaced Text on Reading Comprehension of Stroke Patients
Lindsey Brooke Saunders, 17, Union County High School, Lake Butler, Florida

Ana Sofia Cardoso Monteiro, 16, Colegio Marista Sao Luis, Recife, PE, Brasil

The Effect of Ear Dominance on Object Localization after Audio-Visual Conditioning
Nadege Giraudet, 17, Institute for Collaborative Education, New York, New York

Is Nephila clavata a New Species of Social Spiders? A Preliminary Study on Behaviors of Nephila clavata
Jiaqi Duan, 16, Henan Experimental High School, Zhengzhou, Henan, China
Zihan Zhang, 18, Henan Experimental Middle School, Zhengzhou, Henan, China
Sihan Jiang, 17, Zheng Zhou Foreign Language School Campus, Zheng Zhou, HeNan, China

Impulsivity, Obsessiveness, and School Grades
Christina R. Wassef, 17, Clear Lake High School, Houston, Texas
Audrey Claire Wassef, 17, Clear Lake High School, Houston, Texas

Sonification: A Novel Approach to Data Representation Differentiation of Multiple Streams of Data
Danielle Nguyen, 17, Canyon Crest Academy, San Diego, California
Michelle Xie, 16, Canyon Crest Academy, San Diego, California

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

Computational Analysis of Specific Missense Mutations in the SMN Tudor Domain
Dianna Hu, 18, Half Hollow Hills High School West, Dix Hills, New York

First Award of $3,000

Computational Analysis of Specific Missense Mutations in the SMN Tudor Domain
Dianna Hu, 18, Half Hollow Hills High School West, Dix Hills, New York

From Models to Medications: Identification of Medication Leads for Treating Methamphetamine Addiction
Yamini T. Naidu, 16, Valley Catholic High School, Beaverton, Oregon
Second Award of $1,500

BI018  The Effects of Methyl Jasmonate on Crown Gall Regression and Protein Production in *Lycopersicon esculentum*
Chad Lawrence Harris, 18, Palm Bay High School, Melbourne, Florida

BI031  Regulation of Nitric Oxide Expression as a Form of Neurotransmitter Plasticity
Vaishnavi Lakshminarasimha Rao, 15, Canyon Crest Academy, San Diego, California

BI301  Research on Functional Dietary Fibre of Wheat Bran
Fubin Li, 17, Zhengzhou No.11 Middle School, Zhengzhou, Henan, China
Yakang Li, 18, Zhengzhou No.2 Middle School, Zhengzhou, Henan, China
Zhongning Hao, 15, Henan Experimental High School, Zhengzhou, Henan, China

Third Award of $1,000

BI011  Determination of Estrogen as a Trigger of Protandric Colony Formation of *Amphiprion ocellaris*
Emily Marie Crisp, 18, Loudoun County Academy of Science, Sterling, Virginia

BI027  Lipodystrophy Protein Seipin Functions in Lipid Droplet Biogenesis and Morphology
Anita Sanjay Chandrasahas, 18, Texas Academy of Mathematics and Science, Denton, Texas

BI037  Genetic and Genomic Analysis of TOR1 Signaling in Initiation of Cell Quiescence
Lev Omelchenko, 18, Stuyvesant High School, New York, New York

BI050  Effects of Fatty Acids on Skeletal Muscle Proliferation and Development
Anji Li, 16, Pioneer High School, Ann Arbor, Michigan

BI303  Evaluation of Fusarochromanone 101a: A Novel Fungus-Derived Anti-Cancer Drug
Yoon Jee Kim, 18, Caddo Parish Magnet High School, Shreveport, Louisiana
Daniel Christopher Felty, 18, Caddo Parish Magnet High School, Shreveport, Louisiana

Fourth Award of $500

BI020  Grow Me Some Green!
Brooke Suzanne Conley, 15, Hardee Senior High School, Wauchula, Florida

BI022  Detection and Analysis of Point Mutations of the Oxidative Variety in the K-ras Gene
Charles Preston Blakemore, 18, Academy for Math, Engineering and Science, Salt Lake City, Utah
BI024  Milkfish (Chanos chanos Forsskal) Serum as an Alternative Media Supplement for Culture of A549 (Human Lung) and HCT 116 (Colon) Carcinomas
    Angeli Joyce Yap Dy, 16, Capiz National High School, Roxas, Capiz Province, Philippines

BI032  Inhibition of the ATPase Activity of the Hepatitis C Virus NS3 Protein by Human Lactoferrin
    Sabrina Bouchard, 17, Seminaire de Sherbrooke, Sherbrooke, Quebec, Canada

BI040  Gastro Microbial Fuel Cell: A Novel Implementation of a GMFC in Capsular Nanorobotics
    Raja Selvakumar, 16, Milton High School, Milton, Georgia

BI302  The Use of Click-Chemistry and the Tetrazine-Norbornene Complex to Synthesize Herceptin Radiolabelled to Zr-89 and Ga-67
    Gabriel Isaac Weissmann, 17, Horace Greeley High School, Chappaqua, New York
    Priya Mohindra, 16, Yorktown High School, Yorktown Heights, New York

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
    CB004  Identifying Novel Mechanisms of Cytochrome-P450 2E1 Regulation
    Nithin Reddy Tumma, 17, Port Huron Northern High School, Port Huron, Michigan

First Award of $3,000
    CB004  Identifying Novel Mechanisms of Cytochrome-P450 2E1 Regulation
    Nithin Reddy Tumma, 17, Port Huron Northern High School, Port Huron, Michigan

    CB011  Correcting Dysregulated Splicing of the KLF6 Gene in Pancreatic Cancer Using Modified Antisense Oligonucleotides
    Blake Edward Smith, 17, Oceanside High School, Oceanside, New York

Second Award of $1,500
    CB024  Development of a Low Cost Electroporator for High School and Developing World Applications
    Timothy D. Trippel, 18, Marian High School, Mishawaka, Indiana

    CB029  Novel Role of BAT3 in Regulation of Basal Macroautophagy
    Ishan Chatterjee, 16, Fox Chapel Area High School, Pittsburgh, Pennsylvania
CB039  Identification of Ezrin as a Colonic Substrate for Protein Tyrosine Phosphatase Sigma
Howard Feng, 15, Bayview Secondary School, Richmond Hill, Ontario, Canada

Third Award of $1,000
CB006  Genetic Targets in HPV-Induced Cancers
Arun Brendan Dutta, 17, Western Albemarle High School, Crozet, Virginia

CB012  The Effects of Indoleamine 2, 3-dioxygenase Expression on Tumor-Induced Immunosuppression
Bilal Ahmed Siddiqui, 17, Wellington C. Mepham High School, Bellmore, New York

CB013  CD24 Induced Muscular Regeneration: Unraveling the Mystery behind Satellite Cell Differentiation
Evan M. Chen, 17, Wayzata High School, Plymouth, Minnesota

CB301  RNA Interference as an Effective and Environmentally-Friendly Method of Insect Population Control
Joseph Corbett Ferguson, 18, Paul Laurence Dunbar High School, Lexington, Kentucky
Roshan Palli, 17, Paul Laurence Dunbar High School, Lexington, Kentucky

CB304  Expression of a Schizophrenia-Associated V321L-Nrg1 Protein Reduces Nrg1-ICD Nuclear Translocation and α-7 nicotinic Acetylcholine Receptor Expression
Savina Dine Kim, 17, Commack High School, Commack, New York
Neil Mehta, 16, Jericho High School, Jericho, New York

Fourth Award of $500
CB002  The Role of the Retinoid X Receptor in Astrocytes in Alzheimer’s Disease
Adriana Elysse Zinn, 17, Hathaway Brown School, Shaker Heights, Ohio

CB019  The Effect of Vincristine on Transposon Mobilization-Induced Mutation Rates in Caenorhabditis elegans
Smita Shukla, 18, Massachusetts Academy of Mathematics and Science at WPI, Worcester, Massachusetts

CB020  Strain-Dependent Expression of the Mast Cell-Restricted Tryptase mMCP-7: Implications for Innate Immunity, Acquired Immunity, Inflammation, and Blood Coagulation
Dominick Zheng, 17, Boston Latin School, Boston, Massachusetts

CB023  Inter-α-Trypsin Inhibitor Heavy Chain 4 Promotes Lung Injury but Inhibits Cell Migration Post Endotoxin Exposure
Greeshma Somashekar, 17, North Carolina School of Science and Mathematics, Durham, North Carolina
A Novel Combinational Therapy Targeting Purine Salvage Pathways of *Trichomonas vaginalis*
Mahmoud Motaz Ghulman, 16, Dar Al Thiker School, Jeddah, Makkah, Saudi Arabia

Second Life: Novel and Interspecies Reprogramming of Induced Pluripotent Stem Cells
Won Ik Lee, 18, Academy for the Advancement of Science and Technology, Hackensack, New Jersey
Hong Joon Park, 16, Academy for the Advancement of Science and Technology, Hackensack, New Jersey

**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

**CH034** Drug Synthesis: Braving Legendary Challenges
Raghavendra Ramachanderan, 16, St. John’s International Residential School, Chennai, India

First Award of $3,000

**CH034** Drug Synthesis: Braving Legendary Challenges
Raghavendra Ramachanderan, 16, St. John’s International Residential School, Chennai, India

**CH301** Kinetic Analysis of Nanometallic Catalyst in Reduction of Nitrophenol: Investigation of a New Class of “Super Catalyst”
Quoc-Bao Duy Nguyen, 16, Westwood High School and McNeil High School, Austin, Texas
Mai-Anh N. Vu, 15, Westwood High School and McNeil High School, Austin, Texas

Second Award $1,500

**CH012** Modeling Hydrogen Production Catalyzed by a Novel Electrocatalyst with Density Functional Theory
Shubhro Saha, 18, Choate Rosemary Hall, Wallingford, Connecticut

**CH016** Polyfunctionalized Single-Walled Carbon Nanotubes as Novel Scaffolds for Multimodal Tumor-Targeted Therapy and Biological Imaging
Neil Pathak, 18, Herricks Senior High School, New Hyde Park, New York

**CH036** Synthesis and Manipulation of Silver and Gold Nano-Mirrors
Michael Leonard Janner, 15, Redlands East Valley High School, Redlands, California
Third Award of $1,000

**CHO08**

The Electrochemical Effects of Glucose and Sucrose on the Voltage Output of a Microbial Fuel Cell Using *Saccharomyces cerevisiae*

Jack Erdozain, Jr., 16, Westminster Christian School, Palmetto Bay, Florida

**CHO10**

Lighting Insulin with Gold Nanodots

Yun-Chen Chien, 17, Taipei First Girls’ High School, Taipei, Taipei City, Taiwan (R.O.C), Chinese Taipei

**CHO17**

The Investigation of the Key Steps of Detoxinine Total Synthesis

Alexander Sergeevich Shved, 16, Moscow Chemical Lyceum 1303, Moscow, Russia

**CHO25**

Optimization and Mechanistic Investigation of a User and Eco-Friendly Protocol for Oxidative Cleavage of Alkenes

Prem P. Thottumkara, 18, Macomb High School, Macomb, Illinois

**CHO30**

From Dusk to Dawn: Contact Lenses in the Night Tear Proteome

Jack Huang, 17, Parkland High School, Allentown, Pennsylvania

Fourth Award of $500

**CHO06**

Adventures in the Dendritric Crystallization of Potassium Bromide

Jack Daniel Francis McCann, 16, Loreto College, Coleraine, Northern Ireland, United Kingdom

**CHO11**

Photostabilization of an Organic Dye via Adsorption to Clay Minerals

Maya Ellen Samuels, 17, Har Va’Gai Regional High School, Upper Galilee, Israel

**CHO15**

Investigation of Ideal Conditions to Retain Ascorbic Acid in Common Cooking Methods

Alexander Scott Powers, 16, Bellarmine College Preparatory, San Jose, California

**CHO18**

The Synthesis of Organometallic Complexes of Iridium (III) and Platinum (II) for OLED Applications

Marek Buchman, 18, School for Extraordinary Gifted Children, Bratislava, Slovakia

**CHO33**

Asymmetric Total Synthesis of GlaxoSmithKline’s Potent Phosphodiesterase Inhibitor

Yaroslav Dmitrievich Boyko, 17, Moscow Chemical Lyceum 1303, Moscow, Russia
A Study on the Photo-catalytic Disinfectant Effect of Substrate-Embedded, Annealed, and Anodized TiO2 Thin Films on *E. coli*
Pranav Nagaraj Haravu, 16, North Carolina School of Science and Mathematics, Durham, North Carolina
Vipul Tushar Vachharajani, 17, North Carolina School of Science and Mathematics, Durham, North Carolina

**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

**CS030** Efficient Implementation of Tilt Compensated Compass and Depth Camera in Interactive Augmented Reality
Lai Xue, 18, Chengdu International School, Chengdu, Sichuan, China

First Award of $3,000

**CS009** Composing Frusta to Fold Polyhedral Origami
Herrg Yi Cheng, 18, NUS High School of Mathematics and Science, Singapore, Singapore

**CS030** Efficient Implementation of Tilt Compensated Compass and Depth Camera in Interactive Augmented Reality
Lai Xue, 18, Chengdu International School, Chengdu, Sichuan, China

Second Award of $1,500

**CS004** Eye-Controlled Cursor
Filip Naiser, 18, Gymnazium Aloise Jiraska, Litomysl, Czech Republic

**CS047** Increase in Speed of Interprocess Interaction in Microsoft Singularity
Gadzhi Shamil’evich Osmanov, 16, Lyceum #572, Center of Mathematical Education, Saint Petersburg, Saint Petersburg, Russia

**CS303** The Research on the Space Interactive 3D Mapping Method
Yizheng He, 18, Northeast Yucai School, Shenyang, Liaoning, China
Haoyan Kang, 18, North East Yucai School, Shenyang, China, Liaoning, China
Jiayi Wang, 17, Northeast Yucai School, Shenyang, Liaoning, China

**CS309** The Multimodal Real-Time Recognition of Emotion in Human Speech
Akash Krishnan, 16, Oregon Episcopal School, Portland, Oregon
Matthew Philip Fernandez, 17, Oregon Episcopal School, Portland, Oregon

Third Award of $1,000

**CS002** Creation and Navigation of a 3D Environment with Stereo Vision, a Continuation
Dylan Cooper Dalrymple, 16, Pensacola High School, Pensacola, Florida
CS017  Maintaining Viewing Quality with Lower Number of LEDs
Yu-Jung Chen, 18, The Affiliated Senior High School of National Kaohsiung Norm, Kaohsiung City, Chinese Taipei

CS038  Developing an Adaptive Disaster Evacuation Simulation
Francis Xinghang Chen, 17, Penn High School, Mishawaka, Indiana

CS052  Monte Carlo Simulation of a Serial Dilution PCR Experiment
Jonah Milton Kallenbach, 16, Germantown Academy Upper School, Fort Washington, Pennsylvania

CS056  SEOR: Simulated Environment for Object Reconstruction
Elliott Suk Chung, 18, Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, Georgia

CS307  Position and Vector Detection of Blind Spot Motion with Horn-Schunck Optical Flow
Mike Wu, 16, Torrey Pines High School, San Diego, California
Stephen Sia Yu, 17, Torrey Pines High School, San Diego, California

Fourth Award of $500

CS021  AllLab - Scripting Language for Artificial Intelligence
Ionut Alexandru Budisteanu, 17, High School “Liceul National Mircea cel Batran,” Ramnicu Valcea, Valcea, Romania

CS026  Optical Music Recognition of Printed Music Score
Hyunjoon Song, 16, Novi High School, Novi, Michigan

CS036  Virtual Private Network Using Peer-to-Peer Techniques
Daniel Kasza, 18, Massachusetts Academy of Math & Science, Worcester, Massachusetts

CS040  Enhanced Visual Acuity of Thalamic Visual Prosthesis Simulation Using Head and Eye Tracking
Sameer Kailasa, 15, American Heritage School Plantation, Plantation, Florida

CS055  Active Noise Cancellation in Human-Robot Speech Interaction
Jao-ke Chin-Lee, 16, Stuyvesant High School, New York, New York

CS305  A Genetic Algorithm Approach to Minimizing Beam Loss in High Power Particle Accelerators
Scotty Allan Chung, 18, Oak Ridge High School, Oak Ridge, Tennessee
Yajit Kumar Jain, 17, Oak Ridge High School, Oak Ridge, Tennessee
Carlos E del-Castillo-Negrete, 17, Oak Ridge High School, Oak Ridge, Tennessee
CS310  Sound Wave Propagation: 3D Premises Model
Konstantin Slavnov, 17, Lyceum of Information Technologies #1533, Moscow, Russia
Ilya S Shoshin, 18, Lyceum of Information Technologies #1533, Moscow, Russia

CS311  Dyadic Interaction Assistant for Tracking Head Gestures
and Facial Expressions
Varun Ramesh, 15, Hamilton High School, Chandler, Arizona
Shantanu Bala, 16, Barry Goldwater High School, Phoenix, Arizona

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
EA023  Using Amino Acid Analysis to Distinguish Chondritic Meteorites
from Rocks Launched into Space from Earth
Jane M. Cox, 16, Timpview High School, Provo, Utah

First Award of $3,000
EA023  Using Amino Acid Analysis to Distinguish Chondritic Meteorites
from Rocks Launched into Space from Earth
Jane M. Cox, 16, Timpview High School, Provo, Utah

Second Award of $1,500
EA015  Characterizing Engineered TiO2 Nanoparticle Adhesion: Implications
for Environmental Transport and Remediation
Eric E. Fein, 17, John Adams High School, South Bend, Indiana

EA019  Tracking Quaternary Sealevel with Corals and Molluscs: Cosmic Dose Rate Modeling
and ESR Dating on San Salvador, Bahamas
Aislinn Deely, 17, Francis Lewis High School, Fresh Meadows, New York

Third Award of $1,000
EA018  Gap in the Deep Sea?: Reconstruction of Sedimentary Environment
of the Kurotaki Unconformity, Central Japan Based on Foraminifers
Riou Tanaka, 16, Chiba High School, Chiba, Chiba, Japan

EA024  Using Paleotemperature to Search for the Effects of El Niño Southern Oscillation in
the Red Sea Based on a Temperature Model Derived
from the Sr/Ca Ratio in Coral
Ryan Shockey Davis, 16, Falmouth Academy, Falmouth, Massachusetts

EA026  Nonlinear Parametric Modeling of Hurricane Landfall Decay
Taide Ding, 16, Oxford High School, Oxford, Mississippi
Fourth Award of $500

EA009  A Device for Measuring the Vibrations and Earthquakes
Mohamed Maamoon Sehimat, 15, Zaud Bin Al-Hareth, Karak, Jordan

EA303  CA.W.A.LE.C. Cave Water Level Control
Cristofer Pezzetta, 18, Istituto Statale d'Istruzione Superiore Arturo Malignani, Udine, Udine, Italy
Daniele Olivo, 19, Istituto Tecnico Arturo Malignani, Udine, Udine, Italy
Mattia Olivier, 19, Istituto Tecnico Industriale Arturo Malignani, Udine, Udine, Italy

EA304  Characterization of Volcanic Lightning and Modeling How Volcanic Lightning Occurs at Sakurajima Volcano in Kagoshima, Japan
Nobutada Kawazoe, 17, Kagoshima Prefectural Kinkowan Senior High School, Kagoshima, Kagoshima, Japan
Taiki Maehata, 17, Kagoshima Prefectural Kinkowan Senior High School, Kagoshima, Kagoshima, Japan
Rushia Kanai, 17, Kagoshima Prefectural Kinkowan Senior High School, Kagoshima, Kagoshima, Japan

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

EE322  Inertial Electrostatic Confinement Fusion Using an Electrostatic Focusing Lens
Demitri Joseph Hopkins, 18, Merlo Station High School, Beaverton, Oregon
Forrest Evan Betton, 18, Merlo Station High School, Beaverton, Oregon
Eric Michael Thomas, 18, Merlo Station High School, Beaverton, Oregon

First Award of $3,000

EE025  Electromagnetic Detection of Aquifers
Alexander Kent Kendrick, 18, Los Alamos High School, Los Alamos, New Mexico

EE073  Indoor Ground Manifold Tracking through Low-Cost Stereoscopy
Christopher Stephen Nielsen, 17, Home School, Calgary, Alberta, Canada

EE322  Inertial Electrostatic Confinement Fusion Using an Electrostatic Focusing Lens
Demitri Joseph Hopkins, 18, Merlo Station High School, Beaverton, Oregon
Forrest Evan Betton, 18, Merlo Station High School, Beaverton, Oregon
Eric Michael Thomas, 18, Merlo Station High School, Beaverton, Oregon
Second Award of $1,500

EE003 Novel Oral Drug Inhaler Design to Optimize Drug Deposition in the Lungs
Arnab Dey, 16, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas

EE006 Ball Robot - An Instable System in Balance
Jan Kaeberich, 18, Campe-Gymnasium Holzminden, Holzminden, Niedersachsen, Germany

EE041 Brain Computer Interface
David Alexandre Joseph Campeau, 16, Mayo High School, Rochester, Minnesota

EE071 Acoustic Imaging Using Optimized Beamforming Techniques
Andrew Beekman Feldman, 16, Manalapan High School, Englishtown, New Jersey

EE088 An Adsorption Chiller Prototype for Obtaining Green Refrigeration from Solar Heating
Robert Huntington Verkuil, 16, Roy C. Ketcham High School, Wappingers Falls, New York

EE307 Fabrication and Impact Optimization of Angular and Hydrostatic Body Armor
Atif Javed, 18, Fairfax High School, Fairfax, Virginia
Steven Donald Gillen, 17, Fairfax High School, Fairfax, Virginia

Third Award of $1,000

EE020 Assistant of Walking Aid: Walking Aid Facility for the Old and the Relevant Patients
Zehong Weng, 18, Guangdong Experimental High School, Guangzhou, Guangdong, China

EE038 A Robotic Assistant for the Visually-Impaired (RAVI): A Novel System Employing Digital Image Processing and Sonar Range Detection
Ishwarya Ananthabhotla, 18, Kings Park High School, Kings Park, New York

EE053 A Stand-Off Seismo-Acoustic Method for Humanitarian Demining
Marian Joan Bechtel, 16, Hempfield High School, Landisville, Pennsylvania

EE064 Electrowetting for Novel Electromechanical Applications
Andrey Sushko, 17, Hanford High School, Richland, Washington

EE065 TouchingNotes II: Music for the Senses
Vinicius Guilherme Muller, 19, Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, RS, Brasil
**Fourth Award of $500**

EE002  Design of Portable X-ray and Computed Tomography Scanner  
Tomas Svoboda, 20, High School of Electrotechnical Studies, Brno, Bohemia, Czech Republic

EE016  Set the Switch - Save Energy  
Oleg Dreval, 16, Kiev Lyceum #142, Kyiv, Ukraine

EE026  Humanoid Gripper Helps Level the Playing Field, Year II  
Rachel Ann Aaronson, 16, Satellite High School, Satellite Beach, Florida

EE027  The Liquid Piston Engine, Phase 3  
Kelly Maria Kleier, 18, Notre Dame Academy, Park Hills, Kentucky

EE037  Increasing the Efficiency of Solar Tracking Systems  
Michael Anthony Cerabona, 17, Yorktown High School, Yorktown Heights, New York

EE040  GNut, III: An A.I.R.V.I.S. (Anthropometric Interactive Robot with Vision Intelligence & Speech)  
Arjun Aggarwal, 16, Lexington High School, Lexington, South Carolina

EE058  Passive Solar Tracking  
Anthony Vladimir Surganov, 17, Albert Grannis Lane Technical College Preparatory High School, Chicago, Illinois

EE063  Don't Fear, It's Secure: Flexible and Secure RFID System Deployment  
Shayan J. Mohanty, 17, Plano Senior High School, Plano, Texas

EE072  TongueMove: Barrier Tree Tongue Controller  
Ka Chon Leong, 18, Keang Peng School, Macau, SAR of the People's Republic of China
EE079  Boosting Central Heat / Air Conditioning Efficiency through Evaporative Cooling Supplementation
Trevor Kidder Monroe, 18, Chain of Lakes Collegiate High School, Winter Haven, Florida

EE080  Construction of a Feasible Einstein: Szilard Absorption Refrigeration System
Spencer Wilson, 18, Colquitt County High School, Moultrie, Georgia

EE319  Enhanced Navigation System for Remotely Operated Underwater Vehicle
Io Tong Chan, 18, Keang Peng School, Macau, Macau, SAR of the People’s Republic of China
Chi Kit Cheong, 17, Keang Peng School, Macao, Macau, SAR of the People’s Republic of China
Ka Hong Lao, 17, Keang Peng School, Macau, Macau, SAR of the People’s Republic of China

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
EN019  Celloidosomes: A Journey toward the Bioengineering of Artificial Micro-Glands and Micro-Bioreactors
Samantha Marie Marquez, 15, Maggie L. Walker Governor’s School for Government and Intern, Richmond, Virginia

First Award of $3,000
EN019  Celloidosomes: A Journey toward the Bioengineering of Artificial Micro-Glands and Micro-Bioreactors
Samantha Marie Marquez, 15, Maggie L. Walker Governor’s School for Government and International Studies, Richmond, Virginia
EN301  Algae-based Atmospheric Revitalization for Zero-G and Aerospace Application
Alexander Raymond Crisara, 16, L. C. Anderson High School, Austin, Texas
Alexander Jahan Rabii, 14, L. C. Anderson High School, Austin, Texas

Second Award of $1,500
EN022  Accounting for Cross-talk between Signaling Pathways Identifies Novel Model for Early and Late Post-transplant Acute Rejection
Andrew Liu, 17, Henry M. Gunn Senior High School, Palo Alto, California
**EN023**
Synthesis, Characterization, and Biological Evaluation of a Novel Biomaterial for Post-Lumpectomy Breast Reconstruction
Shyam Venkateswaran, 17, Herricks Senior High School, New Hyde Park, New York

**EN027**
Synthesis and Characterization of Composite Plastics from Thermoplastic Starch and Nano-sized Calcium Phosphate for Film Packaging
Miguel Arnold Silverio Reyes, 16, Philippine Science High School- Main Campus, Quezon City, Metro Manila, Philippines

**EN034**
Developing a Thermo/Hydrochromic Roadway Paint Application to Increase Driver Awareness during Hazardous Conditions
Nicholas Michael Huey, 18, Camdenton High School, Camdenton, Missouri

**Third Award of $1,000**
**EN018**
An Investigation of the Porosity and Morphology of Fusion-Bonded Epoxy
Rachel Alexandra Strauss, 17, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia

**EN025**
Regulatory Signatures of Cancer Cell Lines Inferred from Gene Expression Data
Jayanth Krishnan, 17, Mahopac High School, Mahopac, New York

**EN035**
Creating Porous TiO2 Nanoparticles to Improve the Charge Carrier Efficiency of Photoelectrochemical Cells
Ayush Gupta, 17, Oregon Episcopal School, Portland, Oregon

**EN302**
Study of Steels Suitable for Reactor Pressure Vessels
Marek Kovar, 19, Gymnazium Karla Sladkovskeho, Prague, Czech Republic
Tomas Petak, 19, Gymnazium Karla Sladkovskeho, Prague, Czech Republic

**EN313**
Modeling and Characterization of Novel Heusler Magnetocaloric Effect Alloys
Mathilda Marie Lloyd, 17, Oak Ridge High School, Oak Ridge, Tennessee
Yiwei Li, 18, Oak Ridge High School, Oak Ridge, Tennessee

**EN321**
The Plastic We Will Use in the Future (from Obtaining Bioplastics NOPAL Mucilage)
Xhail Pineda Gonzalez, 17, Official Preparatory Annex to the Normal School of Teotihuac, Colony Nva., Teotihuacan, Mexico

**Fourth Award of $500**
**EN009**
Towards More Efficient Very-Large-Scale Integrated Networks: Increasing the Degree of Parallelism and Semiconductance in Single-Walled Carbon Nanotube Devices
Yosyp Shvab, 17, T. C. Williams High School, Alexandria, Virginia
Can Recycled Rubber Materials Be Used in Concrete to: Reduce Environmental and Landfill Waste, Reduce Petroleum Usage, and Reduce the Carbon Footprint While Improving the Infrastructure of Bridges, Roads and Buildings?
John Charles Boykin, 17, St. Peter Chanel, Bedford, Ohio

The Algae-Mobile 3: Bioactive Energy and Carbon Dioxide Filtration in the Exhaust of a Car
Param Jaggi, 17, Plano East Senior High School, Plano, Texas

Developing a Urine Test for Tularemia through the Use of Cibacron Blue-Core Shell Nanoparticles to Sequester the Bacterial Antigen Tul4
Rithvik Raju Prasannappa, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia
Sameer Kumar Singh, 17, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

Preparation of Hyaluronic Acid Nanoparticles with A. chicha for Applications in Wound Healing
Lorraine da Silva Campos, 16, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil
Vanessa Estefano Uriza, 16, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil

Cellulose Crystals Clean and Cure
Janelle Tam, 15, Waterloo Collegiate Institute, Waterloo, Ontario, Canada
Vivienne Tam, 18, Waterloo Collegiate Institute, Waterloo, Ontario, Canada

Utilization of Mucilage Derived from Lemon Basil Seeds as Coating Substance for Fruit Preservation
Thanasup Gonmanee, 18, Princess Chulabhorn's College Phetchaburi, Cha-am, Phetchaburi, Thailand
Worrada Junmook, 18, Princess Chulabhorn's College Phetchaburi, Cha-am, Phetchaburi, Thailand
Narintadeach Charoensombut, 18, Princess Chulabhorn's College Phetchaburi, Cha-am, Phetchaburi, Thailand

Hatch an Egg with Insulation and Hot Pack Instead of Electricity
Tae Young Roh, 16, Ju Yeop High School, Goyang-si, Gyeonggi-do, South Korea
Yeon Ji Kim, 17, Paik Yang High School, Goyang-si, Gyeonggi-do, South Korea
Beom Kwan Kim, 16, Ilsan Daejin High School, Goyang, Gyeonggi-do, South Korea
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

ET062
A Novel Biofuel Cell Based on Direct Electron Transfer-Type Bioelectrocatalysis Incorporating Photophosphorylation to Efficiently Create Sustainable Electrical Energy
Nathan Sai Kondamuri, 16, Munster High School, Munster, Indiana

First Award of $3,000

ET021
Enhancing Algae Biofuels, Phase II: Stress Analysis of ACCase, an Enzymatic Factor of Lipid Production
Sara Ellen Volz, 15, Cheyenne Mountain High School, Colorado Springs, Colorado

ET062
A Novel Biofuel Cell Based on Direct Electron Transfer-Type Bioelectrocatalysis Incorporating Photophosphorylation to Efficiently Create Sustainable Electrical Energy
Nathan Sai Kondamuri, 16, Munster High School, Munster, Indiana

Second Award of $1,500

ET001
The Engineering of a Novel Magnetic Levitation Train Propulsion System through the Application of a Coil Current Gradient
Christopher Joseph Davlantes, 18, Bishop Kenny High School, Jacksonville, Florida

ET002
Effects of Dopants on the Morphology and Efficiency of Conjugated Polymer OPV Devices
Arjun Mathur, 17, Lake Highland Preparatory School, Orlando, Florida

ET009
Acoustic Cavitation at the Solid Oxide Electrolysis Cell Cathode Layer for Sustainable Hydrogen Production
Eric Lau, 16, Savannah Arts Academy, Savannah, Georgia

ET055
Hydrolize: Kinetics of the Hydrogen Production of the Magnesium-Water Reaction in Aqueous Solution
Tyler Trettel Howard, 18, Olathe Northwest High School, Olathe, Kansas

ET059
Photoelectrochemical Approach to PEM Fuel Cells Using Hydrodynamic Voltammetry
Dheevesh Arulmani, 15, Gordon Graydon Memorial Secondary School, Mississauga, Ontario, Canada
Third Award of $1,000

ET031 Synthesis of Complex Nanostructures for Solar Cells: Analysis Using Novel D-SCOPEn
Shyamal Buch, 15, Vista del Lago High School, Folsom, California

ET032 Optimization of a Microbial Fuel Cell to Drive a Bioelectrochemically Assisted Wastewater Treatment Reactor
Ryota Ishizuka, 17, Greenwich High School, Greenwich, Connecticut

ET048 Synthesizing Hydrocarbon Derivatives as an Alternative Fuel Source Utilizing Effluent Gas from a Catalytic Converter in a Two Stage Induction System with Cobalt Molybdenum Copper in a Hydrodesulphurization Process to Reduce Carbon Emissions
Justin Kenrick Ramsaran, 17, Palm Bay High School, Melbourne, Florida

ET060 Obtaining Bioethanol from Tuna (Opuntia ficus): An Alternative to the Use of Corn
Clara Guadalupe Escarcega Ramirez, 19, Escuela Preparatoria Oficial Num. 19, Mexico, Estado de Mexico, Mexico

ET068 Maximizing Algal Growth and Lipid Yields through Varying Iron3+ Concentration and Bioavailability: A Continued Investigation on Finding Optimal Growing Conditions for Scenedesmus sp. for Biofuel Production
Yanqi Chen, 16, Central York High School, York, Pennsylvania

Fourth Award of $500

ET004 Power Up!: Experimental Design and Mathematical Optimization of a Dual Rotor Wind Turbine
Andrew Samuel Ylitalo, 15, Stillwater Area High School, Stillwater, Minnesota

ET005 The Creation and Testing of a Fully Submersible Geared Water Turbine for Alternative Energy Production
Gavin Grant Ovsak, 17, Eden Prairie High School, Hopkins, Minnesota

ET017 Maximizing Hybrid Rocket Motor Efficiency for Evaluating Recyclable and Renewable Fuels
Megan Lynn Perkins, 16, DuPont Manual Magnet High School, Louisville, Kentucky
Drag’n’ball: How the Humpback Whales Bumped Flippers Can Help Us to Renewable Energy
Hanne Binder, 19, Vejle Technical High School, Vejle, Denmark

Generating Clean Electrical Tidal Power, Year Three of an Ongoing Study
Kyle Scott Saleeby, 16, Niceville High School, Niceville, Florida

Algae as a Biofuel, Part II
Daisuke Dennis Takeda, 19, Newman Smith High School, Carrollton, Texas

Effect of Various Metal Cofactors on the Catalyzation Rate of Pyruvate to Ethanol by Pyruvate Decarboxylase (EC 4.1.1.1) in Saccharomyces cervisiae when Thiamine Pyrophosphate (TPP) Is Absent
Arrush Choudhary, 15, Chantilly High School, Chantilly, Virginia

Analysis of Conducting Polymer PEDOT (Poly (3,4-Ethlenedioxythiophene)) and Nanostructured Titania for Solid-State Dye-Sensitized Solar Cells
Akshai Baskaran, 18, Kennewick High School, WA, Washington

Wave Power Plant
Ennan Umerov, 15, Zagalno-osvitnya shkola I-III stupeniv, Mizhvodne, Crimea Autonomous Republic, Ukraine

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
EM315 Bio-based Packaging Plastics from Fish Scale
Pornwasu Pongtheerawan, 16, Suratpittaya, Maung, Suratthani, Thailand
Tanpitcha Phongchaipaiboon, 17, Suratpittaya School, Meung District, Suratthani, Thailand
Arada Sungkanit, 17, Suratpittaya School, Meung District, Suratthani, Thailand

First Award of $3,000
EM305 The Effects of Micro-algae Characteristics on the Bioremediation Rate of Deepwater Horizon Crude Oil
Xiuqi Cao, 16, Century High School, Rochester, Minnesota
Ying Xiong, 15, Century High School, Rochester, Minnesota

EM315 Bio-based Packaging Plastics from Fish Scale
Pornwasu Pongtheerawan, 16, Suratpittaya, Maung, Suratthani, Thailand
Tanpitcha Phongchaipaiboon, 17, Suratpittaya School, Meung District, Suratthani, Thailand
Arada Sungkanit, 17, Suratpittaya School, Meung District, Suratthani, Thailand
EM330  The Effect of Ocean Acidification and Oil Spills on Emiliania huxleyi Transparent Exopolymer Particles
Kunal Ashok Sangani, 16, Fayetteville Manlius High School, Manlius, New York
Mishka Gidwani, 17, Neuqua Valley High School, Naperville, Illinois

Second Award of $1,500
EM007  Clean Acres: Simulated in situ Bioremediation of Diesel Contaminated Soil Utilizing a Linoleic Acid and R. rhodochrous on Soil Type in and Uncontrolled Environment
Morgan Walker Sinko, 17, John Jay Science and Engineering Academy, San Antonio, Texas

EM038  Improving Pure Water Availability: Optimizing Flux in Reverse Osmosis Membranes
Matthew Jaebol Kim, 17, Commack High School, Commack, New York

EM039  Biochar Carbon Sequestration: The Effects of Feedstock and Temperature of Pyrolysis on Chemical and Physical Stability of Biochar
Meghana Vijay Rao, 15, Jesuit High School, Portland, Oregon

EM312  To Investigate the Adsorption Potential of Orange Peel Biosorbents for the Removal of Copper(II) Ions
Qin Xiang Ng, 18, Anglo-Chinese School (Independent), Singapore, Singapore
Wei Liang Matthew Lee, 18, Anglo-Chinese School (Independent), Singapore, Singapore

EM332  Recycling Rexine Waste—A Novel and Economical Approach
Hetal Kanjibhai Vaishnav, 18, Late Shree S. G. Dholakiya Memorial High School, Rajkot, Gujarat, India
Ankur Kanjibhai Vaishnav, 16, Shree P.V Modi High School, Rajkot, Gujarat, India

Third Award of $1,000
EM012  The Impact of Anthropogenically Modified Wetlands on Anuran Populations: What Do Species Richness, Diversity, and Presence of Invasive Species Tell Us about Everglades Wetlands Restoration?
Jamie Odzer, 15, Dr. Michael M. Krop Senior High School, Miami, Florida

EM014  Determining the Starch Content of Lemna minor in Relation to Nitrate and Phosphate Levels, Year 2
Kristen Elaine Clayton, 15, Viera High School, Viera, Florida

EM021  The Effect of E. crassipes on the Nitrate and Ammonia Levels from Sewage Treatment Waste Water
Kelly M. Martins, 17, Langley High School, McLean, Virginia
Monitoring the Disturbance of Soil Micro-Ecosystems in Dormant Topsoil Using Nematodes and Studying the Methods to Rehabilitate Soil for Effective Site Restoration
Laura Bernadette Lane, 17, Aztec High School, Aztec, New Mexico

Detecting Oil Spills Using Synthetic Aperture Radar
Calvin Ling, 16, The Liberal Arts and Science Academy High School, Austin, Texas
Mark Sands, 17, Liberal Arts and Science Academy High School, Austin, Texas

Bioremoving of Chrome in Leather Shavings
Marcelo Jung Eberhardt, 18, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil
Patrick Comassetto Fuhr, 18, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil

A Quantitative Study of Marine Bacteria of Dispersed and Undispersed Crude Oil and Potential for Enhancement of Biodegradation
Rithika Marumagan Thirumal, 17, Ovey Comeaux High School, Lafayette, Louisiana
Samantha Leigh Biddick, 17, Ovey Comeaux High School, Lafayette, Louisiana

Eco-friendly Ink from *Terminalia chebula*
Pramoda Nekkare Vishnumurthy, 15, Sri Ramakrishna High School, Puttur, India
Bhargava Chakrakodii Subbanna, 14, Sri Ramakrishna High School, Puttur Karnataka, Karnataka, India

Fourth Award of $500

Soil Amendment Variations: Their Role in Improving Surface Mine Reclamation
Travis Cole Sylvester, 17, Greybull High School, Greybull, Wyoming

Viability of Bioremediation of Lake St. Marys, Ohio via Reintroduction of Native Mussels
Andrew Benedict Favorito, 17, Paulding High School, Paulding, Ohio

Biobased Ferrite Nanoparticles: A Novel Approach to Extract Organic Solvents and Heavy Metals from Water
Atreya Shilbhadra Dey, 17, Maharishi School of the Age of Enlightenment, Fairfield, Iowa

Utilization of a Thermophilic Sulfate-Reducing Species for Bioremediation Purposes
Kirsten Perry, 17, Elko High School, Elko, Nevada

Investigating the Effectiveness of Indigenous Plant Solutions in Inhibiting Leaf Gall Insect Development
Jorie Ann Moore, 16, Sanger High School, Sanger, California
EM028 Dependence of Leaf Litter Decomposition and CO₂ Release on Tree Species and Temperature
Vincent Huang Lin, 16, Falmouth High School, Falmouth, Massachusetts

EM037 To Clay or Not to Clay? Management of Algal Growth through Clay and Chitosan Flocculation
Shefali Prashant Shah, 17, Great Mills High School, Great Mills, Maryland

EM321 A Fishy Detector
Haleeda Hilmi, 17, Tunku Kurshiah College, Seremban, Negeri Sembilan, Malaysia
Nurul Amira Salehin, 17, Kolej Tunku Kurshiah, Seremban, Negeri Sembilan, Malaysia

EM326 Oilchemistry: Recycling of Soybean Oil to Produce Alkyd Resins and Paint
Adriana Ferreira Santana, 17, ETEC Getulio Vargas, Sao Paulo, SP, Brasil
Tiago Tolone Craveiro de Oliveira, 17, ETEC Getulio Vargas, Sao Paulo, SP, Brasil

EM334 An Investigation Into Sea Lettuce Briquettes
Muireasa Anne Carroll, 17, Sacred Heart Secondary School, Co. Cork, Cork, Ireland
Denise Marie Hurley, 17, Sacred Heart Secondary School Clonakilty, Co-Cork, Munster, Ireland
Mairead Maeve Kingston, 17, Sacred Heart Seconday School, Co.Cork, Cork, Ireland

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
EV323 Mimicking Wetting Behavior of Spider Silk: Studies on Water-Harvesting Efficiency According to the Fabrication of the Pattern of Wettability Gradient
Jinyoung Seo, 18, Korea Science Academy of KAIST, Busan, Busan, South Korea
Dongju Shin, 18, Korea Science Academy of KAIST, Busan, Busan, South Korea

First Award of $3,000
EV033 An Experimental Study of the Impact of Airborne Pollutants on the Peak Expiratory Flow (PEF) Rate of Asthmatic Subjects PLUS A Novel Risk Assessment Model to Predict the Adverse Effect of PM10 and TVOCs on the PEF Rate
Naomi C. Shah, 16, Sunset High School, Portland, Oregon
Mimicking Wetting Behavior of Spider Silk: Studies on Water-Harvesting Efficiency According to the Fabrication of the Pattern of Wettability Gradient

Jinyoung Seo, 18, Korea Science Academy of KAIST, Busan, Busan, South Korea
Dongju Shin, 18, Korea Science Academy of KAIST, Busan, Busan, South Korea

Second Award of $1,500

The Assessment of Silver Nanoparticles in the Environment on Gene Expression in C. elegans
Alexander Michael Cecil, 17, E.E. Waddell High School, Charlotte, North Carolina

Embrace Air with Algae Repair
Chloe Anassis, 15, The Study School, Westmount, Quebec, Canada

Mussels, a Natural Approach to Sewage Treatment: Evaluating Geukensia demissa as Biofilters of Local Bay Pollution
Ariane Elizabeth Papa, 17, Long Beach High School, Lido Beach, New York
Jane Elizabeth Smyth, 17, Long Beach High School, Lido Beach, New York

A.W.S.S. (Autonomus Water Sanitization System)
David Varlotta, 19, Escuela Tecnica N012 "Libertador General Jose de San Martin", Ciudad Autonoma de Buenos Aire, Buenos Aires, Argentina
Ruth Maurente Jamie, 17, Escuela Tecnica No12 D.E. 10 "Libertador General Jose de San, Ciudad Autonoma de Buenos Aire, Ciudad Autonoma de Buenos Aire, Argentina
Elisa Bustamante, 20, Libertador General Jose de San Martin, Ciudad Autonoma de Buenos Aire, Argentina

Third Award of $1,000

A Cheaper Alternative to a Cleaner Future II: A Study to Optimize the Efficiencies of Dye Sensitized Solar Cells
Sirish Chandra Kamarajugadda, 17, Plano East Senior High School, Plano, Texas

Green Based Conductive Polymer Sensor
Zawin Najah Binti Zulkefli, 17, Tuanku Syed Putra Secondary Science School, Kangar, Malaysia

Degradation of Environmental Pollutants with Nanocomposites
Mehwish Ghafoor, 15, Federal Government College for Women G 10/4, Islamabad, Capital, Pakistan
Ambreen Bibi, 15, Federal Government College for Women G 10/4, Islamabad, Capital, Pakistan
**EV311**  
Photoautotrophic Filtration: The Effects of *Chlorella pyrenoidosa* on the Reduction of CO₂ Emissions  
Andrew Quinn Ross, 16, Clearfield High School, Clearfield, Utah  
Jed Donald Grow, 16, Clearfield High School, Clearfield, Utah

**EV312**  
Activation of the Hexose and Amino Acid Transport Systems in *Chlorella protothecoides* (*vulgari*) for Enhanced Biomass Production via Amphitropic (Mixotrophic) Reaction Using Alternative Organic Carbon Sources  
Michael James Hulick, 18, Morristown Hamblen High School East, Morristown, Tennessee  
Andrew Michael Howington, 18, Morristown-Hamblen High School East, Morristown, Tennessee

**EV321**  
The Effect of Pollutants on *Eisenia hortensis* (Earthworm) and Its Potential as an Indicator Species  
Gillian Claire Gundersen, 17, Herndon High School, Herndon, Virginia  
Brenda Allison Perez, 17, Herndon High School, Herndon, Virginia

**Fourth Award of $500**

**EV028**  
Effects of Di-butyl phthalate (DBP) on Developing *Medaka* Embryos  
Yunqian Tang, 20, North Carolina School of Science and Mathematics, Durham, North Carolina

**EV035**  
Nitrate Retention Chemistry - Development of an Environmentally-Friendly Manure  
Adam Joseph Dando, 16, Franklin Regional Senior High School, Murrysville, Pennsylvania

**EV038**  
Long-wavelength Light as a Catalyst for MS2 Photoinactivation by Cationic Porphyrins  
Marc Herman Webb, 18, Josephine Dobbs Clement Early College High School, Durham, North Carolina

**EV039**  
Red Tide Sensitivity to Ocean Acidification  
Matthew Philip Goldklang, 17, San Diego Jewish Academy, San Diego, California

**EV304**  
Research on Effect of Urban Rainfall Runoff Pollution on Water Environment and Amount Accounting  
Yixin Zhang, 17, Anhui Bengbu No. 2 High School, Bengbu, Anhui, China  
Yumeng Li, 16, Anhui Bengbu No. 2 High School, Bengbu, Anhui, China  
Anqi Wang, 17, Anhui Bengbu No. 2 High School, Bengbu, Anhui, China

**EV305**  
The Toxicity of Bioremediation Agents  
Catherine Rose Mitchell, 16, H. B. Woodlawn, Arlington, Virginia  
Andrea Elise Green, 15, H. B. Woodlawn, Arlington, Virginia
**EV320** Alternative Methods of Optimizing Food Production in "Red-Lined" and Urban Food Deserts Using Aquaponics and Hydroponics vs. Conventional Growing Methods
Quantavious Yorel Griggs, 16, Benjamin E. Mays High School, Atlanta, Georgia
Nouhayla Houssaini, 17, Benjamin E Mays High School, Atlanta, Georgia

**EV322** The Way of CO₂ Storage Using Formation of Carbonate Minerals by Aboriginal Microbes
Woongui Hwang, 18, Cheonnam Science Highschool, Naju, Cheonnam, South Korea
Doyeon Baek, 17, Cheonnam Science Highschool, Naju, Cheonnam, South Korea

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**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**

**MA002 Reformulating the Newton Direction Computation as a Linear Least Squares Problem for Smoothed Overdetermined L1 Functionals**
Matthew Russel Bauerle, 17, Bauerle Homeschool, Fenton, Michigan

**First Award of $3,000**

**MA002 Reformulating the Newton Direction Computation as a Linear Least Squares Problem for Smoothed Overdetermined L1 Functionals**
Matthew Russel Bauerle, 17, Bauerle Homeschool, Fenton, Michigan

**MA017 Linearly Many Faults in (n,k)-star Graphs**
Allen Yuan, 17, Detroit Country Day School, Beverly Hills, Michigan

**Second Award of $1,500**

**MA031 A Novel Implementation of the Elliptic Curve Method, Stage 2: Using Weierstrass and Edwards Elliptic Curves for Faster Factorization**
Aishwarya Ananda Vardhana, 16, Jesuit High School, Portland, Oregon

**MA048 Integer Partitions and Sequences**
Manosij G. Dastidar, 18, South Point High School, Kolkata, India

**MA051 On the Patterns Existing among Carousel Primes in Base n**
Simanta Gautam, 15, Albemarle High School, Charlottesville, Virginia

**Third Award of $1,000**

**MA001 Developing Analytical Approaches to Forecast Wind Farm Production, Phase II**
Kate Alexandra Geschwind, 16, Mayo High School, Rochester, Minnesota

**MA019 On the Second Eigenvalue and Expansion of Bipartite Regular Graphs**
Wenyu Cao, 18, Phillips Academy, Andover, Massachusetts
MA020  Properties of Hawkins Primes  
Aaron Lawrence Zweig, 14, Randolph High School, Randolph, New Jersey

MA032  Method of Optimizing the Monte Carlo Statistical Algorithm to Increase Computational Efficiency in Multidimensional Integration  
Pratheek Nagaraj, 17, Marjory Stoneman Douglas High School, Parkland, Florida

MA050  Lower Bounds for Odd Perfect Numbers  
Anirudh Prabhu, 16, West Lafayette Junior-Senior High School, West Lafayette, Indiana

Fourth Award of $500

MA026  New Triangle Centers Associated with a Triad of the Simulated Circumcircles  
Kang-Ying Liu, 18, Saint Andrew's Priory School, Honolulu, Hawaii

MA029  A Creative Solution for Division by Zero  
Markus Robert Woltjer, 16, Wilsonville High School, Wilsonville, Oregon

MA036  Rational Approximants for Euler-Gompertz Constant  
Vasily Sergeevich Bolbachan, 17, Advanced Science and Education Center - A.N.Kolmogorov Schoo, Moscow, Moscow Region, Russia

MA038  Mathematical Flowers: Patterns in Dots Generated by Intersection Points  
Vahid Fazel-Rezai, 14, Red River High School, Grand Forks, North Dakota

MA052  Braid Group Representations and Braiding Quantum Gates  
Rebecca Chen, 16, Park Tudor School, Indianapolis, Indiana

MA309  From the Around the World Sailing Record to Black Holes: Strange Geometries  
Clement Martinez, 15, College Albert Camus, Miramas, France  
Arnaud Vespa, 16, Adam de Craponne, Salon de Provence, France  
Marine Auriol, 15, College Albert Camus, Miramas, France

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

ME316  Treatment of Simulated Cancer Cells with Compton Scattering-Produced Secondary Radiation  
Matthew Troy Feddersen, 17, Acalanes High School, Lafayette, California  
Blake Marggraff, 18, Acalanes High School, Lafayette, California
First Award of $3,000

ME054 New Smart Weapons: Theranostics—A Novel NanoMedicine Approach to Combat Cancer
Angela Zhang, 16, Monta Vista High School, Cupertino, California

ME083 Risk Assessment of Abdominal Aortic Aneurysm Rupture Using Fluid-Structure Interaction Simulations
Sagar Hitendra Rambhia, 16, Jericho High School, Jericho, New York

ME316 Treatment of Simulated Cancer Cells with Compton Scattering-Produced Secondary Radiation
Matthew Troy Feddersen, 17, Acalanes High School, Lafayette, California
Blake Marggraaff, 18, Acalanes High School, Lafayette, California

Second Award of $1,500

ME004 Inhibition of Plasminogen Activator Inhibitor-1: A Novel Therapeutic Approach for Diabetic Vascular Disease
Samantha Renae Prabakaran, 15, Fort Myers High School, Fort Myers, Florida

ME015 The Effects of Zinc Gluconate and Two Other Divalent Cationic Compounds on Olfactory Function
Christopher Anthony Duncan-Lewis, 18, Winter Springs High School, Winter Springs, Florida

ME030 Monocytic Gene Cell Therapy: Potential Treatment for Alzheimer’s Disease
Jasmine Samaiya Roberts, 18, Paul R. Wharton High School, Tampa, Florida

ME071 Neural Network Diagnostics for Breast Cancer
Brittany Michelle Wenger, 16, The Out-of-Door Academy, Sarasota, Florida

ME076 A Novel Approach to Modeling Genetic Sensory Impairments through De Novo Prediction of Mutant Protein Structure
Rebecca Faye Alford, 17, Commack High School, Commack, New York

ME096 Inflammation Is Skin Deep with Gingerol and Transfersomes
Kishore Balasubramanian, 14, Klein Oak High School, Spring, Texas

Third Award of $1,000

ME017 Seeking Cures: An Evaluation of the Toxicity of MAP Kinase Inhibitor U0126 in an Animal Model
Alexander Zhang, 14, Little Rock Central High School, Little Rock, Arkansas

ME049 Using the Degree of End Organ Damage to Predict the Outcomes of Heart Failure Patients after Mechanical Circulatory Support Device Implantation
Qiaoyi Li, 18, Briarcliff High School, Briarcliff Manor, New York
Silver Nanoparticles Affect Cell Messenger Delivery
Anushua Bhattacharya, 16, East Ridge High School, Woodbury, Minnesota

Testing the Correlation between B7-H1 and PTEN Signal Expression in Kidney Cancer Cells
Michael Charles Zaiken, 17, Century High School, Rochester, Minnesota

In silico Exploration of Aberrant Methylation
Achutha Narayana Raman, 18, Dover-Sherborn Regional High School, Dover, Massachusetts

Effects of Diabetes Mellitus on Vasculogenesis Capacities of Mesenchymal Stem Cells
Shubha Srinivas Raghvendra, 17, Saint Francis High School, Mountain View, California

Modeling of Human Non-Deletional Hereditary Persistence of Fetal Hemoglobin (HPFH) Conditions in Beta-Globin Locus Transgenic Mouse Models: The -175 (T to C) and -195 (C to G) A Gamma-Globin Gene Point Mutations
Prarthana Jignesh Dalal, 17, Shawnee Mission East High School, Prairie Village, Kansas

KLF4 and KLF4-α: Working Together to Fight Pancreatic Cancer
Jiawen Wei, 18, Bellaire Senior High School, Bellaire, Texas

Scaffolds that Baffle: A Study of in vitro Differentiation of Cells via Notch Signaling in a 2D/3D Biomaterial Environment
Shantanu Abhishek Banerjee, 17, Westwood High School, Austin, Texas
Varun Akella Koneru, 17, Westwood High School, Austin, Texas

Efficient Generation of Dopaminergic Neurons from Skin-derived Precursor Cells: Novel and Autologous Treatment for Parkinson's Disease
Mohamed Reda Bensaidane, 18, Champlain College St. Lawrence, Quebec City, Quebec, Canada
Alexandre Lemieux, 18, Cegep de Sainte-Foy, Sainte-Foy, Quebec, Canada

Intracellular Calcium and Prostate Cancer
Dalia Martinez-Marin, 17, Lubbock High School, Lubbock, Texas

CTLA4 Levels in T-Cells of Celiac Disease Patients
Mary Olivia Richardson, 16, duPont Manual Magnet High School, Louisville, Kentucky
Fabric to Health Treatments Impregnated of Zirconium Oxide and Silver Nanoparticles with Chitosan II
Kawoana Trautman Vianna, 18, Fundacao Escola Tecnica Liberato Salzano Veira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil

The Programming of and the Application of Automated Digital Microscopy in Analyzing Lung Inflammation and Cellular Imagery
Joseph Darius Soltzberg, 18, Hawken School, Chesterland, Ohio

Erythrocyte Dysfunction and Amelioration in Hypercholesterolemic Conditions
Siddhartha Gautama Jena, 17, International Academy, Bloomfield Hills, Michigan

A Novel Approach to Wound Therapy: The Effect of Plant Stem Cells on Mesenchymal Stem Cells When Exposed to UV Radiation
Meagan-Helen Henderson, 16, Miss Edgar’s and Miss Cramp’s School, Westmount, Quebec, Canada

Loss of Chaos in Parkinson’s Disease: Using Fractal Mathematics to Understand the Effects of the Decoupling of the Basal Ganglia from the Cortex in Parkinson’s Disease
Leah Avi Balay-Wilson, 18, Lincoln Park High School, Chicago, Illinois

Modulation of ERK5 in Inhibiting Breast Cancer Cell Migration and Invasion

A Novel Discovery: Thalamic Neurodegeneration in Huntington’s Disease
Bowei Deng, 17, White Station High School, Memphis, Tennessee

3-Dimensional Bio-imprinting of Proteins and Viruses
Kelsey Skyler McKenna, 17, South Side High School, Rockville Centre, New York
Alan Eyal Czemerinski, 18, The Wheatley School, Old Westbury, New York
Tom Jie Wang, 16, The Wheatley School, Old Westbury, New York

Neuroscience of Longevity: Effects of Stress and Antioxidant Genes on the Lifespan of Transgenic Drosophila melanogaster
Lisa P Michaels, 15, Shepton High School, Plano, Texas
Tess P Michaels, 17, Plano West Senior High School, Plano, Texas

A Search for Reliable Molecular Cytogenetic Markers of Prostate Cancer Prognosis
Alison Nicole Tradonsky, 17, San Diego Jewish Academy, San Diego, California
Tammy Yetta Rubin, 18, San Diego Jewish Academy, San Diego, California
**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**

M1030  
**A Novel Approach to Mapping Protein Interactions during Pilus Biogenesis by Using *in vivo* Photocrosslinking**
Erica Brooke Portnoy, 17, Commack High School, Commack, New York

**First Award of $3,000**

M1030  
**A Novel Approach to Mapping Protein Interactions during Pilus Biogenesis by Using *in vivo* Photocrosslinking**
Erica Brooke Portnoy, 17, Commack High School, Commack, New York

M1041  
**The Protective Effects of the Violacein Pigment against UV-C Irradiation in *Chromobacterium violaceum***
Andrew Nickolas Abboud, 18, Tippecanoe High School, Tipp City, Ohio

**Second Award of $1,500**

M1009  
**Identification and Characterization of Bacterial Endophytes as Novel Bio-inoculants for Jatropha**
Yuan Jin Tan, 17, Raffles Institution, Singapore, Singapore

M1028  
**A Solution to the Worldwide Malaria Epidemic: *T. gondii* Mitochondria-Associated Proteins as Potential Drug Targets of Tomorrow**
Matthew Karmen McIntyre, 18, Yorktown High School, Yorktown Heights, New York

M1029  
**Identification of the Target of the Antibiotic Salinamide A***
Katherine Yon Ebright, 17, North Brunswick Township High School, North Brunswick, New Jersey

M1067  
**Beta Lactam Antibiotics Stimulate Non Typeable *Haemophilus influenzae* Biofilm Formation *in vitro***
Kathleen Rose Maguire, 17, Marlborough School, Los Angeles, California

**Third Award of $1,000**

M1006  
**Investigating Acyl-homoserine Lactone Based Quorum Sensing Dependency in Mucoid and Nonmucoid *Pseudomonas aeruginosa* Biofilm Development**
Spencer Chang, 16, West Linn High School, West Linn, Oregon

M1024  
**Evaluating the Role of the HOG1 and ESCRT Pathways in Host/Cell Interaction and Stress Response of *Candida albicans***
David Kenneth Tang-Quan, 18, Palos Verdes Peninsula High School, Rolling Hills Estates, California
MI027  Analysis of the Bacterial Heat Shock Response to Photodynamic Therapy-Mediated Oxidative Stress  
Tyler Gordon St. Denis, 17, John Jay High School, Cross River, New York

MI040  Plant Symbiotic Microfungi as Novel Forms of Cellulase and Ligninase Enzymes for Biofuel Production, a Two-Year Study  
Francisco Xavier Orozco, 18, Tucson Magnet High School, Tucson, Arizona

MI050  Functional Characterization of Green Tea-responsive Proteins in *Escherichia coli*  
Peter Yin, 17, Ames High School, Ames, Iowa

MI061  Microbial Explorations of a New Window into the Death Valley Deep Hydrological Flow System  
Alexandra Elane Wheatley, 18, Northwest Career and Technical Academy, Las Vegas, Nevada

MI305  Bioengineered rASS Protein Treatment Mitigates Bacterial Lipopolysaccharide Toxicity  
Alvin Wang, 17, Oak Hall School, Gainesville, Florida  
Gabriel Enrique Molina, 17, Oak Hall School, Gainesville, Florida  
Apurv Suman, 17, Oak Hall School, Gainesville, Florida

Fourth Award of $500

MI014  The Effect of Holy Basil on the Growth of Respiratory Viruses (Adenovirus and Respiratory Syncytial Virus)  
Sangamithra Vardhan, 15, West Shore Junior/Senior High School, Melbourne, Florida

MI021  FiGHTING BACII, Phase IV: The Isolation of Anti-proliferative Phytochemicals from Cranberries to Eradicate *Escherichia coli*  
Jordan Mark Grainger, 18, Rio Rancho High School, Rio Rancho, New Mexico

MI031  Synthesis and Use of Gold Nanoparticle Therapeutics in Antibiotic-Resistant Bacteria  
Soyeun Yang, 16, Fairview High School, Boulder, Colorado

MI032  Epstein-Barr Virus-Induced Alterations to Cellular Chromatin: A Potential Mechanism for Hit and Run Oncogenesis  
Ethan Traveny Skaggs, 17, Caddo Parish Magnet High School, Shreveport, Louisiana

MI037  Investigating the Effects of Autoinducer Analogs on Quorum Sensing in *Vibrio harveyi*  
Felix F. Angelov, 17, Niles Township West High School, Skokie, Illinois

MI043  Nipping Nephritis in the Bud  
Rahi Dilip Punjabi, 14, Advanced Math and Science Academy Charter School, Marlborough, Massachusetts
MI046  Interrupting Bacterial Conversation with Black Olive
(Bucida buceras) Extracts
Rohan Batra, 16, American Heritage School, Plantation, Florida

MI312  Testing the Effect of Variable Surface Adhesiveness on the Movement Velocity of
"Gliding" Cyanobacteria to Test Bacterial Gliding Theory
for Cyanobacterial Motility
Kevin Timothy Keller, 17, Battlefield High School, Haymarket, Virginia
Abhinav Sai Venkat, 17, Battlefield High School, Haymarket, Virginia

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
PH037  Countering Nuclear Terrorism: Novel Active and Passive Techniques
for Detecting Nuclear Threats
Taylor Ramon Wilson, 17, The Davidson Academy of Nevada, Reno, Nevada

First Award of $3,000
PH010  The Flow Feature around Insects and Bionic Wing Based
on Wind Tunnel Test
Yimeng Shi, 18, The High School Affiliated to Renmin University of China, Beijing,
Beijing, China

PH037  Countering Nuclear Terrorism: Novel Active and Passive Techniques
for Detecting Nuclear Threats
Taylor Ramon Wilson, 17, The Davidson Academy of Nevada, Reno, Nevada

Second Award of $1,500
PH015  Characterizing the Effects of Asteroid Belt Perturbations on the Orbits
of the Inner Planets
Nikita Michael Bogdanov, 17, Albuquerque Academy, Albuquerque, New Mexico

PH027  N-Body Computational Analyses of the Aerocapture of Planetesimals
Using Symplectic Algorithms
Ian Alexander Sohl, 16, DaVinci Academy of Science and the Arts, Ogden, Utah

PH062  Better Images, Fewer Samples: Optimizing Sample Distribution
for Compressed Sensing in Radio Interferometry
Clara Louisa Fannjiang, 17, Davis Senior High School, Davis, California

PH304  Studies of Cell Elasticity by Nonlinear Damping
Janet Yun-Chen Sung, 18, Taipei First Girls High School, Taipei City,
Chinese Taipei
Nai-Wen Hu, 16, Taipei First Girls High School, Taipei City, Chinese Taipei
Third Award of $1,000

PH020  The Optimization of an Electrostatic Solar Sail through Three-Dimensional Plasma Simulation
Austin Joseph Hess, 18, Mechanicsburg Area Senior High School, Mechanicsburg, Pennsylvania

PH026  The Construction of a Small Dense Plasma Focus Using a Novel Experimental Setup
Adam Joseph Bowman, 15, Montgomery Bell Academy, Nashville, Tennessee

PH038  Characterizing the Spectral and Flow Characteristics of Microhollow Cathode Discharges
Kamal Shah, 18, Dr. Ronald E. McNair Academic High School, Jersey City, New Jersey

PH039  The Close Binary Fraction: A Bayesian Analysis of SDSS M Dwarf Spectra
Benjamin Mathias Clark, 15, Penn Manor High School, Millersville, Pennsylvania

PH046  Finding Harmonics in Plasma
Dylan Edward Moore, 17, Alameda Community Learning Center, Alameda, California

PH053  Effects of Cathode Composition on Inertial Electrostatic Confinement Fusion Reactors
Charles Douglas Ramey, 18, Northgate High School, Newnan, Georgia

PH064  Light Curve and Orbital Analysis of Amor Asteroid 2000NF5
Weishuang Linda Xu, 17, Lynbrook High School, San Jose, California

Fourth Award of $500

PH002  Size-Effects on Correlated Etching of Few-Layered Graphene Nanoribbons
Arunita Kar, 17, Paul Laurence Dunbar High School, Lexington, Kentucky

PH011  Multifunctional Scanner of the Angular Spectrum
Polina Vladimirovna Shalaeva, 16, Lyceum # 40, Nizhny Novgorod, Russia

PH022  Determining “Hot Spots” through Correlations of CMEs and Solar Flares
Travis Le, 16, Punahou School, Honolulu, Hawaii

PH029  Nonlinear Modeling and Optimization of Opioid Peptide Delivery
Stanley Paul Palasek, 16, Sonoran Science Academy, Tucson, Arizona

PH041  Isolation and Optimization of the Radial Electric Field for the Proton Electric Dipole Moment Experiment
Sahir Raoof, 17, Jericho Senior High School, Jericho, New York

PH048  Extending the Motional Stark Effect Diagnostic to Low Magnetic Fields: Towards Implementing a Laser-induced Fluorescence Technique
Nicole Yeechi Tsai, 17, High Technology High School, Lincroft, New Jersey
PH302  The Desk Model of a Multilayer Magnetic Nanoparticle  
Lev Yurovskiy, 16, Lyceum #40, Nizhniy Novgorod, Nizhegorodskaya, Russia  
Grigory Astretsov, 17, Lyceum # 40, Nizhny Novgorod, Nizhegorodskaya, Russia  

PH310  Determination and Modeling of the Shape of an Asteroid by Analysis of Its Light Curve  
Florian Livet, 17, LGT Leonard de Vinci, Montaigu, France  
Corentin Pasquier, 17, LGT Leonard de Vinci, Montaigu, France  
Titouan Coislier, 17, LGT Leonard de Vinci, Montaigu, France  

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  
PS011  The Use of Sodium Polyacrylate to Increase Crop Production in Dry-Land Farming  
Kira Elizabeth Powell, 16, Odessa High School, Odessa, Washington  

First Award of $3,000  
PS011  The Use of Sodium Polyacrylate to Increase Crop Production in Dry-Land Farming  
Kira Elizabeth Powell, 16, Odessa High School, Odessa, Washington  

Second Award of $1,500  
PS033  Racing to Find Molecular Markers to Differentiate Pathogen Races Attacking Lentil Crops  
Rui Song, 15, Walter Murray Collegiate Institute, Saskatoon, Saskatchewan, Canada  

PS303  Phyto Chemical and Ethnobotanical Studies of Acmella spilanthoides Cass (Buttonwood) and Its Importance in Medicine  
Kelvin Russell Cespedes Nano, 15, Educational Institution Divina Pastora, Oxapampa, Pasco, Peru  
Angel Francisco Solis Gozar, 16, Educational Institution Divina Pastora, Oxapampa, Pasco, Peru  

Third Award of $1,000  
PS001  Improving Environmental Stress Tolerance: The Genetic Engineering of the Oryza sativa Plant Carrying the Escherichia coli Genes Producing Trehalose (Year Two)  
Andrew Michael Joseph, 16, Episcopal High School of Jacksonville, Jacksonville, Florida  

PS020  Enzyme-Mediated DNA Methylation in Arabidopsis thaliana. The Effect of Abiotic Stress on MET1, DRM2, and CMT3 Gene Expression  
Afia Zarrin Khan, 16, Spring Valley High School, Columbia, South Carolina
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS030</td>
<td>The Agricultural Impact of Curlycup Gumweed on Barley Cultivars</td>
<td>Tanner John Coppin, 17, Hankinson High School, Hankinson, North Dakota</td>
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<tr>
<td></td>
<td>Fourth Award of $500</td>
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<tr>
<td>PS002</td>
<td>Efficacy of Chlorine on <em>Salmonella Typhimurium</em> LT2 in Irrigation Water on Produce Items</td>
<td>Kelly Nicole Howard, 18, The Villages Charter High School, The Villages, Florida</td>
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<td>PS004</td>
<td>Rubus Endophytes: Application and Implication for Biological Control</td>
<td>Ann C. Bernert, 18, West Linn High School, West Linn, Oregon</td>
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<tr>
<td>PS010</td>
<td>The Effect of Intraspecific Cooperation in Sibling Plants Descended from the Same Parental Type on the Amount of Biomass Produced</td>
<td>Kelsi Samantha Faley, 16, Heritage High School, Leesburg, Virginia</td>
</tr>
<tr>
<td>PS019</td>
<td>Characterization of the Symbiotic Relationship between <em>Sinorhizobium meliloti</em> and Alfalfa Plants</td>
<td>Fatima Nadeem Mirza, 17, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan</td>
</tr>
</tbody>
</table>