

**The Intel International Science and Engineering Fair 2006**

**presented by Agilent Technologies**

## **Finalist Directory**

**Indianapolis, Indiana**

**May 7-12, 2006**

**Science Service  
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## TABLE OF CONTENTS

Acknowledgments and Award Sponsors .....	ii
Behavioral and Social Sciences .....	1
Biochemistry .....	3
Botany .....	5
Chemistry .....	8
Computer Science .....	10
Earth Science.....	12
Engineering .....	13
Environmental Science.....	19
Mathematics .....	24
Medicine and Health .....	25
Microbiology.....	29
Physics.....	32
Space Science.....	34
Zoology .....	34
Team Projects.....	37
Affiliated Fairs .....	48
Alphabetical List of Finalists .....	67
Finalist Statistics .....	76

SCIENCE SERVICE recognizes and thanks the sponsors of the Intel ISEF 2006 and recognizes with gratitude the Indianapolis Host Committee, its financial supporters, and volunteers for their dedication and hard work. Organizations presenting **Grand Awards** are:

**Intel Foundation**  
**Agilent Technologies, for Biochemistry**  
**Lucent Technologies, for Chemistry**  
**Shell Oil, for Earth Science**  
**Ricoh, for Environmental Science**  
**Lucent Technologies, for Mathematics**  
**Merck Research Laboratories, for Medicine and Health**  
**Lawrence Livermore Laboratories, for Physics**  
**Los Alamos National Laboratories, for Space Science**  
**Science News, for Team Projects**

Special Awards are given by scientific, professional, industrial, educational, and governmental organizations in the form of scholarships, tuition grants, summer internships, scientific field trips, and equipment grants.

Special Award Organizations

Acoustical Society of America	Indiana University
ADA Foundation	Indiana University School of Informatics
Agilent Technologies	Indiana University-Purdue University Indianapolis
Albany College of Pharmacy of Union University	Instituto Tecnológico y de Estudios Superiores de Monterrey
American Association for Artificial Intelligence	Intel Foundation
American Association for Clinical Chemistry	International Amateur-Professional Photoelectric Photometry
American Association of Physics Teachers and The American Physical Society	International Society for Optical Engineering
American Astronomical Society and The Astronomical Society of the Pacific	Marian College
American Chemical Society	MILSET
American Committee for the Weizmann Institute of Science	MIT Lincoln Laboratory
American Geological Institute	Mu Alpha Theta, The National High School and Two Year College Mathematics Honor Society
American Indian Science and Engineering Society	National Anti-Vivisection Society
American Intellectual Property Law Association	National Collegiate Inventors and Innovators Alliance/ The Lemelson Foundation
American Mathematical Society	National Ground Water Association
American Meteorological Society	National Taiwan Science Education Center
American Physiological Society	National Oceanic and Atmospheric Administration –NOAA
American Phytopathological Society	New College of Florida
American Psychological Association	North American Benthological Society
American Society for Horticultural Science	Office of Naval Research on behalf of the U.S. Navy and Marine Corps
American Society for Microbiology	Oregon State University
American Society of Pharmacognosy	Patent and Trademark Office Society
American Speech-Language-Hearing Association	Ricoh
American Statistical Association	Stockholm International Youth Science Seminar (SIYSS)
American Veterinary Medical Association	Showboard, Inc.
ANATEK Electronics, LLC	Sigma Xi, The Scientific Research Society
Ashtavadhani Vidwan Ambati Subbaraya Chetty (AVASC) Foundation	Society for Technical Communication
Association for Computing Machinery	Society of Environmental Toxicology and Chemistry
Association for Women Geoscientists	Society of Exploration Geophysicists
Bureau of Reclamation/U.S. Department of the Interior	Society of Industrial and Applied Mathematics
China Association for Science and Technology (CAST)	U.S. Air Force
Coalition for Plasma Science (CPS)	U.S. Army
Cook Group Incorporated	U.S. Coast Guard
Department of Homeland Security, University Programs Office	United Technologies Corporation
Drexel University	University of Sciences in Philadelphia
Endocrine Society	Vacuum Technology Division of the American Vacuum Society
European Union Contest for Young Scientists	Wolfram Research, Inc.
Florida Institute of Technology	Woodard, Emhardt, Moriarty, McNett & Henry
Geological Society of America	Wright State University
IEEE Foundation	
IEEE Computer Society	

# INTEL ISEF FINALIST DIRECTORY

Each # next to the finalist's name indicates previous ISEF participation

An \* identifies non-competing projects

T: precedes the name of the Teacher-Sponsor of the Finalist

A T after the booth ID number indicates a Team Project

## BEHAVIORAL AND SOCIAL SCIENCES

### GRAND AWARDS PRESENTED BY: INTEL FOUNDATION

- BE001** **Can Art Express a Preschooler's Emotion When Words Fall Short?**  
Luciana Brink Ranelli, 14, Freshman, East High School, Duluth, Minnesota, T: Aaron W. Salmela
- BE002** **The Sociological Importance of a Living Will According to Various Age Groups**  
Stephen T Hallet, 14, Freshman, F.W. Springstead High School, Spring Hill, Florida, T: Chad Willman
- BE003** **Comparing the Benefits of a Tactile Manipulative vs. a Visual and/or Auditory Stimulus on Cognitive Recall, Through Experimentation and Analysis**  
## Jessica Caroline Stanton, 16, Junior, Columbia High School, Lake City, Florida, T: Charleen Marie Kelley
- BE004** **The Effects Six Sigma Methodology Has on E-Bay Businesses**  
Shiyu Xu, 16, Junior, Winona Senior High School, Winona, Minnesota, T: Kenneth James Mann
- BE005** **Name and Its Affect on Personality/Social Traits, Career, and Attire**  
Liesl A. Swoyer, 16, Junior, F.W. Springstead High School, Spring Hill, Florida, T: Craig W. Gates
- BE006** **Working Memory Interference Effect on Visual ERP's**  
Mary Margaret Brinkopf, 17, Junior, Canterbury School, Fort Myers, Florida, T: Mary Elizabeth Mirro-Glass
- BE007** **Eyewitness Accuracy**  
Mariah Lynn Stanley, 18, Senior, Titusville High School, Titusville, Florida, T: Nancy Margaret Yates
- BE008** **Does the Odor of Chocolate Stimulate Human Memory?**  
Adrienne Marie Heintz, 17, Junior, Bradenton Preparatory Academy, Bradenton, Florida, T: Larry Gaudio
- BE009** **The Impact of Work Force Migration on the Psychological and Social Development of Children**  
Sorina Codrea, 17, Sophomore, "Emil Racovita" National College, Iasi, Iasi, Romania, T: Elena Calistru
- BE010** **Testing Social Contract Theory in Structured and Unstructured Societies**  
Edie Marie Uyesugi, 17, Junior, Paoli Junior/Senior High School, Paoli, Indiana, T: Laurie Jo Andry
- BE011** **Is Age a Factor of the Stroop Effect?**  
Jerrica Lynn Williams, 16, Junior, Benjamin E. Mays High School, Atlanta, Georgia, T: Sherry Darby
- BE012** **Animal Caring: An Educational Proposal**  
Anelise dos Santos Klein, 18, Sophomore, Fundacao Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil, T: Vera Maria Mosmann
- BE013** **The Effects of Caffeine Consumption on the REM Sleep Period**  
Caroline Anne Blosser, 16, Sophomore, Upper Arlington High School, Upper Arlington, Ohio, T: Wendy Gallapoo
- BE014** **The Effect of Musical Training on the Cerebral Lateralization of Musical Sequences**  
Alysha Harper Owen, 15, Sophomore, Dallastown Area High School, Dallastown, Pennsylvania, T: Wendy Freyer
- BE015** **Subject Eyewitness Memory of Photograph Stimulus Based Upon Long and Short Response Questions Posed**  
Pioneer Cole Winter, 18, Senior, Dr. Michael M. Krop Senior High School, Miami, Florida, T: Michael Fass
- BE016** **The Effects of Race, Age, and Gender on Spatial Behavior: An Observational Project Conducted on the D.C. Metro Rail**  
Anne Kelly Minoff, 17, Junior, Yorktown High School, Arlington, Virginia, T: Deborah Waldron
- BE017** **The Effect of Information Organization on Memory Recall**  
Alexander Cary Wilkerson, 16, Junior, Chantilly High School, Chantilly, Virginia, T: Jenay Sharp Leach
- BE018** **The Ability to Recall: Male vs. Female**  
Hannah Elizabeth Reid, 16, Sophomore, Upper Sandusky High School, Upper Sandusky, Ohio, T: Teresa Jean Harris
- BE019** **It's Not as Easy as 1-2-3: Limits of the Human Ability to Count**  
Jake Baron, 17, Senior, Stuyvesant High School, New York, New York, T: Anne de Sosta Manwell
- BE020** **The Context Effect of Sense Stimuli on Declarative Memory**  
# Samuel Jang, 16, Sophomore, Nicolet High School, Glendale, Wisconsin, T: Eliot Scheuer
- BE021** **Visualizing Graphical Information for the Visually Handicapped: A Low-cost Haptic Feedback Display**  
## Ahmad Shakir Manshad, 16, Senior, Las Cruces High School, Las Cruces, New Mexico, T: Muhanad Shakir Manshad
- BE022** **The Dependence of Image Recall and Recognition on Pixel Size in Humans**  
Granton A. Jindal, 15, Sophomore, Baton Rouge Magnet High School, Baton Rouge, Louisiana, T: George W. Fisher
- BE023** **The Effects of Stereotype Threat Relating to Gender and 11+ Grading**  
Katherine Charlotte Rachel Donnelly, 18, Senior, Loreto College Coleraine, Coleraine, County Derry, Northern Ireland, T: Brian McKenna
- BE024** **Sounds into Syllables™ II Windows to the World of Childhood Autism**  
# Kayla Cornale, 16, Junior, Assumption Roman Catholic Secondary School, Burlington, Ontario, Canada, T: Kathy Perino
- BE025** **The Emotional Reaction to Films Scores With and Without Original Film Context**  
William Alexander Locke, IV, 17, Junior, Saint Charles West High School, St. Charles, Missouri, T: Joan Twillman
- BE026** **Game Theory and Strategic Behavior: A Study of Behavior in Strategic Settings**  
Lucia Seda, 15, Sophomore, Academia del Perpetuo Socorro, San Juan, Puerto Rico, T: Maribel Garcia
- BE027** **Cerebral Dominance: Does It Affect Academics?**  
Jenna Kathryn Johnson, 16, Junior, Burnsville High School, Burnsville, Minnesota, T: Jennifer Jo Hugstad-Vaa
- BE028** **The Determining Factors of Gasoline Prices**  
Henry Jathuren Neilson, 16, Sophomore, Saint Michael's Academy, Bryan, Texas, T: Somkid Clarke
- BE029** **Word Segmentation in Language Acquisition: Assessing Ambiguities Between Word Offsets and Transitional Probabilities**  
Riana Juhn Betzler, 17, Senior, The Fox Lane High School, Bedford, New York, T: Nancy Williams
- BE030** **Attention in the Brain: A Study of Cognitive Control Using Functional Magnetic Resonance Imaging**  
Maggie Delano, 17, Senior, Ossining High School, Ossining, New York, T: Angelo Piccirillo

- BE031 Visual Illusions as Tools in Schizophrenia Research**  
Esther Pustil'nik, 18, Senior, Israeli Arts and Sciences Academy, Jerusalem, Israel, T: Oren Shriki
- BE032 # The Effects of Television Violence on Adolescents**  
Supal Janak Desai, 17, Senior, Celebration High School, Celebration, Florida, T: Leslie Ann Rivera
- BE033 The Impact of Individual Religious Commitment on Academic Achievement, Hope and Quality of Life in Adolescents**  
Sarah Batya Joselow, 17, Senior, Ossining High School, Ossining, New York, T: Angelo Piccirillo
- BE034 The Playing Monopoly: Does the Shelf-life of a Product Affect the Extent of Collusion Among Its Sellers?**  
William Alexander Johnson, 17, Junior, Murphy High School, Mobile, Alabama, T: Wanda Tomlinson Griffis
- BE035 ### The Wishing Tree: A Six-Year Analysis of Human Desire**  
Elizabeth Anne Baker, 17, Senior, University High School, Tucson, Arizona, T: Gene D. Woon
- BE036 Social Disorder Cures on the Horizon? A Study of the Effects of Oxytocin and Vasopressin on Social Memory**  
Katie Lane Patterson, 18, Senior, Miller County R-III High School, Tuscumbia, Missouri, T: Constance Helen Wyrick
- BE037 How Do People Form Addictions and Are They Hereditary?**  
Kristina Nicole Argo, 17, Junior, Central High School, Brooksville, Florida, T: Chad Joel Willman
- BE038 Coming Out of the Closet: A Statistical Study of the Latino Parent Level of Tolerance Towards Their Teenage Children Expressing Their Homosexual or Lesbian Preference**  
Mariely M. Cepeda-Lopez, 16, Junior, Colegio Sonifel, Fajardo, Puerto Rico, T: Angel L. Diaz-Rosario
- BE039 # On the Count of Three You Will Feel Very Sleepy: Myths and Realities About Hypnosis**  
Michael Gabriel Rodriguez, 16, Junior, Jose Gautier Benitez High School, Caguas, Puerto Rico, T: Lourdes Hernandez
- BE040 Atypical Visual Behaviors as Early Indicators of Autism in Children**  
Maya Nina Wolpert, 18, Senior, Hathaway Brown School, Shaker Heights, Ohio, T: Patty Hunt
- BE041 The Impact of Attack Ads on Public Perceptions During the 2000 Presidential Campaign**  
Michael Brett Katz, 17, Senior, John F. Kennedy High School, Bellmore, New York, T: Barbi Frank
- BE042 The Cognitive and Emotional Factors that Impact an Individual's Likelihood to Use Alternative Energy**  
Allison Erica Dender, 17, Senior, Plainview Old-Bethpage John F. Kennedy High School, Plainview, New York, T: Mary Lou O'Donnell
- BE043 Is Math Just for Boys? Gender Differences in Dropout Rates and Attitudes of Advanced High School Mathematics Students**  
Christina Chung-May Tu, 17, Senior, Roslyn High School, Roslyn Heights, New York, T: Allyson Jane Weseley
- BE044 The Effect of Framing and Described Task Difficulty on Expectations and Performance**  
Michael Elliot Hofer, 17, Senior, Roslyn High School, Roslyn Heights, New York, T: Allyson Jane Weseley
- BE045 Sponj: The Educational Software Suite for CP Children**  
Sinchan Banerjee, 16, Junior, Clear Lake High School, Houston, Texas, T: Stoyan Karabunarliev
- BE046 The Effect of Cognitive Distraction on Driving Ability**  
Henry Branscomb Joe, 16, Sophomore, The Altamont School, Birmingham, Alabama, T: Tessa Magnuson
- BE047 Picture This, That, and the Other: The Post Traumatic Effects of Concussion on the Processing Visual Stimuli, Three Year Study**  
Johnathan Arnold Schoenhals, 18, Senior, Miami High School, Miami, Oklahoma, T: Sally A. Fenska
- BE048 The Human Mind and Mathematics: Explained Through the Golden Ratio**  
Breanna Bounds Johnson, 18, Senior, Southridge High School, Beaverton, Oregon, T: Joel James Morgan
- BE049 Gender Differences in Rationality: A Study of If and Why Gender Differ in How Closely They Adhere to the Theory of Rational Behavior**  
Marshall Bradley Everett, 17, Junior, Shoals Christian School, Florence, Alabama, T: Peter M. Williams
- BE050 Use Your Brain to Lose Your Pain**  
Sarah Beth Gillund, 18, Senior, Wildrose Alamo Public School, Wildrose, North Dakota, T: Shelly D. Christensen
- BE051 The Capacity for Empathizing and Systemizing in Children with Williams Syndrome: Identifying a Cognitive Phenotype**  
Milan Farrell Satcher, 17, Senior, Valley Central High School, Montgomery, New York, T: Joseph Fracalossi
- BE052 Listening with the Eyes: Does Sight Focus Auditory Learning?**  
Zachary Scott Mace, 16, Junior, Parkersburg High School, Parkersburg, West Virginia, T: Fredrick Ira Doak
- BE301T # # Determination of Gender and Age by Thumbprints, Year Two**  
Meryl Adelman Hulteng, 15, Sophomore  
Shannon Marie Cassidy, 16, Sophomore  
Wilsonville High School, Wilsonville, Oregon  
T: Holly Rayliene Gardner; T: Jay Schauer
- BE302T Music to My Ears**  
Jordan Nicole Farris, 16, Sophomore  
Rachel Elizabeth Purtee, 15, Sophomore  
Nettleton High School, Jonesboro, Arkansas  
T: Jana Karen Hudspeth
- BE303T Cultural Influence on Eye Movement Behavior in Response to a Social Target Image as Measured by a Novel Eye-tracking Device**  
Cameron Walden Dennis, 18, Senior  
Suji Paek, 17, Senior  
West Salem High School, Salem, Oregon  
T: Graham Dey
- BE304T Does Gender Affect Handwriting Analysis?**  
Jessica Marie Gamber, 16, Sophomore  
Angela Kristine Neslund, 16, Sophomore  
Champlin Park High School, Champlin, Minnesota  
T: Jaelyn Paul
- BE305T Clothing for Handicapped People**  
Petra Bezchlebova, 20, Senior  
Jana Malcova, 20, Senior  
Secondary School of Clothing, Straznice, Czech Republic  
T: Katarina Nemsosvka
- BE306T The Influence of Self-Esteem in the Learning Process**  
Lidiane Leal Andriolla, 16, Sophomore  
Alexandre Borges Alves Spindola, 17, Senior  
Fundacao Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil  
T: Alberto Dal Molin Filho
- BE307T Comprehension on the Computer: "Seenior" Computer Lately?**  
Kyle Joseph Jurick, 16, Junior  
Jennifer Marie Pelton, 18, Senior  
Rebecca Mae Adams, 18, Senior  
Hicksville High School, Hicksville, Ohio  
T: Kathy R. Laney
- BE308T Evaluating the Use of Softwares in Professional Education**  
Carlos Theobaldo Renck, 18, Freshman  
Bruno Diego de Mello, 18, Freshman  
Estadual Technical School Monteiro Lobato, Taquara, Rio Grande do Sul, Brasil  
T: Joao Alberto da Silva
- BE309T Resilience: A Proposal Facing Adversity, II**  
Gabriela Maricel Andreoli, 16, Sophomore  
Malen Gotte, 16, Junior  
Patricia Natali Grinovero, 18, Senior  
Club de Ciencia Libertad, Cerrito, Entre Rios, Argentina  
T: Miriam Alejandra Hernandez
- BE310T Teen Obesity: Is Portion Size Perception the Problem?**  
Samantha Grace Hennenfent, 14, Freshman  
Austin Marie Malach, 14, Freshman  
Fort Zumwalt West High School, O'Fallon, Missouri  
T: Mary Louise Hennenfent

- BE311T Comparative Study on the Causes of School Violence**  
Tiffany Nicole Doll Requena, 15, Sophomore  
Lorena Enid Berges, 15, Sophomore  
Colegio Marista, Guaynabo, Puerto Rico  
T: Isabel Perez
- BE312T Difference in Behavior of Lake Apopka Area Children Whose Parents Were Directly or Indirectly Exposed to Pesticides**  
Grant Fabian Chernoby, 17, Junior  
Shahin Pourkaviani, 16, Junior  
Lake Brantley High School, Altamonte Springs, Florida  
T: Susan Behel
- BE313T The Familiality of Autistic Traits in Families of Children with Autism Spectrum Disorders (ASD)**  
Nathalie Fay Tadena, 16, Junior  
Alene Georgia Anello, 18, Senior  
Ossining High School, Ossining, New York  
Sleepy Hollow High School, Sleepy Hollow, New York  
T: Angelo Piccirillo ; T: Janet R. Longo-Abinanti
- BE314T Biology Education Across the Nation**  
Gauri Manglik, 17, Senior  
Xinyi Duan, 17, Senior  
Jenna Ashley Rosenberg, 17, Senior  
Briarcliff Manor High School, Briarcliff Manor, New York  
T: Michael Inglis
- BE315T Manipulation Behind the Scenes**  
Dawn Chee Zhao, 15, Freshman  
Karen Jennifer Lin, 14, Freshman  
Shepton High School, Plano, Texas  
T: Nadine Harris
- BE316T Reading, Rote, and Russian**  
Elizabeth Margaret Sullivan, 18, Senior  
Alyssa Joy Edlund, 17, Senior  
John Marshall High School, Rochester, Minnesota  
T: Kirk F. Payne
- BE317T What Is the Relationship Between IQ and Hemispherical Brain Dominance?**  
Brett Lesley Mayer, 17, Junior  
Shanna Erin Wilson, 17, Junior  
Jillayne Renee Pfeifle, 17, Junior  
Timber Lake High School, Timber Lake, South Dakota  
T: LuAnn Lindskov
- BE318T The Effects of CNS Stimulants and SSRIs on the Formation of Conditioned Long Term Memory and Learning Behaviors in Sleep Deprived Wildtype *Drosophila melanogaster***  
Mary Martha Ferrari Douglas, 17, Junior  
Alison W. Liu, 16, Junior  
Manhasset High School, Manhasset, New York  
T: Peter Guastella
- BE319T Video Games and Your Health**  
Helen Terri Ly, 17, Senior  
Wellis Leung, 17, Senior  
Josiah Quincy Upper School, Boston, Massachusetts  
T: June Li
- BE320T Preconceived Stereotypes in School Children**  
Meghan Sophia Luther, 15, Sophomore  
Veronika Nicole Biskis, 15, Sophomore  
Henry Perrine Baldwin High School, Wailuku, Hawaii  
T: Barbara Huntley
- BE321T Manipulating with False Memories**  
Joseph Pak Noh, 15, Freshman  
Styles Michael Smith, 15, Freshman  
Glencoe High School, Hillsboro, Oregon  
T: Ellen Beth Lyon
- BE322T Driving Plus Cell Phones Equals No Concentration**  
Jing Chen, 15, Freshman  
Frances May Bruce, 14, Freshman  
Mayo High School, Rochester, Minnesota  
T: John McDonald; T: Debra DeYoung
- BE323T High School Students. . . Future Freshmen?**  
Felix Meineri, 15, Junior  
Martin Garciaarena, 15, Junior  
Mariana Antonella Nigro, 16, Junior  
Colegio San Ignacio, Tandil, Buenos Aires, Argentina  
T: Marta Luz Meineri
- BE324T The Antigales of Coranzull - Past, Present and Future**  
Rosa Arminda Siares, 17, Freshman  
Noelia Armanda Siares, 17, Freshman  
Escuela Nro 362, Coranzuli, Jujuy, Argentina  
T: Ivan Marcelo Chani
- BE325T Chicha Culture: Between the Respect and the Forgetfulness**  
Jose Humberto Armella, 14, Freshman  
Blanca Zulema Martearena, 14, Freshman  
Escuela de Comercio Nro1 Republica Argentina, La Quiaca, Jujuy, Argentina  
T: Maria Isabel Rocha

## BIOCHEMISTRY

### GRAND AWARDS PRESENTED BY: AGILENT TECHNOLOGIES

- BI001 Effect of Ferric Uptake Regulatory Protein on the Transcription of the Superoxide Dismutase Gene of *Escherichia coli***  
Katherine Marie Shaeffer, 18, Senior, Breck School, Minneapolis, Minnesota, T: Lois Fruen
- BI002 Lead to Gold...Plants to Plastics: Which Agricultural Resource Will Satisfy the "Triple Bottom Line"?**  
Casey Jo Freeman, 18, Senior, Mid-Buchanan High School, Faucett, Missouri, T: Teresa Ann Freeman
- BI003 Oligomer Base Adduction and Cleavage After Epoxide Treatment**  
# Lindsey Marie Hubley, 17, Junior, Woods Cross High School, Woods Cross, Utah, T: Jeanne Wagstaff
- BI004 Bovine Age vs. Cheese Quality**  
Guinevere Patricia Ellen Bitker, 16, Junior, Westbrook-Walnut Grove High School, Westbrook, Minnesota, T: Garret Charles Bitker
- BI005 Transient Gene Expression in HEK-293 Cells: Efficacy of Liposomal Transfection for Protein Production by Suspension Cultures**  
Yueyang Li, 17, Senior, Montgomery Blair High School, Silver Spring, Maryland, T: Glenda Torrence
- BI006 Functionally Predictive Positions in Water and Glycerol Transport Proteins**  
Corbin Andrew Burstein, 15, Sophomore, Blanche Ely High School, Pompano Beach, Florida, T: Lynda Mason
- BI007 Reactive Oxygen Species Accumulation During Embryogenesis Significantly Modulates Plant Fertility: Role of ROS Scavenger Genes in Enhancing Crop Yield**  
## Yahya Maqsood Mohammed, 17, Senior, Niceville Senior High School, Niceville, Florida, T: Jodi Lynn Maker
- BI008 The Autocatalytic Assembly of Azoarcus Ribozyme and the Recombination of RNA in a Compartmentalized System: An Origin-of-Life Study**  
## Sergio-Francis Mellejor Zenisek, 17, Senior, Oregon Episcopal School, Portland, Oregon, T: Niles Lehman
- BI009 The Function of a Novel Apoptosis Regulating Protein, XAF-1C, in Breast Cancer Cells**  
Charles William Dyer, 17, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements
- BI010 Shattered Sugar**  
Laura Ann Willig, 16, Junior, Cornerstone Christian School, San Angelo, Texas, T: Gretchen Carter
- BI011 Glucose Uptake Inhibitors and T-Cell Survival: A Second Year Study in Autoimmunity**  
## Rebecca Joy Vitale, 17, Senior, duPont Manual Magnet High School, Louisville, Kentucky, T: Glenn Zwanzig
- BI012 Insulin-regulated Intracellular Trafficking mRNAs in Skeletal Muscle Cells**  
Nina Oiyen Wong, 16, Junior, Dr. Michael M. Krop Senior High School, Miami, Florida, T: David Buncher

- BI013** **Developing a Flow-Cytometric Technique to Identify and Track Migrating Leukocyte Sub-populations During Inflammation**  
Marie Q. Baylon, 16, Junior, Divine Savior Holy Angels High School, Milwaukee, Wisconsin, T: Betty Jo Azpell
- BI014** **The Effects of Biopolishing and Dye Adhesion on Wool**  
Kimberly Nicole Braulick, 15, Freshman, Saint Mary's High School, Sleepy Eye, Minnesota, T: Patricia Ann Braulick
- BI015** **Preventing Amyloid Aggregation with Osmolytes *in vitro* and *in vivo***  
Luis Lafer-Sousa, 16, Junior, Keystone School, San Antonio, Texas, T: Charles Scott Maderer
- BI016** **The Effects of the Iron Specific Chelator, Salicylaldehyde Isonicotinoyl Hydrazone, in Providing Protection to PC3 Cells Exposed to Cesium Radiation**  
## Zachary Carter Strickland, 17, Junior, Christian Academy of Louisville, Louisville, Kentucky, T: Tina Gibson
- BI017** **A Biochemical, Qualitative, Semi-Quantitative Analysis of the Enzyme Supplement Vitalzyme**  
Michelle Chandra Baker, 13, Freshman, Baker Preparatory Academy, Festus, Missouri, T: Marycarol G. Baker
- BI018** **Effect of Dietary Sugars (Glucose and Fructose) on the Production of Reactive Oxygen Species in Fat Cells**  
# Yevgen Yuri Sautin, 15, Sophomore, Eastside High School, Gainesville, Florida, T: Becky Molton
- BI019** **The Effects of Aspartame-containing Sweeteners on *Drosophila melanogaster***  
Alexandra Berger Valente, 16, Sophomore, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil, T: Cynthia Maria Jannuzzi
- BI020** **Surviving Knockdown in Drug-resistant Ovarian Cancer**  
Zixuan Wang, 18, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Alfred D. Lampazzi
- BI021** **Percent Conservation of the Human Insulin Signaling Pathway vs. CNS Development in Lower Organisms, a Continuation**  
# Kathleen Curley Clement, 16, Junior, Langley High School, McLean, Virginia, T: Robert Culbertson
- BI022** **Characterization of the *Arabidopsis thaliana* plsp1-1 and plsp1-2 Lines: Toc75 Suggests a Novel Protein Targeting Pathway**  
# Vinay Tripuraneni, 17, Junior, Clovis West High School, Fresno, California, T: Wayne Gus Garabedian
- BI023** **A Comparative Analysis of Quantum Dot Nanotechnology and Standard Fluorophores**  
Zane Sami Hatahet, 15, Sophomore, Divine Child High School, Dearborn, Michigan, T: Katherine Ellen Higgins-Luthman
- BI024** **Preventing the Effects of Photoactivated Titanium Dioxide on Chromosomal DNA**  
Matthew Samuel Wieder, 16, Junior, SAR High School, Bronx, New York, T: Tobie Brandriss
- BI025** **Gene-Induced Biosynthesis of a Cancer Therapeutic Derived from the *p53* Amino Terminus Elicits Tumor Selective Apoptotic Death of Human Pancreatic Cancer Cells**  
Michael Vishnevetsky, 17, Senior, Midwood High School, Brooklyn, New York, T: Alan Stack
- BI026** **Molecular Computation Based on DNA**  
Philip Daniel Babcock, 18, Senior, Oeffentliches Schottengymnasium der Benediktiner, Vienna, Austria, T: Alfred Moser
- BI027** **Comparing Mitochondrial DNA Through Electrophoresis and DNA Terminator Sequencing**  
Isaac Michael Ketcham, 14, Freshman, Farmington High School, Farmington, New Mexico, T: Donna Cole Schmitt
- BI028** **A Potential New Approach to Chemotherapy in Brain Tumours: Disruption of Connexin 43 Particle Arrangement to Cause Cell Death in Malignant Glioma**  
Yale Stern Michaels, 14, Freshman, Grant Park High School, Winnipeg, Manitoba, Canada, T: Michael Kattenfeld
- BI029** **MuTX: Microenvironment Induction Affecting Cellular Architecture, Migration, and Cell Differentiation**  
Beatriz Alexandra Salvesen Von Essen, 17, Senior, Academia del Perpetuo Socorro, San Juan, Puerto Rico, T: Maribel Garcia
- BI030** **Characterization of a Monoclonal Antibody Against Marburg VLP's**  
Dipika Jairam Gopal, 17, Senior, Mira Loma High School, Sacramento, California, T: Dean Karagianes
- BI031** **Enhanced Production of Artemisinin, an Antimalarial/Anticancer Compound from *Artemisia annua* Plant Cultures**  
# Yun Song, 18, Senior, Herschel V. Jenkins High School, Savannah, Georgia, T: Gini Lea Ennis
- BI032** **Creation of Monoclonal Antibodies for UT-A and UT-B**  
Katie I. Reese, 18, Senior, Fernley High School, Fernley, Nevada, T: Merrie Rumpy
- BI033** **Preparation of "Fruit Juice Calciums" of High Water Solubility from Eggshells**  
Li Li, 18, Senior, Henan Experimental High School, Zhengzhou, Henan, China, T: Lin Li
- BI034** **Asthmatic Inhibition: Co-localization and Interaction of Biomolecules RGS13 and CREB**  
# Lecia Ashanna Moya Brown, 17, Senior, Suncoast Community High School, Riviera Beach, Florida, T: Beth Cozzi
- BI035** **Examining the Evolution of the Influenza Virus**  
# Sanjay Vasudev Saraf, 15, Sophomore, Alfred M. Barbe High School, Lake Charles, Louisiana, T: Carmen Hamilton
- BI036** **Ethanol Production in Bluestem Grass**  
Allison Ruth Wilson, 17, Senior, West Central Valley High School, Stuart, Iowa, T: Larry Charles Schwinger
- BI037** **Design and Synthesis of a GFP-Based Molecular Switch for the Detection of Protein-Protein Interactions**  
Ahmed Hussein Badran, 17, Senior, Tucson Magnet High School, Tucson, Arizona, T: Margaret Wilch
- BI038** **Evolution of asp-6 Aspartyl Protease in Nematodes**  
Daphne Ezer, 16, Sophomore, Waksman Institute, Piscataway, New Jersey, T: Andrew Vershon
- BI039** **The Role of Jagged1 in Neurogenesis Within the Mammalian Olfactory Epithelium**  
Zena Maria Cardman, 18, Senior, Bruton High School, Williamsburg, Virginia, T: Emil Davis
- BI040** **Which Beverages Will Provide High Levels of Antioxidants?**  
Asanka Thimothy Nanayakkara, 14, Freshman, Oxford High School, Oxford, Mississippi, T: Judy T. Nicholas
- BI041** **Genetic Control of the Eye: Quantitative Genetic Modulation of Photoreceptor Density in the Mouse**  
Congcong Guo, 16, Junior, White Station High School, Memphis, Tennessee, T: Angel Perkins
- BI042** **Kinase Pathways Involved in TNF- $\alpha$  Upregulation of Chemotactic Signal Response**  
# Anand Chandranayan Baxi, 16, Junior, White Station High School, Memphis, Tennessee, T: Angel Perkins
- BI043** **Isolation of the Primary Agent of Hydrogen Gas Production Through Fermentation of Carbohydrate-based Materials**  
Jonathan Daniel Rittle, 18, Senior, Conrad Weiser High School, Robesonia, Pennsylvania, T: Raymond Edwards
- BI044** **Alternative Therapies for Advance Stage Melanoma in *Lumbricus terrestris*: Post Operative Treatments**  
Melanie P. Kabinoff, 15, Freshman, Park Vista High School, Lake Worth, Florida, T: Charlo Ann Henderson
- BI045** **Ligand Binding Properties of Breast Cancer Molecular Target Aromatase, Year Two**  
# Jonathan Lloyd Priester, 18, Senior, William B. Murrh High School, Jackson, Mississippi, T: Stanley Vaughn Smith
- BI046** **Design and Development of a Novel Biosensor for the Efficient Detection of Infectious Pathogens and Environmental Invaders**  
# Adrian Veres, 16, Junior, College Jean-de-Brebeuf, Montreal, Quebec, Canada, T: Martine Brousseau
- BI047** **An Investigation on How Different Saliva Samples Buffer a Change in pH**  
Heidrun Grytaa, 19, Senior, Nesbru Videregaende, Nesbru, Akershus, Norway, T: Brit Holtedahl
- BI048** **Antioxidant Protection Against Vascular Cholesterol-Induced Injury to Vascular Cells**  
Christina Josefa van Lier, 18, Senior, Hathaway Brown School, Shaker Heights, Ohio, T: Patty Hunt

- BI049 The Hype on Hypertension!**  
Lia D'Abate, 15, Freshman, The Sacred Heart School of Montreal, Montreal, Quebec, Canada, T: Peter Judson
- BI050 Tumor Suppressor Gene DBC2 Plays an Important Role in Protein Transport**  
Faith Kan Chang, 18, Senior, Syosset High School, Syosset, New York, T: Angela Lukaszewski
- BI051 Investigating the Role of Nup98/96 in Drosophila Spermatogenesis**  
Yuting Patrick Chiang, 18, Senior, The Wheatley School, Old Westbury, New York, T: Paul Paino
- BI052 Isochore Analysis of Arabidopsis thaliana Chromosomes**  
Jennifer Yin Yee Kwan, 16, Sophomore, Vincent Massey Secondary School, Windsor, Ontario, Canada, T: Hon Keung Peter Kwan
- BI053 Locating VP1 Structural Protein in Adeno-Associated Virus Serotype 2/8's Mosaic Capsid**  
Chelsea Lousie Rence, 18, Senior, Sarasota High School, Sarasota, Florida, T: Mavis Agbandje-McKenna
- BI054 The Best Over-the-Counter Medicine Against Heartburn**  
Zelwyn Zadiel Figueroa-Bravo, 14, Freshman, Segunda Unidad Epifanio Estrada, Aguada, Puerto Rico, T: Maria Soto
- BI055 Study of the E. coli and Fecal Coliforms Parameters in the Coastal Water of Yabucoa, Puerto Rico**  
Juan Yomar Abreu-Velazquez, 14, Freshman, S.U Jesus Sanabria Cruz, Yabucoa, Puerto Rico, T: Mary Arlene Figueroa
- BI056 Building and Testing a Prototype DNA Thermocycler**  
Joseph Kruse Brogie, 18, Senior, Lakeview High School, Columbus, Nebraska, T: Edward Leo Kinzer
- BI057 The Ligands Slit2, SlitL2, and Their Putative Receptors Robo1 and Robo4 Are Selectively Expressed in Hematopoietic Stem Cells**  
Stephanie Jinyu Young, 18, Senior, Leland High School, San Jose, California, T: Steve Bowen
- BI058 Using Drosophila Gene Traps to Explore the Genome**  
Nahathai Srivali, 18, Senior, Baltimore Polytechnic Institute, Baltimore, Maryland, T: David B. Nelson
- BI059 Investigation of Homopolymeric Runs in C. elegans Genome with Novel Model for Control Sequences**  
Hann-Shuin Yew, 17, Senior, The Harker School, San Jose, California, T: Daniel Matthews
- BI060 Computational Exploration of Protein Function**  
Anugraha Mahalakshmi Raman, 14, Sophomore, Dover-Sherborn High School, Dover, Massachusetts, T: Greg Tucker
- BI061 Differential Gene Expressions Upon Removal of Zinc Transporters**  
Ilda Bajraktari, 17, Junior, Massachusetts Academy of Math and Science, Worcester, Massachusetts, T: Robert Traver
- BI062 The Potential Use of Natural Chemicals in Treating Cancer**  
##  
Quintisha Marie Walker, 18, Senior, Saginaw Arts & Sciences Academy, Saginaw, Michigan, T: Mathew H. Miller
- BI063 A Novel Role for Telomerase in Stem Cell Differentiation**  
#  
Anneke Ellen Schwob, 17, Senior, Boston Latin School, Boston, Massachusetts, T: Alexandra Montes
- BI064 The Effect of Opioids on Chemokine Production in U937 Monocytes**  
Julian Terrell Otis, 16, Sophomore, Walter Payton College Preparatory School, Chicago, Illinois, T: Walt Kinderman
- BI065 A New Spin on Wound Healing Scaffolds: Physical and Molecular Optimization**  
Amardeep Singh Grewal, 17, Junior, Detroit Country Day School, Beverly Hills, Michigan, T: Gillian vonSeeger
- BI066 Inducible Expression of Brain-derived Neurotrophic Factor in Tissue Cultures**  
Osarimabo Idemudia Imoisili, 17, Senior, Centennial High School, Ellicott City, Maryland, T: Michelle Bagley
- BI067 Effects of Enhanced Muscle Growth on Fatty Acid Uptake in the Skeletal Muscle**  
Gitasree Devi Borthakur, 18, Senior, Iolani School, Honolulu, Hawaii, T: Teresa Cheung
- BI068 Desaturase Gene Expression in the Human Meibomian Gland of the Eyelid: Implications for Ocular Surface Disease**  
Eric William Prouty, 16, Junior, Central Bucks High School West, Doylestown, Pennsylvania, T: Deborah Ann Wysocki
- BI069 Investigating the Natural Selection Pathways in Ten Regions of the Human Genome**  
##  
Jennifer Jing Huang, 18, Senior, Oak Grove High School, Hattiesburg, Mississippi, T: Teresa Sappington
- BI070 Is JAK2 the Unknown Kinase that Passes the Signal from Leptin to STAT3 to Stop Food Consumption?**  
Katherine Yuan Fang, 14, Freshman, Ann Arbor Pioneer High School, Ann Arbor, Michigan, T: Liangyou Rui
- BI071 X-Ray Crystallographic Investigation of RNA Pseudoknots as a Mechanism for Developing New Anti-viral Agents**  
Natalie Yang-Yang Zhang, 18, Senior, North London Collegiate School, London, United Kingdom, T: Emma Loh
- BI072 Effects of Hormones on Carbohydrate Use**  
Catherine Faye Sherman, 16, Sophomore, Mansfield High School, Mansfield, Missouri, T: Pamela Sue Probert
- BI073 Bisphenol: A Leaching Near You**  
Linh Chuc Tran, 17, Junior, Jefferson County International Baccalaureate, Irondale, Alabama, T: Debbie Anderson
- BI074 Improving the Stability of Novel Calcium-Binding Proteins**  
###  
Lev A. Shaket, 17, Senior, Chamblee Charter High School, Chamblee, Georgia, T: Patricia Mote
- BI075 Break It Down**  
Briann Drenea Mitchell, 15, Sophomore, Lutchter High School, Lutchter, Louisiana, T: Lindsay Seely
- BI076 Kinetic Characterization of Inosine-5'-monophosphate Dehydrogenase**  
Taylor Currie Stevenson, 17, Senior, Louisiana School for Math, Science and the Arts, Natchitoches, Louisiana, T: Christopher James Hynes
- BI077 Comparison of Phytochemicals in Functional and Traditional Foods**  
Kali Anne Shephard, 16, Sophomore, Valley Public School, Hoople, North Dakota, T: Kathleen Faye Melaas
- BI078 Novel Algorithms for Automated SNP Genotyping**  
Albert David Shieh, 16, Junior, Chaparral High School, Scottsdale, Arizona, T: Richard Peterson
- BI079 Protein Analysis of Primary and Recurrent Human Malignant Gliomas**  
Michael R. Mitchell, 18, Senior, Brophy College Preparatory School, Phoenix, Arizona, T: Patricia Mazier
- BI080 Understanding the Molecular Causes of Cancer: The Role of MMSET in the Pathogenesis of Multiple Myeloma**  
Kristie Mercedes Charoen, 17, Senior, Yorktown High School, Yorktown Heights, New York, T: Michael Blueglass
- BI081 Study of the Effects of Overexpressed Neural Lazarillo in Transgenic Drosophila melanogaster**  
Derek Wai Tam, 18, Senior, Alhambra High School, Alhambra, California, T: Daniel Gerard Hyke
- BI301T SNPs and Their Correlation with Alzheimer's Disease**  
Andrea Shannon Trader, 17, Junior  
Amy Rachelle Shipley, 17, Junior  
San Lorenzo Valley High School, Felton, California  
T: Jane Paula Orbuch
- BI303T Detection of Creatine Phosphokinase Using Polyaniline Nylon-6 Film**  
Anastasia Efthymiou, 17, Junior  
Aashish Shah, 16, Junior  
Half Hollow Hills High School West, Dix Hills, New York  
T: Chrysi Notskas
- BI304T Levodopa's Effect on Endogenous Morphine Production and the Mu3 Opiate Receptor in SH-SY5Y Cells**  
Kamalakar Atluri, 18, Senior  
Dhruv Vasishtha, 16, Junior  
Herricks Senior High School, New Hyde Park, New York  
Roslyn High School, Roslyn Heights, New York  
T: Richard Quan; T: John Irwin Kranz
- BI305T Polymorphisms in DNA: A Comparison of Canine DNA Study, Year Two**  
Kelsey Anne Shields, 15, Sophomore  
Carly Alayne Miles, 16, Sophomore  
Riverton High School, Riverton, Utah  
T: Sonja Ferruffino



- BI306T Hydroxyurea and N-Acetylcysteine: The Effect on the Sickle Erythrocyte Proteome**  
# Stephanie Anne Stoughton, 16, Sophomore  
# Michael Yenting Wu, 16, Sophomore  
Shepton High School, Plano, Texas  
T: Nadine Harris
- BI307T Nutri-Tortilla for Pizza**  
# Enedina Mendez Martinez, 17, Junior  
Sara Nino Machorro, 16, Junior  
Colegio de Estudios Cientificos y Tecnologicos, Puebla, Mexico  
T: Adriana Reyes Castro
- BI308T A. vulgare, a Three Year Study: Finding a Solvent for the Extraction of the Aggregation Pheromone**  
## Clara Grace Watson, 18, Senior  
# Cailyn Annalece Estey, 17, Junior  
Grenada High School, Grenada, Mississippi  
T: Thomas Jackson Holliday
- BI309T A Screen for Mutants in *Drosophila melanogaster* Which Affects Triglyceride Levels**  
Daniel Yeh, 18, Junior  
Ryan Wai Tam, 16, Junior  
Alhambra High School, Alhambra, California  
T: Daniel Gerarz Hyke

## BOTANY

GRAND AWARDS PRESENTED BY:  
INTEL FOUNDATION

- BO001 *Pueraria lobata* (Kudzu): A Pesticide?**  
Tyler R. Rowland, 17, Junior, Alfred B. Maclay Jr. Day School,  
Tallahassee, Florida, T: Mary J. King
- BO002 *Acer palmatum* in vitro, Year Two**  
# Michael James Bernert, 16, Sophomore, West Linn High School,  
West Linn, Oregon, T: Jaime Kelso
- BO003 The Lean Green Soybean Machine**  
Hannah Ruth Cox, 15, Sophomore, Zane Trace High School,  
Chillicothe, Ohio, T: Jason A. Clark
- BO004 Seeing Red: Tomato Production Response to Reflective Red Wavelengths**  
John Jacob Register, 15, Freshman, Austin High School, Austin,  
Minnesota, T: Susan Louise Register
- BO005 Evaluation of Pesticidal Properties of a Novel Compound**  
Taylor Beth Hoskins, 15, Sophomore, Lincoln Park Academy,  
Fort Pierce, Florida, T: Ramona Geiger
- BO006 How Does Music Affect Plant Growth?**  
Steven Rene Bordelon, 15, Freshman, Lutchter High School,  
Lutchter, Louisiana, T: Valerie N. Stewart
- BO007 Verifying Greenhouse Techniques Used to Test Potatoes for Susceptibility to Powdery Scab**  
Michaela K. Kaiser, 17, Junior, Sargent High School, Monte  
Vista, Colorado, T: Ronna J. Cochran
- BO008 Investigating Bio-Conservational Techniques as Solutions for Decreasing Economic Productivity, Phase II: The Effects of Tillage Reduction on Sugarcane Yields**  
## Tate Benton-Michael Guillotte, 18, Senior, Catholic High  
School, New Iberia, Louisiana, T: Donald Voorhies
- BO009 Biosuppression of Phytopathogens and Analyzation of Rhizosphere Interactions**  
Chris Chaeha Lim, 17, Senior, John B. Connally High School,  
Austin, Texas, T: Rosendo Garcia
- BO010 The Effects of Alizarin Yellow on Rapid Pericycle and Meristem Growth and Development of *Macbridea alba*: An Investigation for a Novel Method of Agricultural Production**  
## Zachary Mason Sandoval, 17, Senior, Dr. Michael M. Krop  
Senior High School, Miami, Florida, T: David Buncher
- BO011 The Effects of Various Plant Growth Media on Synthetic Seed Growth Through Cloning and Shoot Encapsulation of *Saintpaulia ionantha***  
Neela Devi Thangada, 15, Freshman, Keystone School,  
San Antonio, Texas, T: Donald Howk

- BO012 Creating Post-Translational Switches from Various Steroid Receptors**  
Jia Ren Liew, 17, Senior, Raffles Junior College, Singapore,  
Singapore, T: Toshiro Ito
- BO013 Monitoring the Expression of AVP1 in *Arabidopsis thaliana* Tissue**  
Pratistha Koirala, 17, Senior, Edwin O. Smith High School,  
Storrs Mansfield, Connecticut, T: Julia Sherman
- BO014 Mycoremediation of Heating Oil Contaminated Soil by Pearl Oyster Mushrooms (*Pleurotus ostreatus*) to Allow Plant Growth**  
Cailey Ann Neary, 15, Freshman, Juneau-Douglas High School,  
Juneau, Alaska, T: Jonathan Smith
- BO015 The Positive Identification of Mutant and Wild Type Cytoskeletal Components in *Ceratopteris richardii* Through Fluorescent and Histological Staining**  
# Anna Pilishvili, 17, Senior, Forest Hills High School, Forest  
Hills, New York, T: Brigette Brady
- BO016 The Effects of Buckminsterfullerenes on Hydroponically Grown *Brassica rapa* in Varied Environments, Year Two**  
# Lindsay Mallissia Liles, 18, Senior, C.H. Yoe High School,  
Cameron, Texas, T: Toni Lafferty
- BO017 Investigation of Possible Nutritive Soil Value of *Tamarix ramosissima***  
Katheryn Ann Smith, 18, Senior, Malta High School, Malta,  
Montana, T: Marida J. Demarais
- BO018 Tissue Culture Root Development with Growth Hormones**  
Chelsea Elizabeth Obrebski, 15, Freshman, Hamilton Freshman  
High School, Hamilton, Ohio, T: Elizabeth Carlson
- BO019 Study of the Extract of the Leaf of the *Rue chalepensis* as a Natural Insecticide Against the Cockroach *Germanic blatella***  
Francisco Jose Gotay, 16, Junior, Colegio Maria Auxiliadora,  
Carolina, Puerto Rico, T: Julio Galan
- BO020 Comparative Study of the Use of Extracts of *Padina* Algae *sp Halimeda sp* and *Gracillaria sp* as Natural Herbicide for the *Cyperus rotundus***  
Kevin E. Molina, 16, Junior, Colegio Maria Auxiliadora,  
Carolina, Puerto Rico, T: Julio Galan
- BO021 Using Asymbiotic Method as an Alternative to Growing Orchids Seeds**  
Jonathan Ore Ibasco, 15, Sophomore, Samoana High School,  
Pago Pago, American Samoa, T: Batta Fa Leatualevao
- BO022 *M. sativa*, a Sustainable and Natural Technique for the Remediation of Heavy Metal Contamination**  
## Keely Ann Goodgame, 17, Junior, San Jon High School,  
San Jon, New Mexico, T: Steve Goodgame
- BO023 The Effect of an Applied Mucoid Layer on Winter Wheat Germination and Emergence Under Drought-like Conditions and Cold Temperature Extremes**  
# Kari Lynn Gillespie, 18, Senior, North Toole County High  
School, Sunburst, Montana, T: Lawrence Dexter Fauque
- BO024 Allelopathic Tendencies in Different Pigments of Leaves**  
Hillary Marie Lansdowne, 17, Senior, Bonneville High School,  
Ogden, Utah, T: Michelle L. Wood
- BO025 Effect of Ultramicro-active Calcium Fertilizer on Tomato Growth and Physio-Biochemical Characteristics**  
Yuechen Zhong, 17, Junior, Beijing No.101 Middle School,  
Beijing, China, T: Lixia Ma
- BO026 Organic Mendel: A Genetic Comparison of Organic and Inorganic Plants**  
Carla Jane Harper, 17, Senior, Del Rio High School, Del Rio,  
Texas, T: Libana Zamudio Sirman
- BO027 Effects of Nitrogen on Corn, Phase IV: Nutrient Study**  
Brandon David Wilson, 16, Sophomore, West Central Valley  
High School, Stuart, Iowa, T: Larry Charles Schwinger
- BO028 Free Radical Inhibition and Alleviation by Antioxidants to Prevent Agricultural Devastation from Unfavorable Environmental Conditions with the *Lycopersicon esculentuma***  
## Justin Andrew Townley, 17, Senior, Okaloosa-Walton College  
Collegiate High School, Niceville, Florida,  
T: Nancy Ann Townley
- BO029 Searching for New Sources of Antibiotics**  
Lourdes Desiree Alicea, 16, Junior, Colegio Nuestra Senora del  
Carmen, Hatillo, Puerto Rico, T: Raul Mendez

- BO030** **Kudzu vs. Nitrogen: Effects of Inoculants on the Nitrogen Use Rate of *Pueraria lobata* as Compared to Known Leguminous Plants**  
# Lindsay Marie Stewart, 15, Sophomore, Grove High School, Grove, Oklahoma, T: Keli Don Steen
- BO031** **One "Mite"y Mission: Biological Compensation Suppression of *Convolvulus arvensis* Implementing Host-Specific *Aceria malherbae*, Phase Two**  
# Kaitlyn Jeanne Lingus, 16, Sophomore, Branson High School, Branson, Colorado, T: Mike Ray Daugherty
- BO032** **Study of Fibonacci Patterns in Common Flowers of Puerto Rico**  
Angel Adrian Aponte, 17, Senior, Francisco Morales High School, Naranjito, Puerto Rico, T: Digna Ortiz
- BO033** **Dented and Damaged**  
Jeremiah Wayne Corrigan, 17, Junior, Southeastern High School, Augusta, Illinois, T: Carolyn T. Phillips
- BO034** **Effects of Natural Chemicals on the Seed Dispersal of *Tribulus terrestris***  
Jonathan Daniel Homrighausen, 15, Sophomore, Sunnyside High School, Sunnyside, Washington, T: Joyce E. Stark
- BO035** **Spores of *Myriostoma coliform* with Therapeutics Properties?**  
Maria Paula Diaz, 17, Senior, Instituto Vocacional Concepcion, Concepcion, Tucuman, Argentina, T: Luis Orlando Contreras
- BO036** **Phytoremediation of High Level B Containing Agricultural Areas by Using Hyperaccumulator Plant: *Polygonum equisetiforme* (Polygonaceae)**  
Hasan Sevim, 15, Freshman, Private Fatih High School, Istanbul, Marmara, Turkey, T: Turan Tekin
- BO037** **Production of Interleukin-13 (IL-13) in Transgenic Plants of Immunotherapy of Type 1 Diabetes**  
David Jueyu Wang, 17, Junior, A.B. Lucas Secondary School, London, Ontario, Canada, T: Katy Mary Farrow
- BO038** **Ion Channel Blockers**  
Kaitlyn Anne Feeley, 15, Freshman, North Attleboro High School, North Attleboro, Massachusetts, T: David Robert Vito
- BO039** **Use of Digital Photography for Assessment of Wheat Leaf Colour Changes**  
# Zuzana Tvaruzkova, 19, Senior, Gymnazium Kromeriz, Kromeriz, Czech Republic, T: Helena Havelova
- BO040** **Ohelo, Phase II: Identify BioActive Compound**  
# Jessie Ann Ka'iulani Pa'ahana, 17, Senior, Kamehameha Schools, Kapalama Campus, Honolulu, Hawaii, T: Lawrence J. Mordan
- BO041** ***Arabidopsis* Phospholipase A1's: Novel Sequence Analysis and Steps Toward Functional Characterization**  
David Andrew Levary, 16, Sophomore, Parkway Central High School, Chesterfield, Missouri, T: Adam Bergeron
- BO042** **Design of a Novel Wave Reactor for *in situ* Culturing of *Chlamydomonas reinhardtii*, Phase I: Effect of Wave Mixing**  
Caroline Janet Lang, 14, Freshman, Independence Home School, Yardley, Pennsylvania, T: Cynthia Knox Lang
- BO043** **Wavelengths and Plants**  
Maia Yang, 15, Freshman, Lakeside Junior High School, Hot Springs, Arkansas, T: Mary French
- BO044** **Determination of Cyanide in Philippine Cassava (*Manihot esculenta*)**  
Oliver Glenn Villarin Hernaez, 15, Sophomore, De La Salle High School, Concord, California, T: Victoria Jean Acquistapace
- BO045** **The Investigation of Natural Alternatives for *Phaseolus vulgaris* Production**  
Michael Louis Ginsbach, 18, Senior, Hankinson High School, Hankinson, North Dakota, T: Marcus John Friskop
- BO046** **Tea: Agriculture's Silent Friend**  
Megan Marie Meyer, 15, Freshman, Hankinson High School, Hankinson, North Dakota, T: Marcus John Friskop
- BO047** **Autumn Olive: Identification, Control, and Utilization**  
Patricia Jean Sefton, 18, Senior, Parkersburg High School, Parkersburg, West Virginia, T: Fred Doak
- BO048** **Sugar Levels in Apples Increase with Time**  
Joshua David Wade, 15, Sophomore, Sherando High School, Stephens City, Virginia, T: Susan Renea Saylor
- BO049** **Optimizing Tissue Sterilization in *Cypripedium reginae* Meristem Culture**  
Joseph Paul Dexter, 14, Freshman, Green Mountain Union High School, Chester, Vermont, T: Jonathan Aaron Rice
- BO050** **In Search of a Natural Treatment for *Puccinia hemerocallidis*, Phase III**  
# Kyle James Yawn, 16, Sophomore, Warner Robins High School, Warner Robins, Georgia, T: Randi Collier
- BO051** **Soil Moist vs. Vermiculite**  
Margo Lynn Woodall, 15, Freshman, TGU-Granville High School, Granville, North Dakota, T: Susan Dee Thompson
- BO052** **Optimal Use of P, Zn, and Ni Rhizobial Nodulation and Plant Biomass**  
Megan Angeline Strube, 15, Freshman, Trinity High School, Dickinson, North Dakota, T: Bradley Jay Foss
- BO301T** **How Much Sap Could a Sapsucker Suck If a Sapsucker Could Suck Sap?**  
William Colin Read, 17, Senior  
Lia-Lucine Lara Cary, 17, Senior  
Jensen Beach High School, Jensen Beach, Florida  
T: Richard Thomas Sovieiro
- BO302T** **Direct Evidence of the Symplastic Pathway in the Trap of the Bladderwort, *Utricularia gibba***  
Tanya Chun-Chiao Juang, 17, Junior  
Sonya Di-Chiao Juang, 15, Freshman  
Saint Dominic High School, Kaohsiung, Taiwan, Chinese Taipei  
T: Cheng-Mei Lee  
Wu Fu Junior High School, Kaohsiung, Taiwan, Chinese Taipei  
T: Fu-Chien Chen
- BO303T** **Understanding Leucine-rich Repeats and Their Roles in Gene Families Through the Study of Genes At1g68780, At1g13230, and At4g28560 in *Arabidopsis thaliana* Development**  
# John James Hutchison, 16, Junior  
# Varun Rajendra Hippalgaonkar, 16, Sophomore  
Lake Highland Preparatory School, Orlando, Florida  
T: Judith Faith Legault
- BO304T** **The Quinoa: Cultivation of the Desert with Sea Water**  
Lissis Andrea Orellana, 17, Sophomore  
Patrick Richard Vega, 16, Sophomore  
Victor Samuel Arredondo, 18, Junior  
Elena Duvauchelle Cabezon, Iquique, I Region, Chile  
T: Myrna Medel
- BO305T** **The Effect of Nitrate Concentration on the Growth of Algae Blooms and Epiphytes in Correlation to the Health of Aquatic Life Indigenous to the Chesapeake Bay**  
Gabrielle Marie Strike, 16, Sophomore  
Anup Myneni, 15, Sophomore  
York High School, Yorktown, Virginia  
T: Deborah Eckstein
- BO306T** **Can Seeds Germinate After Being Stored for Many Years?**  
Emivette Zabala-Casillas, 15, Sophomore  
Francheska Perez-Diaz, 15, Sophomore  
Josefa Pastrana High School, Aguas Buenas, Puerto Rico  
T: Merida Rivera
- BO307T** **Tissue Regeneration Capacity of the Plant *Graptophyllum pictum* on *Lumbricus terrestris***  
Celines Acevedo-Milan, 14, Freshman  
Jose Luis Mercado-Santiago, 15, Freshman  
Jose A. Castillo Jr. High School, Sabana Grande, Puerto Rico  
T: Luis R. de Jesus
- BO308T** **Effects of Electrical Circuit on *Phaseolus vulgaris*: Electrobeans**  
Elizabeth Murphy Czura, 14, Freshman  
Colby Taylor Foss, 14, Freshman  
Hilton Head Preparatory School, Hilton Head Island, South Carolina  
T: Tina Webb-Browning
- BO309T** **Algae from Serra da Gardunha Contribution for Their Knowledge**  
Dora Sofia Martins Henriques, 17, Junior  
Ana Ines Batista loureco Rondao, 18, Junior  
Andreia Catarina Parreira Costa Martins Raimundo, 17, Junior  
Escola Secundaria com 30 Ciclo do Fundao, Fundao, Portugal  
T: Joao Paulo Pereira Fidalgo

- BO310T Dehiscence and Dispersal of the Popping Pod *Ruellia tuberosa* L.**  
Krongrath Suwanasri, 18, Senior  
Tanongsak Chinaroonchai, 18, Senior  
Suksun Ithipanyanan, 18, Senior  
Triam Udom Suksa School, Bangkok, Thailand  
T: Nippon Srinarumon
- BO311T The Effect of Goethite and CO<sub>2</sub> Levels on *Brassica rapa***  
Rachel Elizabeth Delevett, 16, Sophomore  
Lauren Staci Powell, 15, Sophomore  
Rockdale Magnet School for Science and Technology, Conyers, Georgia  
T: Mary Mansell
- BO312T Sing a Song of Supple Seedlings**  
David Clinton Cagle, 18, Senior  
Derek Edward Sugg, 18, Senior  
Andrews High School, Andrews, Texas  
T: Vickie J. Gardner

- CH012 Identification of the Determinants of Antimalarial Drug Action**  
##  
Smita Mascharak, 16, Junior, Santa Cruz High School, Santa Cruz, California, T: Nancy Serigstad
- CH013 Celery Extract, an Organic Alternative to Commercial Coolants**  
Larry Nagrampa Caduada, 13, Freshman, Baguio City Science Foundation, Baguio City, Benguet, Philippines,  
T: Osmund Belmonte
- CH014 Bimolecular Photochemical Reactions of Inclusion Compounds in the Solid State**  
Mollie Ann Sussman, 16, Sophomore, Rabbi Alexander S. Gross Hebrew Academy, Miami Beach, Florida, T: Cheryl Gray
- CH015 Interactive Effects of Concentration and Voltage on pH and Ion Mobility in an Electrophoretic System**  
#  
Phillip Michael Jamison, 18, Senior, Noxubee County High School, Macon, Mississippi, T: Shirley M. Granger
- CH016 Optimizing a Catalyst for Elimination of Carbon Monoxide Exhausted from Gas Water Heater**  
Chen Wei Tsai, 16, Junior, The Affiliated Senior High School of NKNU, Kaohsiung, Taiwan, Chinese Taipei,  
T: Ying Fung Tseng
- CH017 Fish Scales Wastes from Selected Teleosts: Innovative Sorption Materials for the Recovery of Astaxanthin**  
Mark Timothy Villa Rodriguez, 16, Sophomore, Claro Mayo Recto High School, Manila, Philippines, T: Juana Pascua Sindac
- CH018 The Mechanisms of Proton Transport Through One-dimensional Water Chain Stabilized by Imidazole Channels**  
#  
Yin Yin Wu, 17, Junior, J.M. Atherton High School, Louisville, Kentucky, T: Sandra Terrel
- CH019 Reactive Molten Metal Flow Over Grooved and Flat Surfaces**  
Alexander Danilo Zbrozek, 18, Senior, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Dusan P. Sekulic
- CH020 Kinetics and Structural Fluctuations of the Ribosome Interacting with tRNA: Role of Flexibility of EF-Tu(GTP)aa-tRNA**  
Sudarsana Eldridge Mohanty, 17, Junior, Lincoln School, Providence, Rhode Island, T: Udayan Mohanty
- CH021 Limitations of Cottrell's Equation**  
#  
Bennet Grill, 18, Senior, Rio Rancho High School, Rio Rancho, New Mexico, T: Nadyne Shimada
- CH022 Comparing Various Diluents with an Experimental Monomer**  
Laura Andrea de la Garza, 17, Senior, John Jay Science and Engineering Academy, San Antonio, Texas, T: Mike Scully
- CH023 Using Nanoceramic Spheres to Purify Distilled Spirits**  
Yin Liang, 17, Junior, Affiliated School of South China Normal University, Guangzhou, China, T: Xin Yu Zhong
- CH024 A Novel Approach in Preparation of Dye-sensitized Solar Cell**  
Kyung-ha Lee, 18, Junior, Oregon Episcopal School, Portland, Oregon, T: Rosa Hernandez Hemphill
- CH025 A Novel Chlorophyll-based Nanocrystalline Photoelectrochemical Cell: A Promising Approach to Hydrogen Production via the Light-driven Redox of Seawater**  
Nilesh Tripuraneni, 15, Freshman, Clovis West High School, Fresno, California, T: Wayne Garabedian
- CH026 Viscosity: To Flow or Not to Flow**  
Harrison Phu Nguyen, 15, Sophomore, Detroit Catholic Central High School, Novi, Michigan, T: Alan Barker
- CH027 Theoretical Studies on Research of Unique Binding Site of SBX**  
Eugene Lee, 17, Senior, Stuyvesant High School, New York, New York, T: Anne Manwell
- CH028 The Effects of Lipid Fat Content on Methyl Ester Cloud Point**  
Anna Patricia Perry, 18, Senior, Elko High School, Elko, Nevada, T: Jeff Wallock
- CH029 Peroxide Power 5**  
Christine Kay Nelson, 17, Junior, Laporte Public Schools, Laporte, Minnesota, T: Wayne Philip Buckley

## CHEMISTRY

### GRAND AWARDS PRESENTED BY: LUCENT TECHNOLOGIES

- CH001 Soaking up the Photons: Determination of the UV Absorbance Properties of Active Sunscreen Ingredients in Pool Water**  
Ashley Brooke Van Galen, 14, Freshman, Pensacola High School, Pensacola, Florida, T: Allan Robinson
- CH002 Discovery of Compounds Active Against *Staphylococcus aureus* from the Marine Sponge *Choristida***  
#  
Sheena Bhalla, 16, Junior, Lincoln Park Academy, Fort Pierce, Florida, T: Sean Lynch
- CH003 An Investigation of Bioactive Ceramics: Synthesis of Bioglass 45S5 <sup>®</sup>Doped Sol-Gels *in vitro* Evaluation of Bioactivity**  
#  
Kayla L. Paulk, 18, Senior, Blanche Ely High School, Pompano Beach, Florida, T: Doris Irene Walden
- CH004 Identification of the Allergen Trartrazine in M&Ms Using Agarose Gel Electrophoresis**  
Jessica Ann Lack, 16, Junior, Nettleton High School, Jonesboro, Arkansas, T: Karen Ladd
- CH005 Synthesis of Oxadiazole Derivatives for Use in Supramolecular Assembly**  
Matthew Bret Weiss, 17, Junior, Breck School, Minneapolis, Minnesota, T: Lois Fruen
- CH006 Applying Liposomes as Luciferase Vesicles in Photodynamic Cancer Therapy**  
Rachel Ragnhild Carlson, 17, Junior, Columbia River High School, Vancouver, Washington, T: Pamela Lehrman
- CH007 Electrochemical Generation of Nickel Hydroxide as an Active Mass of Alkaline Batteries**  
Daniil Mykhailovich Monosov, 17, Junior, Chemical Ecological Lyceum, Dnipropetrovsk, Ukraine, T: Vadim Leonidovich Kovalenko
- CH008 A Study of the Exceptional Volume Contraction During NaF Being Dissolved into Water**  
He Ma, 19, Senior, Jilin Provincial Experimental School, Changchun, Jilin, China, T: Jinhua Li
- CH009 A Comparative Study of Heavy Metals Found in Fertilized and Non-fertilized Soils of Southern Indiana**  
Jessica Lee Jackson, 16, Sophomore, Eastern High School, Pekin, Indiana, T: Sharon A. McElroy
- CH010 Synthesis and Characterization of Novel Polynuclear Manganese Complexes Functioning as Single-Molecule Magnets**  
Sarah Hyunee Nam, 18, Senior, Saint Petersburg Senior High School, Saint Petersburg, Florida, T: Warren Hunnicutt
- CH011 Dynamics of Polyampholytes in Solution: Development of Novel Equations to Predict the Behavior of Charged Polymers**  
###  
Michael J. Pizer, 17, Senior, University School of Milwaukee, Milwaukee, Wisconsin, T: Ronald LeMay

- CH030 Natural Dye-Sensitized Nano-crystalline Titanium Oxide Solar Cell**  
Yongjie Hu, 19, Senior, The Middle School of Northwest Normal University, Lanzhou, Gansu, China, T: Hanxiong Yang
- CH031 A Concept of Remote Group Participation Illustrated by Glycosylations with 6-chloro-6-deoxy-glucosyl Donors**  
Andrey M. Tsedilin, 16, Junior, Moscow Chemical Lyceum #1303, Moscow, Russia, T: Sergey E. Semenov
- CH032 Formation of the Protective and Multifunctional Layers on the Surface of Nitinol and Titanium Alloys for Medicine**  
Andrey S. Gnedenkov, 14, Freshman, Pedagogical Gymnasium at FESTU, Vladivostok, Russia, T: Sergey L. Sinebrukhov
- CH033 Electrochemical Oxidation of Piperidin-4-ones**  
Ruslan F. Nasybullin, 17, Junior, Moscow Chemical Lyceum #1303, Moscow, Russia, T: Sergey E. Semenov
- CH034 # Inhibiting Corrosion Using a Self-Assembled Monolayer**  
Samantha Kay Lawrence, 17, Junior, Christian Heritage High School, Riverdale, Utah, T: Nancy Anderson
- CH035 Oil Extraction from Wild Plant Seeds**  
Hannah Lloyd, 15, Freshman, Ogden High School, Ogden, Utah, T: Barry Alan Lloyd
- CH036 Synthesis and Characterization of a Co-facial Zn-Porphyrin Dimer with bis-Fullerene Adducts**  
Orlando Grajo DeLeon, 18, Senior, Charles E. Gorton High School, Yonkers, New York, T: Clarice Morris
- CH037 Is Pea Flour an Effective Bio-Insecticide Against the Stored Grain Pests?**  
Hamza Sheikh, 15, Freshman, Head Start School, Islamabad, Punjab, Pakistan, T: Fahmida Rizvi
- CH038 A Study Involving the Synthesis of Carbon Nanotube Filters in the Macroscale with Experiments Concerning the Effectiveness of Metal-Derived Catalysts: A Continuation**  
Jennifer Lee Nagel, 18, Senior, Dekalb High School, Waterloo, Indiana, T: Richard Barber
- CH039 Chemical Analysis of the Wakulla River**  
Mia Ann Shandell, 17, Senior, Olympic Heights Community High School, Boca Raton, Florida, T: Kane More
- CH040 Synthesis and Characterization of Biodiesel**  
Shruthi Baskaran, 16, Sophomore, Kennewick High School, Kennewick, Washington, T: Don Fankhauser
- CH041 Satureja Darwinii: Determination of Biologically Active Compounds in Its Essential Oil**  
Vanessa Elizabeth Racigh, 17, Senior, Colegio Provincial de Educacion Polimodal No. 1, Pierda Buena, Santa Cruz, Argentina, T: Julio Nicolas Arganaraz
- CH042 Using Common Purification Techniques, Can Hazardous Contaminants Be Effectively Decreased?**  
Mark Anthony Menn, 17, Junior, S.S. Murphy High School, Mobile, Alabama, T: Wanda Tomlinson Griffis
- CH043 Development of an Improved Oxygen Sensor: Incorporating a Tris-bipyridyl Ruthenium(II) Dye into a Sub-wavelength Optical Cavity**  
Jasmine M. Gregory, 16, Junior, Harry P Harding High School, Charlotte, North Carolina, T: Timothy Guilfoyle
- CH044 # A Novel Medicinal Metabolite from Extremophilic *Trichoderma virens* Found in the Silver Bow Creek System**  
Kels Gordon Phelps, 17, Senior, Butte High School, Butte, Montana, T: Andrea Stierle
- CH045 Fabrication and Stabilization of Biocompatible Silver Nanoparticles for Potential Tumor-Imaging Applications**  
Swathi Bhaskaran, 17, Senior, David H. Hickman High School, Columbia, Missouri, T: Pamela Close
- CH046 Soap Manufacture from the Region's Native Vegetable Oils and Frying Oil**  
Camilla Serra Souza, 17, Junior, Complexo Educacional Dom Bosco, Imperatriz, Maranhao, Brasil, T: Alexandre Passos da Silva
- CH047 Date Rape Drugs: Can They Be Detected?**  
Anne Marie Larissa Child, 15, Freshman, Westdale Secondary School, Hamilton, Ontario, Canada, T: Krista Girolametto
- CH048 # Synthesis and Catalytic Characterization of Size and Shape Selected Metal Nanoparticles, Phase II**  
Grady Clark Slane, 18, Senior, Lake Highland Preparatory School, Orlando, Florida, T: Judith Legault
- CH049 The Application of Gas Chromatography in Detecting Washed Checks**  
Matthew Wayne Brown, 17, Senior, Roanoke Valley Governor's School, Roanoke, Virginia, T: Steve Smith
- CH050 The Effects of Weathering and Substrate Preparation on Coating Integrity and Adhesion**  
Jameson Keith Hackbarth, 18, Senior, L. V. Hightower High School, Missouri City, Texas, T: Tom Miskelly
- CH051 DNA Electrophoresis on Nanopore-sized Polyethersulfone Membrane Surfaces**  
Michael Ding, 16, Junior, Glen Cove High School, Glen Cove, New York, T: Arlene Geoghegan
- CH052 Grass as Fuel**  
Jeff K. Bean, 17, Senior, American Fork High School, American Fork, Utah, T: Donald Curtis Bastian
- CH053 Non-fluid Gel Electrolyte Manufacturing of Boron Minerals and Optimization of Gelation Conditions**  
Ayse Zehra Karakoc, 14, Freshman, Izmir Fatih Private Science High School, Izmir, Turkey, T: Umit Karaca
- CH054 Can Science Give Birth to Art?**  
Laura Huacuja, 15, Sophomore, Alexander High School, Laredo, Texas, T: Mario Rosales
- CH055 Chemical Bioremediation for Degradation of Petroleum Derivates Using Live Microorganism in Contaminated Water and Soil**  
Juan Andres Rivera, 16, Junior, Elvira M. Colon High School, Santa Isabel, Puerto Rico, T: Maria Elisa Thiele
- CH056 The Preservative Effects of Various Saccharides on *Rosa hybrida***  
Allison Marie Lange, 17, Junior, Noblesville High School, Noblesville, Indiana, T: Charles L. Emmert
- CH057 The Influence of Reference Power on Calorimetrically Determined Thermodynamic Parameters**  
Sara D. Niedbalski, 17, Junior, Marian High School, Mishawaka, Indiana, T: Ken W. Andrzejewski
- CH058 Biofuels: Gasoline vs. Ethanol**  
Azurae Kayla Johnson, 16, Sophomore, Cookeville High School, Cookeville, Tennessee, T: Kathy Sutton Shanks
- CH059 The Elimination of Volatile Organic Compounds Through the Use of Polyethyleneimine Nanofibers**  
James Zhen Wang, 18, Senior, Hoover High School, North Canton, Ohio, T: Connie Hubbard
- CH060 Corrosion: The Role of pH, Contamination, and Sample Agitation on Corrosion**  
Kathryn Ann LeCroy, 15, Sophomore, Jefferson County International Baccalaureate School, Irondale, Alabama, T: Debbie Reynolds Anderson
- CH061 Photocatalytic Oxidation Using Immobilized Titanium Dioxide**  
Justin Yen, 17, Senior, Arkansas School for Mathematics, Sciences, & Arts, Hot Springs, Arkansas, T: Jacqueline A. Sturdivant
- CH062 A Novel Treatment to Increase the 'Pop-ability' of *Zea mays everta***  
Kelsey Daly, 15, Freshman, Oak Grove High School, San Jose, California, T: Carol Evans
- CH063 Sorption of Cupric Ions on Bentonite and Calcite**  
Beverly Bilkova, 19, Freshman, Masaryk, Prague, Czech Republic, T: Vera Pacakova
- CH064 Meth Busters: An *in situ* Test for Determining Methamphetamine History in Homes**  
Jia Jennifer Wu, 18, Senior, Arkansas School for Mathematics, Sciences, and the Arts, Hot Springs, Arkansas, T: Brian D. Monson
- CH065 Comparative Study of the Medicinal Properties of the *Rubus ulmifolius* (Shott) Blackberry**  
Catalina Goma Pumarino, 15, Sophomore, Colegio de la Salle, Talca, Talca, Chile, T: Maria Riquelme
- CH066 Eutectic Point Determination of Binary Mixtures for Use in Liquid Crystal Displays**  
Rachel Amos, 17, Senior, City of London School for Girls, London, England, United Kingdom, T: Dinah Barry

- CH067 Nano Electrochemical Sensor Fabrication Using Conical Carbon Nanopipettes**  
# Suhail Malhotra, 16, Junior, duPont Manual Magnet High School, Louisville, Kentucky, T: William Deines
- CH068 Synthesis of Perbenzoylated Carbohydrates in Preparation for Anthocyanin Pigment Characterization**  
Brandon Timothy Lew, 17, Junior, Breck School, Golden Valley, Minnesota, T: Lois Fruen
- CH069 The Effect of Various Anti-Corrosive Methods on the Corrosion Process of Iron**  
Gina A. Noh, 15, Sophomore, Spring Valley High School, Columbia, South Carolina, T: Dale Soblo
- CH070 The Effect of Temperature on the Affinity of Carbon Dioxide to Molecular Sieve 4A**  
Robert Adrian Ray, 16, Sophomore, De La Salle High School, Concord, California, T: Victoria Jean Acquistapace
- CH071 Adventures in Gold Nanorod Synthesis**  
Christopher Thomas Phare, 16, Junior, Jefferson County International Baccalaureate, Birmingham, Alabama, T: Debbie Anderson
- CH072 Boiling Salts: The Effect of Molality on the Van't Hoff Factor, I, Second Year**  
George Robert Morris, III, 17, Senior, Burkburnett High School, Burkburnett, Texas, T: Pamela Francis
- CH073 Jitterbuzz: The Dance of the Teenage Caffeine Addict**  
Christine Marie Wrolson, 17, Junior, Trinity Christian High School, Williston, North Dakota, T: Annette Marie Kreft
- CH301T Comparison of Different Flax Biodiesels**  
Ross Michael Hemmingsen, 16, Junior  
Zackary Jordan Drescher, 16, Junior  
Alden-Conger High School, Alden, Minnesota  
T: David Duane Bosma
- CH302T Lighting a Fire: A Study of the Fuels Involved in the Hayman Fire**  
# Max Krakauer, 15, Sophomore  
Alex Ruch, 15, Sophomore  
Palmer High School, Colorado Springs, Colorado  
T: Nancy Hampson
- CH303T Analysis of an Alternative Fuel Synthesized from Carbon and Water**  
David Chandler Russ, 18, Senior  
Samuel Richard Gates, 17, Senior  
Christian Academy of Louisville, Louisville, Kentucky  
T: Tina Gibson
- CH304T The Effects of the Crosslinkers Glutaraldehyde, DTBP, and Sebacic Acid on Catalase's Viability and Immunity to Proteases**  
Hariharan Umasundar Athreya, 16, Junior  
Joshua Aaron Ozer, 17, Junior  
Keystone School, San Antonio, Texas  
T: Charles Scott Maderer
- CH305T The Biggest Bang: An Analytical Comparison Between Rocket Engine Designs**  
Mathew Bryn Trussell, 17, Junior  
Jonathan Anthony Walker, 17, Junior  
Berkmar High School, Lilburn, Georgia  
T: Walter Snow
- CH306T Oil Frictions**  
Mackinley Allen Schultz, 16, Junior  
Anthony Kristian Wittmer, 17, Junior  
Alden-Conger High School, Alden, Minnesota  
T: David Duane Bosma
- CH307T Out of the Frying Pan, into the Tank**  
Dustin Eugen Shung, 15, Sophomore  
Yasha Benjamin Lashgari, 16, Sophomore  
R. C. Clark High School, Plano, Texas  
T: Cathy Bambenek
- CH308T The Effects of Supercritical Carbon Dioxide on the Compatibilization and Crystallinity of Polymer Thin Films**  
Christopher Donald Pynn, 17, Senior  
Zimra Payvand Ahdout, 17, Senior  
Half Hollow Hills High School West, Dix Hills, New York  
Roslyn High School, Roslyn Heights, New York  
T: Chrysi Notskas; T: Irena Tsarevsky
- CH309T Is the Water Safe to Drink? A Dipstick Test for Heavy Metals**  
Rasmus Buch Moller, 20, Senior  
Sebastian Ravn, 19, Senior  
Vejele Tekniske Gymnasium, Vejle, Jutland, Denmark  
T: Dorthe Lind Damkjaer
- CH310T Return of the Rings: The Investigation of Multiple Systems of Liesegang Rings and Bifurcations, Two Year Study**  
# Skylar Davis Williams, 18, Senior  
# Aaron Mark Weaver, 16, Junior  
Miami High School, Miami, Oklahoma  
T: Sally Ann Fenska
- CH311T The Transesterification of Cooking Oil into Biodiesel**  
Amanda Michelle Hester, 17, Senior  
Mary Elizabeth Jewell, 19, Senior  
Hart County High School, Munfordville, Kentucky  
T: Linda A. Gosser

## COMPUTER SCIENCE

### GRAND AWARDS PRESENTED BY: INTEL FOUNDATION

- CS001 Assessment of Emotion by Voice Analysis Utilizing Artificial Intelligence**  
# Daniel Stephen Smith, 18, Senior, Episcopal High School of Jacksonville, Jacksonville, Florida, T: Marion Zeiner
- CS002 An Innovative Way to Improve the Speech Skills of the Hearing Impaired Using Fourier Analysis, Year III**  
# Krystelle Andree Denis, 18, Senior, Lake Brantley High School, Altamonte Springs, Florida, T: Susan N. Behel
- CS003 From Scrap to Supercomputer**  
Terrence Dean Bonner, 16, Junior, Fort White High School, Fort White, Florida, T: Stephanie Bundy
- CS004 Creating an Online Study Session Network**  
### Daniel Jonathan Parrott, 18, Senior, Bartlesville High School, Bartlesville, Oklahoma, T: Betty Henderson
- CS005 Magic Workplace Studio 2005: Unique Complex of Applied Software Based on Specially Developed Technologies**  
Anatoli L. Tsyorny, 16, Sophomore, Lyceum of Belarus State University, Minsk, Belarus, T: Anzhalka I. Lapo
- CS006 Back-In-Time Debugger**  
Vasily Dyachenko, 17, Junior, Centre of Mathematical Education, Saint-Petersburg, Russia, T: Dmitry Shtukenberg
- CS007 A New Approach to Lossless Compression**  
Humberto Diaz Suarez, 18, Senior, Southwestern Educational Society, Mayaguez, Puerto Rico, T: Eric Seda
- CS008 Testing the Efficient Market Hypothesis with Artificial Neural Networks and Genetic Algorithms**  
# Benjamin Louis Brinkopf, 17, Junior, Canterbury School, Fort Myers, Florida, T: Mary Elizabeth Mirro-Glass
- CS009 A Device for Cutting Tangible Shapes Designed by Computer**  
Amjad Fakhri Abu Salem, 17, Junior, Terra Sancta College, Amman, Jordan, T: Jeries Awad Salem
- CS010 Stereovision Correspondence Using Wavelet Based Dynamic Programming**  
# Alex Conway Buchanan, 18, Senior, Myers Park High School, Charlotte, North Carolina, T: Dale Conway Buchanan
- CS011 Modeling Wave Characteristics**  
James Daniel Brandenburg, 14, Freshman, Cocoa High School, Cocoa, Florida, T: Raul M. Montes
- CS012 Teaching a Computer to Understand English**  
Michael Eric Warkander, 14, Freshman, Rutherford High School, Panama City, Florida, T: Helen H. Libby
- CS014 Can Password Based Checksums Be Used to Safely and Securely Encode Data?**  
Elliott James Stepusin, 15, Sophomore, Celebration High School, Celebration, Florida, T: Leslie Ann Rivera
- CS015 Facool: Convenient Internet Face Retrieval System**  
Liu Liu, 19, Senior, Shanghai Datong High School, Shanghai, China, T: Xiaoqing Yu

- CS016 An Excel-lent Test Analyzer**  
Kelley Marie Fleming, 16, Sophomore, Dove Science Academy, Tulsa, Oklahoma, T: Mesut Ekici
- CS017 Building a Power-Optimized MIPS Pipeline**  
Vidya Ganapati, 18, Senior, Sunset High School, Portland, Oregon, T: John Sheu
- CS018 Compiler Design**  
Kristopher Kyle Micinski, 15, Sophomore, Decatur High School, Decatur, Texas, T: Audrey Rae Micinski
- CS019 Java Based Algorithm Automated Prescription Reminder and Renewal**  
Nadia N Naja, 17, Senior, Dearborn Center for Math, Science & Technology, Dearborn Heights, Michigan, T: Natasya Shajira
- CS020 Viability of an Alternative Linking Algorithm**  
Jonathan J. Pezzino, 17, Junior, Nicolet High School, Glendale, Wisconsin, T: Eliot Scheuer
- CS021 Linux Clusters and Parallel Processing: The Power of Many**  
Taylor Edward Helsper, 17, Junior, Catholic High School, Huntsville, Alabama, T: Brian Joseph Finzel
- CS022 KeyQR-Code: A Design and Implementation of Personal Authentication System with 2-Dimensional Bar Code on Mobile Network System**  
Kohei Saijo, 16, Sophomore, Tokyo Gakuji University High School Oizumi Campus, Nerima-ku, Tokyo, Japan, T: Takahiro Goto
- CS023 Analysis of Parliamentary Structures**  
Andrey S. Kravchenko, 17, Junior, Lyceum of Information Technologies # 1533, Moscow, Russia, T: Fuad T. Aleskerov
- CS024 Statistical-based Adaptive Binarization for Document Imaging**  
# Nat Piyapramote, 17, Junior, Sarasit Phithayalai School, Banpong, Ratchaburi, Thailand, T: Narumon Panlumlern
- CS025 Program Task Distribution, Performance, and Scalability of a Knoppix-OpenMosix Cluster**  
# Jean-Louis Rochet, 17, Junior, Colegio San Ignacio de Loyola, San Juan, Puerto Rico, T: Wilma M. Giol
- CS026 MD-OS Operating System**  
Denis V. Mandrov, 16, Junior, School #117, Omsk, Russia, T: Victor P. Ivannikov
- CS027 Quantitative Analysis of Music in MP3**  
Will Rowan Fletcher, 16, Junior, Hellgate High School, Missoula, Montana, T: Gary Lee Gagermeier
- CS028 A Novel Approach to the Automatic Recognition of Emotions in Natural Speech**  
Caroline Elizabeth Pietsch, 17, Senior, Ossining High School, Ossining, New York, T: Angelo Piccirillo
- CS029 Displacement Mapping Based Mesh Simplification for Remeshing**  
# Muhammad Sadan Nasir, 19, Senior, ADP IQRA Quetta, Quetta, Balochistan, Pakistan, T: Talha Shams
- CS030 Two Eyes Vision Motion Detection: Tracking and 3D Positioning of an Intruder**  
Raphael Ouzan, 18, Senior, Boys Town Jerusalem, Jerusalem, Israel, T: Samuel Uziel
- CS031 Power Demon: Improved Through Software**  
Sierra Marie Kahn, 15, Freshman, Park Vista High School, Lake Worth, Florida, T: Charlsa A. Henderson
- CS032 A Study on the Design and Implementation of an Artificially Intelligent Control System**  
Sagar Indurkha, 16, Junior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Myra Halpin
- CS033 Deyabu: Reading and Writing Interface for the Blind**  
Maria Estela Godinez, 16, Junior, CBTis No.139, San Francisco del Rincon, Guanajuato, Mexico, T: Jose Carlos Tovar
- CS034 Alquimistas**  
Arturo Medina HERNANDEZ, 17, Senior, CBTis No. 168, Aguascalientes, Aguascalientes, Mexico, T: Antonio Diaz de Leon Gonzalez
- CS035 Fuzzy Logic Based Music Composition Tool**  
Hyeonho Lee, 17, Senior, Gongju High School, Gongju-si, Chungcheongnam-do, South Korea, T: Jin-Hwan Choi
- CS036 Fractals in Medicine?**  
Lavanya Sivakumar, 13, Freshman, Franklin Regional Senior High School, Murrysville, Pennsylvania, T: Richard Sunny
- CS037 Development of Pedestrian Simulation Framework Based on Behavior Interpreter**  
Kyuhyong Byun, 18, Senior, Hansung Science High School, Seoul, South Korea, T: Jae-ik Jang
- CS038 Alekhine: Computer Program that Restructures User Access to Software Components and Free BSD Operative System Processes**  
Jorge Andres Morales Delgado, 18, Senior, Colegio Biliguel del Caribe, Limon, Costa Rica, T: Sandra Torres Lizano
- CS039 The Effects of Refrigerant-cooled Oil Submersion on the Performance of a Central Processing Unit in a Computer**  
Brock Anderson Hinig, 16, Sophomore, Tuscarawas Valley High School, Zoarville, Ohio, T: Lucinda Martin
- CS040 Tough or Diabolical? An Analysis of Sudoku Difficulty Level**  
Elsa Star Culler, 16, Sophomore, Lincoln Park High School, Chicago, Illinois, T: Scott Payne
- CS041 Three-dimensional Face Recognition from Video: Facial Surface Reconstruction and Analysis Using Tensor Algebra and Differential Geometry**  
# Justin Moore Solomon, 18, Senior, Thomas Jefferson High School for Science and Tech., Alexandria, Virginia, T: Joshua Strong
- CS042 Simulating an Infinitely Large Grid with the Game of Life**  
Eric Grey Oetker, 17, Senior, Arkansas School for Mathematics, Sciences, & the Arts, Hot Springs, Arkansas, T: Daniel Moix
- CS043 Network Master 2.0 Professional**  
Miroslav Kosik, 15, Freshman, Private Secondary Grammar School, Kosice, Slovak Republic, T: Roland Onofrej
- CS044 The Unpredictable Is Predictable**  
Alejandro Sebastian Valdivia, 17, Senior, Grants High School, Grants, New Mexico, T: Shelby L. Alexander
- CS045 Impact Study of Differing Traffic Control Systems**  
Caine Landreth Jette, 17, Senior, Maui High School, Kahului, Hawaii, T: Keith Imada
- CS046 How Long Does a Game of War Take?**  
Michael Warren Swift, 15, Freshman, Flagstaff Home Educators, Flagstaff, Arizona, T: James William Swift
- CS047 Efficiency of Programming Languages: A Generator/Solver Approach**  
Jorge Alberto Jimenez, 18, Senior, Franklin High School, El Paso, Texas, T: Stephen Sundeen
- CS048 Musical Instrument Recognition on Monophonic Musical Phrases**  
Huseyin Alp Gurkan, 19, Senior, Galatasaray High School, Istanbul, Turkey, T: Sukran Gerceker
- CS049 Creating a Leukodystrophy Database Using FileMaker Pro 7**  
# Farre Nixon, 17, Senior, Pleasant Grove High School, Texarkana, Texas, T: Shali Martindale
- CS301T An Image Matching Program to Automate Homeland Security**  
Christopher Robert Bethel, 16, Junior  
Elizabeth Alice Ennis, 15, Sophomore  
Lake Brantley High School, Altamonte Springs, Florida  
T: Suzy Behel
- CS302T Combining Touch Screen and Scanner Input for Handwriting Recognition**  
# Alan Garrett Pierce, 16, Junior  
# Nathaniel John Broussard, 17, Junior  
School of Science and Technology, Beaverton, Oregon  
T: Hector M. Morales
- CS303T Contemporary 2D Programming**  
Yue Kenneth Yuan, 14, Sophomore  
Drew Michael Bratcher, 16, Sophomore  
Houston County High School, Warner Robins, Georgia  
T: Laura Byrd
- CS304T Work Scheduling: A Conflict in America**  
Joshua Daniel Whelchel, 18, Senior  
David Omid Attarzadeh, 18, Senior  
duPont Manual Magnet High School, Louisville, Kentucky  
T: Glenn Zwanzig

- CS305T Reconstruction of Three-dimensional Objects from Video Films**  
Thomas Buenger, 17, Senior  
Tobias Grelle, 18, Senior  
Heinrich-Hertz-Oberschule, Berlin, Germany  
T: Hans Peter Luedtke
- CS306T Leaf! What Are You?**  
Hung-Ju Chen, 18, Senior  
Min Ju Yang, 17, Senior  
National Hsinchu Girls, Hsinchu City, Taiwan, Chinese Taipei  
T: I-Chen Hsu
- CS307T Neural Network Security System**  
David Nicholaas de Klerk, 18, Senior  
Dirk Johannes Jacobus Oosthuizen, 18, Senior  
Afrikaanse Hoer Seunskool, Pretoria, Gauteng, South Africa  
T: Mariana Haasbroek
- CS308T Geometric Compression System**  
## Giuliano Sider, 18, Senior  
## Rodrigo Luger, 18, Senior  
Escola Americana de Campinas, Campinas, Sao Paulo, Brasil  
T: Douglas Takeuti
- CS309T Using Eulerian Models to Determine Initial Conditions of Severe Weather**  
# Gwyneth Rhiannon Glissmann, 15, Freshman  
Robert Vaughan Glissmann, 18, Senior  
Peak to Peak Charter School, Lafayette, Colorado  
T: Adam DiGiacomo; T: Steven Goldhaber
- CS310T PDA Based Guide**  
Ilya D. Lopatin, 16, Junior  
Alexander M. Nazarov, 16, Junior  
Yury V. Kuzin, 16, Junior  
Centre of Education Tsaritsino #548, Moscow, Russia  
T: Maxim V. Sinev
- CS311T Parabolic Dish Receptors: Increasing Wireless Internet Connection Strength and Stability**  
Brian Jonathan Cain, 16, Junior  
Ross Anthony Mittiga, III, 17, Junior  
The Villages Charter High School, The Villages, Florida  
T: Emily M. Keeler
- CS312T Quick-LAC**  
Yanet Rojas Caracheo, 18, Senior  
Gabriela Pina Ortiz, 18, Senior  
Angelica Arias Gallegos, 18, Senior  
Colegio de Estudios Cient. y Tec. del Edo. de Gto., Cortazar, Guanajuato, Mexico  
T: Ivon Rojas Caracheo
- CS313T HumanSIS**  
Oscar Federico Flores Galvan, 18, Senior  
Jose de Jesus Briones Serna, 17, Senior  
CBTis No. 168, Aguascalientes, Aguascalientes, Mexico  
T: Antonio Diaz de Leon Gonzalez
- CS314T AI: Natural Language Processing**  
Xavier Jeremy Falco, 16, Sophomore  
Emmanuel Georgiou Liodakis, 16, Sophomore  
Hillcrest High School, Midvale, Utah  
T: Robert Mullins
- CS315T CAE: Computer Analysis of Exercises, Part II**  
# Alicia Renee Andrade, 18, Senior  
# Jacqueline Elise Mooney, 18, Senior  
Wachusett Regional High School, Holden, Massachusetts  
T: Robert Fry
- CS316T Paladin: A New Fast and Secure Symmetric Block Cipher**  
Victor Andrew Shia, 17, Senior  
George Chen, 17, Senior  
Frank Fu-Han Chuang, 17, Senior  
Monta Vista High School, Cupertino, California  
T: Bruce Kawanami
- CS317T Intellectual Data-Analytical Forecasting System, UNICUM**  
Dmitry Purgin, 16, Junior  
Artyom Karelskiy, 17, Junior  
Technical Lyceum #165, Almaty, Kazakhstan  
T: Elena Kholodova

- CS318T A New Algorithm to Minimize Factory Inefficiency Through Penalty Reduction**  
# Andrew David Gamalski, 17, Senior  
# Vinayak Muralidhar, 16, Senior  
Hamilton High School, Chandler, Arizona  
T: Teresa Clark  
Corona del Sol High School, Tempe, Arizona  
T: Steven Morgan

## EARTH SCIENCE

### GRAND AWARDS PRESENTED BY: SHELL OIL

- EA001 Storm Warning: Is There a Predictable Correlation Between the North Atlantic Oscillation and Tropical Cyclone Activity?**  
# John Christopher Turner, 17, Junior, Lincoln High School, Tallahassee, Florida, T: Christy Pecha
- EA002 Is Soil Porosity Useful in Measuring Flooding Potential?**  
Kayla E. Potter, 16, Sophomore, Union Scioto High School, Chillicothe, Ohio, T: Amanda Seebomh
- EA003 Breakthrough Substitutions of Synthetic Polymers with Natural Chitosan for the Prevention of Soil Erosion**  
Dhanur Damodar, 15, Sophomore, duPont Manual Magnet High School, Louisville, Kentucky, T: William H. Deines
- EA004 ENSO Dampening of Atlantic Tropical Cyclone Activity via Thermal Wind**  
Alexander Abram Robel, 17, Senior, Maritime and Science Technology Academy, Miami, Florida, T: Wafa Khalil
- EA005 Pleistocene Debris Flow Deposition into an Active Graben Near Emery, Utah**  
Nicole Marie Hovat, 17, Senior, Carbon High School, Price, Utah, T: Dan Taylor
- EA006 Why Did the Levees Break? New Orleans and Its Soil**  
Austin Alexander James Toner, 16, Sophomore, T.C. Williams High School, Alexandria, Virginia, T: Roderick Brame
- EA007 Can We Predict the Next Katrina? A Study of the Correlation Between Hurricane Intensity and Antarctic Ozone Level**  
Michael Lee Tucker, 17, Senior, University of Missouri High School, Columbia, Missouri, T: Debra Yvonne Tucker
- EA008 The Effects of Oil and Gas Development on Flood Plains, Northwest New Mexico**  
Shandiin Chanel Copeland, 15, Sophomore, Kirtland Central High School, Kirtland, New Mexico, T: Cassandra Nicole Siegersma
- EA009 Impact of Emerging Arctic Ground Cover upon Albedo and the Acceleration of Global Warming**  
Krista BreAnn Pfeifer, 17, Junior, Latta High School, Ada, Oklahoma, T: Susie Stevens
- EA010 Measuring Long Term Trends in the San Francisco Bay Delta Using Satellite Imagery**  
# Mina Renee Bionta, 18, Senior, Livermore High School, Livermore, California, T: Sarah Palmer
- EA011 An Estimation of Heavy Metal Contamination in Soil Using Reflectance Spectroscopy and Partial Least Squares Regression**  
# Caaminee Mayank Pandit, 18, Senior, Noblesville High School, Noblesville, Indiana, T: Gabriel Filippelli
- EA012 Identification of Conditions that Affect the Resolution of the Global Positioning System (GPS)**  
Natasha Hasbah Gail, 17, Junior, Rough Rock Community School, Chinle, Arizona, T: Helena Sabrea Al-kubaisi
- EA013 The Performances of Different Kinds of Trees in Reducing the Destructiveness of an Earthquake and Functioning of Cities' Nature**  
Hayri Genc, 16, Freshman, Private Fatih High School, Istanbul, Marmara, Turkey, T: Sumeyra Kurt
- EA014 Environmental Setting for Earth's Earliest Eukaryotes**  
Aarisha Shrestha, 18, Senior, Eleanor Roosevelt High School, Greenbelt, Maryland, T: William Martin

- EA015 Mapping the World**  
Vanessa Charlene King, 17, Senior, Flandreau Indian School, Flandreau, South Dakota, T: Lewis Lewellyn Kubicek
- EA016 Sleuthing Epicenter Direction from Seismites, Cretaceous Wahweap Formation, Cockscomb Area, Grand Staircase-Escalante National Monument, Utah**  
# Hannah Louise Wolf, 16, Sophomore, Parkland High School, Allentown, Pennsylvania, T: Wendy Smith Simpson
- EA017 Hurricanes: The Effect of Astral Phenomenon**  
Honey Kapeesh Kumbhat, 15, Freshman, Floral Park Memorial High School, Floral Park, New York, T: Sarah J. Werbitsky
- EA018 Weather Station**  
Patricia Louise O'Neal, 18, Senior, Harmony Grove High School, Benton, Arkansas, T: Winston Scott Ausbrooks
- EA019 The Correlation Between Sunspot Activity and the Temperature of the Earth**  
# Dominique Marianna Cox, 16, Junior, Morenci High School, Morenci, Michigan, T: Kerry Nieman
- EA020 Analysis of Simulated Slip-Stick Earthquake Motion**  
Katherine Marie Hushebeck, 18, Senior, Notre Dame Academy, Park Hills, Kentucky, T: Sr. Mary Ethel Parrott
- EA301T Waves of Destruction, II: Calculating Wave Intrusion on Coastal Regions**  
Scott Edward Hasbrook, 15, Freshman  
Nathan Tyler Hasbrook, 15, Freshman  
Highland East Junior High School, Moore, Oklahoma  
T: Michael Swart
- EA302T Tracing Early Hominid Migrations in India: ESR Dating at Hathnora and Devni-Khadri**  
Maysun Mazhar Hasan, 17, Senior  
Hermain Suhail Khan, 16, Junior  
Francis Lewis High School, Fresh Meadows, New York  
Staten Island Technical High School, Staten Island, New York  
T: Michael Sass; T: Bonnie Blackwell
- EA303T Hurricanes: Forces of Nature**  
Laura Torres, 16, Junior  
Daniel Omar Caballero, 17, Junior  
James Pace High School, Brownsville, Texas  
T: Dora Elia Lopez- Garcia

## ENGINEERING

### GRAND AWARDS PRESENTED BY: INTEL FOUNDATION

- EN001 Robotics Surveillance System**  
Joey Lee Edgar, 19, Senior, Jensen Beach High School, Jensen Beach, Florida, T: Richard Thomas Soviero
- EN002 The Effect of Model Controllers on the Friction Control of High Performance Robotics Systems**  
Melissa Amoi Belinda Smith, 16, Junior, Coral Glades High School, Coral Springs, Florida, T: Paula Wagner
- EN003 Engineering of an Ammonia-Based Hydrogen Storage System as an Alternative to Oil**  
Ariah Aram Klages-Mundt, 16, Sophomore, Winona Senior High School, Winona, Minnesota, T: Kenneth James Mann
- EN004 Fractal Dimension and Its Relation to the Efficiency of Proposed Artificial Lung Models**  
Avi William Levy, 14, Freshman, West Linn High School, West Linn, Oregon, T: Jamie Kelso
- EN005 Multi-Purpose Device Designed for Physical Effects Analysis**  
Martin Olejar, 20, Senior, Communication Engineering High School, Prague, Czech Republic, T: Antonin Blahovec
- EN006 Touch-based Navigation Aid for the Blind and Visually Impaired**  
William Decker Neiswanger, 15, Sophomore, School of Science and Technology, Beaverton, Oregon, T: Hector M. Morales
- EN007 Running on Empty**  
Harold Franklin Hedrick, 17, Junior, River Ridge High School, New Port Richey, Florida, T: Julie Hallwas

- EN008 Radial Momentum**  
Jordan T.C. Lutz, 16, Sophomore, Ada-Borup High School, Ada, Minnesota, T: Kevin Lindell
- EN009 What Effects Do Leading Edge Tubercles Have on Hydrofoil Characteristics?**  
# Mark Richard Fleming, 15, Sophomore, Loyola High School, Mankato, Minnesota, T: Susan Mary Goebel
- EN010 Water-Based Rapid Prototyping and Tooling System**  
Ka Yi Ding, 17, Sophomore, Shun Tak Fraternal Association Yung Yau College, Hong Kong, Region of China, T: Chung Hong Henry Ho
- EN011 New Generation Artificial Leg: A New Hope for the Disabled to Walk Again for a Lower Price**  
Yin Fan Denis Huen, 18, Senior, La Salle College, Hong Kong, Region of China, T: Tong Chan
- EN012 The Leg, Part Five: Walking Alone**  
Alan Larkin O'Donnell, 16, Junior, Maurice J. McDonough High School, Pomfret, Maryland, T: Harold Covey
- EN013 Potential of Bentonite-Based Geopolymer Composites in Engineering Applications**  
# Myriah Lynn Sylvester, 18, Senior, Greybull High School, Greybull, Wyoming, T: Joel M. Kuper
- EN014 Comparison of Energy Absorption History for Aircraft Wing Structures: Testing Impact with Aluminum, Fiberglass, and Aluminum/Fiberglass Laminate**  
Lakshmi Menaka Ram, 15, Sophomore, Lecanto High School, Lecanto, Florida, T: Ronald Worthington
- EN015 A Kalman Filter to Track Moving Targets in a Dual Mode Millimeter-Wave/Infrared (MMW/IR) Sensor: A Special Algorithm for Multi-Mode Data Fusion**  
# Peter Bao-Phuc Nguyen, 16, Junior, Fort Walton Beach High School, Fort Walton Beach, Florida, T: Tavia Marez
- EN016 Computerizing Psychometrics**  
Lucas Adam Coffin, 17, Junior, Canterbury School of Florida, Saint Petersburg, Florida, T: Patricia Foran
- EN017 Designing an Optical Sensor to Easily Decipher the Relative Longevity of a High Pressure Sodium Light Through Spectral Analysis**  
# Carl Anthony Turner, 16, Junior, New Prague Senior High School, New Prague, Minnesota, T: Jeff Decker
- EN018 Fly into the Sky**  
Kelcy Stephen Anderson, 16, Freshman, Monroe High School, Albany, Georgia, T: Bryan Haas
- EN019 System Control Interface**  
Daniel Osariemwen Odaro, 17, Senior, Niger College, Benin City, Edo State, Nigeria, T: Amenaghawon E. Edmond
- EN020 What Goes Around Comes Around?**  
Atalie Danielle Mickelson, 16, Sophomore, Alma High School, Alma, Arkansas, T: Robert James Wolfe
- EN021 Point and Click, Literally, Phase II**  
# Christopher D. Messick, 16, Junior, Sargent High School, Monte Vista, Colorado, T: Cammie N. Wilson
- EN022 Intelligent Control of Door Mirrors Through Blind Spot Monitoring**  
Gabriel Artur Mineiro, 20, Senior, Escola Tecnica Estadual Monteiro Lobato, Taquara, Rio Grande do Sul, Brasil, T: Guilherme Petry Breier
- EN023 Design and Construction of a Dynamic Artificial Neural Network**  
# Forrest Quinn Friesen, 16, Junior, Palmer High School, Colorado Springs, Colorado, T: Sandy Smith
- EN024 Automated Quiz Board**  
Uwalia Blessing Osawaru, 15, Junior, Holy Mary Comprehensive College, Benin City, Edo State, Nigeria, T: Nosa Egharevba
- EN025 Aerodynamics: Going with the Flow**  
Christopher Ernie Lopez, 16, Sophomore, Taos High School, Taos, New Mexico, T: Ernie Manuel Lopez
- EN026 Aviation Wing Deicer**  
Robbie Brandt Morgan, 16, Sophomore, Brush High School, Brush, Colorado, T: David Miner
- EN027 3D Silhouette Laser Scanning: The Digital Reconstruction of Real-World Objects into Point Clouds**  
Brandon Lee Reavis, 16, Sophomore, Cody High School, Cody, Wyoming, T: Nelson Budde Thomas



- EN028 Testing the Effects of Corrugated and Flat Sheet Metal Reinforcement on the V50 Ballistic Rating of a Composite Reinforced Frame Wall**  
John Joseph Conner, 16, Junior, York Catholic High School, York, Pennsylvania, T: Matthew Euclide
- EN029 Acoustic Localization, Detection, and Identification #**  
Joseph Anthony Crivello, 18, Senior, University School of Milwaukee, Milwaukee, Wisconsin, T: Ronald LeMay
- EN030 Indoor Firefighter Location**  
Matthew Zubiel, 15, Sophomore, Lewis-Palmer High School, Monument, Colorado, T: Tyler Dall
- EN031 Streamlining Pickup Trucks, Part II #**  
John Christopher Tarleton, 17, Junior, Union Grove High School, McDonough, Georgia, T: Leon Louis Olivier
- EN032 Maximizing Solar Thermal Power Generation**  
Jeremy Halden Fowers, 17, Senior, Maritime and Science Technology Adacemy, Miami, Florida, T: Wafa Khalil
- EN033 Does Corona Discharge Wear Out Carbon Nanotubes?**  
Amanda Lorraine Armstrong, 15, Freshman, Shorewood High School, Shorewood, Wisconsin, T: Junhong Chen
- EN034 Environmental Investigations Using Recombinant Dynamic Nodal Analysis**  
Tyson O. Boardman, 17, Junior, Delta High School, Delta, Utah, T: Austin Wayne Day
- EN035 Power for the Poor**  
Pieter Christiaan Berning Luyt, 17, Junior, Harriston School, Harrismith, Free State, South Africa, T: Kobus Cronje
- EN036 Low Cost Nanowire-based Gas Sensor Test Platform for Military and Civilian Applications ##**  
Trevor Elliot Powers, 19, Senior, Christian Academy of Louisville, Louisville, Kentucky, T: Tina Gibson
- EN037 Power Up: An Experiment in Perpetual Energy #**  
Daniel Mark Ellsworth, 17, Junior, Buena High School, Sierra Vista, Arizona, T: Brian Dean Ellsworth
- EN038 Emergency Vehicle Alert System, Part Four ##**  
Justine Alyson Fortier, 16, Junior, LaSalle Academy, Providence, Rhode Island, T: Leslie V Martinelli
- EN039 Determining the Effects of Flow Circulation and the Kutta Condition in Flight**  
Garrett Darl Lewis, 16, Junior, Sandia Preparatory School, Albuquerque, New Mexico, T: Neil McBeth
- EN040 Tracking the Sound: A Second Year Study on an Ultrasonic Train Wreck Avoidance System ##**  
Courtney Anne Rafes, 18, Senior, Northwest High School, Justin, Texas, T: Tommye Lou Rafes
- EN041 The Solar Steamer: A Solar Thermal Rocket Powered by a Fresnel Concentrator and H<sub>2</sub>O Propellant**  
Nathan Michael Tinker, 14, Freshman, Covenant Christian Academy, Huntsville, Alabama, T: Rhonda Lisauckis
- EN042 Design of an Aerodynamically-Enhanced Plasma for Synthesis of Nanoparticles**  
Rohith Chandrasekar, 17, Senior, Princeton High School, Princeton, New Jersey, T: Carol Lee
- EN043 Home Floods: A Device to Stop Them. A System for Preventing Floods and Leaks in Homes #**  
Christopher Michael Jenkins, 18, Senior, South River High School, Edgewater, Maryland, T: Deborah Heyes
- EN044 The Boomerang Drill: Development of a 180 Degree Curved Drill ##**  
Benjamin Thomas Unsworth, 17, Senior, Kingswood Academy, Sulphur, Louisiana, T: Thomas Robert Unsworth
- EN045 Research, Engineering, and Design of a Hard Surface Sailer, Part II #**  
Christopher Brennan Long, 16, Junior, Angels Rest Homeschool, Pearisburg, Virginia, T: Kenneth Abel
- EN046 Milk Pasteurizer II #**  
Hugo Gualterio Chiardola, 20, Senior, Technical School NO 139 "De Produccion Agro-Ind.", Viale, Entre Rios, Argentina, T: Humberto Javier Jose
- EN047 High Speed Size-exclusion Chromatography Using Spherical Meso-structured Cellular Foam**  
Shu Ren Sarah Ong, 18, Senior, Raffles Junior College, Singapore, Singapore, T: Hwee Tiang Ning
- EN048 Nanoengineering Aerogel for Insulin Insulation**  
Alex Nathan Capececlatro, 18, Senior, Brewster High School, Brewster, New York, T: Edward J. Schmidt
- EN049 Remote Musical Actuation Web Service**  
Jacob Aaron Liechty, 17, Junior, Leo High School, Leo, Indiana, T: Bill Copeland
- EN050 Development of an Optical and Electrical Automobile Crash Avoidance System**  
Diana Christine Burk, 17, Senior, West Potomac High School, Alexandria, Virginia, T: William Ferzoco
- EN051 Wind Resistance: Analyzing House Structures**  
Mariana Ximena Cruz, 17, Junior, Westfield High School, Chantilly, Virginia, T: Christopher Lyndon
- EN052 Harnessing the Energy Which Escapes Photovoltaic Cells by Using a Flat Plate Solar Panel**  
Rebecca Grace Willmott, 16, Sophomore, Langley High School, McLean, Virginia, T: Kanwaljit Sachdeva
- EN053 Free Energy in Your Own Back Yard**  
Brian Joseph Sutterer, 17, Junior, Terre Haute North Vigo High School, Terre Haute, Indiana, T: Glen M. Cook
- EN054 A Novel, Non-invasive Approach to Diagnosing Obstructive Uropathy Using CFD and Computer Simulation**  
Nirmish Singla, 15, Senior, Andover High School, Bloomfield Hills, Michigan, T: Emily Wendt
- EN055 Optimizing Ethanol Production Efficiency #**  
Jessica Lynn Laviolette, 18, Senior, Brandon High School, Ortonville, Michigan, T: Kelly Sweet
- EN056 Optically Realistic Autostereoscopic Projector**  
Howard Yee, 18, Senior, Stuyvesant High School, New York, New York, T: Samantha Daves
- EN057 Autonomous Metal Detection: Robotic Identification and Classification of Metals #**  
Amanda Sarah Hersh, 16, Junior, Yeshivah of Flatbush Joel Braverman High School, Brooklyn, New York, T: Vikram Kapila
- EN058 Seeing Cane for Blinds**  
Robert Varga, 18, Senior, Csepel-Sziget Secondary School of Technology, Budapest, Hungary, T: Laszlo Nagy
- EN059 Optimizing a Model for Rocket Stability**  
Robert Gerard Wright, 17, Senior, York School, Monterey, California, T: Pam Durkee
- EN060 Enhanced Maneuverability of Rocket Torpedos Using a Porous Plate Design #**  
Robert Francis Minehart, 17, Senior, Dominion High School, Sterling, Virginia, T: James Bond
- EN061 Marx Bank Driven Flash X-ray Generator: A Powerful Tool to Study High Speed Phenomena**  
Ross Alexander MacKinnon, 16, Junior, Stevenson School, Pebble Beach, California, T: Armando Galindo
- EN062 Matlab® Nonlinear Unconstrained Optimization of a Floating Arm Trebuchet (FAT) for Maximum Projectile Range**  
Amanda Gayle Kimbel, 18, Senior, Saint Charles West High School, St. Charles, Missouri, T: Joan Marie Twillman
- EN063 Hammock Swinger**  
Mario Enrique Gonzalez Torres, 15, Sophomore, Colegio de la Salle, Bayamon, Puerto Rico, T: Wanda I. Aviles
- EN064 The Pain Relieving Belt for Health**  
Piyaporn Yoosuk, 16, Junior, Klonglanwitaya School, Klonglan, Kumpangphet, Thailand, T: Samran Sornliamthong
- EN065 The Development of Autonomous Self Configuring Multi-Cell Based Robots #**  
Jessica Lauren Malone, 18, Senior, Berea High School, Berea, Ohio, T: Terry LeVon Malone
- EN066 A Dynamic Analog Concurrently-Processed Adaptive Chip #**  
Malcolm Christopher Ross Stagg, 17, Junior, Alberta Distance Learning Center, Calgary, Alberta, Canada, T: Don Cross
- EN067 Telescopic Morphing Wings: Design-Build-Fly**  
Stephen Gerald Warrenner, 18, Senior, East Noble High School, Kendallville, Indiana, T: Mark Liepe
- EN068 Spatial Resolution Enhancement of a Prosthetic Retina #**  
Iheoma Uchanma Umez-Eronini, 16, Junior, Benjamin Banneker Academic High School, Washington, District of Columbia, T: Kim Burke Ables

- EN069 Cornboard**  
Philip John Schmidt, 18, Senior, Fenelon Falls Secondary School, Fenelon Falls, Ontario, Canada, T: Rick Christie
- EN070 Bifurcation of Oil-Water Emulsions Using Electrostatic Forces, Year Three**  
# Leanne Louise Thompson, 16, Junior, Bishop Kenny High School, Jacksonville, Florida, T: Susana Suarez
- EN071 Economical Wifi Rover with GPS Automation and Telepresent Operation**  
Kenneth Iven Aycock, 17, Senior, Skyview High School, Billings, Montana, T: Rich Daren McFate
- EN072 Advanced Optical Camouflage**  
Ian Michael Fuller, 18, Senior, Bellbrook High School, Bellbrook, Ohio, T: Berch Carpenter
- EN073 Bomb Sniffing Robot**  
Evan Bernard Cummings, 15, Freshman, Saint Josephs High School, Ogden, Utah, T: Pamela Stewart
- EN074 Performance of Electric Motor vs. Petroleum Engine in Automotive Racing**  
Brent Singleton, 18, Senior, Bonneville High School, Ogden, Utah, T: Michelle Wood
- EN075 Development of Fixed and Flapping-wing Surveillance Micro Air Vehicles**  
## John Pease Moore, IV, 18, Senior, Dayton Christian High School, Miamisburg, Ohio, T: Tom William Minor
- EN076 Save the Water, Reclaim the Rain**  
Shelby Lynn Terry, 14, Freshman, Wildwood High School, Wildwood, Florida, T: Kahil Tucker
- EN077 Multifunctional Therapeutic Cum Mobility System for Cerebral Palsy Children**  
Mukund Vinod Tiwari, 18, Senior, Saint Aloysius High School, Kanpur, Uttar Pradesh, India, T: Rama Tiwari
- EN078 Glabenerator: An Advanced Alternative and Augmentative Communication Device**  
Apurv Mishra, 16, Senior, Dayanand Anglo Vedic Public School, Bhubaneswar, Orissa, India, T: Chakradhar Prusty
- EN079 Blind Navigation**  
Steven Adam Gasior, 16, Sophomore, Saint Joseph Secondary School, Mississauga, Ontario, Canada, T: Julian Smith
- EN080 The Invention of the Pressurized Grass Cutter**  
Joseph Levi Melton, 17, Junior, Wilcox-Hildreth High School, Wilcox, Nebraska, T: Randall G. Lienemann
- EN081 The Electronic Scroll-Wire: A New Versatile and Applicable Interface**  
Bert Thomas Ruyten, 16, Sophomore, Tullahoma High School, Tullahoma, Tennessee, T: Harold Liner
- EN082 A New Technology for Portable Constructional Beams and a Process for Their Production and Use with Application to Third World and Displaced Population**  
Micah Lathaniel Toll, 17, Junior, Cedar Crest High School, Lebanon, Pennsylvania, T: Jolanda Hopwood
- EN083 Is a Piezo-Electric Guitar Pickup Equal in Qualities of Sustain, Amplitude, and Electromagnetic Interference to a Single Coil Electric Guitar Pickup?**  
Eli William Rosenwasser, 17, Junior, Hershey High School, Hershey, Pennsylvania, T: Jason Sibbach
- EN084 LISSA: Light Intensity and Sonar Sensing Assistant**  
Sophia Alexandra Goreczky, 16, Sophomore, Shepton High School, Plano, Texas, T: Nadine Harris
- EN085 Design and Build of an MHD Generator Utilizing a Paraffin-Based Hybrid Rocket Motor**  
# Kirk Michael Davenport, 18, Senior, Tullahoma High School, Tullahoma, Tennessee, T: Harold M. Liner
- EN086 Time and Life Indicators of Outdoor Lighting, Year Seven**  
# Brandon Eric Northcut, 15, Sophomore, Monterey High School, Lubbock, Texas, T: William D. Northcut
- EN087 Formulation and Development of a "Stomach-Friendly" NSAID [Ibuprofen Delivery System]**  
Anuj Atul Shukla, 16, Sophomore, White Station High School, Memphis, Tennessee, T: Yichun Sun
- EN088 Designing a Personal Aircraft for the Future of Short-Distance Travel**  
Nicholas Hane Wiles, 17, Senior, Academic Magnet High School, North Charleston, South Carolina, T: Wiliam Bruce Newton
- EN089 Evaluating the Usefulness of Carbon Nanofoam Electrodes and Carbon Nanotube Catalyst Support in the Direct Methanol Fuel Cell**  
# Jordan Andrew Hurwich, 18, Senior, John Adams High School, South Bend, Indiana, T: Nevin E. Longenecker
- EN090 The Design and Optimization of a Pitch Elevator and It's Effect on the Oscillation Frequencies of a Membraphone**  
Sarah Narceille Vaden, 16, Sophomore, Staunton River High School and Roanoke Valley Governor's School, Moneta, Virginia, T: Dewey Spangler
- EN091 Balancing Robot**  
Matthew Scott Rosoff, 18, Junior, Bergen County Academies, Hackensack, New Jersey, T: Bahadir Karuv
- EN092 Computational Thermodynamics and Kinetics**  
Kimberly Jo Larrabee, 17, Junior, Reading High School, Reading, Pennsylvania, T: Jeanne Louise Gochauer
- EN093 Adaptive Airfoils: Better than Existing Technology**  
Tyler Jason Clark, 17, Senior, Salpointe Catholic High School, Tucson, Arizona, T: Tim Barry
- EN094 The Effect of Transesterification Catalyst Base Strength on Biodiesel Production**  
Anmar Lou DeJoya Siochi, 15, Sophomore, Warwick High School, Newport News, Virginia, T: Tarek Abdel Fattah
- EN095 The Development of Gradient-based Computational Fluid Dynamics Applications**  
Robert Michael Parrish, 16, Junior, Chamberlain High School, Tampa, Florida, T: Mary Wilson
- EN096 Hypo Hoist**  
Tanya Louise Budd, 18, Senior, Waingels College, Reading, Berkshire, United Kingdom, T: Graham Prickett
- EN097 Finding an Alternative Insulating Material for Space Shuttles**  
Mary Elizabeth Cromwell, 15, Sophomore, The Good Hope School, Frederiksted, St. Croix, Virgin Islands, T: Mary Jane Coles
- EN098 Heated Water at Low Cost: The Construction of a Solar Heating with Recycling Materials Using Thermo-solar Energy as a Tool to Confront Social Problems**  
Allon Rozansky, 16, Junior, Escola Brasileira Israelita Chaim Nachman Bialik, Sao Paulo, Brasil, T: Rogerio Giorgion
- EN099 Multifunctional Wheelchair**  
Lucas Remoaldo Trambaiolli, 16, Junior, Colegio Mater Amabilis, Guarulhos, Sao Paulo, Brasil, T: Egidio Trambaiolli Neto
- EN100 Grass Trimmer Robot - RCG-1**  
Bruno Marques Prescott, 16, Senior, Colegio de Aplicacao Emmanuel Leontsinis, Rio de Janeiro, Brasil, T: Geraldo Ricardo Bergamo Martins
- EN101 Can You Hear It Now? . . . Good**  
David Wayne Counsell, 17, Junior, Heritage Christian High School, Indianapolis, Indiana, T: Stephen Terry
- EN102 An Analysis of the Effect of Different Building Configurations on Wind Turbine Efficiency**  
Logan Mark Skelley, 18, Senior, Joplin High School, Joplin, Missouri, T: Cathy Reed
- EN103 Carruednergy: The New Source of Electric Energy**  
Wilmarie Fuentes-Payan, 17, Junior, Bonifacio Sanchez Jimenez High School, Aibonito, Puerto Rico, T: Jeannette Waleska Viera
- EN104 Design and Construction of a Wireless Potable Water Meter and System**  
Patricia Torres, 17, Senior, University Gardens High School, San Juan, Puerto Rico, T: Nelson Ruiz Cortes
- EN105 The Nautical Ramjet: An Alternative Approach to Torpedo Propulsion**  
Jason Arel Strauss, 16, Junior, North Shore Hebrew Academy High School, Great Neck, New York, T: Allen L. Sachs
- EN106 Development of a Non-Prestrained Dielectric Elastomer Actuator**  
Rupak Chakraborty, 17, Senior, L.V. Hightower High School, Missouri City, Texas, T: Tom Miskelly
- EN107 Query by Humming**  
# Benjamin Min-Jia Chang, 17, Senior, Sewanhaka High School, Floral Park, New York, T: David Sexton

- EN108 **Fahrenheit: Temperature Biotelemeter**  
LoriLei Chavez, 15, Sophomore, Bernalillo High School, Bernalillo, New Mexico, T: Dianne Y. Williams
- EN109 **IMPAXX: Designing Better Playground Surfaces with Finite Element Analysis**  
# Nicholas Samir Ekladyous, 14, Sophomore, Cranbrook Kingswood School, Bloomfield Hills, Michigan, T: Albert S. Ekladyous
- EN110 **Faster, Stronger, Cheaper 'InVector System' Increasing Fuel-Efficiency in Jet Engines by Installing Three New Parts**  
Bradley James Peterson, 17, Junior, Riverton High School, Riverton, Utah, T: Rochelle Diane Norton
- EN111 **Smart Seat: A Safer Child's Car Seat**  
Jordan Michael Krell, 15, Sophomore, Plankinton High School, Plankinton, South Dakota, T: Troy Eugene Poncelet
- EN112 **An *in vitro* Study of Aerosol Delivery Using Carina Models**  
# Abhiram Ramaswamy Bhashyam, 17, Senior, Bethel Park Senior High School, Bethel Park, Pennsylvania, T: Timothy Corcoran
- EN113 **Right Angle Coupling: The Theory of Coupling Wave-Guides at a Right Angle on the Nano-Scale**  
Trinity Ann Romney, 16, Sophomore, Riverton High School, Riverton, Utah, T: Steve Blair
- EN114 **T-shirt Folder**  
# Daniel Martinez Bautista, 18, Senior, CBTis No. 149, Morelia, Michoacan, Mexico, T: Manuel Sanchez Arroyo
- EN115 **Proximity Fire Alarm**  
James Julian Malin, 17, Junior, Oakham School, Rutland, Leicestershire, United Kingdom, T: Graeme Lawrie
- EN116 **Study of Low-cycle Fatigue of Heat-treated Al-Mg Alloys**  
Nayomi Zuleika Plaza, 16, Junior, Eugenio Maria de Hostos, Mayaguez, Puerto Rico, T: Marisol Colon
- EN117 **How Does a Variable Sintering Temperature Affect Stereological Characteristics in SOFCs?**  
David Perry Kunding, 17, Senior, DeLand High School, DeLand, Florida, T: Michael Dunn
- EN118 **Pressure Braking, Year Two**  
# Alexander Winslow Mavrogordato, 19, Senior, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Tina Webb-Browning
- EN119 **Analysis of Hydrophobicity on Common Leaves and Fabrication of Hydrophobic Surface**  
Jeong Soo Lee, 16, Junior, Korea Science Academy, Busan, South Korea, T: Hoon Eui Jeong
- EN120 **Self-assembling Microcontainers for On-demand Release of Chemical Agents**  
Emma Kathryn Call, 17, Junior, Baltimore Polytechnic Institute, Baltimore, Maryland, T: David Nelson
- EN121 **Development of a Functional Knee Brace for Patients with Medial or Lateral Compartment Syndrome Caused by Osteoarthritis**  
Andrea Lynn Sims, 15, Sophomore, Mecosta Oseloa Math Science Technology Center, Big Rapids, Michigan, T: Matthew Scott Williams
- EN122 **Chording Glove: A Novel Alternative to Text Entry in Bluetooth® Enabled Peripheral Devices**  
# Evan Takashi Morikawa, 18, Senior, High Technology High School, San Diego, California, T: Darrell McClendon
- EN123 **Voltage Generation Using an Oscillating Fabric**  
Julie Christina Sung, 17, Junior, Hopkinton High School, Hopkinton, Massachusetts, T: Valerie Lechtanski
- EN124 **A Collaborative Framework to Enhance Camera-based Security Systems Using Intelligent Wireless Sensor Networks**  
Vinayak Ramesh, 15, Sophomore, Oak Ridge High School, El Dorado Hills, California, T: Stuart MacKay
- EN125 **"Go Fast, Turn Left": The Redesign of a 'Racer 2' Airfoil for Optimal Performance**  
# Paul Michael Sitler, 18, Senior, Westfield High School, Westfield, Massachusetts, T: David Roberts
- EN126 **Characterizing the Structural Stability of Model Buildings Through the Use of a Biaxial Shaker for the Purpose of Structural Optimization, Phase Three**  
# Jonathan Brooks Bell, 17, Junior, R. Nelson Snider High School, Fort Wayne, Indiana, T: Barbara Gabet
- EN127 **The Effect of Hole Orientation on Parachute Drag**  
Stephen Gabriel Welty, 16, Sophomore, Northside College Preparatory High School, Chicago, Illinois, T: Johan Tabora
- EN128 **Self-powered Prosthetics: The Utilization of Faraday's Law of Electromagnetic Induction**  
Thomas Shaw, 18, Senior, Monta Vista High School, Cupertino, California, T: Bruce Kawanami
- EN129 **Optimizing a Fast Neutron Gamma-insensitive Continuous Operation Tension Metastable Fluid Detector**  
Alexander Robert Hagen, 17, Junior, Lafayette Jefferson High School, Lafayette, Indiana, T: Joe Lapinskas
- EN130 **An Experimental Analysis of the Thrust Produced by an Ornithopter at Low Reynolds Numbers**  
Anjaney Pramod Kottapalli, 16, Junior, Lynbrook High School, San Jose, California, T: Amanda Day-Alonzo
- EN131 **Using Robotics to Test Mechanical Advantages and Wire Gauges in Electrical Circuits: A Second Year Continuation**  
Brian Michael Cherbak, 16, Sophomore, Hanover Central High School, Cedar Lake, Indiana, T: Travis Justin Lechien
- EN132 **Developing Atmospheric Responsiveness for a Robotic Hot Air Balloon**  
# Gabriel Carson Elder, 17, Junior, Highland High School, Albuquerque, New Mexico, T: Paul Losinski
- EN133 **Development of a Planar Perfused Tumor Bioreactor**  
# Lucas Hudson Hofmeister, 17, Senior, Martin Luther King, Jr. Magnet School, Nashville, Tennessee, T: Kara Krinks
- EN134 **Preparation and Characterization of a Superparamagnetic Polymer Nanocomposite for Biomedical Applications**  
Nicole Rachelle Brenner, 18, Senior, Lawrence High School, Cedarhurst, New York, T: Rebecca P. Isseroff
- EN135 **The Many Sides of Strength?**  
# Shannon Lee Klein, 16, Sophomore, Wishek Public School, Wishek, North Dakota, T: William A. Malaski
- EN136 **The Use of Conductive Concrete in Deicing and Cathodic Protection of Bridges**  
Alyssa Renee Jenkins, 17, Senior, Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan, T: John Goudie
- EN137 **Bending Spacetime in the Basement**  
Maria Kathleen LaGasse, 18, Senior, Rome Catholic School, Rome, New York, T: Tom Potter
- EN138 **Life Seeker and Keeper Box**  
Mohanad Alaa Abd Elmonem, 14, Freshman, Abdalla ElNadiem, Alexandria, Egypt, T: Mina Anton Boghdady
- EN139 **Development and Design of an All Terrain, Omnidirectional Platform with Obstacle Climbing Capabilities**  
Christopher Jon Olsen, 17, Senior, Valley Central High School, Montgomery, New York, T: Joseph Fracalossi
- EN140 **Enhancing Autonomous Navigation Capabilities of a Robot**  
Thomas Lyle Wentz, 16, Junior, Wentz-Simmons Home School, Silver City, New Mexico, T: Gayle Marie Simmons
- EN141 **Modern Safety Applications of Micro-Electronic-Mechanical Systems (MEMS)**  
David Michael Strouse, 17, Senior, Cherry Creek High School, Greenwood Village, Colorado, T: Jessica Reynolds Olsen
- EN142 **Characterization of NiTi Nanoparticles**  
David Bellamy Miller, 17, Senior, Cherry Creek High School, Englewood, Colorado, T: Timothy J. Donahue
- EN143 **A Novel Valveless Piezoelectric Micropump and Its Characteristics**  
# Yichi Zhang, 18, Junior, Dunlap High School, Dunlap, Illinois, T: Sarah Lynne Lueschow
- EN144 **Development of a Human Exoskeleton, Phase II**  
Ian Michael Bouligny, 15, Sophomore, Catholic High School, New Iberia, Louisiana, T: Donald Voorhies
- EN145 **Two-Phase Loop Thermoelectric CPU Cooling System**  
Kenan Ahiska, 19, Junior, Cagribey Anatolian High School, Ankara, Turkey, T: Durdane Polat
- EN146 **Mega Muffler**  
Matthew Boman Johnson, 16, Sophomore, Autauga Academy, Prattville, Alabama, T: John Johnson
- EN147 **Can Nano-Technology Solve the Produced Water Problem?**  
Brittni Briann Romero, 16, Sophomore, Socorro High School, Socorro, New Mexico, T: Morey Miller

- EN148 Curvature**  
Mitchell Myron Smette, 15, Freshman, TGU Granville High School, Granville, North Dakota, T: Susan Dee Thompson
- EN149 Smart Track II**  
Mohd Irwan Sharifuddin Mohd Aseri, 18, Junior, Royal Military College, Kuala Lumpur, Malaysia, T: Hanita Abdul Hamid
- EN150 Tailgate Up or Tailgate Down? Busting the Myth**  
Mary Siobhan Gallagher, 14, Freshman, Savannah Country Day School, Savannah, Georgia, T: Cher Callahan
- EN151 Operator Injury Mitigation Using Electronic Sensing, Mechanical Braking, and Decoupling Devices in Handheld Circular Saws**  
# Erin F. Eppard, 17, Junior, Thunderbird High School, Phoenix, Arizona, T: Renee Kaye
- EN152 Biomimetics: Emulating Nature**  
Nathanael James Macias, 15, Sophomore, Captain John L. Chapin High School, El Paso, Texas, T: Karl Queen
- EN301T Creation of an Efficient, Tidal-Influenced Magneto-hydrodynamic Generator for Commercial Application: A New Phase in a Four Year Study**  
### Ryan Paul Jones, 18, Senior  
### Eric Anthony Smith, 17, Senior  
Astronaut High School, Titusville, Florida  
T: Scott McCord
- EN302T Saving Energy While Running**  
Mihai Dorian Vidrighin, 16, Sophomore  
Tudor Macicasan, 16, Sophomore  
Florin Petru Muresan, 16, Sophomore  
Tiberiu Popoviciu High School, Cluj-Napoca, Romania  
T: Gabriela Sanda Balan
- EN303T Enhancing Hydrodynamic Performance**  
# Adam Kelby Mitchell, 16, Sophomore  
Brad Allen Odell, 16, Sophomore  
Muskogee High School, Muskogee, Oklahoma  
T: Terri Lee Brossett
- EN304T Bionic Robofish**  
Xing Lu, 18, Senior  
Chang Liu, 18, Senior  
No.1 Middle School Affiliated to CCNU, Wuhan, Hubei, China  
T: Weijia Wang
- EN305T Comparative Analysis of Yagi Antenna Using Genetic Algorithms and Polynomial Component Optimization**  
# Andrew Joseph Duchi, 17, Junior  
James Henry Notwell, 17, Senior  
# Erich John Kreutzer, 18, Senior  
Upper Arlington High School, Upper Arlington, Ohio  
T: Laura Brennan
- EN306T V.I.P.J.E.: Variable Intake Pulse Jet Engine**  
Robert Scott Behringer, 15, Sophomore  
Kyle Joseph Hoffpauir, 15, Sophomore  
Catholic High School, New Iberia, Louisiana  
T: Donald Joseph Voorhies
- EN307T Energymotor: Wind to Watts**  
Mark Benjamin Hurta, 17, Senior  
Patrick Roy Schuessler, 18, Senior  
Samantha Ann Little, 18, Senior  
Mason High School, Mason, Texas  
T: Bonnie K. Schmidt  
Mason High School, Mason, Texas
- EN308T Head Control Input Device for PC**  
Desai Chen, 17, Junior  
Haotian Liu, 18, Senior  
High School Affiliated to Fudan University, Shanghai, China  
T: Yongwei Wu
- EN309T Pursuing Nanotechnology's Future in Energy Conversion**  
Joseph N Abayev, 17, Senior  
David James Sauer, 16, Sophomore  
Ballard High School, Louisville, Kentucky  
T: Robert N. Baar
- EN310T Analysis of the Thermic Conduction and the Formation of the Condensation Inside a Wall**  
Paola Cantarelli, 19, Senior  
Alessio Gaimarri, 19, Senior  
Arianna Marelli, 20, Senior  
Liceo Scientifico "Gaspere Aselli", Cremona, Italy  
T: Marco Maianti
- EN311T No Strings Attached: The Wireless Power Solution**  
Ian August Johnson, 18, Senior  
Ethan Larry Huwe, 18, Senior  
Perham High School, Perham, Minnesota  
T: Shawn Stafki
- EN312T Breakthrough: A Safety Gas Valve Box Access Locking Mechanism**  
Barbara Jane Fleming, 17, Senior  
Daniel Dominic Evans, 17, Senior  
Caron Maire Malone, 17, Senior  
Rathmore Grammar School, Belfast, Ulster, Northern Ireland  
T: Kieran Doherty
- EN313T Novel Classification Algorithm for Augmented Cognition via Discrimination of Multiplex Quantum Cluster Distributions**  
William Fan, 17, Senior  
Edward Cat Nguyen, 16, Junior  
School of Science and Technology, Beaverton, Oregon  
T: Hector M. Morales
- EN314T Innovative Thickness Measurement of Biological Tissue by Using Maximum Bubble Pressure Method**  
Yung-Chieh Chen, 18, Senior  
Chao-Hsi Lee, 18, Senior  
Taipei Municipal LiShan High School, Taipei, Taiwan, Chinese Taipei  
T: Sheng-Tai Chen
- EN315T 2061 Starsky Robot Band**  
XiaoBin Wu, 17, Junior  
ZiJun Lin, 18, Junior  
Bin Ke, 17, Junior  
No.7 High School of QuanZhou, Quanzhou, FuJian, China  
T: Li Yang
- EN316T Eco-Hybrid House: Sustainable Combination of Fuel Cells, Desalinated Water and Solar Panels as Sources of Energy in A Solar House**  
# Roberto Jose Manzano, 17, Senior  
Luis Antonio Manzano, 14, Freshman  
Colegio de la Salle, Bayamon, Puerto Rico  
T: Maritza Rodriguez; T: Wanda Aviles
- EN317T Exploring the Capabilities of a Stiquito Robot**  
Jennifer A'mir Townsend, 16, Junior  
Renee Ann Baker, 17, Junior  
North Mecklenburg High School, Huntersville, North Carolina  
T: James Conrad  
Concord High School, Concord, North Carolina
- EN318T The Conversion of Solar Energy Utilizing Phase-change Materials for Electrical Generation**  
Kevin Clair Cheatham, 18, Senior  
Andrew Scott Magstadt, 18, Senior  
Greybull High School, Greybull, Wyoming  
T: Joel M. Kuper
- EN319T Distal and Proximal Search Strategies for Robotic Path Recovery**  
Samuel Leopold Wagner, 15, Sophomore  
Walter Oscar Beller-Morales, 16, Freshman  
Peter N. Sebrechts, 15, Sophomore  
Bethesda-Chevy Chase High School, Bethesda, Maryland  
T: Deborah Haase
- EN320T Electromagnetic Particle Accelerator**  
James Ryan Walker, 17, Senior  
Troy Marshall Bonham, 18, Senior  
North Valleys High School, Reno, Nevada  
T: Ron Dee Geyer

- EN321T Does Paper Designed to Meet the American National Standard Institute Z39.28 Standard Resist Damage from Ultraviolet Light Better than Pre-Standard Paper?**  
Madeline Jean Belflower, 15, Sophomore  
Taylor Danielle Fleming, 15, Sophomore  
Union Grove High School, McDonough, Georgia  
T: Leon Olivier
- EN322T It Is Distans Controller for Gas Boilers**  
Marcelo Jorge Haffner, 17, Junior  
Daniela Maria Saavedra, 17, Junior  
Escuela Tecnica No 139 De Produccion AgroInd, Viale, Entre Rios, Argentina  
T: Aldo Antonio Grinovero
- EN323T Versatile Color Identification and Luminance Contrast Determination Using a Triluminate Source**  
Ian Preston Cannon, 17, Senior  
Rickystan Batane Savaiko, 19, Senior  
Redeemer Baptist School, North Parramatta, New South Wales, Australia  
T: Stuart Malcolm Garth
- EN324T Diesel, Corn Oil, or Mixture: Which Fuel Type Will Run Our Farm Tractor Farther and Longer?**  
Amanda Lynne Chapman, 16, Sophomore  
Fred Leon Grubb, IV, 15, Sophomore  
Musselman High School, Inwood, West Virginia  
T: Brenda Gail Waterworth
- EN325T Bacterial Fuel Cells: Utilizing *E. coli*'s Metabolism to Produce Energy**  
# Quinn Alexander Morris, 17, Senior  
# Courtney Henrietta Fox, 18, Senior  
# May Liu, 17, Senior  
North Carolina School of Science and Math, Durham, North Carolina  
T: Myra J. Halpin
- EN326T Electrical Engine Load Dimensioning System**  
# Bibiana Maite Petry, 18, Senior  
# Jonas Obert Martins Osorio, 19, Senior  
# Henrique Fuhr, 20, Senior  
Fundacao Escola Tecnica Liberato Salzano, Novo Hamburgo, Rio Grande do Sul, Brasil  
T: Rosana Bemvenuti Jacques
- EN327T Ergo-net Phone: A Fully Adjustable Public Phone with Internet Access**  
Lucas Rocha Sodre, 18, Senior  
Wellington Lima Queiroz Barbosa, 17, Senior  
Colegio Santo Americo, Sao Paulo, Brasil  
T: Gilson da Silva Domingues
- EN328T The Use of Biofuel in a Gasoline Engine**  
Christopher Adam Foster, 17, Senior  
Xiong Zhao, 18, Senior  
North Park Collegiate-Vocational School, Brantford, Ontario, Canada  
T: Richard Humpartzoomian
- EN329T Project CCH**  
William Alex Roach, 15, Freshman  
Joar Schaffhouser, 15, Freshman  
Owensboro Senior High School, Owensboro, Kentucky  
T: Melanie Hope Eans
- EN330T The Cutting Edge**  
Ian McKenzie Carlson, 15, Freshman  
Anthony Paul Winterton, 15, Freshman  
Garretson High School, Garretson, South Dakota  
T: Julie Marie Mueller
- EN331T Polycaprolactone-Chitosan Nanocomposite Biomaterials for Wound Healing and Tissue Engineering**  
# Wilfred Chung-Him Wong, 17, Senior  
# Ashish Mohan Bakshi, 17, Senior  
Herricksen Senior High School, New Hyde Park, New York  
T: Richard Quan  
Manhasset High School, Manhasset, New York  
T: Peter Guastella
- EN332T Revolutionary Plastics: Surfaces that Self-Sterilize**  
# Miki Claire Duruz, 17, Senior  
# Kara Allyn Morgenstern, 17, Senior  
Long Beach High School, Lido Beach, New York  
T: Linda Trusz
- EN333T Phototropic Nanotechnology via Magnetohydrodynamic Propulsion**  
Lai Xue, 16, Senior  
Charles Cumberland McGuire, 17, Junior  
Gleb Kuznetsov, 18, Senior  
West High School, Salt Lake City, Utah  
T: Daniel J. McGuire
- EN334T The Detection of Alkaline Phosphatase and C-Reactive Protein Using a Miniaturized Electrochemical Biosensor for Clinical and Future Diagnostic Tests**  
# Joanne Helen Wang, 16, Junior  
Benita Tjoe, 17, Senior  
Hathaway Brown School, Shaker Heights, Ohio  
T: C.C. Liu
- EN335T Fire Fighter Communication Improvement**  
Bernhard Missbichler, 20, Senior  
Simon Wannemacher, 19, Freshman  
Peter Klar, 20, Senior  
Technisches Gewerbe Museum, Vienna, Austria  
T: Karl Schiffner
- EN336T Developing a Control Methodology for Efficient Tinting of Electrochromic Windows: To Squint ... Or to Tint, Year III**  
Ananth Ram, 16, Sophomore  
Arun Venkatraman, 16, Sophomore  
Clark High School, Plano, Texas  
T: Cathy Bambenek
- EN337T Self-healing Struts**  
# Jay Carson, 17, Senior  
# Eletha Joy Flores, 17, Senior  
Charles Herbert Flowers High School, Springdale, Maryland  
T: Robert Strain
- EN338T Magneto-Rheo-logical Fluid**  
Thanh Thi Nguyen, 17, Junior  
Stephanie Grace-Anne Romasanta, 16, Junior  
Yen Ngoc Nguyen, 17, Junior  
Oak Grove High School, San Jose, California  
T: Carol Jean Evans
- EN339T Collapsible Wheelchair, Year Two**  
# William Caleb Rodgers, 18, Senior  
# Joshua Robert Turner, 18, Senior  
Hiram High School, Hiram, Georgia  
T: Leon R. Grant  
Paulding County High School, Dallas, Georgia
- EN340T My Freight Hitchhikes: Intercontinental Freight Exchange**  
Ondrej Krabs, 19, Senior  
Petra Hakova, 18, Junior  
SPSSE Liberec, Liberec 1, Czech Republic  
T: Jan Mojzis
- EN341T CSI: Controlled Spherical Intelligence**  
# Benjamin Gulak Poss Gulak, 16, Junior  
Alexander Jason Molloy, 17, Junior  
Hillfield Strathallan College, Hamilton, Ontario, Canada  
T: Ron Capobianco
- EN342T Designing a Rigid Radiopaque Hydrogel for Biomedical Application**  
Mohan Gautam, 17, Senior  
Ankuri G. Desai, 16, Junior  
Sachem High School East, Farmingville, New York  
Ward Melville High School, East Setauket, New York  
T: Michael Vaccariello
- EN343T Lebenmonitor: Protecting the Masses from the Silent Killer**  
# Michael Getahun Hailemariam, 17, Senior  
Brook Tassew Kassa, 16, Sophomore  
Piney Woods School, Piney Woods, Mississippi  
T: Olivia Brooks; T: Robert Holloway

- EN344T **Socially Integrated Robots: Sustainable Robotic Cognition in a Socioeconomic Model**  
Aaron Thomas Maturen, 17, Senior  
Pascal Anthony Carole, 17, Senior  
Remy Gerard Carole, 17, Senior  
Heritage High School, Saginaw, Michigan  
Saginaw Arts and Sciences Academy, Saginaw, Michigan  
T: Dennis Roebuck; T: Stephen Tack; T: Bruce Isotalo
- EN345T **Digital Acoustic Velocimeter**  
Daniel William Hutchinson, 18, Senior  
Thomas Mark Stable, 18, Senior  
Samuel John Lee, 17, Senior  
Ulverston Victoria High School, Ulverston,  
Cumbria, United Kingdom  
T: Kath Walley
- EN346T **Magnetic Fetch**  
Mark M. Head, 17, Senior  
Jaae In, 17, Junior  
Glen Rose High School, Malvern, Arkansas  
T: Connie Marlene Tuggle
- EN347T **Testing the Most Effective Ionic Charger and Its Effect on Particle Charging**  
Foster Theodore Holcomb, 15, Sophomore  
David Gates Steward, 17, Sophomore  
Russel Gerard Viegas, 16, Sophomore  
Little Rock Central High School, Little Rock, Arkansas  
T: Melissa Donham
- EN348T **The Hydrogen Economy: *Futurum Nostrum***  
Daniel Robert Femerstrom, 19, Senior  
Christopher Cheah Mollen, 18, Senior  
Ebersteinska Gymnasiet, Norrkoping, Ostergotland, Sweden  
T: Bengt Carlegrim
- EN349T **The Effects of Supercritical Carbon Dioxide (scCO<sub>2</sub>) on the Segregation of POSS Nanoparticles and on the Metallization of PS and PMMA Thin Films**  
Srienne Ashley Kugler, 17, Junior  
Jamie Erin Rosengard, 17, Senior  
Jericho High School, Jericho, New York  
T: Christopher Hoppner  
Half Hollow Hills High School West, Dix Hills, New York  
T: Chrysi Notskas
- EN350T **The Capturing and Utilization of Wasted Energy, a Second Year Study**  
Janelle Marie Goettman, 16, Junior  
Michelle Elise Alfert, 17, Junior  
Burkburnett High School, Burkburnett, Texas  
T: Pamela Francis

## ENVIRONMENTAL SCIENCE

### GRAND AWARDS PRESENTED BY:

RICOH

- EV001 **Impact of Water Reclamation: An Analysis of Water Quality and the Growth, Development, and Propagation of *Brassica rapa***  
Yun Li, 16, Sophomore, Stanton College Preparatory High School, Jacksonville, Florida, T: Kathryn Halloran
- EV002 **Will the Saturation Levels Increase in an Estuary?**  
Nicole Kimberly Bell, 18, Senior, Central High School, Brooksville, Florida, T: Chad Willman
- EV003 **Bioremediation of Oil Using the *Pseudomonas* and *Penicillium* Species**  
Sunny Jay Panchal, 17, Junior, Belleview High School, Belleview, Florida, T: Cindy Andrews
- EV004 **Determining the Bioavailability of Heavy Metals in Potential Land Applied Wastes Using a Stomach Simulator**  
Shivani Bharat Parikh, 16, Sophomore, Lecanto High School, Lecanto, Florida, T: Ronald Worthington
- EV005 ***Hippospongia lachne* vs. *Hypoxia***  
Benjamin R. Fruits, 18, Senior, J.W. Mitchell High School, New Port Richey, Florida, T: Melanie Militecs

- EV006 **Tributary Impact, Three Points of Interest: A Field and Laboratory Study of Honey Creek and Its Tributary, Cave Springs Branch**  
# Molly Katheryn Steen, 16, Junior, Grove High School, Grove, Oklahoma, T: Keliana D. Steen
- EV007 **Evaluating the Synergistic Effects of Lead, Cadmium, Zinc, and Manganese on Selected Cellular Models**  
### Kristen Elaine Fenska, 18, Senior, Miami High School, Miami, Oklahoma, T: Sally Ann Fenska
- EV008 **A Device to Minimize the Percentage of Acidic Gases in Diesel Exhaust**  
Dana Jamal Abdul-Jaleel, 16, Junior, Modern Montessori School, Amman, Jordan, T: Iman Moh As
- EV009 **The Useful DIMP Spring (Device for Improving the Mixing Process in Gasoline Engines)**  
Sa'ed Younes Aldaraghme, 16, Sophomore, King Abdullah the Second School for Excellence, Amman, Jordan, T: Sameera Mahmoud ALshurman
- EV010 **Quantitative Determination of the Cadmium Influence on the Mammals' Organism and Its Integrative Index**  
Nataliya Ihorivna Mysula, 17, Junior, Ternopil Specialised School 3, Ternopil, Ukraine, T: Volodymyr Andriyovych Kondratjuk
- EV011 **Correlation of Dissolved Oxygen and Turbidity in the Minnesota River Basin**  
Lisa Pauline Broderius, 15, Freshman, Glencoe-Silver Lake High School, Glencoe, Minnesota, T: Roxanne Stensvad
- EV012 **Poisonous Playgrounds, III: What's the Real Protection?**  
# Kaitlyn Rebecca Milman, 16, Junior, Thomas Stone High School, Waldorf, Maryland, T: Jan Milman
- EV013 **Harvesting Energy from Wastewater in a Two-chamber Microbial Fuel Cell**  
Sikandar Singh Porter-Gill, 15, Freshman, Gaithersburg High School, Gaithersburg, Maryland, T: Richard Musson
- EV014 **The Canal that Could**  
# Steve Anthony Morgan Jr., 17, Junior, Henry Louis Bourgeois High School, Gray, Louisiana, T: Kelly Hash
- EV015 **The Effects of Nutrient Enrichment on the Growth of Algae**  
# Yun Liu, 15, Sophomore, Terrebonne High School, Houma, Louisiana, T: Rene Naquin
- EV016 **Water and Soil Desalinization Using *Iris giganticaerulea*, Native to Louisiana**  
Alicia Marie Ranney, 16, Junior, Lafayette High School, Lafayette, Louisiana, T: Lisa B. Ranney
- EV017 **Microbiological Reduction of Glycerin in Biodiesel**  
Rachel Nicole Levrone, 17, Senior, Colquitt County High School, Moultrie, Georgia, T: Thomas Edison Hall
- EV018 **Myco-Restoration**  
Sishir Mannava, 16, Sophomore, Classen School of Advanced Studies, Oklahoma City, Oklahoma, T: Carolyn Marie Bish
- EV019 **Boards and Branches, Year Five: A Continued Multivariable Study of Snow Interception for Water Conservation**  
# Erica Elizabeth David, 16, Sophomore, Pinedale High School, Pinedale, Wyoming, T: Elizabeth J. David
- EV020 **The Effects of Common Garden Chemicals on Earthworms (*E. hortensis* and *E. foetida*)**  
Mark Andrew Vitale, 15, Freshman, duPont Manual Magnet High School, Louisville, Kentucky, T: Kathy Fries
- EV021 **The Effect of Pollution from Agricultural Burning on the Surface Tension of Water Droplets in Clouds**  
Danyelle Lee Evans, 14, Freshman, James Bowie High School, Austin, Texas, T: Lorrie S. Ayers
- EV022 ***Spirulina platensis*: Potential Biosorbent for Lead**  
Jose Alfonso Aldas Casurra, 17, Freshman, Caraga Regional Science High School, Surigao City, Surigao del Norte, Philippines, T: Marygen Custodio Sitoy
- EV023 **Studies on Environmental Indication and Ecological Function of Bryophytes in Shanghai City, China**  
Zhirui Zhu, 18, Senior, Shanghai Luwan High School, Shanghai, China, T: Hongze Yu
- EV024 **Initial Greenhouse Gas Inventory of Cook Stoves**  
Laura Elizabeth Willson, 16, Sophomore, Rocky Mountain High School, Fort Collins, Colorado, T: Bryan Willson

- EV025 **Determining the Efficiency of a Cyanobacteria Bioreactor in the Reduction of CO<sub>2</sub> in an Indoor Air Environment**  
Scott Potter, 16, Sophomore, Carbon High School, Price, Utah, T: Dan Taylor
- EV026 **The Environmentally-Safe Eradication of *Reticulitermes flavipes* Through the Utilization of Amoxicillin and *Aspergillus niger***  
Ramsey Harbi Shadfan, 15, Sophomore, Keystone School, San Antonio, Texas, T: Charles Scott Maderer
- EV028 **Long Term Monitoring of the Rio San Jose Watershed**  
Kendra Ann Valdez, 17, Senior, Grants High School, Grants, New Mexico, T: Shelby L. Alexander
- EV029 **Determining Analytical Characteristics of Bioluminescent-signaling Bacteria for Use in Biosensors**  
Daniel James Tao, 17, Senior, Lafayette Jefferson High School, Lafayette, Indiana, T: Joseph Ruhl
- EV030 **Investigation of Different Concentrations of Micronutrients (Molybdenum and Iron) on Growth of Nuisance Algae (*Lyngbya wollei* and *Vaucheria* sp.) from Florida Springs**  
Ankur Deepak Bhatia, 17, Senior, R.L. Paschal High School, Fort Worth, Texas, T: Melissa Gibbons
- EV031 **Investigating the Behavioral Effects of Conjugated Estrogens on *Daphnia magna* and *Hydra oligactis***  
Stephanie Elizabeth Hamm, 18, Senior, Perham High School, Perham, Minnesota, T: Shawn Stafki
- EV032 **Air Quality Inside Air-Conditioned Buses in Guangzhou**  
Mao Jing Fu, 18, Senior, Affiliated School of South China Normal University, Guangzhou, Guangdong, China, T: Tao Xia
- EV033 **Tides: A Sustainable Solution for Continuous Generation of Energy**  
# Sarah Lane Menezes, 15, Sophomore, Escola Americana de Campinas, Campinas, Sao Paulo, Brasil, T: Daniel Jussieu Figueiredo Rezende
- EV034 **Developing a Mathematical Predictive Model Using Factors Affecting *Escherichia coli* Levels at Fairport Harbor Beach**  
Tessie Rose Panthani, 18, Senior, Mentor High School, Mentor, Ohio, T: Richard Woodman
- EV035 **Comparing Salt Marshes on the Long Island Sound Using Health Indices in *Fundulus heteroclitus***  
Andrew Joseph Taylor, 16, Junior, Newtown High School, Sandy Hook, Connecticut, T: Frank LaBanca
- EV036 **Sand Prairies: Restoring an Endangered Biome**  
Anna Christine McReynolds, 16, Sophomore, Sikeston High School, Sikeston, Missouri, T: Wanda Rainey Throop
- EV037 **Removal of Arsenic from Drinking Water by Water Hyacinths (*Eichhornia crassipes*), Year II**  
Kathryn VanderWeele Snyder, 16, Sophomore, Oregon Episcopal School, Portland, Oregon, T: Rosa Hemphill
- EV038 **Evaluation of Diatomaceous Earth Combined with Pyrethrin to Control *Rhizopertha dominica* in Stored Wheat**  
## Abigail Marie Hines, 16, Junior, Orchard Day School, Fort Wayne, Indiana, T: Maria Louise Hines
- EV039 **Investigating a Mystery in a Tribal Pond**  
# Anna Maria Lopez, 16, Sophomore, Coolidge High School, Coolidge, Arizona, T: Joyce Carol Baldwin
- EV040 **Radionuclides in the Miocene Aquifers of Coastal Georgia, Phase II**  
Sherrie Alyssa Hall, 16, Junior, Cedar Shoals High School, Athens, Georgia, T: Stella Guerrero
- EV041 **The Effects of D-limonene on *Solenopsis invicta***  
# Amarette Hope Aube, 17, Senior, Seminary Attendance Center, Seminary, Mississippi, T: Cherie Humphrey
- EV042 **Behavioral Effects of the Herbicide Metolachlor on the Perception of Chemical Stimuli and Winner-effect in Environments with and without Plants**  
Matthew Brian Newcomb, 18, Senior, Peachtree Ridge High School, Suwanee, Georgia, T: Susan Kramer
- EV043 **Assessing Bioaccumulation of Waterborne Arsenic and Selenium in Plants from the Poaceae and Linaceae Families**  
# Lindsay Rose Gilbertson, 18, Senior, Elko High School, Elko, Nevada, T: Dave Meisner
- EV044 **The Effects of Variable Fish Communities on Type 4 and Type 5 Wetland Characteristics in Polk County**  
Megan Marie Miller, 15, Freshman, Lincoln High School, Thief River Falls, Minnesota, T: Cheryl Marie Winkler-Miller
- EV045 **Gaseous Emissions from Agricultural Waste, Phase II**  
## Tara Ellen Gloyna, 16, Junior, Temple High School, Temple, Texas, T: Carol Colwell
- EV046 **Replacing Petroleum Fuel with Alcohol Blended with Orange Oil and Pine Oil**  
Raymond Tan, 14, Freshman, William Mason High School, Mason, Ohio, T: Elizabeth Imrie
- EV047 **Hinsdale Groundwater Study**  
Christina Lee Mogan, 15, Freshman, Hinsdale Public School, Hinsdale, Montana, T: Connie Kay Mogan
- EV048 **Effects of Salicylic Acid on Fertilizer-Induced Eutrophication**  
Rachel Beth Cohn, 17, Senior, Niles North High School, Skokie, Illinois, T: Jacklyn Naughton
- EV049 **The Possible Reforestation of a Landfill: Using a New Liner**  
# Luis Armando Otero, 17, Senior, Academia Nuestra Senora de la Providencia, San Juan, Puerto Rico, T: Miguel Rene Deliz
- EV050 **An Analysis of the Effectiveness of Chloramine in Municipal Water Distribution Systems**  
Andrea Kate Jensen, 17, Junior, Burnsville High School, Burnsville, Minnesota, T: Jennifer Jo Hugstad-Vaa
- EV051 **The Urban Heat Island Affect in Cities with Populations Under 20,000**  
Trevis J. Matheus, 16, Junior, Fernley High School, Fernley, Nevada, T: Merrie Rumpy
- EV052 **An Investigation of the Removal of Heavy Metal Ions Using Titanium Dioxide and Ultra Violet in a Flowing Photocatalytic Reduction Apparatus**  
# Megan Moulding, 15, Sophomore, Fremont High School, Plain City, Utah, T: R. Kim Wilde
- EV053 **Management of Aphid Pest of Cowpea by a Bio-Pesticide *Fusarium pallidorosum***  
Swathi Soman, 14, Freshman, Christ Nagar Senior Secondary School, Trivandrum, Kerala, India, T: Sudharma K
- EV054 **Effect of Salinity on Population Density and Diversity of Benthic *Foraminifera* in the Indian River Lagoon, Year II**  
# Phaedra Calista Tinder, 17, Senior, Sebastian River High School, Sebastian, Florida, T: Joyce Miller
- EV055 **Mussels: Do They Have a Preferred Environment?**  
# Cory Ray Knowles, 18, Senior, Drew Central High School, Monticello, Arkansas, T: Dennis V. Thurman
- EV056 **Immobilization and Recovery of Aquatic Metal Contaminants**  
# Morgen Elizabeth Anyan, 18, Senior, Selah High School, Selah, Washington, T: Kristen Harris
- EV057 **Sun-Tracker: An Automated Blind System**  
Raymond Claud Chassevent, 16, Sophomore, Lake View Academy, Fountain Inn, South Carolina, T: Ray Chassevent
- EV058 **Multi-Tiered Wetlands: A Technique for Improving the Effectiveness of Constructed Wetlands**  
### Andrew James Stewart, 18, Senior, Karabar Distance Education Centre, Queanbeyan, New South Wales, Australia, T: Kevin Ronald Stewart
- EV059 **"Don't Drink That!" Environmental Sensitivity of Coliform and *Enterococcus* Bacteria**  
Rachel Elizabeth Pian, 17, Senior, Yorktown High School, Yorktown Heights, New York, T: Michael Jay Blueglass
- EV060 **The Design and Development of an Underwater System in Quarter Master Harbor to Analyze the Effectiveness of Aeration in Plankton Germination Traps**  
Meghan Elizabeth Gavin, 18, Senior, Bellarmine Preparatory School, Tacoma, Washington, T: Ronald Nilsen
- EV061 **Recommendations for Developing a River Purifying System**  
Minako Kohki, 16, Junior, Okinawa Prefecture Kaihou Senior High School, Shimajiri-gun, Okinawa, Japan, T: Tadashi Kyan
- EV062 **Breakdown: The Effect of the Percentage of Recycled Fibers on the Biodegradation of Paper**  
Shannon Lee Taylor, 15, Freshman, Mount Tabor High School, Winston-Salem, North Carolina, T: William Andrew Clifton

- EV063 Purifying a Toxic Soup**  
Nabeel A. Lookmanjee, 15, Sophomore, Clark High School, Plano, Texas, T: Cathy Bambenek
- EV064 A Study of the Effects of Biosolids on Soil Fertility and Coliform Counts**  
Catherine Michelle Seals, 16, Junior, Liberty High School, Bedford, Virginia, T: Cheryl Lindeman
- EV065 The Ecotoxicological Effects of Ionic Liquids on Aquatic Life**  
Neeta P. Kamat, 16, Sophomore, John Adams High School, South Bend, Indiana, T: Nevin E. Longenecker
- EV066 Using *Dracaena sanderiana* as a Vehicle to Hyperaccumulate Industrial Wastewater**  
# Amanda DeLyn Forbis, 17, Senior, O'Donnell High School, O'Donnell, Texas, T: Rubeth Griffing
- EV067 Removal of Estrogenic Compounds in Dairy Waste Lagoons by Ferrate(VI): Oxidation/Coagulation**  
Jarrett Renn Remsberg, 16, Junior, Middletown Senior High School, Middletown, Maryland, T: Sharon Steger
- EV068 Fly Away Chemicals: The Effects of Inhaling Deep**  
Kelsey Ann Holkesvik, 17, Junior, Central High School, Aberdeen, South Dakota, T: Jan Palmer
- EV069 There's Something in the Water: Nitrate Levels Through the Seasons**  
Robert Allen Manduca, 18, Senior, Century High School, Rochester, Minnesota, T: Cheryl Moertel
- EV070 Bioremediation Using Soil Bacteria in Hydrocarbon Degredation**  
Kylie Mae Phillips, 17, Junior, Timber Lake High School, Timber Lake, South Dakota, T: LuAnn Lindskov
- EV071 Raising Cane to Reduce Hypoxia in the Gulf of Mexico**  
Caleb Andrew Lampert, 14, Freshman, Hahnville High School, Boutte, Louisiana, T: Emily Boackle
- EV072 The Silent Passenger: Carbon Monoxide, Carboxyhaemoglobin, and the Commuter**  
Jordan Daniel Bowman, 16, Junior, Saint Mary Catholic Secondary School, Hamilton, Ontario, Canada, T: Richard Daniel Wesolowski
- EV073 Earthworm-produced Humus Accelerates the Growth of Coffee Plants Under Laboratory Conditions**  
Abdiel Jose Ortiz, 15, Freshman, Colegio Radians, Cayey, Puerto Rico, T: Jose Luis Caballero
- EV074 Evaluating the Impact of Trivalent Arsenicals on Selenium Metabolism Using *E. coli* as a Model System**  
Daniel Kenneth Cook, 16, Sophomore, Lake Highland Preparatory School, Orlando, Florida, T: Judith Faith Legault
- EV075 Underwater Structures as a Means of Mitigating Wave Inundation**  
## Eric Lee Keeling, 17, Junior, La Veta High School, La Veta, Colorado, T: Pat Keeling
- EV076 Bricklam: Building to Conserve**  
Josue Roberto Murillo Fernandez, 17, Junior, Colegio Gregorio Jose Ramirez Castro, Alajuela, Costa Rica, T: Patricia Herrera Castillo
- EV077 Ecological and Environmental Studies of the Tar Creek Super Fund Site**  
Jason Allen Cossey, 16, Sophomore, Dove Science Academy, Tulsa, Oklahoma, T: Mesut Ekici
- EV078 Electrochemical Remediation of the Enviroment (Production of Ferrate)**  
# Mario Roberto Velarde Rodriguez, 17, Junior, High School COBAES #42, Escuinapa Sinaloa, Sinaloa, Mexico, T: Oralia Crimilda Aguilera Crespo
- EV079 What Lies in the River**  
Markie Michelle Dohrenwend, 14, Freshman, Owensboro High School, Owensboro, Kentucky, T: Melanie Hope Eans
- EV080 The Importance of Salinity, pH and Temperature of Seawater for the Survival of the Hawksbill *Eretmochelys imbricata* in the Beaches of Puerto Rico**  
Alba Nydia Rosado-Soto, 17, Senior, Aurea E. Quiles Claudio High School, Guanica, Puerto Rico, T: Glenda Lee Almodavar-Morales
- EV081 Bioelectromagnetism II: Optimization of Conditions for Sustainable Current and Power Output in a Microbial Generator Using Magnetospirillum MS-1**  
## Kartik Madiraju, 16, Junior, Centennial Regional High School, Greenfield Park, Quebec, Canada, T: Janet Bray
- EV082 Examining the Feasibility of Utilizing Dinoflagellates *Pyrocystis fusiformis* as a Bioassay to Test Metal Toxicity Levels**  
Nicole Khezri, 17, Junior, John L. Miller Great Neck North High School, Great Neck, New York, T: Alan Christopher Schorn
- EV083 Environmental Factors Affecting the Filtration Rate of *Cumberlandia monodonta***  
Michael Logan Musser, 18, Senior, Gleason School, Gleason, Tennessee, T: Betty Hopkins Jackson
- EV084 Making Methane**  
Elizabeth Louise Bosworth, 16, Sophomore, White Lake High School, White Lake, South Dakota, T: Janice E. Geraets
- EV085 Deadly Waters: A Twelve Month Water Quality Study of a Newly Erupted Sulfur Spring and Its Longitudinal Effect on Diamond Fork Creek, Phase IV**  
# Shannon L. Babb, 18, Senior, American Fork High School, American Fork, Utah, T: Jay Allen
- EV086 The Biodegradation of Crude Oil by a Novel Marine Bacterial Community**  
Jordan Russell Singer, 18, Senior, Ephrata Senior High School, Ephrata, Pennsylvania, T: Patricia Hachten Wee
- EV087 The Effect of Different Months on the Soil's pH in an Apple Orchard**  
Logan Russell Douglas, 15, Sophomore, James Wood High School, Winchester, Virginia, T: Jill Marie Barker
- EV088 Danger in the Air! How Damaging is Particulate Matter?**  
Jared Keith Willis, 15, Freshman, Wetumpka High School, Wetumpka, Alabama, T: Virginia Ann Vilaridi
- EV089 Bioenergy, Phase III, Plants C3 and C4: Which Will Be the Best Energy Producer?**  
# Nataly Soto, 17, Senior, Luis Munoz Marin High School, Barranquitas, Puerto Rico, T: Leticia Rodriguez
- EV090 Utilizing Ultrasonic Activation to Prevent the Adhesion of the *Balanus glandula* Within the Maximum Radius**  
# Ryan John Clark, 16, Sophomore, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Tina Webb-Browning
- EV091 Are You Sure You Want to Drink That, Part II: What's Really in Your Water?**  
Emily Nicole Termotto, 16, Junior, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Kenn Luthanen
- EV092 Pond Scum: Power Plant of the Future**  
Jamilee Kae Lightfoot, 18, Senior, Central Lee High School, Donnellson, Iowa, T: Alicia Danyel Schiller
- EV093 Producing Alternative Energy from Sugar Beet Processing Wastewater**  
Austin James LaFromboise, 18, Senior, Turtle Mountain Community High School, Belcourt, North Dakota, T: Renee C. Aalund
- EV094 Biogas: Optimizing Methanogenic Bacteria in an Anaerobic Digester**  
Adan Lopez, 17, Junior, James Pace High School, Brownsville, Texas, T: Dora Elia Lopez
- EV095 Quantification, Removal and Recovery of APFO from Contaminated Drinking Water with a Concomitant Endocrinological and Epidemiological Assessment**  
# Kelydra Elizabeth Welcker, 17, Junior, Parkersburg South High School, Parkersburg, West Virginia, T: Susan Smith
- EV096 What Goes in, Must Come Out: Does the Use of Chicken Litter as a Fertilizer Cause Increased Arsenic & Phosphorus Levels in Soil?**  
Megan Lydon Snyder, 16, Sophomore, Grove High School, Grove, Oklahoma, T: Keliana Don Steen
- EV097 Control of Seed Germination by Corn Gluten Meal Supplementation**  
Rachel Ann Schoenian, 15, Freshman, Northwestern High School, Kokomo, Indiana, T: Patricia Zeck



- EV098** **Something Smells Fishy: The Response of Medaka Embryos to Davis Creek**  
Kristan Marie Conlon, 17, Senior, Coalfield School, Coalfield, Tennessee, T: Michael Smith
- EV099** **Blast from the Plast: Using Protoplasts to Determine the Location of the Metal-binding Protein AgNt84**  
Savannah Jay Ramey, 17, Junior, Jefferson County High School, Dandridge, Tennessee, T: Jan Coley
- EV100** **A Sphagnum Solution for Safe Water**  
Arielle Katherine Garrett, 15, Sophomore, Stellys Secondary School, Saanichton, British Columbia, Canada, T: Glynis McFerran
- EV101** **The Effects of Nutrient Enrichment (N and P) on the Cyanobacteria Genus, *Anabaena***  
Nicole Christina Corbett, 15, Sophomore, Abington High School, Abington, Massachusetts, T: Diane Marie Salvetti
- EV102** **Lichens as Indicators of Air Pollution II: A Fluorometric Analysis of Heavy Metals in *Flavoparmelia caperata* Collected in Areas Surrounding a Coal Burning Power Plant**  
Angela Devi Shrestha, 17, Senior, Saginaw Arts and Sciences Academy, Saginaw, Michigan, T: Daniel E. Sealey
- EV103** ***Escherichia coli* as an Indicator of Human Waste**  
# Katherine May Coury, 18, Senior, Port Huron Northern High School, Port Huron, Michigan, T: Gail Rosales
- EV104** **What Conditions Best Aid the Reproduction Rate of *Lemna minor*?**  
Rebecca Grace Dolan, 17, Senior, Taunton High School, Taunton, Massachusetts, T: Lisa Ann Lundy
- EV105** **The Effect of Particle Size on Cellulose Conversion Rates**  
Manraj Singh Rangil, 17, Junior, duPont Manual Magnet High School, Louisville, Kentucky, T: Craig DaRif
- EV106** **Biological Implications of Sediment Concentrations of Mercury Near Olin Chlor-alkali Facility, Phase Three: Savannah River**  
# Lauren Wooten Smith, 17, Junior, John S. Davidson Fine Arts School, Augusta, Georgia, T: Cynthia Pousman
- EV107** **Is Precipitation Pickling the Environment?**  
Breanne Nicole Anderson, 15, Sophomore, Academy of Math, Engineering and Science, Salt Lake City, Utah, T: Tanya Maria Vickers
- EV108** **A Polymeric Treatment for Removal of Heavy Metal Contaminates from Water**  
Tyler Matthew Keck, 18, Senior, Monte Vista High School, Monte Vista, Colorado, T: Gary Wilkinson
- EV109** **Was the Elimination a Solution? The Pertinent Affects of Lead-Based Paint on the Environment: A Conclusion**  
Sarah Michelle Cole, 17, Junior, Demopolis High School, Demopolis, Alabama, T: Cynthia Phillips
- EV111** **A Study of Lead in Drinking Water**  
Miram Rayzel Gleiber, 17, Senior, Lakeshore High School, Stevensville, Michigan, T: Lynda Smith
- EV112** **Water Purification using Magnetic Particles**  
# Adria Katrin Schwarber, 16, Sophomore, Notre Dame Academy, Park Hills, Kentucky, T: Mary Ethel Parrott
- EV113** **Satellite Remote Sensing Applied to Inland Waters, Part Two: The Model**  
Christopher Michael Strait, 17, Senior, Liverpool High School, Liverpool, New York, T: Carol M. Matthews
- EV114** **Rescuing Our Natural Waters: Fighting Eutrophication Globally Through the Electrical Attraction of Nitrate and Phosphate**  
Miguel Angel Bustos, 18, Senior, Uniondale High School, Uniondale, New York, T: Paul A. Lichtman
- EV115** **Effectiveness of Strobe Lights, Sound Frequency, and Lasers in Reducing Salmon Entrainment Through Hydropower Turbines**  
Alexa A. Carey, 17, Junior, Gold Beach High School, Gold Beach, Oregon, T: Robyn L. Darbyshire
- EV116** **The Effect of Actinomyces, *Ophiostoma piliferum*, and Propiconazole on the Growth of *Ophiostoma minus***  
Katie Elizabeth Termer, 17, Junior, Clay High School, Green Cove Springs, Florida, T: Gail Wright Gartin
- EV117** **Aquatic Plants: Today's Solution for Industrial Pollution**  
Krissandra Genevieve Jentz, 16, Junior, Hankinson High School, Hankinson, North Dakota, T: Marcus John Friskop
- EV118** **Aquatic Assailant**  
Bridget Rae Rekow, 16, Sophomore, Ellendale Public High School, Ellendale, North Dakota, T: Spring Klima
- EV119** **Pyrethroids as Endocrine Disruptors: The Effect of Residual Pyrethroid Levels as Found in *L. esculentum* (Tomatoes) on the Abnormal Proliferation of MCF-7 Human Breast Cells**  
Graham William Wakefield Van Schaik, 16, Sophomore, Spring Valley High School, Columbia, South Carolina, T: Robin R. Henderson
- EV120** **Prawn Pond Sludge as an Organic Fertilizer, Phase II**  
Larry Ellee Nyanti, 16, Sophomore, Sekolah Menengah Kebangsaan Batu Lintang, Kuching, Sarawak, Malaysia, T: Mi Ing Wong
- EV121** **The Recycling of Paper by Flotation De-Inking**  
Michelle Heather Lucier, 17, Senior, Burkburnett High School, Burkburnett, Texas, T: Pamela Francis
- EV122** **Do Office Machines Emit Dangerous Levels of Ozone?**  
Alicia Kristine Novoa, 18, Senior, Hart County High School, Munfordsville, Kentucky, T: Linda A. Gosser
- EV123** **Releasing Seawater from Salt by Multiplication of Solar Rays**  
Maritza Esquivel, 17, Senior, Eagle School Antofagasta, Antofagasta, Chile, T: Katherine Rodriguez
- EV124** **The Effect of Herbicide on Pond Organisms**  
Drew Jared MacDonald, 15, Sophomore, Valley High School, Hoople, North Dakota, T: Kathleen Faye Melaas
- EV125** **Toxicity and Ecological Implications of Nanomaterials to Phytoplankton**  
Jingyuan Luo, 17, Junior, Hamilton High School, Chandler, Arizona, T: Deborah Nipar
- EV301T** **Decline of the North American Lesser Scaup, Phase Two: Chromium and Selenium in Foods**  
# Matt Moraco Weegman, 17, Junior  
# Mitch Dale Weegman, 17, Junior  
Winona Senior High School, Winona, Minnesota  
T: Ken Mann
- EV302T** **Association of Fungi for Remediation of Oil Polluted Soil**  
Alina A. Baliuta, 16, Junior  
Lubov V. Makuta, 17, Junior  
Gymnasium #1 Named After F.Scarina, Minsk, Belarus  
T: Inessa Adamovna Gontcharova
- EV303T** **Irrigation System for Small Farms**  
Abdel Rahman Ibrahim Alzorgan, 15, Sophomore  
Mohammad Ibrahim Alzorgan, 14, Freshman  
Al Shaiekh Ahmed Addabbag, Tafelah, Jordan  
T: Abdl Hafeez M. Al Hijjawi
- EV304T** **Fifty-percent More Efficient Environmentally Clean Wind Energy Source**  
Roman Evgenovich Levin, 15, Sophomore  
Maxym Anatoliyovich Dmytrenko, 17, Junior  
Yevgen Yuriyovich Zaytsev, 16, Sophomore  
Zaporizhzhya City Council Gymnasium 28, Zaporizhzhya, Ukraine  
T: Andriy Mikolaevich Andreev
- EV305T** **An Environmentally Friendly Cleaning Powder**  
Kwai-Yan Wong, 18, Senior  
Chun-Kit Chu, 18, Senior  
Kwok-Chung Yau, 17, Senior  
South Tuen Mun Government Secondary School, Hong Kong, Region of China  
T: Ying-choi Lee
- EV306T** **Distribution of Nitrogen, Phosphorus, and Algae in Water Along Ten Mile Creek**  
Anthony Joseph Stoffella, 14, Freshman  
John Wilmot Mann, 15, Freshman  
John Carroll Catholic High School, Fort Pierce, Florida  
T: Zhenli He
- EV307T** **Global Warming on Zooxanthalle**  
Nicholas S. Azadian, 17, Senior  
Mario A. Simoes, 18, Senior  
Michael A. Flegiel, 18, Senior  
Center for Advanced Technologies, St. Petersburg, Florida  
T: Paul H. Dickman

- EV308T Impact of Drought on Hydrologic Ecosystems**  
Colin R. Sears, 17, Sophomore  
Caitlyn Rae Sears, 15, Freshman  
Alma High School, Alma, Arkansas  
T: Brian Curd
- EV309T Alternative Means of Disposing Biomass (Waste Paper)**  
Osafamwen Cynthia Igbino, 16, Junior  
Obi Chuks Ike-Nwosu, 16, Junior  
Osarenogae Ogieva, 16, Junior  
Iginiedion Education Centre, Benin City, Edo State, Nigeria  
T: Philomine Mary Joseph
- EV310T The Effect of Antibiotics on Aquatic Ecosystems**  
Frederick Reginald Bentley, 15, Sophomore  
Kyle Abney Huninghake, 16, Sophomore  
duPont Manual Magnet High School, Louisville, Kentucky  
T: William H. Deines
- EV311T Livestock Antibiotic Effects on Nitrogen Cycling by Soil Microorganisms**  
Gregory Sergey Artiushin, 16, Junior  
Dayan Wang, 17, Junior  
Laura Elizabeth Steinmetz, 17, Junior  
Paul Laurence Dunbar High School, Lexington, Kentucky  
T: Elisa Marie D'Angelo
- EV312T A Toxicity Assay to Understand the Effects of Global Warming**  
# Brenna Nelson Heintz, 18, Senior  
Kevin Crossland Heffern, 18, Senior  
Juneau-Douglas High School, Juneau, Alaska  
T: Jon Smith
- EV313T A Simulative Study of the Exxon Valdez Oil Spill and Its Detrimental Effects on Marine Organisms as Determined by the Bioluminescent Capabilities of the Dinoflagellate**  
# Cole Thomas Streiff, 18, Senior  
# Matthew Aaron McKinney, 18, Senior  
Oregon Episcopal School, Portland, Oregon  
T: Rosa Hemphill
- EV314T The Effect of Water-Soluble and Lipid-Soluble Extracts on Plant Cells**  
Doha Hashim Ali, 16, Junior  
Buena Young Chan, 16, Junior  
Bayside High School, Bayside, New York  
T: Jenny J. Li
- EV315T Is There a Cost-Effective Way to Reduce the Risk of New Orleans Flooding Again?**  
Stephanie Lynn Miller, 16, Sophomore  
Sarah Marie Smith, 15, Sophomore  
Mary-Anne Kim Anh Nguyen, 16, Sophomore  
Saint Joseph's Academy, Baton Rouge, Louisiana  
T: Linda Kerr Messina
- EV316T A Novel Bioabsorbent of "Ya-Plong" as An Oil Spill Removal**  
Pirachula Chulanon, 14, Freshman  
Chitsachee Sihanugrist, 14, Sophomore  
Takphet Lekavijit, 15, Sophomore  
Bodindecha (Sing Singhaseni) School, Wangthonglang, Bangkok, Thailand  
T: Patchara Pusuntisumpun
- EV317T The Effects of Migrant Compounds of Used Motor Oil on the Vitality of *Daphnia magna***  
Danny Adam Miller, 17, Junior  
Ben James Roark, 16, Junior  
North Toole County High School, Sunburst, Montana  
T: Lawrence Dexter Fauque
- EV318T Bioremediation and Degradation of CCA Treated Wood in Landfills**  
David William Charles, 15, Freshman  
Patrick Chase Brown, 14, Freshman  
Salpointe Catholic High School, Tucson, Arizona  
T: Tim Barry
- EV319T The Effect of Iron, Copper, and Zinc Contamination of Corn and Soybeans**  
Lucas James Heintzman, 17, Senior  
Zachary Ryan Schulz, 18, Senior  
Central High School, Aberdeen, South Dakota  
T: Jan Palmer
- EV320T The Domesticated Production of Methane by Using Economic and Energy Efficient Apparatus to Obtain the Purest Form of Methanol to Be Used for Both Rural and Urban Use, Year Two**  
## Nathan Abay Kebede, 18, Senior  
# Berhanemeskel Alemu Nida, 18, Senior  
Filmon Berhe, 17, Senior  
Piney Woods Country Life School, Piney Woods, Mississippi  
T: Olivia Devon Brooks
- EV321T Water Quality Maintenance by Controlled Release of Sodium Hypochlorite from Biopolymeric Gels**  
Mariana Tomaz Cunha, 15, Sophomore  
Luciana Maria Arcanjo Frota, 15, Sophomore  
Colegio Christus, Fortaleza, Ceara, Brasil  
T: Luewton Lemos Felicio Agostinho
- EV322T Geoclean System for Cleaning Polluted Lakes**  
Berhat Bildirir, 15, Freshman  
Beray Bildirir, 15, Freshman  
Private Fatih High School, Istanbul, Marmara, Turkey  
T: Ibrahim Sasmaz
- EV323T A Reversal of PhosFATE: Safely Reintroducing Phosphates into Cleaning Agents**  
Maureen Anne Williams, 16, Junior  
Joseph Kent Henry, 17, Junior  
Bishop Moore Catholic High School, Orlando, Florida  
T: Paul Becht
- EV324T Degradation of Compact Disks by the Fungus *Geotrichum candidum***  
Olga Valerievna Yuts, 18, Senior  
Jose Pablo Jimenez Trigueros, 17, Senior  
Diego Guillermo Ulate Segura, 17, Senior  
Colegio Cientifico Costarricense San Pedro, San Jose, Costa Rica  
T: Heidy Maria Villalobos Barrantes
- EV325T Production of Methane with Organic Waste Material to Use It as a Source of Renewable Energy**  
Iliana Zoe Gonzalez, 14, Freshman  
Andrea Lopez, 14, Freshman  
Hogar Colegio La Milagrosa, Arecibo, Puerto Rico  
T: Yadira Gonzalez
- EV326T Biogas. . . A Hope to the Yuriria's Lagoon**  
Susana Rangel, 17, Senior  
Teresa Chimal, 18, Senior  
Carlos Perez, 17, Senior  
CBTis No. 172, Cortazar, Guanajuato, Mexico  
T: Miguel Quintana
- EV327T Integral Plan of Management and Conservation on a Sustained Base that Improves Biodiversity and Water Quality in La Plata Estuary, the Ojo del Bucy Wetland and the Coral Reef**  
Michelle Noelis Nieves Diaz, 16, Sophomore  
Linoshka Oliveras, 15, Sophomore  
Alexander Roman, 15, Freshman  
Jose Santos Alegria, Dorado, Puerto Rico  
T: Blanca Iris Hernandez
- EV328T The Levels of Nitrates and Phosphates in Freshwater Systems**  
Haley Marie Burgess, 16, Sophomore  
Shala Ann Hawes, 15, Sophomore  
Central Lee High School, Donnellson, Iowa  
T: Alicia Danyel Schiller
- EV329T Effect of Land Use on Water Chemistry and Macroinvertebrates in Three Watersheds**  
# Richard C Lee, 14, Freshman  
Christine Weizer Li, 18, Senior  
Cookeville High School, Cookeville, Tennessee  
T: Marcia Wiley; T: Jennifer Williams
- EV330T Pollutants as Predictors: Monitoring Particulate Matter and Ozone as Indicators for Emergency Room Visits**  
# Rachna Beeravolu Reddy, 15, Sophomore  
# Elizabeth Wells Busdicker, 15, Sophomore  
Port Huron Northern High School, Port Huron, Michigan  
T: Brian Jamison

- EV331T Assessing Ferric Runoff in Watersheds**  
Shelly Kakar, 18, Senior  
Lindi Lee Swenson, 18, Senior  
Ballard High School, Louisville, Kentucky  
T: Robert L. Baar
- EV332T Rice Straw, a Friend of the Environment**  
Aya Mohamed Ataby, 18, Senior  
Nawal Hossam El Boghdady, 17, Senior  
Dar El Tarbia American School, Cairo, Egypt  
T: Nermine Sherif Abed
- EV333T Cellulosic Ethanol from Corn Biomass**  
Kody Austin Nelson, 15, Freshman  
Mark Andrew Lessen, 15, Freshman  
Delavan High School, Delavan, Illinois  
T: Mary Kay Adamczyk Wonders

## MATHEMATICS

### GRAND AWARDS PRESENTED BY: LUCENT TECHNOLOGIES

- MA001 Riemann's Zeta Function: The Zeros Off the Critical Line**  
Dmitri V. Skjorshammer, 17, Junior, South Fork High School,  
Stuart, Florida, T: Donna Fitzpatrick
- MA002 Novel Method of Computing Jacobi Symbols for Mersenne Numbers: Allowing for Generation of S Values for the Lucas-Lehmer Primality Test**  
## Anarghya A. Vardhana, 17, Senior, Jesuit High School,  
Portland, Oregon, T: John Robert Gorman
- MA003 Integration by Quotients: An Alternative Solution to the Gamma Function**  
William Richard Doenlen, 16, Sophomore, Pensacola High School,  
Pensacola, Florida, T: James Bobbitt
- MA004 The 196 Algorithm in Varying Bases with Applications to Cryptography**  
Aaron Conner Barnett, 17, Senior, Central High School,  
Saint Joseph, Missouri, T: Dennis Douglas Reule
- MA005 Regularity Property of Random Walks**  
Dmitry Todorov, 17, Junior, Centre of Mathematical Education,  
Saint-Petersburg, Russia, T: Alexander Gorbulsky
- MA006 A Problem About the Sum of Digits of a Positive Integer in Arbitrary Numeration Basis**  
Adrian Ioan Zahariuc, 17, Junior, Caolegiul National "Ferdinand I",  
Bacau, Romania, T: Ion Drobota
- MA007 Egyptian Fractions**  
Gardenia Arredondo, 15, Sophomore, Dove Science Academy,  
Oklahoma City, Oklahoma, T: Burak Yilmaz
- MA008 What Drives You? A Scientific and Mathematic Study of Performance and Fuel Economy**  
Christopher Blake Overby, 16, Junior, Wetumpka High School,  
Wetumpka, Alabama, T: Virginia Ann Vilardi
- MA009 Some Topological Properties of a Fault-Tolerant Design**  
# Po-Chun Kuo, 18, Senior, National Hsinchu Senior High School,  
Hsinchu, Taiwan, Chinese Taipei, T: Shin-Biau Jang
- MA010 Strength or Endurance**  
Kevin Michael Meigh, 16, Sophomore, Wheeling Park High School,  
Wheeling, West Virginia, T: Carol L. Obermann
- MA011 Graphs Representation of the Complex Function in Four Dimension Using a Tri-dimensional Model**  
Samuel Lopez Nieves, 17, Senior, Carmen Belen Veiga,  
Juana Diaz, Puerto Rico, T: Maria de Lourdes Plaza Buscana
- MA012 The Use of Modules for the Development of Patterns with Unitary Functions**  
# Diana Maria Rosario-Torres, 17, Senior, Carmen Belen Veiga High School,  
Juana Diaz, Puerto Rico, T: Maria de Lourdes Plaza Boscana
- MA013 Polygonal Numbers**  
Wilson Felipe Alvarez, 18, Senior, Centro Residencial de Oportunidades Educativas,  
Mayaguez, Puerto Rico, T: Edwin Benvenuti
- MA014 Formula to Found Magic Sum on Impair Order Magic Squares Using Triangular Numbers**  
# Andres O. Fontanez, 16, Junior, Ramon Power y Giralt, Las piedras,  
Puerto Rico, T: Pedro Andino
- MA015 Extended Fault Tolerance of Hyper-star Graphs**  
Meelap Vijay Shah, 17, Senior, Stoney Creek High School,  
Rochester Hills, Michigan, T: Eddie Cheng
- MA016 Tilings on a Square Stripe**  
Maxim A. Ulanov, 16, Junior, Advanced Education and Science Centre of MSU,  
Moscow, Russia, T: Arkadiy B. Skopenkov
- MA017 On Embeddability of Cubic Graphs with Rotations in the Torus**  
Gleb A. Pogudin, 15, Freshman, Gymnasim 6, Novosibirsk, Russian Federation,  
T: Arkadiy B. Skopenkov
- MA018 A Fully Combinatorial Proof of the Chan-Robbins-Yuen Theorem**  
Daniel Abraham Litt, 17, Senior, Orange High School,  
Pepper Pike, Ohio, T: James J. Lenczewski
- MA019 Reinterpretation of the Theory of Graph Minors and the Study of a Special Case of Hadwiger's Conjecture**  
## Manuel Luis Rivera-Morales, 17, Senior, Colegio San Ignacio de Loyola,  
San Juan, Puerto Rico, T: Wilma M. Giol-Ruiz
- MA020 Character Sums and Ramsey Properties of Generalized Paley Graphs**  
Nicholas Michael Wage, 17, Senior, Appleton East High School,  
Appleton, Wisconsin, T: Michael Allen
- MA021 Classification of Trig Values by Means of Complex Radicals**  
Jaime Varela, 17, Junior, Caprock High School, Amarillo, Texas,  
T: Daphne Steinkirchner
- MA022 How Thick Is Your Zinc?**  
Lindsey Dale Tillman, 16, Sophomore, Wildwood High School,  
Wildwood, Florida, T: Susan M. Swartzfager
- MA023 Kepler's Quest - Isoperimetric Biogeometry**  
# Daniel Karoly Bezdek, 16, Sophomore, Father Lacombe High School,  
Calgary, Alberta, Canada, T: Brandon Bulger
- MA024 After Wilma: A Statistical Analysis of Tropical Behavior**  
Tiago Petracca Szvarca, 17, Senior, A.W. Dreyfoos High School of the Arts,  
West Palm Beach, Florida, T: Catherine C. Miller
- MA025 Illust-Logic Will Save the Earth**  
Saori Koshino, 16, Sophomore, Nanzan Girls, Nagoya City, Aichi,  
Japan, T: Yoshihiro Shikata
- MA026 Discrete Dynamical Systems in Directed Graphs**  
Jeff D. Nanney, 17, Senior, Plano East Senior High School, Plano,  
Texas, T: Zuoqin Wang
- MA027 Hexaflexagons: Are You in the Group? Or Out?**  
Emily Lynne Hartley, 16, Junior, Academy of Math and Science, Tucson,  
Arizona, T: Kathleen Marie Caine
- MA028 The Evolution of Operant Conditioning and Cooperation in Delayed Gratification Games**  
## Benjamin Scott Hamner, 18, Senior, Academic Magnet High School,  
North Charleston, South Carolina, T: William Bruce Newton
- MA029 The Force of Morse: A Mathematical Analysis of the Forces in a Crystal**  
Nikhil Eshwar Chelliah, 14, Freshman, Charlottesville High School,  
Charlottesville, Virginia, T: Amy Wissekerke
- MA030 The Golden Ratio: An Alternative Approximation**  
Austin Hung-Huan Hu, 17, Senior, Memorial High School, Victoria,  
Texas, T: Virginia Wagner
- MA031 A New Algorithm for Constructing a Prime List by Twin Primes**  
Yujing Wang, 18, Senior, High School of Peking University, Beijing,  
China, T: Dan Xu
- MA032 On the Reducibility of Cyclotomic Polynomials Over Finite Fields**  
# Brett Alexander Harrison, 17, Senior, Half Hollow Hills High School West,  
Dix Hills, New York, T: Chrysi Notskas
- MA033 On the Extreme Problems**  
Paata Ivanishvili, 17, Junior, Rustavi, The 1st Secondary School, Rustavi,  
Georgia Republic, T: Zaza Melikidze
- MA034 Closed Forms for Quadratic Recursions**  
Aleksandr Arkhipov, 17, Senior, Dr. Ronald E. McNair Academic High School,  
Jersey City, New Jersey, T: Jeremy Richard Stanton

- MA035 Factorization by Using the Difference of Perfect Squares**  
George Kartoza, 15, Freshman, Georgia-American High School, Tbilisi, Georgia Republic, T: Mamuka Meskhishvili
- MA036 The Solution of the Dirichlet Problem with Rational Boundary Data**  
Michael Anthony Viscardi, 17, Senior, Josan Academy, San Diego, California, T: Peter Ebenfelt
- MA037 Generalized  $3x+1$  Dynamical Systems Under Semi-group Action**  
# Daniel Zi Wang, 16, Junior, Plano Senior High School, Plano, Texas, T: Karen Shepherd
- MA038 Understanding the Relationship Between Protein Essentiality and Protein Interaction Networks Using Mathematics**  
Emily Zhao, 17, Junior, Terre Haute South Vigo High School, Terre Haute, Indiana, T: David Drake
- MA039 Elliptical Traveling Salesman Solution**  
# Jacob Donald Mitchell, 18, Senior, Westfield High School, Westfield, Massachusetts, T: Renee Coombs Sweeney
- MA040 Morphing Mendel's Genetics**  
Paige Michael Poole, 17, Senior, Jefferson County International Baccalaureate School, Irondale, Alabama, T: Catherine Dupree Shields
- MA041 Predicting Improper Fractional Base Integer Length**  
John Wilson Dorminy, 15, Freshman, Sola Fide Homeschool, McDonough, Georgia, T: Ann Wells Dorminy
- MA042 A Finiteness Property for Integral Points in a Family of Conics**  
# Sohan Venkat Mikkilineni, 17, Junior, Detroit Country Day School, Beverly Hills, Michigan, T: Gene Menton
- MA043 Computer-aided Identification of Cancer from Photomicrographs by Entropy Analysis**  
Lucia Mocz, 15, Freshman, Mililani High School, Mililani, Hawaii, T: Sandra L. Webb
- MA044 Application of Three - Pages Approach in the Theory of Knots for the Hypothesis**  
Yevgeniya Malitskaya, 17, Junior, High School Ridder, Kazakhstan, T: Galina Antipina
- MA045 Criteria of Realization of Bouquets on the Plane and Tore**  
Bakhytzhann Baizhanov, 17, Junior, Aktobe Kazakh-Turkish High School, Aktobe, Kazakhstan, T: Muammer Gul
- MA046 Constructing Su Doku Puzzles**  
Alexander L. Carter, 15, Freshman, Murphy High School, Mobile, Alabama, T: Wanda Tomlinson Griffis
- MA047 Does Mispricing Exist in the Stock Market? A Mathematical Approach to Proving the Contrarian Theory**  
Aditya Soni, 17, Senior, Scarsdale High School, Scarsdale, New York, T: Jeremy Szerlip
- MA048 My Traveling Salesman Problem Algorithm: Is It Efficient and Fast?**  
Lukas William Roots, 16, Junior, El Cerrito High School, El Cerrito, California, T: Jolanta Ewe Walukiewicz
- MA049 Efficient Parameterisation of the Binomial Option-Pricing Model**  
Gohar Jehanzeb Abbasi, 17, Senior, Synge Street CBS Secondary School, Dublin, Ireland, T: Jim Cooke
- MA050 Cheating in Baseball: Does It Help?**  
Jon Charles Pavlicek, 15, Freshman, Linton High School, Linton, North Dakota, T: Kathryn Jo Knoepfle
- MA051 Topology , Topology**  
Ralph F. Jennings III, 16, Junior, Southside High School, Atlanta, Georgia, T: Jacqueline Rhodes
- MA301T About One-Dimensional Compact Topological Semigroups**  
Alexey Dmitriev, 16, Junior  
Anton Kurbanov, 17, Junior  
Vadim Raskumandrin, 16, Junior  
Centre of Mathematical Education, Saint-Petersburg, Saint-Petersburg, Russia  
T: Stanislav Kublanovskiy
- MA302T Applications of Modular Crypto-Function in the Secret Code Theory, Phase Two**  
# Kevin Joel Rodriguez-Torres, 17, Senior  
# Artemio Jose Lopez-Gonzalez, 17, Senior  
Carmen Belen Veiga High School, Juana Diaz, Puerto Rico  
T: Miguel A. Rosario-Garcia
- MA303T Randomness: Are We Capable?**  
Henoc Eduardo Rodriguez, 15, Sophomore  
Ivan Castro-Nogueras, 15, Junior  
Centro Residencial de Oportunidades Educativas, Mayaguez, Puerto Rico  
T: Edwin Benvenuto
- MA304T Some Problems in Steiner Minimal Trees Theory**  
Lubov V. Tupikina, 16, Junior  
Vitaly A. Agafonov, 16, Junior  
Aleksandra S. Serkina, 16, Junior  
Lyceum # 1511 at MPhI, Moscow, Russia  
T: Alexey A. Tuzhilin
- MA305T Negativity Criterion of Coefficients of Inverse Power Series**  
Alexey P. Alekhin, 16, Junior  
Roman D. Kozin, 16, Junior  
Centre of Mathematical Education, St. Petersburg, Russia  
T: Ilya A. Chistyakov
- MA306T A Noval Technique to Find Cube Root**  
Amardeep ., 16, Senior  
Vakeel Ahmad, 16, Senior  
Jawahar Navodaya Vidyalaya, Meerut, India  
T: Ramkumar Pundir
- MA307T Extremal Cayley Graphs of Finite Cyclic Groups**  
Elysia Ja-Zeng Sheu, 17, Senior  
Joseph J. Lee, 18, Senior  
Lawrence E. Elkins High School, Sugarland, Texas  
Hudson High School, Hudson, Ohio  
T: Xingde Jia
- MA308T Impossibility of Construction of Triangle by Using Three Bisectors**  
Lado Meskhishvili, 15, Freshman  
Irakli Baiadze, 16, Junior  
Georgia-American High School, Tbilisi, Georgia Republic  
T: Mamuka Meskhishvili
- MA309T Demystifying the Human Brain: An Exploration of Artificial Neural Network Development**  
# Matthew Huang, 17, Senior  
Nathan Ezra Gould, 17, Senior  
Scarsdale High School, Scarsdale, New York  
T: Jeremy Szerlip; T: Beth Schoenbrun

## MEDICINE AND HEALTH

GRAND AWARDS PRESENTED BY:  
MERCK RESEARCH LABORATORIES

- ME001 Effects of Folate Supplementation on Mitochondrial Function in Radiation-Damaged Human Keratinocytes**  
# Kyla Davis Horn, 15, Sophomore, Cocoa Beach High School, Cocoa Beach, Florida, T: Veronica Duys
- ME002 Medicinal Mushrooms in Southern Oregon**  
Claire Elizabeth Glasgow, 16, Junior, Henley High School, Klamath Falls, Oregon, T: Gitte Jensen
- ME003 *Lumbriculus variegatus* and Tobacco Smoke with Natural Tea Remedies**  
Natasha Rosales, 16, Sophomore, McArthur High School, Hollywood, Florida, T: Beverly Grimm
- ME004 Is There an Inverse Correlation Between Cancer and Heart Disease?**  
Brian Edward Clement, 17, Junior, Lake Brantley High School, Altamonte Springs, Florida, T: Susan N. Behel
- ME005 Novel Gene Therapy on Inner/Middle Ear of Pompe's Disease Mice**  
Kushagra Shrinath, 16, Junior, Vanguard High School, Ocala, Florida, T: John Patrick Hare
- ME006 The Effect of Cardiac Resynchronization Therapy (CRT) with Sequential Biventricular Pacemaker in Patients with Severe Congestive Heart Failure**  
Shivam Narendra Upadhyaya, 15, Sophomore, Stranahan High School, Ft. Lauderdale, Florida, T: Georgette Treloar

- ME007 Mathematical Modeling of Smoking Effect on Down Syndrome**  
Daniel Zheng, 16, Junior, Saint Paul Academy and Summit School, Saint Paul, Minnesota, T: Tina Barsky
- ME008 Subluxation Splint: A New Hip Brace for Infants with Developmental Dysplasia of the Hip**  
Shelby R. Doyle, 16, Junior, Bartlesville High School, Bartlesville, Oklahoma, T: Betty A. Henderson
- ME009 Chloroplast Genetic Engineering: A Novel Method to Produce Therapeutic Proteins**  
## Shiv Mukesh Gaglani, 17, Senior, West Shore High School, Melbourne, Florida, T: Tonya Galaida
- ME010 Stevia Induction of DNA Repair Mechanisms: A Study of Induced DNA Damage and Genetic Expression**  
### Kaleb Markus Naegeli, 18, Senior, Northwestern High School, Kokomo, Indiana, T: Patricia Arnett Zeck
- ME011 Mercury Release from Palladium-Containing Dental Amalgam After Bleach Exposure**  
Emma Caroline Jeffries, 17, Junior, Columbia River High School, Vancouver, Washington, T: Pam Lehrman
- ME012 The Bioactivity of Triclosan**  
Drew Francis Chesaneck, 16, Junior, Bradenton Preparatory Academy, Bradenton, Florida, T: Larry Gaudio
- ME013 Engineering of a Novel Inhibitor of Biofilm-Encapsulated Pathogens**  
Madhavi Pulakat Gavini, 16, Junior, Mississippi School for Mathematics & Science, Columbus, Mississippi, T: Mary Davidson
- ME014 Quercetin and Iron as Potential Enhancements for GDNF Production to Reduce Parkinson's Disease**  
# Amy Kathleen Feller, 17, Junior, Greybull High School, Greybull, Wyoming, T: Joel M. Kuper
- ME015 Effects of Estrogen Regulation on the CCR5 Co-receptor in the Uterus**  
# Alison Lea Siler, 18, Senior, Garinger High School, Charlotte, North Carolina, T: Yvette Huet Hudson
- ME016 The Effects of Resveratrol on Cell Invasion and Expression of Matrix Metalloproteinase-2 (MMP-2) in ER- and ER+ Breast Cancer Cells *in vitro***  
Pamela Eunice Palmer, 18, Senior, Little Rock Hall High School, Little Rock, Arkansas, T: Beverly Lyn-Cook
- ME017 Copper(II)2(3,5-diisopropylsalicylate)4-Induced Redifferentiation of Pancreatic Adenocarcinoma Cells**  
Mehak Gupta, 15, Sophomore, Little Rock Central High School, Little Rock, Arkansas, T: Trinity K. Lahti
- ME018 Self-Folding Devices for Transmucosal Drug Delivery, Part II**  
Andrew Lee, 17, Senior, Upper Arlington High School, Upper Arlington, Ohio, T: Laura Allison Brennan
- ME019 The Effects of MPP+ on Gene Expression and Dopamine in PC-12 Cells: An *in vitro* Model of Parkinson's Disease**  
# Heather Kay Ali, 16, Junior, Fayetteville High School, Fayetteville, Arkansas, T: William Carol Rosser
- ME020 Statistical Analysis of Maxillary Central Incisors & Nail Plates to Determine a Correlation**  
Robin B. Jones, 16, Junior, Brunswick High School, Brunswick, Georgia, T: Patricia A. McVeigh
- ME021 Alicin vs. CHAP: Synergistic/Detrimental**  
Juman Ziad Khweis, 14, Freshman, Taos High School, Taos, New Mexico, T: Ernie Manuel Lopez
- ME022 A Human Pulse Analysis System Based on Virtual Instruments and Artificial Intelligence**  
Liang Zhao, 17, Senior, No. 2 High School of East China Normal University, Shanghai, China, T: Weiyi Lou
- ME023 Bleaching Out Bacteria: A Study on the Use of Clorox® Regular-bleach as a Cleaning Agent in an Elementary School Setting**  
Katherine Anne Horton, 18, Senior, Wetumpka High School, Wetumpka, Alabama, T: Virginia Ann Vilardi
- ME024 Development of a System for the Local Prevention of Catheter Associated Urinary Tract Infections**  
Silvana Konermann, 17, Junior, Saechsisches Landesgymnasium St. Afra, Meissen, Germany, T: Jens Viehweg
- ME025 Classification of Cell Culture and Pre-Malignant Tissue Based on Radial-LBF Analysis of NuMA in the Mammary Epithelium**  
# Eugenia Gabrielova, 17, Senior, West Lafayette Junior/Senior High School, West Lafayette, Indiana, T: Marshall Overley
- ME026 Nanotechnology, Phase II: Development of a Nanoparticle-based Sensor to Detect a Cancer Biomarker**  
Gina Elisabeth Paietta, 16, Junior, Carroll High School, Dayton, Ohio, T: Laurie Fuhr
- ME027 Non-invasive Biosensors for the Detection and Management of Crohn's Disease**  
Stephanie Maria Bachas-Daunert, 17, Senior, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Jack Moon
- ME028 Laughter: The Best Medicine? Effects of Laughter on Blood Glucose Levels in Comparison to Exercise**  
Kendra Malia Ho Ching, 17, Junior, Kahuku High School, Kahuku, Hawaii, T: Anne Cecelia Zellinger
- ME029 Molecular Basis of Anoxia Stress Survival**  
Desh Prakash Mohan, 16, Senior, Texas Academy of Mathematics and Science, Denton, Texas, T: Pamela Padilla
- ME030 Cell Survival, Genomic Instability, and Bystander Effects Induced by Ionizing Radiation**  
# Danna Elisabeth Thomas, 16, Junior, Broadneck Senior High School, Annapolis, Maryland, T: Jody Jallepalli
- ME031 Treatment of Age-related Macular Degeneration, Year Two: Effect of Intraocular Steroid on Choroidal Neovasculture and Vitreal Vascular Endothelial Growth Factor Level**  
Sabrina Lakshmi Prabakaran, 15, Freshman, Canterbury School, Fort Myers, Florida, T: Betsy Mary Elizabeth Glass
- ME032 The Influence of the Consumption of B12 and B9 Vitamin and Zinc Supplements for Senior Citizens' Life Quality**  
Alana Rocha Schmidt Witt, 17, Senior, Fundacao Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil, T: Solange Bianco Borges Romeiro
- ME033 The Stroop Effect**  
Ashly Laura Rocco, 18, Senior, Mercy Cross High School, Biloxi, Mississippi, T: Deborah Longo Worrel
- ME034 MAM and the Development of Cerebellar Granule Cells**  
Fei Chen, 16, Junior, School of Science and Technology, Beaverton, Oregon, T: Hector M. Morales
- ME035 A Novel Function of Lactate Transporter MCT1 in Gastric Restitution**  
Lisa Madeleine Marrone, 18, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Robert Latham
- ME036 Modeling Auditory Attention by Implementing IHC Movement into Frequency Selectivity of the Inner Ear: A Novel Approach to Stimuli Separation**  
Jonathan Blake Sellon, 18, Senior, Staples High School, Westport, Connecticut, T: Alfred J. Scheetz
- ME037 A Novel Non-invasive Method for the Early Detection of Malignant Melanoma**  
Jason Bernard Clain, 16, Junior, Greenwich High School, Greenwich, Connecticut, T: Ray Hamilton
- ME038 Micro-pathology Lab Chip for Detecting Molecular Lesions of Glioblastoma**  
# Carol Yoon Joo Suh, 17, Junior, Palos Verdes Peninsula High School, Rolling Hills Estates, California, T: Peter Starodub
- ME039 Sick from Non-stick? A Study Done with Polytetrafluoroethylene and *Caenorhabditis elegans***  
Richelle Rae Fritzier, 15, Sophomore, Merino High School, Merino, Colorado, T: Carlye Jo Armstrong
- ME040 The Effects of T-REG Depletion in EAE Remission**  
# Leslie Wen-Hsien Tse, 17, Senior, Detroit Country Day School, Beverly Hills, Michigan, T: Gene Menton
- ME041 Detecting Novel Submicroscopic Chromosomal Abnormalities in Autism**  
Maryam Ibrahim Sultan, 18, Senior, Townsend Harris High School, Flushing, New York, T: Susan Brustein
- ME042 The Role of the Histone Deacetylase Inhibitor, Apicidin, in the Treatment of T-cell Leukemia and Lymphoma**  
Alma Shi, 18, Senior, Townsend Harris High School, Flushing, New York, T: Susan Brustein

- ME043** **Miracle Cells: Activation of Human Pluripotent Stem Cell Factors with the Mouse Oct-4 Gene**  
Subha Subramanian, 16, Junior, Iowa City West High School, Iowa City, Iowa, T: Jackie R. Bickenbach
- ME044** **The Impact of Muller Cell Reactivity During Retinal Degeneration**  
Sheel Tyle, 14, Freshman, Pittsford Mendon High School, Pittsford, New York, T: Robert Rountree
- ME045** **An Examination of the Metal Contamination of Donated Blood to Be Used in Neonatal Blood Transfusions**  
Allison Michelle Blatz, 18, Senior, Mentor High School, Mentor, Ohio, T: Lori A. Pollak
- ME046** **Can Light Be Used to Detect Blood Sugar Levels? Year Two**  
Julie Krystine Loza, 16, Junior, Kouts High School, Kouts, Indiana, T: Andrea Clinkenbeard
- ME047** **Pharmacological Study of Dopamine Transmission in the Rat Nucleus Accumbens**  
Michelle Andrea Nguyen-McCarty, 17, Senior, Academy of the Holy Names, Albany, New York, T: Donna Marie Mooney
- ME048** **Cellular and Molecular Mechanisms of Nicotine's Pro-angiogenesis Activity: Potential Impact on Different Disease Processes**  
Sarah S. Mousa, 18, Senior, Columbia High School, East Greenbush, New York, T: Frederick Rudofsky
- ME049** **A Pox on You? A Study of the Effectiveness of the CDC's Response Plans to a Smallpox Outbreak**  
Ian Douglas Cummings, 17, Junior, Saint Josephs High School, Ogden, Utah, T: Pamela Stewart
- ME050** **The Correlation Between the Transcription Factor of HIF-1 $\alpha$  and the Reduction in Proliferation Index**  
Andrew Allen Gilbert, 16, Junior, Northern Utah Academy for Mathematics, Engineering and Science, Roy, Utah, T: Andrew Adams Lavin
- ME051** **Umbilical Cord Blood: Is It a Treatment for Strokes?**  
Justus Roberts, II, 18, Senior, Paul R. Wharton High School, Tampa, Florida, T: Carmen S. Austin
- ME052** **Comprehensive Genetic Study, Using Computational Analysis, of an Amino Acid Substitution Causing Autosomal Dominant Retinitis Pigmentosa in Family 0815**  
Garrison Dakota Alger, 18, Senior, Pine View High School, St. George, Utah, T: Sandy Ferrell
- ME053** **The Role of Heme Oxygenase 2 in Cisplatin Resistance in C13 Serous Epithelial Ovarian Tumor Cells**  
Vivek Kumar, 15, Sophomore, Suncoast Community High School, Riviera Beach, Florida, T: Elizabeth Cozzi
- ME054** **Study of the Anchoring of Glutamate Decarboxylase to GABAergic Synaptic Vesicle Membrane**  
Eric Michael Cohen, 17, Senior, Boca Raton Community High School, Boca Raton, Florida, T: JoAnne Weise
- ME055** **G.U.M.: Germs Under the Microscope**  
Rebecca Lynn Takacs, 18, Senior, Boone Grove High School, Valparaiso, Indiana, T: Kenneth G. Snow
- ME056** **Investigating the Antibacterial Properties of Turmeric (*Curcuma longa*) Against Methicillin-resistant *Staphylococcus epidermidis***  
Medha Chunduru, 17, Senior, Capital High School, Olympia, Washington, T: Anne Cecil
- ME057** **T Cell Signaling in Disease Settings Following Allogeneic Bone Marrow Transplantation**  
Melanie Yan-Yan Chow, 17, Junior, Rye High School, Rye, New York, T: Jaime Zung
- ME058** **360° Steerable Catheter Utilizing Nitinol Wire**  
Josh Paul Jones, 18, Senior, Wilcox-Hildreth Public School, Wilcox, Nebraska, T: Randall G. Lienemann
- ME059** **Postnatal Development, Behavior, and Motor Function in Growth Restricted Offspring**  
Antoinette Shani Dawson, 17, Senior, Murrah High School, Jackson, Mississippi, T: Jeff Stokes
- ME060** **Frankincense Oil as a Novel Cancer Therapeutic Agent: Results of a Clinical Trial in Equine Melanoma, a Third Year Study**  
Carrie Elizabeth Shaw, 18, Senior, Career Center High School, Winston-Salem, North Carolina, T: Terri McMurray
- ME061** **Contribution of gp91phox in Cardiac Apoptosis and Injury Post Myocardial Infarction**  
Dawn Zhao, 17, Junior, White Station High School, Memphis, Tennessee, T: Angel Perkins
- ME062**  **$\beta$ -Catenin's Role in Drug Resistance**  
Cortney Nicole Ragatz, 18, Senior, Frederick High School, Frederick, Maryland, T: Susan D. Mertins
- ME063** **The Effects of Unprocessed and Ozonated *Leptospermum scoparium* Honey on Caco2 (Colon Cancer) Cell Proliferation, *in vitro***  
Elena Kurtz Ovaitt, 17, Junior, West Platte High School, Weston, Missouri, T: Brad Lynch
- ME064** **The Antiviral Effects of Echinacea**  
Emily Danielle Reinbold, 16, Junior, Timber Lake High School, Timber Lake, South Dakota, T: Donna Jean Aberle
- ME065** **The Millet as a Nutritional Alternative in Mexico**  
Jazmin Ethel Guerra, 19, Senior, CBTis No. 39, Aguascalientes, Mexico, T: Alfredo Villalobos
- ME066** **The Role of Keratins as Susceptibility Genes for Liver Disease in AfroAmericans**  
Farnoosh Nik-Ahd, 17, Junior, California High School, San Ramon, California, T: Pavel Strand
- ME067** **Molecular Mechanism of Pain Involving Free Radicals**  
Shayma Adil Hasan, 18, Senior, Glenwood High School, Chatham, Illinois, T: Natalie Christine Crothers
- ME068** **Possible Radioprotective Effects of N-Acetylcysteine in LX-1 Small Cell Lung Carcinoma Cells**  
Michael Lev Rutenberg Schoenberg, 15, Junior, Woodrow Wilson High School, Portland, Oregon, T: Leslie Muldoon
- ME069** **Functional Conservation of Telomerase from Fish to Humans: Implications for Novel Models of Aging and Cancer**  
Sohini Sircar, 17, Junior, Maggie L. Walker Governor's School, Richmond, Virginia, T: Joy Ross
- ME070** **Health Analysis Green vs. Black, Phase II**  
Shauna Marie Waite, 17, Senior, Florence High School, Florence, South Dakota, T: James Chilson
- ME071** **A New Target to Fight Breast Cancer: hHb1-AN**  
Melissa Victoria Sussman, 17, Senior, Lawrence High School, Cedarhurst, New York, T: Rebecca P. Isseroff
- ME072** **Incorporation and Maximization of Synthetic Penicillin Production in Transgenic *Lemma minor***  
Zachary Scott Solomon, 17, Senior, Long Beach High School, Lido Beach, New York, T: Linda Trusz
- ME073** **The Analysis of Squamous Cell Carcinoma Related Oncogene's Functional Role in E3 Ligase Ubiquitination Pathway**  
Manish Ashok Shaha, 17, Senior, John L. Miller Great Neck North High School, Great Neck, New York, T: Alan Schorn
- ME074** **Characterization of Canine Embryonic Stem Cells by Immunohistochemistry and Special Stains**  
Alissa Michelle Aron, 16, Junior, Ballard High School, Seattle, Washington, T: Ellen Reimer
- ME075** **Chronic Hexosamine Flux Activates AMP-Activated Protein Kinase in Adipocytes: An Explanation for the Metabolic Complications of Type 2 Diabetes**  
Mark Gordon Evans, 17, Junior, Hillcrest High School, Midvale, Utah, T: Robert Mullins
- ME076** **Sock-Aid: Help for the Elderly and Physically Disabled**  
Gitte Ahlquist Jonsson, 19, Senior, EUC Lolland, Nakskov, Denmark, T: Henrik Neve
- ME077** **Pharmacological Evaluation of *Ludwigia octovalvis* Extract and Its Fungicidal Effect on *Trichophyton rubrum*, *Microsporum gypseum* and *Microsporum cookei* *in vitro***  
Xavier Alexis Cruz, 16, Junior, Elvira M. Colon High School, Santa Isabel, Puerto Rico, T: Maria Elisa Thiele
- ME078** **Eating Habits in the Adolescent's Integral Health**  
Lynette Vega, 16, Junior, Luis Munoz Marin High School, Yabucoa, Puerto Rico, T: Claribel Torres
- ME079** **Viewing Nutrition's Effect on Blood Through Dark Field Microscopy**  
Christopher Thomas Kady, 15, Sophomore, Tri-City College Prep High School, Prescott, Arizona, T: David Boyd Somerville

- ME080 Finding a Link Among Ca<sup>2+</sup> Signaling, Apoptosis and Neurodegenerative Diseases to Develop Novel Treatments**  
Eric Nelson Delgado, 16, Sophomore, Bayonne High School, Bayonne, New Jersey, T: Marie Anne Aloia
- ME081 The Scientific Study of Korean Traditional Hub Medicine in gu-jung-gu-pyo Method (Nine Boiled & Nine Dried Method)**  
Bo Hyun Nam, 17, Senior, Chongnam Science High School, Gongju-si, Chungcheongnam-do, South Korea, T: Hee Kune Lee
- ME082 Effects of MMP-Carrying Inflammatory Leukocytes on Tumor Cell Intravasation**  
Joanne Yula Zhang, 16, Junior, Torrey Pines High School, Encinitas, California, T: Julia Newman
- ME083 Immunohistochemical Identification of Early Disease Markers in Amyotrophic Lateral Sclerosis**  
Phillip Yanhua Zhang, 16, Sophomore, Torrey Pines High School, San Diego, California, T: Valerie Atkinson
- ME084 Silencing of Gene Expression in *Neurospora crassa* Through Targeted mRNA Cleavage**  
Srikanth Kodali, 16, Senior, John B. Connally High School, Austin, Texas, T: Rosendo Garcia
- ME085 Single Nucleotide Polymorphisms Are Associated with the Aggressiveness of Colon Cancer in African American Patients**  
#  
Rahul Ram Goli, 16, Junior, The Altamont School, Birmingham, Alabama, T: Donna Kentros
- ME086 A Walk in the Park: Determining the Normal Gait of Children**  
Emily Claire Boden, 18, Senior, Midland High School, Midland, Texas, T: Charles Arthur Bell
- ME087 The Antimicrobial Properties of *Curcuma longa* and Its Growth Impediment Effects on *Saccharomyces cerevisiae* and *Escherichia coli***  
#  
Nhila Jagadeesan, 16, Junior, Lake Central High School, St. John, Indiana, T: Marjorie Lynn Thompson
- ME088 Shake and Bake: It's Not Just for Dinner Anymore. The Effects of SV40 Large T-Antigen on Skin Phenotype in VDR-null Mice**  
Elizabeth Blair Laing, 17, Senior, Lakeshore High School, Stevensville, Michigan, T: Lynda Smith
- ME089 Functional Analysis of the Human Biofluidome**  
Luyi Zhao, 18, Senior, Parkway South High School, Manchester, Missouri, T: Tim Morrison
- ME090 That Little Voice Inside Your Head**  
#  
Erin Marie Fischell, 18, Senior, High Technology High School, Lincroft, New Jersey, T: Michael T. Roche
- ME091 Discovery of a Gene that Blocks Breast Cancer Cell Metastasis**  
Tejal Ulhas Naik, 16, Junior, The Charter School of Wilmington, Wilmington, Delaware, T: Beenu Gupta
- ME092 Mutagenic Effect of Tobacco on Microorganisms**  
Sameem S. Qazi, 16, Junior, Carman-Ainsworth High School, Flint, Michigan, T: Ali Hekmati
- ME093 Designing an Optical Waveguide for Genetic Testing Through Telemedicine**  
#  
Matthew Edwin Trusheim, 18, Senior, Breck School, Golden Valley, Minnesota, T: Lois Fruen
- ME094 The Use of Xylitol to Prevent *Burkholderia cepacia* and *Pseudomonas aeruginosa* Infections in Cystic Fibrosis Patients**  
Paul Robert Chakkaphak, 15, Sophomore, Ridgeview High School, Orange Park, Florida, T: Mary R. Turner
- ME095 Regulation of CGRP Secretion from Trigeminal Neurons by Grape Extracts**  
#  
Sun Qiu, 15, Sophomore, Greenwood Laboratory School, Springfield, Missouri, T: Hugh Denver Brewer
- ME096 Thwarting the Pandemic: Targeted Social Distancing Strategies**  
#  
Laura McBride Glass, 15, Sophomore, Albuquerque High School, Albuquerque, New Mexico, T: Robert John Glass
- ME097 Wonder Bugs, Bacterial Endophytes, a Biological Control of Human Infection**  
Matthew Julian Duenas, 15, Sophomore, Father Duenas Memorial School, Hagatna, Guam, T: Roland Anthony San Nicolas
- ME098 The Hygiene Hypothesis: Fact or Fiction?**  
Ella Ruthann Hein, 15, Freshman, Wing Public School, Wing, North Dakota, T: Julie Ann Hein
- ME301T Alzheimer's Disease Brain Atrophy and Immunohistochemical Detections of Neurofibrillary Tangles Using Multiple Antibodies**  
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Ryan Kimlong Huynh, 17, Junior  
Richie Kimlong Huynh, 17, Junior  
Champlin Park High School, Champlin, Minnesota  
T: Kevin Molohon
- ME302T Honey: A Wealth of Health**  
Geraldyn Anne Schexnayder, 14, Freshman  
Lacey Marie Gravois, 14, Freshman  
Lutcher High School, Lutcher, Louisiana  
T: Valerie N. Stewart
- ME303T Postsynaptic Neurotransmitter Binding Inhibition of Opposite Leaf Spot Flower, (*Acmella opositifolia*) Flower Isolate: A Prospect Agent Against Uncontrolled Neuronal Firing**  
Beverly Canoy Casimero, 15, Freshman  
Kenneth Joseph Chan Burerros, 16, Freshman  
John Paul Lawas dela Cruz, 17, Freshman  
Bayugan National Comprehensive High School, Philippines  
T: Gregor Carpentero Burdeos
- ME304T Nature's Shield: The Protective Role of Cyanadin Against Cellular Deterioration due to Carcinogenic Elements**  
Christopher Jason Lorn, 18, Senior  
Sishira Mannuru, 15, Freshman  
Nina Ezinne, 16, Junior  
John B. Connally High School, Austin, Texas  
T: Rosendo Garcia
- ME305T The Effects of Gene Suppression and Exposure to MPTP on Dopamine Neurons of *C. elegans* as a Model for Parkinson's Disease**  
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Marilynn Tedja, 17, Senior  
Elise Marie Adcock, 17, Senior  
Elizabeth Nicole Monier, 17, Junior  
Keystone School, San Antonio, Texas  
T: Charles Scott Maderer
- ME306T Are Nanoparticles Toxic to Brain Cells?**  
Jonathan Wang, 14, Freshman  
Jared Vega Goodman, 15, Freshman  
Oak Hall School, Gainesville, Florida  
T: Sandra Swindler
- ME307T The Cytotoxic Implications of Titanium Dioxide Nanoparticle Penetration into Dermal Fibroblast Cells**  
Lauren Amanda Sipzner, 17, Senior  
Jaimie Stettin, 17, Senior  
Yeshiva University High School for Girls, Holliswood, New York  
T: Ruth Fried
- ME308T Gender Effects on Scent Recognition**  
Charlotte Ann Voss, 14, Freshman  
Lauren Paige Young, 14, Freshman  
Turpin High School, Cincinnati, Ohio  
T: Corey L. Mullins
- ME309T The Effect of Selected Ingested Plasticizers on the Growth and Development of *Drosophila melanogaster***  
Andrea Inez Simons, 16, Junior  
Jessica Brooke Nagy, 18, Senior  
North Toole County High School, Sunburst, Montana  
T: Lawrence Dexter Fauque
- ME310T The Effects of Green Tea and Traditional Chinese Herbs on the Inhibition of HMGB1: A Novel Mediator of Lethal Sepsis**  
Charlotte Yum, 18, Senior  
Xiaotian Chen, 18, Senior  
Ossining High School, Ossining, New York  
Stuyvesant High School, New York, New York  
T: Angelo Piccirillo
- ME311T Experimental Relation Between Dietary Intake of Fatty Acids and Onset of Asthma**  
Asif Ahsan Ali Jafferani, 17, Senior  
Asif Anwar Surani, 17, Senior  
Shahzad Mansoor Khoja, 17, Senior  
Aga Khan Higher Secondary School, Karachi, Sindh, Pakistan

- ME312T Insulin Resistance, Part II: What Is the Role of p38MAPK in Insulin Signaling?**  
# Ariel Leigh Potter, 15, Sophomore  
Christine Minji Pak, 17, Junior  
Rio Rico High School, Rio Rico, Arizona  
T: Teresa Brown Potter
- ME313T The Etiology and Mass Distribution of Congenital Hypothyroidism in Infants: The Results in Henan Province, China**  
Shang Guo, 18, Senior  
Jin Wang, 18, Senior  
Zhengzhou Foreign Language School, Zhengzhou, Henan, China  
T: Bo Wang; T: Xu Li
- ME314T Calcium Supplementation Aggravates Vascular Calcification in Rats**  
ShaoYu Lin, 18, Senior  
Wei Li, 18, Senior  
Beijing No.166 Middle School, Beijing, China  
T: Lei Wang
- ME315T The Contribution of Therapy "X " in the Patients of Alzheimer's Disease**  
Vivian F. Irlanda, 14, Freshman  
Glorimar Santiago- Ruiz, 15, Freshman  
Sotero Figueroa School, Rio Piedras, Puerto Rico  
T: Maria E. Lopez
- ME316T The Effects of Variations in Dietary Fat Intake Using *Caenorhabditis elegans* as a Model Organism for Fat Storage**  
Whitney Strine Quackenbush, 16, Sophomore  
Erin Nicole D'Agostino, 15, Sophomore  
Manhasset High School, Manhasset, New York  
T: Peter Guastella
- ME317T Plastic Food Containers: An Unsafe Situation?**  
# Trisha Lea Schleich, 18, Senior  
# Terra Jo Toribio, 17, Senior  
Mitchell High School, Mitchell, South Dakota  
T: Julie Olson
- ME318T Oxidation of the Neuronal Protein SNAP-25 Protects It from Destruction by Botulinum Neurotoxin (BOTOX®)**  
Elizabeth C. Flores, 16, Sophomore  
Christina S. Izatt, 16, Sophomore  
Timpview High School, Provo, Utah  
T: Dixon Woodbury
- ME319T The Potential of Swamp Tea Tree Leaves Extract as Anti Monocellate Cobra Venom**  
Hidayah Hanim Hisham, 18, Freshman  
Rose Marhaini Haji Ismail, 18, Freshman  
Nur Farahin Ramdzan, 18, Freshman  
Maktab Rendah Sains Mara, Serting, Negeri Sembilan, Negeri Sembilan, Malaysia  
T: Zaid Ali Bajunid Omar
- ME320T The Growth of Pathogenic or Allergenic Fungi in the *Columba livia* Excrement, Phase III**  
# Legna Figueroa, 15, Sophomore  
# Darlene Torres, 16, Sophomore  
Maria Davila Semidey, Patillas, Puerto Rico  
Natividad Rodriguez Gonzalez School, Arroyo, Puerto Rico  
T: Teresa Cordero
- ME321T Effects of Plasticizer DEHP on Reproduction and Reproductive Fitness**  
# Sameer Gorav Gupta, 17, Senior  
# Brice Alfred Bongiovanni, 18, Senior  
Central High School, Macon, Georgia  
T: Tina Brigmond
- ME322T Use'em and Abuse'em: The Feeding Rituals of *Pseudomonas aeruginosa* in the Cystic Fibrosis Lung**  
Elaine Christine Owen, 16, Sophomore  
Shannon Kaukeolani Thorp, 17, Senior  
Saint Andrew's Priory School, Honolulu, Hawaii  
T: Joe N. Pacific
- ME323T Tissue Inflammation and Cytokine Expression During *Yersinia pestis* Pneumonia**  
Lin Chen, 17, Senior

- Andrew John Lechner, 18, Senior  
Parkway Central High School, Chesterfield, Missouri  
T: Adam Bergeron; T: Michael Herrmann
- ME324T A Study of Kaposi's Sarcoma Herpes Virus in Human B Cells**  
Evangelia Amighthalia Athanasoula, 16, Sophomore  
Thomai Gastopoulos, 15, Sophomore  
Central High School, Philadelphia, Pennsylvania  
T: Dennis Erlick
- ME325T *In vitro* Studies on How Properties of *Melastoma* sp. Methanol Extracts Inhibit the Calcium Oxalate Crystals (Kidney Stones) Growth**  
Fayadh Aiman Fauzi, 17, Junior  
Muhd Fakhurrazi Mohd Bakri, 18, Junior  
Mohd Irfan Syuhaidi Nasir, 17, Junior  
Sultan Mohamad Jiwa Science Secondary School, Sungai Petani, Kedah, Malaysia  
T: Harris Ganai Nainar
- ME326T Dystrophic Skeletal Muscle Cell Membranes Patched by Ploxamer 407**  
# Lalith Kumar Polepeddi, 17, Senior  
# Michael McCord Polmear, 18, Senior  
Cherry Creek High School, Greenwood Village, Colorado  
T: T.J. Donahue
- ME327T A Hybrid Reaction-Diffusion Cellular Automata Model of Glioblastoma**  
Hersh Vivek Goel, 17, Senior  
Corina I. Oprescu, 16, Junior  
Michael Allen Fan, 18, Senior  
Gilbert High School, Gilbert, Arizona  
Corona del Sol High School, Tempe, Arizona  
Dobson High School, Mesa, Arizona  
T: Alvin Bridges; T: Stan Bristol; T: Barbara Seibert

## MICROBIOLOGY

### GRAND AWARDS PRESENTED BY: INTEL FOUNDATION

- MI001 Entry of Plasmid-Encoded Toxin into the Eukaryotic Cell**  
Kaitlin Elizabeth Burlingame, 16, Junior, Lake Brantley High School, Altamonte Springs, Florida, T: Suzy Behel
- MI002 Identifying Essential Amino Acids in Media for *Xylella fastidiosa***  
Sambita Basu, 17, Junior, Griffin High School, Griffin, Georgia, T: Laura Cole
- MI003 Cecropins: Nature's Secret Antibiotics**  
Charles John Hansen, 14, Freshman, Northwestern High School, Kokomo, Indiana, T: Patricia Arnett Zeck
- MI004 Epidemiology of Community Associated MRSA vs. Healthcare Associated MRSA**  
Kathryn Leigh Davis, 17, Junior, Leesburg High School, Leesburg, Florida, T: Sandra M. Good
- MI005 CPLD Prevention in Cystic Fibrosis: Reduction of *Pseudomonas aeruginosa* Biofilm and Virulence by *Punica granatum***  
# Maryam Khadijah Mohammed, 15, Sophomore, Niceville Senior High School, Niceville, Florida, T: Linda Pink
- MI006 Animal and Plant Coliforms of the Weber River**  
Jordan Boyd Phillips, 16, Junior, Clearfield High School, Clearfield, Utah, T: Bruce Staley
- MI007 Synthesis of RC-101 Resistant HIV-1: Investigating HIV-1 Methods of Peptide Evasion**  
# Andrew David Warren, 16, Junior, Lake Highland Preparatory School, Orlando, Florida, T: Judith Faith Legault
- MI008 Environmental Bacteriophages: A Third Year Study of Bacteriophage Genomes**  
Kyle Alexander Wallace, 18, Junior, John Jay Science and Engineering Academy, San Antonio, Texas, T: Jay Sumpter



- MI009** **The Effect of *Allium sativum* and Antibiotics on Bacteria**  
Rebekah Anne Meller, 14, Freshman, Pettisville Local School, Pettisville, Ohio, T: Donna Jean Meller
- MI010** **Target Binding by Papillomavirus E6 Oncoproteins**  
Brian Weber Vande Pol, 17, Junior, Albemarle High School, Charlottesville, Virginia, T: Marvin Tuck Curry
- MI011** **RNA Palindromes (Inverted Repeats) in the Bioinformatics Analysis of Mutagenesis-Pathogenesis of Hemagglutinin and Other Segments of H5N1 and H1N1 (1918 Pandemic) Influenza**  
Alex Brendan Heeb, 15, Freshman, Heeb Homeschool, Chaffee, Missouri, T: Dan Laird Heeb
- MI012** **The Effects of Turmeric on the Growth and Development of *Dictyostelium discoideum* and Its Implications to Cancer**  
Sahitya Krishna Denduluri, 16, Junior, Saint Pius X High School, Albuquerque, New Mexico, T: Anne L. Hall
- MI013** **Efficacy of Ginseng as a Phagocytosis Stimulant**  
## Sarah Jayne Harshman, 17, Junior, Mount de Chantal Visitation Academy, Wheeling, West Virginia, T: Shirley Wilson
- MI014** **Appalachian Trail Water Sources: Safe or Not?**  
Erin Elizabeth Long, 15, Freshman, Angels Rest Homeschool, Pearisburg, Virginia, T: Myra Dee Williams
- MI015** **Investigation of an Antimicrobial Efflux Pump-Encoding Gene with an Environmental Health Perspective**  
## Jennifer Ann Taylor, 18, Senior, Florence High School, Florence, Alabama, T: Linda J. Kanipe
- MI016** **Comprehensive Bacterial Identification and Analysis Software: Protecting the Armed Forces and Improving Health Care Worldwide**  
## Benjamin Albert Schwank, 18, Senior, James Madison High School, Vienna, Virginia, T: Judith Barrile
- MI017** **An Unlikely Weapon Against Deadly Bacteria: Bacteriophage Therapy as an Alternative to Traditional Treatments**  
Leslie Ann Hase, 17, Junior, Merino High School, Sterling, Colorado, T: Carlye Jo Armstrong
- MI018** **Fire on the Mountain**  
Lindsey Eva Rugh, 15, Freshman, Hotchkiss High School, Hotchkiss, Colorado, T: Douglas Ray Horton
- MI019** **The Effects of Ferric Oxide on K12 *Escherichia coli***  
Ganga Sudha Moorthy, 15, Sophomore, Alva High School, Alva, Oklahoma, T: Julie Marie Angle
- MI020** **Do Alpha Tocopherol and Gamma Tocopherol Synergistically Induce Apoptosis in Lung Cancer Cells?**  
Shwetha Suresh Maddur, 16, Sophomore, Novi High School, Novi, Michigan, T: James L. Didio
- MI021** **Inhibiting *Clostridium perfringens* in Poultry via Extract Usage, Phase II**  
# Joseph Robert Stunzi, 16, Sophomore, Clarke Central High School, Athens, Georgia, T: Buddy Sims
- MI022** **The Isolation and Analysis of the prp8 gene in the Dimorphic Fungus *Histoplasma capsulatum***  
Hana Kamal Ali, 17, Junior, Oak Grove High School, Hattiesburg, Mississippi, T: Teresa B. Sappington
- MI023** **Improving the Widely Used pTrc99A Expression Vector**  
Suman Nag, 16, Sophomore, Brookwood High School, Snellville, Georgia, T: Pat Saulson
- MI024** **The Effect of Selected Antioxidants on Cilia Regeneration in *Tetrahymena***  
Kate Elizabeth Christiaens, 16, Junior, North Toole County High School, Sunburst, Montana, T: Lawrence Dexter Fauque
- MI025** **Microbial Growth Comparison After Surgical Prep**  
Kayla Ann Grint, 17, Senior, Weber High School, Pleasant View, Utah, T: Jennifer Burbank
- MI026** **The Relative Sensitivity of Fungal Mycelium to Allelopathic Chemicals Produced by Noxious Weeds**  
Angela Roberta Tomscheck, 17, Junior, North Toole County High School, Sunburst, Montana, T: Lawrence Dexter Fauque
- MI027** **Arkansas Honey Compared to Other Regional Honey**  
Ethan Muriah Clement, 14, Freshman, Sheridan Freshman Academy, Sheridan, Arkansas, T: Vickie Lea Nelson
- MI028** **Knockdown of Chromogranin A in PC12 Cells**  
Diondra Trenee Burney, 17, Senior, Suncoast Community High School, Riviera Beach, Florida, T: Elizabeth Cozzi
- MI029** **Adaptive Resistance of *E. coli* to Triclosan and Cross-resistance to Antibiotics**  
Steven Konstantin Lisica, 16, Sophomore, Bergen County Academics, Hackensack, New Jersey, T: Donna Leonardi
- MI030** **The Antimicrobial Effects of Root Extracts in Comparison to Hand Sanitizers**  
## Melissa Marie Roark, 18, Senior, Rosholt High School, Rosholt, South Dakota, T: Kristin Marie Schultz
- MI031** **Use of a Paramyxovirus to Reduce Tumor Development *in vivo* and Kill Transformed Cells *in vitro***  
# Nandini Sarma, 16, Sophomore, Shawnee Mission East High School, Prairie Village, Kansas, T: Cole Ogdon
- MI032** **Analyzing the Role of  $\gamma$ - $\Delta$  TCR+ T Lymphocytes in the Pathogenesis of Abdominal Aortic Aneurysm (AAA)**  
Yandi Lu, 17, Freshman, Suncoast Community High School, Riviera Beach, Florida, T: Elizabeth Cozzi
- MI033** **Gene Clone and Secondary Structure Analysis of Mulberry Mosaic Wither Viroid**  
RuoChen Zhu, 18, Senior, The High School Attached to Tsing Hua University, Beijing, China, T: JiaXin Yu
- MI034** **Cultivation of *Pleurotus ostreatus* from Agroindustrial Biosolids**  
Rodrigo Franco Ferreira, 15, Freshman, Colegio Interativa, Londrina, Parana, Brasil, T: Marisa Falco Fonseca Garcia
- MI035** **Antibiotic Algae: The Effects of Marine Plant Extracts on *E. coli* and *kB. meg***  
Leah T'Keya Guthrie, 15, Sophomore, The Good Hope School, Frederiksted, Virgin Islands, T: Mary Jane Coles
- MI036** **The Microbiological Quality in Juice**  
Sol Abigail Mercado Jimenez, 14, Freshman, Timoteo Delgado School, Hatillo, Puerto Rico, T: Adabel Nieto
- MI037** **The Effects of *Allium sativum* and *Melaleuca alternifolia* on *Fusobacterium necrophorum***  
Jessica Rae Parries, 18, Senior, Estacada High School, Estacada, Oregon, T: Karen Nicole Doersam
- MI038** **An *in vitro* Study of the Antimicrobial Properties for the Enzyme Phospholipase A-2 in the Treatment of *Candida albicans***  
Josue Edgardo Juan-Martinez, 16, Junior, Blanca Malaret High School, Sabana Grande, Puerto Rico, T: Luis R. de Jesus
- MI039** **Study of the Presence of *Salmonella* in Reptiles**  
Omar Andre Rivera, 15, Sophomore, University Gardens High School, San Juan, Puerto Rico, T: Nelson Ruiz
- MI040** **Investigation of Eye Infections: Bacterial Adherence vs. Contact Polymer Type and the Antibiotic Properties of Contact Solutions**  
Katie Joan Nix, 14, Freshman, Grove High School, Grove, Oklahoma, T: Keliana Don Steen
- MI041** **Functional Characterization of the *Legionella* Vip Proteins**  
Jennifer Michelle Schindler, 17, Junior, Oceanside High School, Oceanside, New York, T: Renee Marie Barcia
- MI042** **The Effect of Ultraviolet Light and Microgravity on Growth Patterns of *Bacillus subtilis***  
Ragini Annesha Basu, 17, Junior, Roanoke Valley Governor's School, Roanoke, Virginia, T: John C. Kowalski
- MI043** **Photoenzymatic Repair: The Effect of UV-A and UV-B Radiation on Ciliates**  
Eric Alan Sherman, 12, Freshman, Ephrata Senior High School, Ephrata, Pennsylvania, T: Patricia Hachten Wee
- MI044** **Finding and Mapping Unknown Mutations on the T4rII Bacteriophage Using Complementation and Recombination Techniques**  
Michael Scott van Dijk, 15, Freshman, Pleasant Grove High School, Pleasant Grove, Utah, T: David Michael van Dijk
- MI046** ***In vitro* Assessment of *Francisella novicida* Transcriptional Activation Factors MglA and IgIC with Additional Cytoplasmic Proteins**  
# Cory John Millmier, 15, Sophomore, Central Lee High School, Donnellson, Iowa, T: Alicia Danyel Schiller
- MI047** **A Quantitative Assay of Food-borne Bacteria in Prepackaged Fresh-cut Produce**  
Ying Fan, 16, Junior, Cookeville High School, Cookeville, Tennessee, T: Sharon G. Berk

- MI048 Search for Methane-oxidizing Archaeons**  
Maxwell S. Mann, 16, Sophomore, Falmouth Academy, Falmouth, Massachusetts, T: Alison Stone Ament
- MI049 CD20 Involvement in Hypoxia Inducible Factor Stabilization**  
Edison Wakulyaka, 19, Senior, Somerville High School, Somerville, Massachusetts, T: Sebastian LaGambina
- MI050 Use of GFP to Analyze *Pseudomonas syringae* pv. *phaseolicola* 1448A in Plant Cells**  
# Daniel Abraham Blumenthal, 18, Senior, Jones College Preparatory School, Chicago, Illinois, T: Nichole Lowery
- MI051 High Intensity Focused Ultrasound Effect on *Saccharomyces cerevisiae* and Cancer**  
China M. Melton, 17, Junior, Poughkeepsie High School, Poughkeepsie, New York, T: Maxwell Bundrant
- MI052 Localization of the HIV-1 Nef and Vpu Proteins**  
Tiffany Renee Steele, 18, Senior, Baltimore Polytechnic Institute, Baltimore, Maryland, T: Sally Kutzer
- MI053 The Use of Capsaicin Solution from Jalapeno and Habanero Peppers as An Antibacterial Agent against *Escherichia coli***  
Chad Everette Peters, 16, Senior, Mayo High School for Math, Science, and Technology, Darlington, South Carolina, T: Gerald Allan Porter
- MI054 Compartmentalization of Gene Expression in a Sporulating Coccus, *Sporosarcina ureae***  
Mamatha Chetlur Chary, 16, Senior, Central High School, Philadelphia, Pennsylvania, T: Dennis Erlick
- MI055 Can Mating-type Switching in *Saccharomyces cerevisiae* Be Used to Detect DNA Damage? Does Increasing Transcription Influence DNA Repair After UV Exposure?**  
Cristina De Obaldia, 15, Freshman, Moorestown High School, Moorestown, New Jersey, T: Eugene Nicolo
- MI056 Ancient Medicine to Modern Medicine—Lichens: What's the Potential?**  
# Rebecca Renee Alexander, 15, Sophomore, Grants High School, Grants, New Mexico, T: Shelby L. Alexander
- MI057 Eye Aware: A Two Year Study of *Acanthamoeba* in Eyewash Stations and Their Environment**  
Kristin Lynea Fields, 15, Sophomore, Ballard High School, Louisville, Kentucky, T: Ronda Kay Fields
- MI058 A Study of the Anti-microbial Effects of Honey on *Escherichia coli***  
Nyssa Catherine Boyd, 16, Sophomore, Eastern High School, Pekin, Indiana, T: Sharon A. McElroy
- MI059 Colonization and Identification of Microbes in the Weight Room**  
Jalissa Jean Hovland, 17, Junior, Maddock Public School, Maddock, North Dakota, T: Sam Mark Gutormson
- MI060 Improving Survival of Bifidobacteria in Yogurt Containing Exopolysaccharides**  
Kara Renee Gutormson, 18, Senior, Maddock High School, Maddock, North Dakota, T: Sam Mark Gutormson
- MI061 A Relationship of Deviation Between Growth Rate and Mutation Using *E. coli* Transformation: A Means of Disease Control**  
David Len Elion, 18, Freshman, Mississippi School for Mathematics and Science, Columbus, Mississippi, T: Mary Lofton Davidson
- MI301T Xylitol Xtreme Two: A Time Sequencing Study Assessing the Inhibitory Effect of Pentahydroxypentane (Xylitol) on the Bacterial Growth Curve of *Strep. mutans*.**  
## Justin A. Johns, 18, Senior  
# Christine E. Johns, 15, Sophomore  
Evangelical Christian School, Fort Myers, Florida  
T: Stephen F. Morriss
- MI302T Decreasing the Microbial Contamination of an Oak Wine Barrel by Improving the Sanitation of *Brettanomyces bruxellensis* Using 254nm Ultraviolet Light and an Ultrasonic Bath**  
Arnaud Georges Sillis, 17, Junior  
Brian Furness Siperstein, 17, Junior  
Keenan Joseph Ferar, 17, Junior  
Oregon Episcopal School, Portland, Oregon  
T: Rosa Hemphill; T: Tanja Horvat; T: Peter Langely
- MI303T American Indian Medicine: An Analysis of Antiseptic Plants for Antimicrobial Effectiveness**
- ## Shana Marie Wolff, 16, Junior  
# Elizabeth Jean Cochran, 16, Sophomore  
Cheyenne Central High School, Cheyenne, Wyoming  
T: Michael Wallace; T: Anne Marie Wolff
- MI304T Modulation of Quorum Sensing is *Pseudomonas aeruginosa***  
Kuan Yee Wong, 18, Junior  
Siew Han Wong, 18, Junior  
National Junior College, Singapore, Singapore  
T: Lai Yuen Chee
- MI305T *B. thurgiensis* Spore Destruction Utilizing a Fe-TAML, CTAB Catalyzed, TBHP Reaction**  
Gabby Stoner, 16, Sophomore  
Rana Gibson, 15, Sophomore  
San Jon Municipal Schools, San Jon, New Mexico  
T: Steve Goodgame
- MI306T Hamburger: Healthful or Hazardous? Ways to Decrease Microbial Contamination on Hamburger**  
Kristen Pamela Delwiche, 16, Sophomore  
Annika Marie Sullivan, 16, Sophomore  
Grant High School, Portland, Oregon  
T: John Thomas Kilkenny
- MI307T What Shares Your Air?**  
Kacie Barnett, 17, Junior  
David Jacks, 17, Junior  
Drew Central High School, Monticello, Arkansas  
T: Dennis Thurman
- MI308T The Effect of Electrode Materials on the Efficiency of a Microbial Fuel Cell**  
Jessica Hee Park, 14, Freshman  
Veronica Leigh Winget, 15, Freshman  
Gig Harbor High School, Gig Harbor, Washington  
T: Kristin Bergh
- MI309T A Comparison of Antibiotic Resistance in *Staphylococcus aureus* of Caucasians, African Americans, Asians, and Hispanics**  
Vyshak Chandra, 18, Senior  
Richard John Cassidy, 18, Senior  
Allen D. Nease High School, Saint Augustine, Florida  
T: Sally Mitalas
- MI310T Effects of Stream Hydrodynamics and Water Filtration Plant Discharges on the Colonization, Diversity and Biomass of Aquatic Fungi at Rio Sabana in Luquillo, Puerto Rico**  
# Zacha M. Ortiz-Correa, 17, Senior  
## Esteban Hernandez, 17, Senior  
Sylvanna D. Savona-Silva, 19, Senior  
Casiano Cepeda High School, Rio Grande, Puerto Rico  
Colegio Sonifel, Fajardo, Puerto Rico  
T: Angel L. Diaz-Rosario
- MI311T Legionella Monitoring of Industrial Water Systems by PCR: A Novel Must in Sustainable Development of Industrialization Worldwide**  
Omer Faruk Yuca, 14, Freshman  
Ahmet Faruk Kavak, 15, Freshman  
Private Fatih High School, Istanbul, Marmara, Turkey  
T: Irem Uzonur
- MI312T Multi-factor Optimization of *Saccharomyces cerevisiae* Gene Expression**  
Krystina Rose Daniels, 17, Senior  
Adeline Emily Wong, 17, Senior  
Milpitas High School, Milpitas, California  
Homestead High School, Cupertino, California  
T: Laurie Belanger
- MI313T Propionibacterium Acne? Not a Problem!**  
Victoria Hope Clunie, 18, Senior  
Moriah Anne Greenwood, 17, Senior  
Sweetwater High School, Sweetwater, Tennessee  
T: Jane Davenport
- MI314T Fish Mucus: Antibacterial Property Unique to the Hawaiian *Eleotris sandwicensis***  
# Genevieve C. Pang, 17, Senior  
# Alayna Rachele Betsill, 17, Senior  
Henry Perrine Baldwin High School, Wailuku, Hawaii  
T: Stuart Donachie

- MI315T The Effect of the Green Tea Polyphenol, EGCG, on T Cell-Antigen Presenting Cell Interactions**  
Yi Cai, 17, Junior  
# Iddoshe Haile Hirpa, 16, Junior  
duPont Manual Magnet High School, Louisville, Kentucky  
T: Craig DaRif

## PHYSICS

### GRAND AWARDS PRESENTED BY: LAWRENCE LIVERMORE LABORATORIES

- PH001 SMA: The Shape of Things to Come, Year Two**  
Mario Charles Mistretta Jr., 17, Senior, Satellite High School, Satellite Beach, Florida, T: Lisa Scott
- PH002 A Compact Approach for the 3D Localization of Sounds**  
David S. Holz, 17, Senior, Monarch High School, Coconut Creek, Florida, T: Thomas Todack
- PH003 A Novel Way of Optical Projection: Making Photocamera Images More Similar to Things that People Really See**  
Arseni O. Ivanou, 17, Junior, Secondary School #4, Minsk, Belarus, T: Olga A. Smehovich
- PH004 A Study of the Rainbow Effect in Transparent Liquids**  
Elena Fernandez, 15, Sophomore, Southwestern Educational Society, Mayaguez, Puerto Rico, T: Evelyn Montalvo
- PH005 Vortex Avalanches in Superconductors**  
Adam Janecka, 19, Junior, Mendelovo Gymnazium, Opava, Prispěvkova Organizace, Opava, Moravskoslezsky Kraj, Czech Republic, T: Petr Pavlicek
- PH006 How Does the Amount of Powder in a Bullet Affect the Average Velocity?**  
John R.F. Kelly, 16, Freshman, Loveland High School, Loveland, Colorado, T: Dennis Heyrman
- PH007 An Experimental Study of "Mpemba Effect": Why Hot Water Freezes Faster than Cold Water**  
Shen Li, 19, Senior, Jilin Provincial Experimental School, Changchun, Jilin, China, T: Jinhua Li
- PH008 Small Mass Measurements from Oscillations in a Magnetic Suspension Field**  
Carl Louis Rodriguez, 17, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Sheryl Thomas
- PH009 Vision Aid: A New Horizon for the Visually Impaired**  
Ricardo Wagner Melero, 19, Senior, Fundacao Escola Tecnica Liberato S. V. da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil, T: Helio Luiz Brochier
- PH010 Propellantless Propulsion: The Role of Drift Transport in Asymmetrical Capacitor Thrust Production**  
# Stephen Jerome Trettel, 16, Sophomore, New Prague Senior High School, New Prague, Minnesota, T: John Novak
- PH011 The Effect of Wavelength on the Photo-assisted Growth of C60 Whiskers in a Liquid-liquid Interface**  
Tianyuan Wang, 17, Senior, duPont Manual Magnet High School, Louisville, Kentucky, T: Glenn E. Zwanzig
- PH012 A Poor Man's Way of "Hearing" Apart Coke<sup>®</sup> and Root Beer**  
Kuan-Hao Chen, 16, Junior, Private Hong Wen Senior High School, Taichung, Taiwan, Chinese Taipei, T: Chin-Ling Lu
- PH013 Cartesian Diver, Interfacial Phenomena, and the Cheerios<sup>®</sup> Effect**  
Sung-Kai Kao, 17, Junior, National Chai-Yi Senior High School, Chia-Yi City, Taiwan, Chinese Taipei, T: Weng-Tang Lee
- PH014 Hawking Radiation and Dark Matter**  
Ian Miles Winson, 17, Junior, The King, Johannesburg, Gauteng, South Africa, T: Irma Krynauw
- PH015 Synthetic Depth of Focus**  
# Holly Kristine Zelnio, 18, Senior, Chaminade Julianne High School, Dayton, Ohio, T: Barbara Groene
- PH016 Chaos from Order-Order from Chaos: Can There Be a Way of Containing Chaos in Tokamaks?**  
Esther Oluchukwu Uduehi, 17, Junior, Francis Joseph Reitz High School, Evansville, Indiana, T: Chris Gibson

- PH017 Conditions Affecting the Surreptitious Readability of RFID-Enabled Passports**  
# Devon Daniel Smith Kibby, 17, Senior, Juneau-Douglas High School, Juneau, Alaska, T: Clay Darn Good
- PH018 Coil Gunnery**  
John Robert Krause, 17, Junior, Centreville High School, Clifton, Virginia, T: Joseph Fehr
- PH019 Detection of Metal Fatigue and Defects by Electron Work Function Topography and Gradient**  
# Geoffrey Hubert Woo, 17, Junior, Palos Verdes Peninsula High School, Rolling Hills Estates, California, T: Peter Starodub
- PH020 Development of an Inexpensive Raman System and a Littrow Spectrograph**  
## Mary Masterman, 16, Junior, Westmoore High School, Oklahoma City, Oklahoma, T: Jeffrey L. Baughman II
- PH021 Effect of Pomerom Exchange in Soft and Hard Diffraction in Quantum Chromodynamics**  
Jared Max Lafer, 17, Senior, The Beacon School, New York, New York, T: Reid Schwebach
- PH022 Angular Transfer Dynamics of a Momentum eXchange/Electrodynamic-Reboost (MXER), Space Tether**  
# Adam Matthew Fuhrmann, 16, Junior, Heritage High School, Leesburg, Virginia, T: Cheri Ann Poremba Faley
- PH023 The Right Light: Effectiveness of Artificial Light Sources to Generate Current in a Solar Cell**  
Emily Charlotte Pardini, 14, Freshman, Solon High School, Solon, Iowa, T: Jennifer Boldt
- PH024 A New Dye-sensitized Solar Cell**  
Ishaan Guptasarma, 15, Freshman, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert M. Heun
- PH025 Laser Photonics Activated Robotic Hand**  
Lydia Arnold, 17, Senior, Audenshaw School, Manchester, Tameside, United Kingdom, T: Ray Davies
- PH026 Cracking the Brazil Nut Effect**  
## Meredith Ann MacGregor, 17, Junior, Fairview High School, Boulder, Colorado, T: Helen Petach
- PH027 The Research of Diffusion Transfer Processes in the Inhomogeneous Mediums**  
Alexander P. Kamantsev, 16, Junior, Lyceum # 31, Chelyabinsk, Russia, T: Alexander A. Mirzoev
- PH028 Where Under the Sun Are You?**  
Sarah Lynn McCuskee, 14, Freshman, Campbell Collegiate, Regina, Saskatchewan, Canada, T: Jean-Pierre St-Maurice
- PH029 Nanoscale Displacement Metrology of Piezoelectric Elements with Optical Fiber Interferometry**  
Christian Damon Lobo, 17, Senior, Westview High School, Portland, Oregon, T: Mark Anthony Geren
- PH030 Stability of Connected Chaotic Circuits**  
## Brandon John Campbell, 17, Junior, Fremont High School, Plain City, Utah, T: Kim Wilde
- PH031 Physics of a Simple Prototype for Static Magnetic Levitation**  
Hamsa Padmanabhan, 16, Junior, Kendriya Vidyalaya Ganeshkhind, Pune, Maharashtra, India, T: Arvind Gupta
- PH032 Semiconductor Nuclear Radiation Detector**  
Andres Esteban Travaini, 17, Senior, Colegio Provincial Tecnico No 760, Comodoro Rivadavia, Chubut, Argentina, T: Renato Daniel Dellagiovanna
- PH033 Factors in the Formation of Anti-bubbles**  
James Ernest Hanson, 16, Sophomore, Century High School, Rochester, Minnesota, T: Aaron Larson
- PH034 Alternative Energy Converter**  
# Denilson Luz Freitas, 18, Senior, Colegio Opcao de Ensino, Vitoria da Conquista, Bahia, Brasil, T: Valmir Henrique Araujo
- PH035 Anatomy of an Accident: Physics Applied**  
Tamara June Parliament, 16, Junior, Hamlin High School, Hayti, South Dakota, T: Christine Anne Owen
- PH036 Factors Affecting Hydrogen Production**  
Tyler John Parisien, 16, Junior, Turtle Mountain Community High School, Belcourt, North Dakota, T: Renee C. Aalund

- PH037 Atomic Size and Rutherford Scattering**  
Candice Murray, 17, Junior, The Academy for Math, Engineering, and Science, Salt Lake City, Utah,  
T: Tanya Maria Vickers
- PH038 Optical Transmission Through Metallic Sub-wavelength Structures**  
Arthur James Gottschalk, 18, Senior, Sarasota High School, Sarasota, Florida, T: Shannon Yeager
- PH039 Optical, Acoustic, and Mechanical Properties of StealthWear: Third Year Study of a Novel Material**  
# Graham Edward Gintz, 15, Sophomore, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Tina Webb-Browning
- PH040 The Effect of AC Frequency on the Electrical Properties of a  $YBa_2Cu_3O_7$  High Temperature Superconductor**  
## Jonathan Joseph Naber, 16, Junior, Waterloo High School, Waterloo, Illinois, T: Richard McDermott
- PH041 There's a Venturi in the Attic**  
Lauren Makenzie Maddox, 17, Junior, Midland High School, Midland, Texas, T: Chuck Bell
- PH042 The Determination of Therapeutic Advantage of GRID Radiation Therapy Using Film and Thermoluminescent Dosimetry**  
# Navid John Soleimani-Meigooni, 17, Senior, Henry Clay High School, Lexington, Kentucky, T: Kai Dou
- PH043 *In vitro* Identification of Cancerous Tumors by Raman Spectroscopy**  
# Shannen Alexei Adcock, 18, Senior, Little Rock Central High School, Little Rock, Arkansas, T: Melissa Carol Donham
- PH044 Detection and Analysis of Capacitance Variations Produced by Moving Objects, Phase III**  
# Sean Thomas Malone, 17, Senior, Malone Homeschool, Edgewood, New Mexico, T: Anne Marie Malone
- PH045 It Ain't Loud Enough**  
Whitfield Albert Parham, 17, Junior, Palmetto High School, Williamston, South Carolina, T: Anthony Joseph Amato
- PH046 The Supercritical Brayton Cycle for Space Exploration**  
Ian Michael Rousseau, 18, Senior, Essex High School, Essex Junction, Vermont, T: Joseph Chase
- PH047 Hovering on Air**  
Janelle Lynn Hinesley, 14, Freshman, Edgemont High School, Edgemont, South Dakota, T: Scott Lynn Corbett
- PH048 Sensitivity of 1/f Noise to Chemical Constituents: A Study of Pentacene and Its Oxidative Impurity in Thin-Film Transistors**  
Winston Xia Yan, 17, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Robert Latham
- PH049 Fuel Cell: A Clean Renewable Energy**  
Andrew Lee Norvell, 15, Freshman, Glynn Academy, Brunswick, Georgia, T: Leigh Ann Truesdale
- PH050 A General Model for Three Way Neutrino Oscillations**  
# Renaldo Michael Webb, 17, Senior, Louisiana School for Math Science and the Arts, Natchitoches, Louisiana, T: Christopher McMullen
- PH051 Microbial Cells and Corrosion Prevention**  
## Mary Katherine Soltys, 17, Senior, Notre Dame Academy, Park Hills, Kentucky, T: Sr. Mary Ethel Parrott
- PH052 Noise Reduction in Aquatic Systems**  
Margaret Louise Greenwood, 17, Junior, Chillicothe High School, Chillicothe, Missouri, T: Greg Lynn Thurmon
- PH053 The Effect of Salt Water Crystallization on Monopole Antenna Reception**  
Danielle Marie Hettmann, 16, Sophomore, Battlefield High School, Haymarket, Virginia, T: Amy Linn Neff
- PH054 Surface Tension of Liquids**  
Miranda Jo Meier, 15, Freshman, Dickinson Trinity High School, Dickinson, North Dakota, T: Bradley Jay Foss
- PH055 Investigation of Tone Holes in Woodwind Instruments**  
Colby Anne Wilkason, 15, Freshman, Warner Robins High School, Warner Robins, Georgia, T: Randi Collier
- PH301T Synthesis of Clean Fuel from a Renewable Source**  
Ziyad Husni Abdel Khaleq, 17, Junior  
Amen Ali Modhafar, 17, Junior  
Modern Montessori School, Amman, Jordan  
T: Iman Moh As; T: Raed Shami
- PH302T Radiation Reduction of Cellular Phones**  
Samuel Joseph Tamo, 16, Sophomore  
Daniel Theodore Wallis, 16, Sophomore  
Wilbur D. Mills University Studies High School, Little Rock, Arkansas  
T: Gary A. Ealeywine
- PH303T Elastomeric Grating for Wavelength Switching in Optical Communication Systems**  
Maria Katrina Derez Guevara, 17, Sophomore  
Ace Fredric Resurreccion Palabrica, 17, Sophomore  
Nicole Andrea San Agustin Yazon, 16, Junior  
Philippine Science High School - Main Campus, Quezon City, National Capital Region, Philippines  
T: Edgar Naoe Tafaleng
- PH304T The Physics of Paintball: The Effect of the Pneumatic Ram on the Performance of a Paintball Marker**  
Kyle Heideman, 18, Senior  
Joseph Palmer Schafer, 17, Senior  
Buena High School, Sierra Vista, Arizona  
T: Joann Deakin
- PH305T An Approach to UAV Deployment with Water Rockets**  
Trent William Lukaczyk, 18, Senior  
Travis Weston Halbert, 17, Senior  
James W. Robinson Jr. Secondary School, Fairfax, Virginia  
T: Karen McLean; T: Jonathan L. Warner
- PH306T Development of Multipass Pulse Cleaner for Ultrafast High-power Lasers**  
# Alexander Chernyak, 18, Senior  
Pavel V. Chvykov, 15, Sophomore  
International Academy, Bloomfield Hills, Michigan  
T: David Lyons  
Lincoln Consolidated High School, Ypsilanti, Michigan  
T: Kathy Betrus
- PH307T Is There Torque in Your Toast? A Mathematical Analysis of a Falling Rectangular Object**  
## Adreanne Laree Brungardt, 16, Junior  
Nichole Byrldine Catlett, 16, Junior  
Brush High School, Brush, Colorado  
T: David Miner
- PH308T Thermal Effects on the Degeneration of Permanent Magnets**  
Danil Efron Smiles, 17, Junior  
Alan Hayden Cherney, 17, Senior  
Niles North High School, Skokie, Illinois  
T: Jacklyn Naughton
- PH309T A Comparative Analysis of Laser Efficiency: The Effect of Scattering Surfaces Inside a Diffuse Reflector Solid State Laser Pump Chamber**  
Bretton Skyler Griffin, 17, Senior  
Chelsey Lynn Webb, 16, Freshman  
Alexandra Morgan Smith, 16, Junior  
Hilton Head Preparatory School, Hilton Head Island, South Carolina  
T: Tina Webb-Browning
- PH310T The Relation Between the Time of Exposure and Its Distance on a Developing Process of a Homemade Pinhole Camera and 110 Film**  
Xavier Enrique Lozada, 17, Junior  
Omar Andres Rodriguez, 16, Junior  
Colegio de la Salle, Bayamon, Puerto Rico  
T: Maritza Rodriguez
- PH311T Liquid or String Elasticity and Sound Velocity**  
Yuji Sasabe, 17, Junior  
Kazuhiro Okumoto, 17, Junior  
Toshiya Kobayashi, 17, Junior  
Hiroshima Prefecture Daimon Senior High School, Fukuyama City, Hiroshima, Japan  
T: Jyunpei Okamoto

- PH312T Lift-Off! Working with Wings and Pressure**  
Minru Wong, 14, Freshman  
Abigail Cristine Khushf, 14, Freshman  
Dreher High School, Columbia, South Carolina  
T: David Nelson
- PH313T Factors Affecting the Tribological Properties of Carbon Nanotubes**  
Tirth Tarang Patel, 17, Junior  
Byron Henry Lowry, 17, Junior  
Spruce Creek High School, Port Orange, Florida  
T: Andrea Marie White; T: Linda Kerney

## SPACE SCIENCE

### GRAND AWARDS PRESENTED BY: LOS ALAMOS NATIONAL LABORATORIES

- SP001 The Effect of Space Shuttle Launch Induced g-forces on Soybean Seeds Planted in a Lunar Simulated Soil Treated with Bio-solid: Degree of g-force/Length of Exposure Time**  
Rachel Jean Lisson, 17, Junior, Cloquet High School, Cloquet, Minnesota, T: Cynthia Ann Welsh
- SP002 The Hitchhiker's Guide to the Galaxies: A Multifractal Analysis of the Universe**  
# Zihao Zhang, 18, Senior, West Shore High School, Melbourne, Florida, T: Tonya Galaida
- SP003 Life in the Stratosphere: Investigating Bacteria on the Edge of the Earth**  
Peter Young Borden, 15, Sophomore, Seacrest School, Naples, Florida, T: Dale Griffin
- SP004 Using a New Geometrical Series in Studying the Planets' Distances from the Sun**  
Anoud Khaled Al shogran, 15, Sophomore, Al zahra, Amman, Jordan, T: Omar Faleh Al zoubi
- SP005 Implementing a Novel Program for Forecasting Latitude/Longitude Locations and Movement Rates of Sunspots and Active Solar Magnetic Regions, Year Three**  
## Elyse Autumn Hope, 18, Senior, Oregon Episcopal School, Portland, Oregon, T: Rosa Maria Hernandez Hemphill
- SP006 Dust Adhesion Minimization of the Mars Exploration Rover Calibration Target Through Thin Metal Film Technology**  
Jessica Andrea Barreto, 16, Senior, Maritime and Science Technology Academy, Miami, Florida, T: Wafa Khalil
- SP007 Magic Mirror for Galaxy Clusters**  
Hsin-Yu Chen, 18, Senior, Taipei First Girl High School, Taipei, Taiwan, Chinese Taipei, T: Jiun-Huei Protty Wu
- SP008 The Titan Blimp**  
# John Thomas Hagen, 18, Senior, Ayersville High School, Defiance, Ohio, T: Chris Silvers
- SP009 Phaseolus lunatus Growth Patterns in a Simulated Mars Environment, Year Three**  
# Sasha Annalicia Rohret, 16, Sophomore, Keystone School, San Antonio, Texas, T: Charles Scott Maderer
- SP010 Earth Eclipse Effect on GPS Satellite Orbits**  
Daniel Kaleonahe Apau Jachowski, 17, Senior, West Potomac High School, Alexandria, Virginia, T: Jinmyun Jo
- SP011 Detecting Dark Matter with a Novel Simulation of Gravitational Lensing**  
## Aliza Ilana Malz, 18, Senior, Hunter College High School, New York, New York, T: Asumana Randolph
- SP012 The Influence of Topography on Martian Polar Clouds**  
Sukrit Ranjan, 18, Senior, Glenbrook North High School, Northbrook, Illinois, T: Lynne Zielinski
- SP013 Life Out in the Cold: The Orbital Journey of Asteroid 42 Isis**  
Anh Duy Nguyen, 17, Junior, Woodrow Wilson Senior High School, Washington, District of Columbia, T: Angela Benjamin
- SP014 Radio Interferometry Using 2 NASA RadioJOVES at 20.1 MHz with Software Implementation in Java**  
Hieu Huu Tran, 16, Junior, Southside High School, Greenville, South Carolina, T: Thomas Rogers

- SP015 The Sky Is Falling! A Five Year Study of Meteor Activity in Northeast Mississippi**  
# Channing Jordan Arnold, 16, Sophomore, Booneville High School, Booneville, Mississippi, T: Brenda Pike Scott
- SP016 Variations in Muon Density: The Examination of Cosmic Rays Through Muon Detection**  
Thomas Anthony Catanach, 16, Sophomore, Bishop Lynch High School, Dallas, Texas, T: Sister Cecilia Sehr
- SP017 Investigating the Chemical Signatures of Meteorite Impacts**  
# Terik Daly, 16, Junior, Oak Grove High School, San Jose, California, T: Carol Evans
- SP018 Computer Simulations of Large-scale Structure Formation in the Universe**  
Daniel T. McCoy, 16, Sophomore, McCoy Home School, Socorro, New Mexico, T: John D. McCoy
- SP019 The Dust Devils Did It: Wind Erosion and Transport in Gusev Crater Mars**  
Julie Emily Walker, 15, Freshman, Leonardtown High School, Leonardtown, Maryland, T: R. L. McCarthy
- SP020 Modeling Planetary Atmosphere Circulation in a Rotating Annulus**  
# Yuan Zhu, 18, Senior, Liverpool High School, Liverpool, New York, T: Carol Merry Matthews
- SP021 Using a Comet Technique for "Seeing" Extra Solar Planets**  
Ryan Gamurot, 18, Senior, Kapolei High School, Kapolei, Hawaii, T: Naidah Gamurot
- SP022 Group Analysis to Pattern Discovery in Stellar and Galactic Distributions**  
Philip Mocz, 16, Sophomore, Mililani High School, Mililani, Hawaii, T: Pauline S. Higa
- SP023 The Application of the Titius-Bode Law to Various Orbiting Bodies of the Galaxy**  
Andrea Danielle Cumbie, 17, Senior, Macomb Senior High School, Macomb, Illinois, T: Thomas Tjark Johnson

## ZOOLOGY

### GRAND AWARDS PRESENTED BY: INTEL FOUNDATION

- ZO001 Does the Intramammary Teat Sealant Orbeseal® Help Prevent New Intramammary Infection of Dairy Cows During the Dry Period, Resulting in Lower Somatic Cell Counts**  
Joy L. Burnham, 14, Freshman, Okeechobee High School, Okeechobee, Florida, T: Richonda Manson
- ZO002 Effect of Embryo Culture in the Presence of IGF-1 on Post-Transfer Survival of *in vitro* Produced Bovine Embryos, a Three Year Study**  
Matthew Steven Walker, 16, Sophomore, Okeechobee High School, Okeechobee, Florida, T: Richonda Manson
- ZO003 Biological Control of a Common Corn Criminal, Phase Three: The Effects of Entomogenous Nematodes on the *Carpophilus dimidiatus*, Corn Sap Beetle**  
## Douglas Ray Horton, 17, Junior, Hotchkiss High School, Hotchkiss, Colorado, T: Douglas Ray Horton
- ZO004 Evolution of Snakes in the Genus *Bothrops***  
Kirby Leigh Erlandson, 16, Junior, Lake Brantley High School, Altamonte Springs, Florida, T: Suzy Behel
- ZO005 The Effect of Cellular Telephone Electromagnetic Radiation on the Nervous System of Developing *Drosophila melanogaster***  
Victoria Amanda Wheeler, 15, Freshman, Greenwood High School, Greenwood, Mississippi, T: Gwendolyn Jyles
- ZO006 The Effects of Headache Suppressants on the Nervous System of the Pill Bug**  
Darius Trevor Love, 15, Sophomore, Greenwood High School, Greenwood, Mississippi, T: Leighla Hughes

- ZO007 Comparison of Natural and Artificial Sweeteners: Discrimination and Preference of *Drosophila melanogaster*, Phase II**  
# Zoe Elizabeth Teague, 16, Junior, Nettleton High School, Jonesboro, Arkansas, T: Karen D. Ladd
- ZO008 Does the Nonhuman Primate Oocyte Express Membrane Progesterone Receptors that Are Necessary for Non-mammalian Oocyte Maturation?**  
Yufei Cao, 16, Junior, Liberty High School, Hillsboro, Oregon, T: Ramona Toth
- ZO009 The Effects of Heat and Refrigeration on the Development of the *Gallus domesticus* Embryo**  
Kathryn Ann Piehl, 15, Freshman, Saint Marys High School, Sleepy Eye, Minnesota, T: Patricia Ann Braulick
- ZO010 Examination of Long-Term Memory in Heterozygous Mindbomb Mutant Zebrafish**  
# Beatrice Smith Parker, 16, Junior, Bethesda-Chevy Chase High School, Bethesda, Maryland, T: Deborah Pober Haase
- ZO011 How Attractive Are You...to Mosquitoes?**  
Howell Ross Fishel, 15, Freshman, Bay High School, Panama City, Florida, T: Jill Marie Hansen
- ZO012 Intelligent Aviary**  
Igor Germano Seibert, 18, Senior, Fundacao Escola Tecnica Liberato Salzano Viera da, Novo Hamburgo, Rio Grande do Sul, Brasil, T: Elemar Schneider
- ZO013 Evaluation of Primary and Secondary Cells for *in vitro* Assessment of the Foreign Body Response**  
Ashley Loree Pollock, 17, Junior, Wiggins Junior/Senior High School, Wiggins, Colorado, T: Mary Linton
- ZO014 A Forensic Study on the Effects of Seawater on the Growth Rate of Local Sarcophagid and Calliphorid Larvae**  
## Genevieve Mount, 17, Senior, Santa Cruz High School, Santa Cruz, California, T: Robert Clark Mount
- ZO015 Gametic Compatibility of Conspecific Sea Urchins, *Arbacia punctulata***  
# Hillary Ann Futch, 16, Freshman, Paxon School for Advanced Studies, Jacksonville, Florida, T: Maria Oehler
- ZO016 Do Herbal Memory Enhancers, such as B12, Ginkgo Biloba, and Echinacea, Increase the Learning of Planaria?**  
Elizabeth Brooke Bailey, 16, Sophomore, Union Grove High School, McDonough, Georgia, T: Sandra Swindall
- ZO017 Biofuel and Soaps from Janitor Fish (*Pterygoplichthys pardalis*) Oil**  
Raymond Joseph Sarmiento Amurao, 16, Sophomore, Marikina Science High School, Marikina City, National Capital Region, Philippines, T: Janet Sramiento Amurao
- ZO018 Analysis of Cotton Bollworm Response to Gossypol**  
Yuqian Jiang, 17, Junior, Shanghai Weiyu High School, Shanghai, China, T: Haisheng Wang
- ZO019 Mode of Inheritance of Spinosad-Resistance in *Liriomyza trifolii***  
Emily Victoria Schock, 16, Sophomore, Lake Highland Preparatory School, Orlando, Florida, T: Judith Legault
- ZO020 A Versatile Hunter: Giant Wood Spider Adjusts Web Structure and Silk Properties When Encountering Different Prey**  
Yi-Chi Chao, 18, Junior, The Affiliated Senior High School of NTNU, Taipei, Taiwan, Chinese Taipei, T: I-Min Tso
- ZO021 A Comparative Study of the Effects of Various Antioxidant Supplements on the Longevity of *Pogonomyrmex occidentalis***  
Shane Douglas Mackey, 15, Freshman, Dr. Michael M. Krop Senior High School, Miami, Florida, T: David L. Buncher
- ZO022 A Device for Determining the Gender of Salmon Using Morphological Characteristics, Phase Four: Age & Morphological Differences Between Male & Female Kokanee Salmon**  
# Susannah Lee Clary, 14, Sophomore, Los Lunas High School, Los Lunas, New Mexico, T: Eric Brown
- ZO023 BDNF Regulates Taste Bud Development at Late Embryonic Ages**  
Amanda Lynn Driskell, 17, Junior, Ballard High School, Louisville, Kentucky, T: Robert Baar
- ZO024 Osteoporosis: A Phase II Study of Calcium Absorption and Depletion in *Crassostrea virginica***  
# Lacy Beth Casteel, 17, Senior, Brooks High School, Killen, Alabama, T: Wanda Jane Phillips
- ZO025 A Molecular Analysis of Variation Within Microsatellite Loci of a Controlled Population of White-tailed Deer (*Odocoileus virginianus*) from Southern Maryland**  
Ethan Douglas Sperry, 16, Junior, Terre Haute South Vigo High School, Terre Haute, Indiana, T: David E. Drake
- ZO026 The Effects of Tunnel Ventilation vs. Conventional Ventilation on the Performance of Commercial Turkey Operations**  
# Travis Elliott Schaffer, 17, Senior, North Daviess High School, Elnora, Indiana, T: John Merle Callahan
- ZO027 A Correlation Study of Buoyant and In Air Weighing Techniques for Coral Fragments**  
## Jared Benjamin Steed, 17, Senior, Buckeye Valley High School, Delaware, Ohio, T: Paul Grimes
- ZO028 Mollusks in Decline: An Ecological Study of a Rare Freshwater Mussel (*Margaritifera falcata*)**  
# Emily Sarah Munday, 16, Senior, Butte High School, Butte, Montana, T: Maureen Driscoll
- ZO029 Utilizing Science to Promote Sustainable Economic Development in Our Tribal Community: Protein Metabolism in Tilapia Fish for Optimal Growth, Year Three (*Oreochromis* Hybrids)**  
# Annette Joy Mendivil, 17, Junior, Casa Grande Union High School, Casa Grande, Arizona, T: Joyce Carol Baldwin
- ZO030 How the Brain and Body Learn Right from Left: Revealing Embryonic Symmetry-Breaking Mechanisms Through *in vitro* and Mathematical Models**  
Sarah Kate Rapoport, 17, Senior, Horace Mann School, Bronx, New York, T: Frances Pearlmutter
- ZO031 Overwintering Adaptations of *Cucujus clavipes***  
Kennan L. Jeannet, 17, Junior, Jeannet Homeschool, Fairbanks, Alaska, T: M. Katrina Jeannet
- ZO032 The Role of Serotonin Pathways in Mouse Compulsive-like Behavior: Implications for the Study of Obsessive-compulsive Disorder**  
Harpreet Kaur Sangha, 17, Junior, West Valley High School, Fairbanks, Alaska, T: Cynthia Beale
- ZO033 Glycogen Induces Extension of Pharynx During Feeding in Planarians**  
Seira Shimoyama, 17, Junior, Urawa Daiichi Girls High School, Urawa-City, Saitama Prefecture, Japan, T: Akira Kanno
- ZO034 Coral Bleaching Adaptation**  
Malcolm Bruce Young, 17, Junior, Centaurus High School, Lafayette, Colorado, T: Abby Scott
- ZO035 Toxicological Evaluation of Aqueous Leaf Extracts of Two Mangrove Species, and Field Efficacy of Quick Stick on *Aedes polynesiensis* Larvae**  
# Angela Faasalia Polu, 17, Senior, Tafuna High School, Pago Pago, American Samoa, T: Joserose S. Jyothibhavan
- ZO036 A Study to Find the Best Living Situations for Tilapia, Year Two: Food Source**  
Gabriel Heath Miller, 14, Freshman, Lefors High School, Lefors, Texas, T: Gaylon Lavon Fry
- ZO037 Cave Harvestmen Adaptations**  
Eric Bryan Freeze, 15, Sophomore, Carlsbad High School, Carlsbad, New Mexico, T: Michelle Perry
- ZO038 Avian Instinct**  
Irvin James Louque, 16, Freshman, Lutchter High School, Lutchter, Louisiana, T: Matt T. Dornier
- ZO039 Predator Behavior of *Corethrella appendiculata***  
Sonya Makhni, 17, Junior, Saint Edward's Upper School, Vero Beach, Florida, T: Joyce Brumberger
- ZO040 Trouble in Paradise? Assessment of Interannual and Spatial Variability on a Red Sea Fringing Coral Reef**  
# Zaki Daniel Moustafa, 15, Sophomore, A.W. Dreyfoos High School of the Arts, West Palm Beach, Florida, T: Catherine Miller
- ZO041 Identification of a New Species of Silver Trevally**  
James George Robinson, 16, Junior, Shore School, North Sydney, New South Wales, Australia, T: Marta Cassidy

- ZO042 Dropping Like Flies: A Study of Life Stage Bacterial Exposure of *Drosophila* and Effect on Longevity**  
Kahla Nichole White, 16, Sophomore, Latta High School, Ada, Oklahoma, T: Susie Stevens
- ZO043 # "Making the Grade": An Assessment of Beef Quality**  
Megan Jean Webb, 16, Sophomore, Keyser High School, Keyser, West Virginia, T: Tabitha Woy
- ZO044 Is that Gas Buggin' You?**  
Colleen Sutton Heacock, 15, Sophomore, Clark High School, Plano, Texas, T: Cathy Ann Bambenek
- ZO045 Pbx1 and Pbx2 Affect Hox Gene Expression and Chondrogenesis During Limb Development**  
Victoria Ann Wells, 18, Senior, Fort Lee High School, Fort Lee, New Jersey, T: Phyllis Irene Citrin
- ZO046 Shoo Fly Shoo, Year Five, An Order Comparison: The Pupacidal Effect of Various Mint Essential Oils on Dipterans**  
Howard Malcolm Tomlinson, 17, Junior, Brenham High School, Brenham, Texas, T: Tommy Sewall
- ZO047 Regeneration Anomalies in Planaria Subjected to Various Phthalate Esters**  
Jessica Leann Baker, 18, Senior, Seneca High School, Seneca, Missouri, T: Shannon Diahann Sample
- ZO048 A New Unique Species of the Arboreal Cricket of the Group Rileyi (*Insecta: Orthoptera: Ensifera*) for Central and Northern Zones in Puerto Rico**  
Keysha Karelis Reyes-Olivo, 16, Sophomore, Jose Santos Alegria, Dorado, Puerto Rico, T: Blanca I. Hernandez
- ZO049 Soil Invertebrate Biodiversity Indexes at the Caribbean National Forest, Puerto Rico: Response to Forest Biomass Production, Altitude and Soil Physico-Chemical Parameters**  
Jorge A. Fernandez-Vidro, 18, Senior, Colegio Sonifel, Fajardo, Puerto Rico, T: Angel L. Diaz-Rosario
- ZO050 # The Effect of Muskrat Behavior on Lake Fish**  
Aurelia Eugenia-Glory DeNasha, 15, Sophomore, Fond du Lac Ojibwe School, Cloquet, Minnesota, T: Leslie Hoffman
- ZO051 Analyzing Planarian Regeneration in Solutions on *Mimosa pudica* Extract**  
Sindhura Kunaparaju, 16, Senior, Elmont Memorial High School, Elmont, New York, T: Michelle Ann Seeley
- ZO052 Looking a Toad in the Eye, II: The Black Box**  
Fleur Leussink, 15, Sophomore, Academy of Science and Technology, Conroe, Texas, T: Richard Perzan
- ZO053 If My Feet Hurt, I Won't Squirt**  
Jared Byers McDonald, 17, Junior, Hedgesville High School, Hedgesville, West Virginia, T: Dwain A. Donaldson
- ZO054 The Correlation of Back Fat on Swine Carcass Quality**  
Emily Katherine Arkfeld, 16, Junior, Lourdes Central High School, Nebraska City, Nebraska, T: Roger Eitzmann
- ZO055 The Effects of a Natural Antioxidant and Flavonoid on Oxidative Stress Resistance and Longevity in Genetically Suppressed *C. elegans***  
Devin Indi Marmel, 17, Junior, Keystone School, San Antonio, Texas, T: Charles Scott Maderer
- ZO056 Effects of Chronic Stress on the Hematological Parameters in Tilapia**  
Javed Asif Sayed, 18, Senior, Homestead High School, Fort Wayne, Indiana, T: Ahmed Mustafa
- ZO057 The Effects of *A. planipennis* Habitat Destruction on the Populations of Limno-Terrestrial Tardigrades Residing on the Lichens of *F. pennsylvanica***  
Ana Marie Lyons, 16, Sophomore, Mecosta Osceola Math, Science & Technology Center, Big Rapids, Michigan, T: Matt Scott Williams
- ZO058 For the Birds: Testing the Efficacy of Sonic and Ultrasonic Bird Deterrent Devices**  
Joanna Christine Guy, 14, Freshman, Southern Garrett High School, Oakland, Maryland, T: Christa Bowser
- ZO059 The Big Green Nuisance**  
Renee Jennifer Crane, 15, Freshman, Capac Junior/Senior High School, Capac, Michigan, T: Rand Fuller
- ZO060 Decreased Oxygen Levels: A Possible Explanation for Coral Bleaching**  
Alessandra I. Vaccaro, 17, Junior, Campagna Academy, Schererville, Indiana, T: Kathryn L. Hedges
- ZO061 Do Earthworms Help Speed Up the Decomposition Process?**  
Martina Cotelo, 15, Freshman, Oxford High School, Oxford, Mississippi, T: Judy Thompson Nicholas
- ZO062 Variations in the Cerebral Cortex in Two Inbred Mouse Strains**  
Chenxia Monica Guan, 16, Junior, Martin Luther King, Jr. Magnet High School, Nashville, Tennessee, T: Kathryn Lee
- ZO063 The Effect of Artificial Sweeteners on Chicken Embryos**  
Alison Paige Scaggs, 17, Junior, Lewis County High School, Vanceburg, Kentucky, T: Shawna Sexton Voiers
- ZO064 The Effects of Passive Smoke on *Dugesia dorotocephala***  
Kristen Marie Smith, 16, Junior, Westview High School, Martin, Tennessee, T: Rosemary Ann Neville
- ZO065 Olfaction in Southern Ground Hornbills**  
Shahodat Neymatovna Hamraeva, 17, Junior, Kapolei High School, Kapolei, Hawaii, T: Naidah Ann Gamurot
- ZO066 The Role of Kelp Herbivores on the Pacific Northwest Intertidal Trophic Cascade**  
Laurie Lea Fletcher, 17, Junior, Gold Beach High School, Gold Beach, Oregon, T: Robyn Darbyshire
- ZO067 A Study of the Solitary Sea Anemone *Anthopleura sola* as an Indicator of Global Warming in the Northern California Rocky Intertidal**  
# Sonia Singhal, 18, Senior, Carlmont High School, Belmont, California, T: Kristina Doss
- ZO068 The Determination of Intraspecific Alarm Stress and Predator Induced Stress by Using Serum Hemolymph Glucose Levels, Year Three**  
# Alexander Lynn Thurmon, 17, Junior, Chillicothe High School, Chillicothe, Missouri, T: Greg Lynn Thurmon
- ZO069 An Analysis of the Effects of Growth Enhancers on *Sus scrofa***  
# Adam Lee Hubrig, 17, Junior, Hankinson High School, Hankinson, North Dakota, T: Marcus John Friskop
- ZO070 Cell Proliferation Is Episodic and Pulsatile During Growth of Zebrafish Fins**  
Isha Himani Jain, 15, Sophomore, Freedom High School, Bethlehem, Pennsylvania, T: Mary Kathryn Iovine
- ZO071 Responsive Stimulations with Mice**  
Cassidy J. Whisenhunt, 14, Freshman, North Lamar High School, Paris, Texas, T: Teresa Bussel
- ZO072 The Third Year of the Effect of White Noise on the *Tito alba***  
Justin Wynn Clewis, 16, Junior, Alhambra High School, Alhambra, California, T: Daniel Hyke
- ZO301T Determining the Filtration Rate of the Mussel, *Elliptio complanata***  
Sarah Elizabeth Hall, 18, Senior  
Samantha Garvin Carson, 17, Senior  
Fayette County High School, Fayetteville, Georgia  
T: Warren James Bernard
- ZO302T How Does Caffeine Affect Hamsters?**  
Sarah Elizabeth Whiteside, 16, Junior  
Sarah Elizabeth Anderson, 17, Junior  
Charleston Catholic High School, Charleston, West Virginia  
T: Dorothy Scharf; T: Amy Arnold
- ZO303T # Can Scented Oils Be Used as an Effective Pesticide?**  
Leigh Taylor Wamble, 18, Senior  
Sheila Elizabeth Mitchell, 17, Senior  
David Kells Parker, 18, Senior  
West Lauderdale High School, Collinsville, Mississippi  
T: Faye D. Kinard
- ZO304T The Effects of Heated and Unheated Disaccharide Substitutes on Lifespan, Mortality Rates, and Gender Ratios of *Drosophila melanogaster* During the F-1 and F-2 Generations**  
Stephanie Marie Hicks, 15, Sophomore  
Sara Catherine Clark, 15, Sophomore  
Keystone School, San Antonio, Texas  
T: Scott Maderer

- ZO305T Tadpole Activity Changes of Emei Woodfrog *Rana omeimontis* Caused by Pesticide Pollution and Predation**  
Shan Yu, 18, Senior  
Xiao Liu, 18, Senior  
Ze Diao, 18, Senior  
Chengdu No.7 High School, Chengdu, Sichuan, China  
T: Zong Wen
- ZO306T The Behavioral and Biological Assessment at the Hunger-Barriers of Male and Female House Crickets (*Acheta domestica*)**  
Thomas Kun Pak, 16, Junior  
Kwang Yul Kim, 16, Sophomore  
Duck Ju Kang, 16, Junior  
W. T. Woodson High School, Fairfax, Virginia  
T: Donna Marie West
- ZO307T Use of Nile Red in Determining Lipid Accumulation in Daf-2 and Wild Type *C. elegans***  
Vasudha Gupta, 16, Junior  
Lana Rachel Tolen, 16, Junior  
Forest Hills High School, Forest Hills, New York  
T: Brigitte Brady
- ZO308T Cadmium Effect on the *Holothuria glaberrima* Visceral Regeneration**  
Cesar Oscar Perez-Colon, 17, Junior  
Alexander Santiago-Llorens, 17, Junior  
Gerardo Manuel Guasp-Perez, 16, Junior  
Colegio San Ignacio de Loyola, San Juan, Puerto Rico  
T: Wilma M. Giol-Ruiz
- ZO309T Effect of Chinaberry Fruit Extract Oil on Feeding, Growth and Fecundity of *Plutella xylostella***  
Varun Mittal, 15, Senior  
Kanishka Tiwary, 16, Senior  
Sanatan Dharam Public School, Delhi, Pitampura, India  
T: Sonika Verma
- ZO310T Sexual Selection in *Drosophila*: A Behavioral, Morphological, and Geographic Study**  
# Benjamin Alan Pollack, 17, Senior  
Abhinav Khanna, 17, Senior  
Plainview Old Bethpage John F. Kennedy High School, Plainview, New York  
T: Mary Lou O'Donnell
- ZO311T The Effects of Tobacco Extract on Fires Ants**  
Mildelis Martinez, 17, Senior  
Bryan Garcia, 17, Senior  
Marcelino Rodriguez Roman, Moca, Puerto Rico  
T: Ana Cruz
- ZO312T Mathematical Analysis of the Web Structures in Orb-Web Building Spiders**  
Doo Young Lee, 17, Senior  
Gil Young Park, 17, Senior  
Korean Minjok Leadership Academy, Hoengsung-gun, Kangwon-do, South Korea  
T: Joo Pil Kim
- ZO313T Stochastic/Deterministic Analysis of Arboviral Transovarial Transmission in *Culicidae***  
## Gabriel Joel Mendoza, 17, Junior  
Fredrick Phillip Rojas, 17, Senior  
Americas High School, El Paso, Texas  
T: Craig Peters
- ZO314T Competition Between Co-Extensive Homologous Efferent Terminals During Synapse Maturation**  
Rupal Hiren Patel, 17, Senior  
Erin N. McCormick, 17, Senior  
Kalamazoo Area Mathematics and Science Center, Kalamazoo, Michigan  
T: John Jellies
- ZO315T Genetic Diversity of Rocky Mountain Goats (*Oreamnos americanus*) Through Noninvasive Microsatellite Genotyping**  
Jeremy Rosendo Reynoso, 17, Junior  
Forrest Connell Jessop, 17, Senior  
Alissa Raenelle Schlecht, 16, Junior  
Corvallis High School, Corvallis, Montana  
T: Jim F. Striebel

- ZO316T The Birds of the Paraguay River in the Province of Formosa, Argentina**  
Fabricio Carlos Gorleri, 15, Freshman  
Juan Gabriel Gonzalez, 14, Freshman  
Guillermo Rolon, 14, Freshman  
Gobernador Juan Jose Silva, Formosa, Argentina  
T: Luisa Margarita Murdoch

## TEAM PROJECTS

### GRAND AWARDS PRESENTED BY: SCIENCE NEWS

- BE301T Determination of Gender and Age by Thumbprints, Year Two**  
# Meryl Adelman Hulteng, 15, Sophomore  
# Shannon Marie Cassidy, 16, Sophomore  
Wilsonville High School, Wilsonville, Oregon  
T: Holly Rayliene Gardner; T: Jay Schauer
- BE302T Music to My Ears**  
Jordan Nicole Farris, 16, Sophomore  
Rachel Elizabeth Purtee, 15, Sophomore  
Nettleton High School, Jonesboro, Arkansas  
T: Jana Karen Hudspeth
- BE303T Cultural Influence on Eye Movement Behavior in Response to a Social Target Image as Measured by a Novel Eye-tracking Device**  
Cameron Walden Dennis, 18, Senior  
Suji Paek, 17, Senior  
West Salem High School, Salem, Oregon  
T: Graham Dey
- BE304T Does Gender Affect Handwriting Analysis?**  
Jessica Marie Gamber, 16, Sophomore  
Angela Kristine Neslund, 16, Sophomore  
Champlin Park High School, Champlin, Minnesota  
T: Jaclyn Paul
- BE305T Clothing for Handicapped People**  
Petra Bezchlebova, 20, Senior  
Jana Malcova, 20, Senior  
Secondary School of Clothing, Straznice, Czech Republic  
T: Katarina Nemsovska
- BE306T The Influence of Self-Esteem in the Learning Process**  
Lidiane Leal Andriolla, 16, Sophomore  
Alexandre Borges Alves Spindola, 17, Senior  
Fundacao Liberato Salzano Vieira da Cunha, Novo Hamburgo, Rio Grande do Sul, Brasil  
T: Alberto Dal Molin Filho
- BE307T Comprehension on the Computer: "Seenior" Computer Lately?**  
Kyle Joseph Jurick, 16, Junior  
Jennifer Marie Pelton, 18, Senior  
Rebecca Mae Adams, 18, Senior  
Hicksville High School, Hicksville, Ohio  
T: Kathy R. Laney
- BE308T Evaluating the Use of Softwares in Professional Education**  
Carlos Theobaldo Renck, 18, Freshman  
Bruno Diego de Mello, 18, Freshman  
Estadual Technical School Monteiro Lobato, Taquara, Rio Grande do Sul, Brasil  
T: Joao Alberto da Silva
- BE309T Resilience: A Proposal Facing Adversity, II**  
Gabriela Maricel Andreoli, 16, Sophomore  
Malen Gotte, 16, Junior  
Patricia Natali Grinovero, 18, Senior  
Club de Ciencia Libertad, Cerrito, Entre Rios, Argentina  
T: Miriam Alejandra Hernandez
- BE310T Teen Obesity: Is Portion Size Perception the Problem?**  
Samantha Grace Hennenfent, 14, Freshman  
Austin Marie Malach, 14, Freshman  
Fort Zumwalt West High School, O'Fallon, Missouri  
T: Mary Louise Hennenfent



- BE311T Comparative Study on the Causes of School Violence**  
Tiffany Nicole Doll Requena, 15, Sophomore  
Lorena Enid Berges, 15, Sophomore  
Colegio Marista, Guaynabo, Puerto Rico  
T: Isabel Perez
- BE312T Difference in Behavior of Lake Apopka Area Children Whose Parents Were Directly or Indirectly Exposed to Pesticides**  
Grant Fabian Chernoby, 17, Junior  
Shahin Pourkaviani, 16, Junior  
Lake Brantley High School, Altamonte Springs, Florida  
T: Susan Behel
- BE313T The Familiality of Autistic Traits in Families of Children with Autism Spectrum Disorders (ASD)**  
Nathalie Fay Tadena, 16, Junior  
Alene Georgia Anello, 18, Senior  
Ossining High School, Ossining, New York  
Sleepy Hollow High School, Sleepy Hollow, New York  
T: Angelo Piccirillo T: Janet R. Longo-Abinanti
- BE314T Biology Education Across the Nation**  
Gauri Manglik, 17, Senior  
Xinyi Duan, 17, Senior  
Jenna Ashley Rosenberg, 17, Senior  
Briarcliff Manor High School, Briarcliff Manor, New York  
T: Michael Inglis
- BE315T Manipulation Behind the Scenes**  
Dawn Chee Zhao, 15, Freshman  
Karen Jennifer Lin, 14, Freshman  
Shepton High School, Plano, Texas  
T: Nadine Harris
- BE316T Reading, Rote, and Russian**  
Elizabeth Margaret Sullivan, 18, Senior  
Alyssa Joy Edlund, 17, Senior  
John Marshall High School, Rochester, Minnesota  
T: Kirk F. Payne
- BE317T What Is the Relationship Between IQ and Hemispherical Brain Dominance?**  
Brett Lesley Mayer, 17, Junior  
Shanna Erin Wilson, 17, Junior  
Jillayne Renee Pfeifle, 17, Junior  
Timber Lake High School, Timber Lake, South Dakota  
T: LuAnn Lindskov
- BE318T The Effects of CNS Stimulants and SSRIs on the Formation of Conditioned Long Term Memory and Learning Behaviors in Sleep Deprived Wildtype *Drosophila melanogaster***  
Mary Martha Ferrari Douglas, 17, Junior  
Alison W. Liu, 16, Junior  
Manhasset High School, Manhasset, New York  
T: Peter Guastella
- BE319T Video Games and Your Health**  
Helen Terri Ly, 17, Senior  
Wellis Leung, 17, Senior  
Josiah Quincy Upper School, Boston, Massachusetts  
T: June Li
- BE320T Preconceived Stereotypes in School Children**  
Meghan Sophia Luther, 15, Sophomore  
Veronika Nicole Biskis, 15, Sophomore  
Henry Perrine Baldwin High School, Wailuku, Hawaii  
T: Barbara Huntley
- BE321T Manipulating with False Memories**  
Joseph Pak Noh, 15, Freshman  
Styles Michael Smith, 15, Freshman  
Glencoe High School, Hillsboro, Oregon  
T: Ellen Beth Lyon
- BE322T Driving Plus Cell Phones Equals No Concentration**  
Jing Chen, 15, Freshman  
Frances May Bruce, 14, Freshman  
Mayo High School, Rochester, Minnesota  
T: John McDonald; T: Debra DeYoung
- BE323T High School Students. . . Future Freshmen?**  
Felix Meineri, 15, Junior  
Martin Garciaarena, 15, Junior  
Mariana Antonella Nigro, 16, Junior  
Colegio San Ignacio, Tandil, Buenos Aires, Argentina  
T: Marta Luz Meineri
- BE324T The Antigales of Coranzull - Past, Present and Future**  
Rosa Arminda Siares, 17, Freshman  
Noelia Armanda Siares, 17, Freshman  
Escuela Nro 362, Coranzuli, Jujuy, Argentina  
T: Ivan Marcelo Chani
- BE325T Chicha Culture: Between the Respect and the Forgetfulness**  
Jose Humberto Armella, 14, Freshman  
Blanca Zulema Martearena, 14, Freshman  
Escuela de Comercio Nro1 Republica Argentina, La Quiaca, Jujuy, Argentina  
T: Maria Isabel Rocha
- BI301T SNPs and Their Correlation with Alzheimer's Disease**  
Andrea Shannon Trader, 17, Junior  
Amy Rachele Shipley, 17, Junior  
San Lorenzo Valley High School, Felton, California  
T: Jane Paula Orbuch
- BI303T Detection of Creatine Phosphokinase Using Polyaniline Nylon-6 Film**  
Anastasia Efthymiou, 17, Junior  
Aashish Shah, 16, Junior  
Half Hollow Hills High School West, Dix Hills, New York  
T: Chrysi Notskas
- BI304T Levodopa's Effect on Endogenous Morphine Production and the Mu3 Opiate Receptor in SH-SY5Y Cells**  
Kamalakar Atluri, 18, Senior  
Dhruv Vasishta, 16, Junior  
Herricks Senior High School, New Hyde Park, New York  
Roslyn High School, Roslyn Heights, New York  
T: Richard Quan; T: John Irwin Kranz
- BI305T Polymorphisms in DNA: A Comparison of Canine DNA Study, Year Two**  
Kelsey Anne Shields, 15, Sophomore  
Carly Alayne Miles, 16, Sophomore  
Riverton High School, Riverton, Utah  
T: Sonja Ferrufino
- BI306T Hydroxyurea and N-Acetylcysteine: The Effect on the Sickle Erythrocyte Proteome**  
# Stephanie Anne Stoughton, 16, Sophomore  
# Michael Yenting Wu, 16, Sophomore  
Shepton High School, Plano, Texas  
T: Nadine Harris
- BI307T Nutri-Tortilla for Pizza**  
# Enedina Mendez Martinez, 17, Junior  
Sara Nino Machorro, 16, Junior  
Colegio de Estudios Cientificos y Tecnologicos, Puebla, Mexico  
T: Adriana Reyes Castro
- BI308T A. vulgare, a Three Year Study: Finding a Solvent for the Extraction of the Aggregation Pheromone**  
## Clara Grace Watson, 18, Senior  
# Cailyn Annalee Estey, 17, Junior  
Grenada High School, Grenada, Mississippi  
T: Thomas Jackson Holliday
- BI309T A Screen for Mutants in *Drosophila melanogaster* Which Affects Triglyceride Levels**  
Daniel Yeh, 18, Junior  
Ryan Wai Tam, 16, Junior  
Alhambra High School, Alhambra, California  
T: Daniel Gerarz Hyke
- BO301T How Much Sap Could a Sapsucker Suck If a Sapsucker Could Suck Sap?**  
William Colin Read, 17, Senior  
Lia-Lucine Lara Cary, 17, Senior  
Jensen Beach High School, Jensen Beach, Florida  
T: Richard Thomas Soviero
- BO302T Direct Evidence of the Symplastic Pathway in the Trap of the Bladderwort, *Utricularia gibba***  
Tanya Chun-Chiao Juang, 17, Junior  
Sonya Di-Chiao Juang, 15, Freshman  
Saint Dominic High School, Kaohsiung, Taiwan, Chinese Taipei  
T: Cheng-Mei Lee  
Wu Fu Junior High School, Kaohsiung, Taiwan, Chinese Taipei  
T: Fu-Chien Chen
- BO303T Understanding Leucine-rich Repeats and Their Roles in Gene Families Through the Study of Genes At1g68780,**

- At1g13230, and At4g28560 in *Arabidopsis thaliana* Development**  
 # John James Hutchison, 16, Junior  
 # Varun Rajendra Hippalgaonkar, 16, Sophomore  
 Lake Highland Preparatory School, Orlando, Florida  
 T: Judith Faith Legault
- BO304T The Quinoa: Cultivation of the Desert with Sea Water**  
 Lissis Andrea Orellana, 17, Sophomore  
 Patrick Richard Vega, 16, Sophomore  
 Victor Samuel Arredondo, 18, Junior  
 Elena Duvauchelle Cabezon, Iquique, I Region, Chile  
 T: Myrna Medel
- BO305T The Effect of Nitrate Concentration on the Growth of Algae Blooms and Epiphytes in Correlation to the Health of Aquatic Life Indigenous to the Chesapeake Bay**  
 Gabrielle Marie Strike, 16, Sophomore  
 Anup Myneni, 15, Sophomore  
 York High School, Yorktown, Virginia  
 T: Deborah Eckstein
- BO306T Can Seeds Germinate After Being Stored for Many Years?**  
 Emivette Zabala-Casillas, 15, Sophomore  
 Francheska Perez-Diaz, 15, Sophomore  
 Josefa Pastrana High School, Aguas Buenas, Puerto Rico  
 T: Merida Rivera
- BO307T Tissue Regeneration Capacity of the Plant *Graptophyllum pictum* on *Lumbricus terrestris***  
 Celines Acevedo-Milan, 14, Freshman  
 Jose Luis Mercado-Santiago, 15, Freshman  
 Jose A. Castillo Jr. High School, Sabana Grande, Puerto Rico  
 T: Luis R. de Jesus
- BO308T Effects of Electrical Circuit on *Phaseolus vulgaris*: Electrobeans**  
 Elizabeth Murphy Czura, 14, Freshman  
 Colby Taylor Foss, 14, Freshman  
 Hilton Head Preparatory School, Hilton Head Island, South Carolina  
 T: Tina Webb-Browning
- BO309T Algae from Serra da Gardunha Contribution for Their Knowledge**  
 Dora Sofia Martins Henriques, 17, Junior  
 Ana Ines Batista loureco Rondao, 18, Junior  
 Andreia Catarina Parreira Costa Martins Raimundo, 17, Junior  
 Escola Secundaria com 30 Ciclo do Fundao, Fundao, Portugal  
 T: Joao Paulo Pereira Fidalgo
- BO310T Dehiscence and Dispersal of the Popping Pod *Ruellia tuberosa* L.**  
 Krongrath Suwanasri, 18, Senior  
 Tanongsak Chinaronchai, 18, Senior  
 Suksun Itthipanyanan, 18, Senior  
 Triam Udom Suksa School, Bangkok, Thailand  
 T: Nippon Srinarumon
- BO311T The Effect of Goethite and CO<sub>2</sub> Levels on *Brassica rapa***  
 Rachel Elizabeth Delevett, 16, Sophomore  
 Lauren Staci Powell, 15, Sophomore  
 Rockdale Magnet School for Science and Technology, Conyers, Georgia  
 T: Mary Mansell
- BO312T Sing a Song of Supple Seedlings**  
 David Clinton Cagle, 18, Senior  
 Derek Edward Sugg, 18, Senior  
 Andrews High School, Andrews, Texas  
 T: Vickie J. Gardner
- CH301T Comparison of Different Flax Biodiesels**  
 Ross Michael Hemmingsen, 16, Junior  
 Zackary Jordan Drescher, 16, Junior  
 Alden-Conger High School, Alden, Minnesota  
 T: David Duane Bosma
- CH302T Lighting a Fire: A Study of the Fuels Involved in the Hayman Fire**  
 # Max Krakauer, 15, Sophomore  
 Alex Ruch, 15, Sophomore  
 Palmer High School, Colorado Springs, Colorado  
 T: Nancy Hampson
- CH303T Analysis of an Alternative Fuel Synthesized from Carbon and Water**  
 David Chandler Russ, 18, Senior  
 Samuel Richard Gates, 17, Senior  
 Christian Academy of Louisville, Louisville, Kentucky  
 T: Tina Gibson
- CH304T The Effects of the Crosslinkers Glutaraldehyde, DTBP, and Sebacic Acid on Catalase's Viability and Immunity to Proteases**  
 Hariharan Umasundar Athreya, 16, Junior  
 Joshua Aaron Ozer, 17, Junior  
 Keystone School, San Antonio, Texas  
 T: Charles Scott Maderer
- CH305T The Biggest Bang: An Analytical Comparison Between Rocket Engine Designs**  
 Mathew Bryn Trussell, 17, Junior  
 Jonathan Anthony Walker, 17, Junior  
 Berkmar High School, Lilburn, Georgia  
 T: Walter Snow
- CH306T Oil Frictions**  
 Mackinley Allen Schultz, 16, Junior  
 Anthony Kristian Wittmer, 17, Junior  
 Alden-Conger High School, Alden, Minnesota  
 T: David Duane Bosma
- CH307T Out of the Frying Pan, into the Tank**  
 Dustin Eugen Shung, 15, Sophomore  
 Yasha Benjamin Lashgari, 16, Sophomore  
 R. C. Clark High School, Plano, Texas  
 T: Cathy Bambenek
- CH308T The Effects of Supercritical Carbon Dioxide on the Compatibilization and Crystallinity of Polymer Thin Films**  
 Christopher Donald Pynn, 17, Senior  
 Zimra Payvand Ahdout, 17, Senior  
 Half Hollow Hills High School West, Dix Hills, New York  
 Roslyn High School, Roslyn Heights, New York  
 T: Chrysi Notskas; T: Irena Tsarevsky
- CH309T Is the Water Safe to Drink? A Dipstick Test for Heavy Metals**  
 Rasmus Buch Moller, 20, Senior  
 Sebastian Ravn, 19, Senior  
 Vejle Tekniske Gymnasium, Vejle, Jutland, Denmark  
 T: Dorthe Lind Damkjaer
- CH310T Return of the Rings: The Investigation of Multiple Systems of Liesegang Rings and Bifurcations, Two Year Study**  
 # Skylar Davis Williams, 18, Senior  
 # Aaron Mark Weaver, 16, Junior  
 Miami High School, Miami, Oklahoma  
 T: Sally Ann Fenska
- CH311T The Transesterification of Cooking Oil into Biodiesel**  
 Amanda Michelle Hester, 17, Senior  
 Mary Elizabeth Jewell, 19, Senior  
 Hart County High School, Munfordville, Kentucky  
 T: Linda A. Gosser
- CS301T An Image Matching Program to Automate Homeland Security**  
 Christopher Robert Bethel, 16, Junior  
 Elizabeth Alice Ennis, 15, Sophomore  
 Lake Brantley High School, Altamonte Springs, Florida  
 T: Suzy Behel
- CS302T Combining Touch Screen and Scanner Input for Handwriting Recognition**  
 # Alan Garrett Pierce, 16, Junior  
 # Nathaniel John Broussard, 17, Junior  
 School of Science and Technology, Beaverton, Oregon  
 T: Hector M. Morales
- CS303T Contemporary 2D Programming**  
 Yue Kenneth Yuan, 14, Sophomore  
 Drew Michael Bratcher, 16, Sophomore  
 Houston County High School, Warner Robins, Georgia  
 T: Laura Byrd
- CS304T Work Scheduling: A Conflict in America**  
 Joshua Daniel Whelchel, 18, Senior  
 David Omid Attarzadeh, 18, Senior  
 duPont Manual Magnet High School, Louisville, Kentucky  
 T: Glenn Zwanzig

- CS305T Reconstruction of Three-dimensional Objects from Video Films**  
Thomas Buenger, 17, Senior  
Tobias Grelle, 18, Senior  
Heinrich-Hertz-Oberschule, Berlin, Germany  
T: Hans Peter Luedtke
- CS306T Leaf! What Are You?**  
Hung-Ju Chen, 18, Senior  
Min Ju Yang, 17, Senior  
National Hsinchu Girls, Hsinchu City, Taiwan, Chinese Taipei  
T: I-Chen Hsu
- CS307T Neural Network Security System**  
David Nicholaas de Klerk, 18, Senior  
Dirk Johannes Jacobus Oosthuizen, 18, Senior  
Afrikaanse Hoer Seunskool, Pretoria, Gauteng, South Africa  
T: Mariana Haasbroek
- CS308T Geometric Compression System**  
## Giuliano Sider, 18, Senior  
## Rodrigo Luger, 18, Senior  
Escola Americana de Campinas, Campinas, Sao Paulo, Brasil  
T: Douglas Takeuti
- CS309T Using Eulerian Models to Determine Initial Conditions of Severe Weather**  
# Gwyneth Rhiannon Glissmann, 15, Freshman  
Robert Vaughan Glissmann, 18, Senior  
Peak to Peak Charter School, Lafayette, Colorado  
T: Adam DiGiacomo; T: Steven Goldhaber
- CS310T PDA Based Guide**  
Ilya D. Lopatin, 16, Junior  
Alexander M. Nazarov, 16, Junior  
Yury V. Kuzin, 16, Junior  
Centre of Education Tsaritsino #548, Moscow, Russia  
T: Maxim V. Sinev
- CS311T Parabolic Dish Receptors: Increasing Wireless Internet Connection Strength and Stability**  
Brian Jonathan Cain, 16, Junior  
Ross Anthony Mittiga, III, 17, Junior  
The Villages Charter High School, The Villages, Florida  
T: Emily M. Keeler
- CS312T Quick-LAC**  
Yanet Rojas Caracheo, 18, Senior  
Gabriela Pina Ortiz, 18, Senior  
Angelica Arias Gallegos, 18, Senior  
Colegio de Estudios Cient. y Tec. del Edo. de Gto., Cortazar, Guanajuato, Mexico  
T: Ivon Rojas Caracheo
- CS313T HumanSIS**  
Oscar Federico Flores Galvan, 18, Senior  
Jose de Jesus Briones Serna, 17, Senior  
CBTis No. 168, Aguascalientes, Aguascalientes, Mexico  
T: Antonio Diaz de Leon Gonzalez
- CS314T AI: Natural Language Processing**  
Xavier Jeremy Falco, 16, Sophomore  
Emmanouel Georgiou Liodakis, 16, Sophomore  
Hillcrest High School, Midvale, Utah  
T: Robert Mullins
- CS315T CAE: Computer Analysis of Exercises, Part II**  
# Alicia Renee Andrade, 18, Senior  
# Jacqueline Elise Mooney, 18, Senior  
Wachusett Regional High School, Holden, Massachusetts  
T: Robert Fry
- CS316T Paladin: A New Fast and Secure Symmetric Block Cipher**  
Victor Andrew Shia, 17, Senior  
George Chen, 17, Senior  
Frank Fu-Han Chuang, 17, Senior  
Monta Vista High School, Cupertino, California  
T: Bruce Kawanami
- CS317T Intellectual Data-Analytical Forecasting System, UNICUM**  
Dmitry Purgin, 16, Junior  
Artyom Karelskiy, 17, Junior  
Technical Lyceum #165, Almaty, Kazakhstan  
T: Elena Kholodova
- CS318T A New Algorithm to Minimize Factory Inefficiency Through Penalty Reduction**  
# Andrew David Gamalski, 17, Senior  
# Vinayak Muralidhar, 16, Senior  
Hamilton High School, Chandler, Arizona  
T: Teresa Clark  
Corona del Sol High School, Tempe, Arizona  
T: Steven Morgan
- EA301T Waves of Destruction, II: Calculating Wave Intrusion on Coastal Regions**  
Scott Edward Hasbrook, 15, Freshman  
Nathan Tyler Hasbrook, 15, Freshman  
Highland East Junior High School, Moore, Oklahoma  
T: Michael Swart
- EA302T Tracing Early Hominid Migrations in India: ESR Dating at Hathnora and Devni-Khadri**  
Maysun Mazhar Hasan, 17, Senior  
Hermain Suhail Khan, 16, Junior  
Francis Lewis High School, Fresh Meadows, New York  
Staten Island Technical High School, Staten Island, New York  
T: Michael Sass; T: Bonnie Blackwell
- EA303T Hurricanes: Forces of Nature**  
Laura Torres, 16, Junior  
Daniel Omar Caballero, 17, Junior  
James Pace High School, Brownsville, Texas  
T: Dora Elia Lopez- Garcia
- EN301T Creation of an Efficient, Tidal-Influenced Magneto-hydrodynamic Generator for Commercial Application: A New Phase in a Four Year Study**  
### Ryan Paul Jones, 18, Senior  
### Eric Anthony Smith, 17, Senior  
Astronaut High School, Titusville, Florida  
T: Scott McCord
- EN302T Saving Energy While Running**  
Mihai Dorian Vidrighin, 16, Sophomore  
Tudor Macicasan, 16, Sophomore  
Florin Petru Muresan, 16, Sophomore  
Tiberiu Popoviciu High School, Cluj-Napoca, Romania  
T: Gabriela Sanda Balan
- EN303T Enhancing Hydrodynamic Performance**  
# Adam Kelby Mitchell, 16, Sophomore  
Brad Allen Odell, 16, Sophomore  
Muskogee High School, Muskogee, Oklahoma  
T: Terri Lee Brossett
- EN304T Bionic Robofish**  
Xing Lu, 18, Senior  
Chang Liu, 18, Senior  
No.1 Middle School Affiliated to CCNU, Wuhan, Hubei, China  
T: Weijia Wang
- EN305T Comparative Analysis of Yagi Antenna Using Genetic Algorithms and Polynomial Component Optimization**  
# Andrew Joseph Duchi, 17, Junior  
James Henry Notwell, 17, Senior  
# Erich John Kreutzer, 18, Senior  
Upper Arlington High School, Upper Arlington, Ohio  
T: Laura Brennan
- EN306T V.I.P.J.E.: Variable Intake Pulse Jet Engine**  
Robert Scott Behringer, 15, Sophomore  
Kyle Joseph Hoffpauir, 15, Sophomore  
Catholic High School, New Iberia, Louisiana  
T: Donald Joseph Voorhies
- EN307T Energymotor: Wind to Watts**  
Mark Benjamin Hurta, 17, Senior  
Patrick Roy Schuessler, 18, Senior  
Samantha Ann Little, 18, Senior  
Mason High School, Mason, Texas  
T: Bonnie K. Schmidt  
Mason High School, Mason, Texas
- EN308T Head Control Input Device for PC**  
Desai Chen, 17, Junior  
Haotian Liu, 18, Senior  
High School Affiliated to Fudan University, Shanghai, China  
T: Yongwei Wu

- EN309T Pursuing Nanotechnology's Future in Energy Conversion**  
Joseph N Abayev, 17, Senior  
David James Sauer, 16, Sophomore  
Ballard High School, Louisville, Kentucky  
T: Robert N. Baar
- EN310T Analysis of the Thermic Conduction and the Formation of the Condensation Inside a Wall**  
Paola Cantarelli, 19, Senior  
Alessio Gaimarri, 19, Senior  
Arianna Marelli, 20, Senior  
Liceo Scientifico "Gaspere Aselli", Cremona, Italy  
T: Marco Maianti
- EN311T No Strings Attached: The Wireless Power Solution**  
Ian August Johnson, 18, Senior  
Ethan Larry Huwe, 18, Senior  
Perham High School, Perham, Minnesota  
T: Shawn Stafki
- EN312T Breakthrough: A Safety Gas Valve Box Access Locking Mechanism**  
Barbara Jane Fleming, 17, Senior  
Daniel Dominic Evans, 17, Senior  
Caron Maire Malone, 17, Senior  
Rathmore Grammar School, Belfast, Ulster, Northern Ireland  
T: Kieran Doherty
- EN313T Novel Classification Algorithm for Augmented Cognition via Discrimination of Multiplex Quantum Cluster Distributions**  
William Fan, 17, Senior  
Edward Cat Nguyen, 16, Junior  
School of Science and Technology, Beaverton, Oregon  
T: Hector M. Morales
- EN314T Innovative Thickness Measurement of Biological Tissue by Using Maximum Bubble Pressure Method**  
Yung-Chieh Chen, 18, Senior  
Chao-Hsi Lee, 18, Senior  
Taipei Municipal LiShan High School, Taipei, Taiwan, Chinese Taipei  
T: Sheng-Tai Chen
- EN315T 2061 Starsky Robot Band**  
XiaoBin Wu, 17, Junior  
ZiJun Lin, 18, Junior  
Bin Ke, 17, Junior  
No.7 High School of QuanZhou, Quanzhou, FuJian, China  
T: Li Yang
- EN316T Eco-Hybrid House: Sustainable Combination of Fuel Cells, Desalinated Water and Solar Panels as Sources of Energy in A Solar House**  
# Roberto Jose Manzano, 17, Senior  
Luis Antonio Manzano, 14, Freshman  
Colegio de la Salle, Bayamon, Puerto Rico  
T: Maritza Rodriguez; T: Wanda Aviles
- EN317T Exploring the Capabilities of a Stiquito Robot**  
Jennifer A'mir Townsend, 16, Junior  
Renee Ann Baker, 17, Junior  
North Mecklenburg High School, Huntersville, North Carolina  
T: James Conrad  
Concord High School, Concord, North Carolina
- EN318T The Conversion of Solar Energy Utilizing Phase-change Materials for Electrical Generation**  
Kevin Clair Cheatham, 18, Senior  
Andrew Scott Magstadt, 18, Senior  
Greybull High School, Greybull, Wyoming  
T: Joel M. Kuper
- EN319T Distal and Proximal Search Strategies for Robotic Path Recovery**  
Samuel Leopold Wagner, 15, Sophomore  
Walter Oscar Beller-Morales, 16, Freshman  
Peter N. Sebrecchts, 15, Sophomore  
Bethesda-Chevy Chase High School, Bethesda, Maryland  
T: Deborah Haase
- EN320T Electromagnetic Particle Accelerator**  
James Ryan Walker, 17, Senior  
Troy Marshall Bonham, 18, Senior  
North Valleys High School, Reno, Nevada  
T: Ron Dee Geyer
- EN321T Does Paper Designed to Meet the American National Standard Institute Z39.28 Standard Resist Damage from Ultraviolet Light Better than Pre-Standard Paper?**  
Madeline Jean Belflower, 15, Sophomore  
Taylor Danielle Fleming, 15, Sophomore  
Union Grove High School, McDonough, Georgia  
T: Leon Olivier
- EN322T It Is Distans Controller for Gas Boilers**  
Marcelo Jorge Haffner, 17, Junior  
Daniela Maria Saavedra, 17, Junior  
Escuela Tecnica No 139 De Produccion AgroInd, Viale, Entre Rios, Argentina  
T: Aldo Antonio Grinovero
- EN323T Versatile Color Identification and Luminance Contrast Determination Using a Triluminat Source**  
Ian Preston Cannon, 17, Senior  
Rickystan Batane Savaiko, 19, Senior  
Redeemer Baptist School, North Parramatta, New South Wales, Australia  
T: Stuart Malcolm Garth
- EN324T Diesel, Corn Oil, or Mixture: Which Fuel Type Will Run Our Farm Tractor Farther and Longer?**  
Amanda Lynne Chapman, 16, Sophomore  
Fred Leon Grubb, IV, 15, Sophomore  
Musselman High School, Inwood, West Virginia  
T: Brenda Gail Waterworth
- EN325T Bacterial Fuel Cells: Utilizing *E. coli's* Metabolism to Produce Energy**  
# Quinn Alexander Morris, 17, Senior  
# Courtney Henrietta Fox, 18, Senior  
# May Liu, 17, Senior  
North Carolina School of Science and Math, Durham, North Carolina  
T: Myra J. Halpin
- EN326T Electrical Engine Load Dimensioning System**  
# Bibiana Maite Petry, 18, Senior  
# Jonas Obert Martins Osorio, 19, Senior  
# Henrique Fuhr, 20, Senior  
Fundacao Escola Tecnica Liberato Salzano, Novo Hamburgo, Rio Grande do Sul, Brasil  
T: Rosana Bemvenuti Jacques
- EN327T Ergo-net Phone: A Fully Adjustable Public Phone with Internet Access**  
Lucas Rocha Sodre, 18, Senior  
Wellington Lima Queiroz Barbosa, 17, Senior  
Colegio Santo Americo, Sao Paulo, Brasil  
T: Gilson da Silva Domingues
- EN328T The Use of Biofuel in a Gasoline Engine**  
Christopher Adam Foster, 17, Senior  
Xiong Zhao, 18, Senior  
North Park Collegiate-Vocational School, Brantford, Ontario, Canada  
T: Richard Humpartzoomian
- EN329T Project CCH**  
William Alex Roach, 15, Freshman  
Joar Schaffhouser, 15, Freshman  
Owensboro Senior High School, Owensboro, Kentucky  
T: Melanie Hope Eans
- EN330T The Cutting Edge**  
Ian McKenzie Carlson, 15, Freshman  
Anthony Paul Winterton, 15, Freshman  
Garretson High School, Garretson, South Dakota  
T: Julie Marie Mueller
- EN331T Polycaprolactone-Chitosan Nanocomposite Biomaterials for Wound Healing and Tissue Engineering**  
Wilfred Chung-Him Wong, 17, Senior  
# Ashish Mohan Bakshi, 17, Senior  
Herricks Senior High School, New Hyde Park, New York  
T: Richard Quan  
Manhasset High School, Manhasset, New York  
T: Peter Guastella

- EN332T Revolutionary Plastics: Surfaces that Self-Sterilize**  
# Miki Claire Duruz, 17, Senior  
# Kara Allyn Morgenstern, 17, Senior  
Long Beach High School, Lido Beach, New York  
T: Linda Trusz
- EN333T Phototropic Nanotechnology via Magnetohydrodynamic Propulsion**  
Lai Xue, 16, Senior  
Charles Cumberland McGuire, 17, Junior  
Gleb Kuznetsov, 18, Senior  
West High School, Salt Lake City, Utah  
T: Daniel J. McGuire
- EN334T The Detection of Alkaline Phosphatase and C-Reactive Protein Using a Miniaturized Electrochemical Biosensor for Clinical and Future Diagnostic Tests**  
# Joanne Helen Wang, 16, Junior  
Benita Tjoe, 17, Senior  
Hathaway Brown School, Shaker Heights, Ohio  
T: C.C. Liu
- EN335T Fire Fighter Communication Improvement**  
Bernhard Missbichler, 20, Senior  
Simon Wannemacher, 19, Freshman  
Peter Klar, 20, Senior  
Technisches Gewerbe Museum, Vienna, Austria  
T: Karl Schiftner
- EN336T Developing a Control Methodology for Efficient Tinting of Electrochromic Windows: To Squint ... Or to Tint, Year III**  
Ananth Ram, 16, Sophomore  
Arun Venkatraman, 16, Sophomore  
Clark High School, Plano, Texas  
T: Cathy Bambenek
- EN337T Self-healing Struts**  
# Jay Carson, 17, Senior  
# Eletha Joy Flores, 17, Senior  
Charles Herbert Flowers High School, Springdale, Maryland  
T: Robert Strain
- EN338T Magneto-Rheo-logical Fluid**  
Thanh Thi Nguyen, 17, Junior  
Stephanie Grace-Anne Romasanta, 16, Junior  
Yen Ngoc Nguyen, 17, Junior  
Oak Grove High School, San Jose, California  
T: Carol Jean Evans
- EN339T Collapsible Wheelchair, Year Two**  
# William Caleb Rodgers, 18, Senior  
# Joshua Robert Turner, 18, Senior  
Hiram High School, Hiram, Georgia  
T: Leon R. Grant  
Paulding County High School, Dallas, Georgia
- EN340T My Freight Hitchhikes: Intercontinental Freight Exchange**  
Ondrej Krabs, 19, Senior  
Petra Hakova, 18, Junior  
SPSSE Liberec, Liberec 1, Czech Republic  
T: Jan Mojziz
- EN341T CSI: Controlled Spherical Intelligence**  
# Benjamin Gulak Poss Gulak, 16, Junior  
Alexander Jason Molloy, 17, Junior  
Hillfield Strathallan College, Hamilton, Ontario, Canada  
T: Ron Capobianco
- EN342T Designing a Rigid Radiopaque Hydrogel for Biomedical Application**  
Mohan Gautam, 17, Senior  
Ankuri G. Desai, 16, Junior  
Sachem High School East, Farmingville, New York  
Ward Melville High School, East Setauket, New York  
T: Michael Vaccariello
- EN343T Lebenmonitor: Protecting the Masses from the Silent Killer**  
# Michael Getahun Hailemariam, 17, Senior  
Brook Tassew Kassa, 16, Sophomore  
Piney Woods School, Piney Woods, Mississippi  
T: Olivia Brooks; T: Robert Holloway
- EN344T Socially Integrated Robots: Sustainable Robotic Cognition in a Socioeconomic Model**  
Aaron Thomas Maturen, 17, Senior  
Pascal Anthony Carole, 17, Senior  
Remy Gerard Carole, 17, Senior  
Heritage High School, Saginaw, Michigan  
Saginaw Arts and Sciences Academy, Saginaw, Michigan  
T: Dennis Roebuck; T: Stephen Tack; T: Bruce Isotalo
- EN345T Digital Acoustic Velocimeter**  
Daniel William Hutchinson, 18, Senior  
Thomas Mark Stable, 18, Senior  
Samuel John Lee, 17, Senior  
Ulverston Victoria High School, Ulverston, Cumbria, United Kingdom  
T: Kath Walley
- EN346T Magnetic Fetch**  
Mark M. Head, 17, Senior  
Jae In, 17, Junior  
Glen Rose High School, Malvern, Arkansas  
T: Connie Marlene Tuggle
- EN347T Testing the Most Effective Ionic Charger and Its Effect on Particle Charging**  
# Foster Theodore Holcomb, 15, Sophomore  
David Gates Steward, 17, Sophomore  
Russel Gerard Viegas, 16, Sophomore  
Little Rock Central High School, Little Rock, Arkansas  
T: Melissa Donham
- EN348T The Hydrogen Economy: *Futurum Nostrum***  
Daniel Robert Femerstrom, 19, Senior  
Christopher Cheah Mollen, 18, Senior  
Ebersteinska Gymnasiet, Norrköping, Östergötland, Sweden  
T: Bengt Carlegrim
- EN349T The Effects of Supercritical Carbon Dioxide (scCO<sub>2</sub>) on the Segregation of POSS Nanoparticles and on the Metallization of PS and PMMA Thin Films**  
# Srienne Ashley Kugler, 17, Junior  
Jamie Erin Rosengard, 17, Senior  
Jericho High School, Jericho, New York  
T: Christopher Hoppner  
Half Hollow Hills High School West, Dix Hills, New York  
T: Chrysi Notskas
- EN350T The Capturing and Utilization of Wasted Energy, a Second Year Study**  
# Janelle Marie Goettman, 16, Junior  
Michelle Elise Alfert, 17, Junior  
Burkburnett High School, Burkburnett, Texas  
T: Pamela Francis
- EV301T Decline of the North American Lesser Scaup, Phase Two: Chromium and Selenium in Foods**  
# Matt Moraco Weegman, 17, Junior  
# Mitch Dale Weegman, 17, Junior  
Winona Senior High School, Winona, Minnesota  
T: Ken Mann
- EV302T Association of Fungi for Remediation of Oil Polluted Soil**  
Alina A. Baliuta, 16, Junior  
Lubov V. Makuta, 17, Junior  
Gymnasium #1 Named After F.Scarina, Minsk, Belarus  
T: Inessa Adamovna Gontcharova
- EV303T Irrigation System for Small Farms**  
Abdel Rahman Ibrahim Alzorgan, 15, Sophomore  
Mohammad Ibrahim Alzorgan, 14, Freshman  
Al Shaiekh Ahmed Addabbag, Tafeliah, Jordan  
T: Abdl Hafeez M. Al Hijjawi
- EV304T Fifty-percent More Efficient Environmentally Clean Wind Energy Source**  
Roman Evgenovich Levin, 15, Sophomore  
Maxym Anatoliyovich Dmytrenko, 17, Junior  
Yevgen Yuriyovich Zaytsev, 16, Sophomore  
Zaporizhzhya City Council Gymnasium 28, Zaporizhzhya, Ukraine  
T: Andriy Mikolaevich Andreev

- EV305T An Environmentally Friendly Cleaning Powder**  
Kwai-Yan Wong, 18, Senior  
Chun-Kit Chu, 18, Senior  
Kwok-Chung Yau, 17, Senior  
South Tuen Mun Government Secondary School,  
Hong Kong, Region of China  
T: Ying-choi Lee
- EV306T Distribution of Nitrogen, Phosphorus, and Algae in Water Along Ten Mile Creek**  
Anthony Joseph Stoffella, 14, Freshman  
John Wilmot Mann, 15, Freshman  
John Carroll Catholic High School, Fort Pierce, Florida  
T: Zhenli He
- EV307T Global Warming on Zooxanthalle**  
Nicholas S. Azadian, 17, Senior  
Mario A. Simoes, 18, Senior  
Michael A. Flegiel, 18, Senior  
Center for Advanced Technologies, St. Petersburg, Florida  
T: Paul H. Dickman
- EV308T Impact of Drought on Hydrologic Ecosystems**  
Colin R. Sears, 17, Sophomore  
Caitlyn Rae Sears, 15, Freshman  
Alma High School, Alma, Arkansas  
T: Brian Curd
- EV309T Alternative Means of Disposing Biomass (Waste Paper)**  
Osafamwen Cynthia Igbiosa, 16, Junior  
Obi Chuks Ike-Nwosu, 16, Junior  
Osarenogae Ogieva, 16, Junior  
Iginiedion Education Centre, Benin City, Edo State, Nigeria  
T: Philomine Mary Joseph
- EV310T The Effect of Antibiotics on Aquatic Ecosystems**  
Frederick Reginald Bentley, 15, Sophomore  
Kyle Abney Huninghake, 16, Sophomore  
duPont Manual Magnet High School, Louisville, Kentucky  
T: William H. Deines
- EV311T Livestock Antibiotic Effects on Nitrogen Cycling by Soil Microorganisms**  
Gregory Sergey Artiushin, 16, Junior  
Dayan Wang, 17, Junior  
Laura Elizabeth Steinmetz, 17, Junior  
Paul Laurence Dunbar High School, Lexington, Kentucky  
T: Elisa Marie D'Angelo
- EV312T A Toxicity Assay to Understand the Effects of Global Warming**  
# Brenna Nelson Heintz, 18, Senior  
# Kevin Crossland Heffern, 18, Senior  
Juneau-Douglas High School, Juneau, Alaska  
T: Jon Smith
- EV313T A Simulative Study of the Exxon Valdez Oil Spill and Its Detrimental Effects on Marine Organisms as Determined by the Bioluminescent Capabilities of the Dinoflagellate**  
# Cole Thomas Streiff, 18, Senior  
# Matthew Aaron McKinney, 18, Senior  
Oregon Episcopal School, Portland, Oregon  
T: Rosa Hemphill
- EV314T The Effect of Water-Soluble and Lipid-Soluble Extracts on Plant Cells**  
Doha Hashim Ali, 16, Junior  
Buena Young Chan, 16, Junior  
Bayside High School, Bayside, New York  
T: Jenny J. Li
- EV315T Is There a Cost-Effective Way to Reduce the Risk of New Orleans Flooding Again?**  
Stephanie Lynn Miller, 16, Sophomore  
Sarah Marie Smith, 15, Sophomore  
Mary-Anne Kim Anh Nguyen, 16, Sophomore  
Saint Joseph's Academy, Baton Rouge, Louisiana  
T: Linda Kerr Messina
- EV316T A Novel Bioabsorbent of "Ya-Plong" as An Oil Spill Removal**  
Pirachula Chulanon, 14, Freshman  
Chitsachee Sichanugrist, 14, Sophomore  
Takphet Lekavijit, 15, Sophomore  
Bodindecha (Sing Singhaseni) School, Wangthonglang, Bangkok, Thailand  
T: Patchara Pusuntisumpun
- EV317T The Effects of Migrant Compounds of Used Motor Oil on the Vitality of *Daphnia magna***  
Danny Adam Miller, 17, Junior  
Ben James Roark, 16, Junior  
North Toole County High School, Sunburst, Montana  
T: Lawrence Dexter Fauque
- EV318T Bioremediation and Degradation of CCA Treated Wood in Landfills**  
David William Charles, 15, Freshman  
Patrick Chase Brown, 14, Freshman  
Salpointe Catholic High School, Tucson, Arizona  
T: Tim Barry
- EV319T The Effect of Iron, Copper, and Zinc Contamination of Corn and Soybeans**  
Lucas James Heintzman, 17, Senior  
Zachary Ryan Schulz, 18, Senior  
Central High School, Aberdeen, South Dakota  
T: Jan Palmer
- EV320T The Domesticated Production of Methane by Using Economic and Energy Efficient Apparatus to Obtain the Purest Form of Methanol to Be Used for Both Rural and Urban Use, Year Two**  
## Nathan Abay Kebede, 18, Senior  
# Berhanemeskel Alemu Nida, 18, Senior  
Filmon Berhe, 17, Senior  
Piney Woods Country Life School, Piney Woods, Mississippi  
T: Olivia Devon Brooks
- EV321T Water Quality Maintenance by Controlled Release of Sodium Hypochlorite from Biopolymeric Gels**  
Mariana Tomaz Cunha, 15, Sophomore  
Luciana Maria Arcaño Frota, 15, Sophomore  
Colegio Christus, Fortaleza, Ceara, Brasil  
T: Luewton Lemos Felício Agostinho
- EV322T Geoclean System for Cleaning Polluted Lakes**  
Berhat Bildirir, 15, Freshman  
Beray Bildirir, 15, Freshman  
Private Fatih High School, Istanbul, Marmara, Turkey  
T: Ibrahim Sasmaz
- EV323T A Reversal of PhosFATE: Safely Reintroducing Phosphates into Cleaning Agents**  
Maureen Anne Williams, 16, Junior  
Joseph Kent Henry, 17, Junior  
Bishop Moore Catholic High School, Orlando, Florida  
T: Paul Becht
- EV324T Degradation of Compact Disks by the Fungus *Geotrichum candidum***  
Olga Valerievna Yuts, 18, Senior  
Jose Pablo Jimenez Trigueros, 17, Senior  
Diego Guillermo Ulate Segura, 17, Senior  
Colegio Científico Costarricense San Pedro, San Jose, Costa Rica  
T: Heidy Maria Villalobos Barrantes
- EV325T Production of Methane with Organic Waste Material to Use It as a Source of Renewable Energy**  
Iliana Zoe Gonzalez, 14, Freshman  
Andrea Lopez, 14, Freshman  
Hogar Colegio La Milagrosa, Arecibo, Puerto Rico  
T: Yadira Gonzalez
- EV326T Biogas... A Hope to the Yuriria's Lagoon**  
Susana Rangel, 17, Senior  
Teresa Chimal, 18, Senior  
Carlos Perez, 17, Senior  
CBTis No. 172, Cortazar, Guanajuato, Mexico  
T: Miguel Quintana

- EV327T Integral Plan of Management and Conservation on a Sustained Base that Improves Biodiversity and Water Quality in La Plata Estuary, the Ojo del Buey Wetland and the Coral Reef**  
Michelle Noelis Nieves Diaz, 16, Sophomore  
Linoshka Oliveras, 15, Sophomore  
Alexander Roman, 15, Freshman  
Jose Santos Alegria, Dorado, Puerto Rico  
T: Blanca Iris Hernandez
- EV328T The Levels of Nitrates and Phosphates in Freshwater Systems**  
Haley Marie Burgess, 16, Sophomore  
Shala Ann Hawes, 15, Sophomore  
Central Lee High School, Donnellson, Iowa  
T: Alicia Danyel Schiller
- EV329T Effect of Land Use on Water Chemistry and Macroinvertebrates in Three Watersheds**  
Richard C Lee, 14, Freshman  
# Christine Weizer Li, 18, Senior  
Cookeville High School, Cookeville, Tennessee  
T: Marcia Wiley; T: Jennifer Williams
- EV330T Pollutants as Predictors: Monitoring Particulate Matter and Ozone as Indicators for Emergency Room Visits**  
# Rachna Beeravolu Reddy, 15, Sophomore  
# Elizabeth Wells Busdicker, 15, Sophomore  
Port Huron Northern High School, Port Huron, Michigan  
T: Brian Jamison
- EV331T Assessing Ferric Runoff in Watersheds**  
Shelly Kakar, 18, Senior  
Lindsy Lee Swenson, 18, Senior  
Ballard High School, Louisville, Kentucky  
T: Robert L. Baar
- EV332T Rice Straw, a Friend of the Environment**  
Aya Mohamed Attaby, 18, Senior  
Nawal Hossam El Boghdady, 17, Senior  
Dar El Tarbia American School, Cairo, Egypt  
T: Nermine Sherif Abed
- EV333T Cellulosic Ethanol from Corn Biomass**  
Kody Austin Nelson, 15, Freshman  
Mark Andrew Lessen, 15, Freshman  
Delavan High School, Delavan, Illinois  
T: Mary Kay Adamczyk Wonders
- MA301T About One-Dimensional Compact Topological Semigroups**  
Alexey Dmitriev, 16, Junior  
Anton Kurbanov, 17, Junior  
Vadim Raskumandrin, 16, Junior  
Centre of Mathematical Education, Saint-Petersburg, Saint-Petersburg, Russia  
T: Stanislav Kublanovskiy
- MA302T Applications of Modular Crypto-Function in the Secret Code Theory, Phase Two**  
# Kevin Joel Rodriguez-Torres, 17, Senior  
# Artemio Jose Lopez-Gonzalez, 17, Senior  
Carmen Belen Veiga High School, Juana Diaz, Puerto Rico  
T: Miguel A. Rosario-Garcia
- MA303T Randomness: Are We Capable?**  
Henoc Eduardo Rodriguez, 15, Sophomore  
Ivan Castro-Nogueras, 15, Junior  
Centro Residencial de Oportunidades Educativas, Mayaguez, Puerto Rico  
T: Edwin Benvenuti
- MA304T Some Problems in Steiner Minimal Trees Theory**  
Lubov V. Tupikina, 16, Junior  
Vitaly A. Agafonov, 16, Junior  
Aleksandra S. Serkina, 16, Junior  
Lyceum # 1511 at MEPhI, Moscow, Russia  
T: Alexey A. Tuzhilin
- MA305T Negativity Criterion of Coefficients of Inverse Power Series**  
Alexey P. Alekhin, 16, Junior  
Roman D. Kozin, 16, Junior  
Centre of Mathematical Education, St. Petersburg, Russia  
T: Ilya A. Chistyakov
- MA306T A Noval Technique to Find Cube Root**  
Amardeep ., 16, Senior  
Vakeel Ahmad, 16, Senior  
Jawahar Navodaya Vidyalaya, Meerut, India  
T: Ramkumar Pundir
- MA307T Extremal Cayley Graphs of Finite Cyclic Groups**  
Elysia Ja-Zeng Sheu, 17, Senior  
Joseph J. Lee, 18, Senior  
Lawrence E. Elkins High School, Sugarland, Texas  
Hudson High School, Hudson, Ohio  
T: Xingde Jia
- MA308T Impossibility of Construction of Triangle by Using Three Bisectors**  
Lado Meskhishvili, 15, Freshman  
Irakli Baiadze, 16, Junior  
Georgia-American High School, Tbilisi, Georgia Republic  
T: Mamuka Meskhishvili
- MA309T Demystifying the Human Brain: An Exploration of Artificial Neural Network Development**  
# Matthew Huang, 17, Senior  
Nathan Ezra Gould, 17, Senior  
Scarsdale High School, Scarsdale, New York  
T: Jeremy Szerlip; T: Beth Schoenbrun
- ME301T Alzheimer's Disease Brain Atrophy and Immunohistochemical Detections of Neurofibrillary Tangles Using Multiple Antibodies**  
## Ryan Kimlong Huynh, 17, Junior  
## Richie Kimlong Huynh, 17, Junior  
Champlin Park High School, Champlin, Minnesota  
T: Kevin Molohon
- ME302T Honey: A Wealth of Health**  
Geraldyn Anne Schexnayder, 14, Freshman  
Lacey Marie Gravois, 14, Freshman  
Lutcher High School, Lutcher, Louisiana  
T: Valerie N. Stewart
- ME303T Postsynaptic Neurotransmitter Binding Inhibition of Opposite Leaf Spot Flower, (*Acmella opositifolia*) Flower Isolate: A Prospect Agent Against Uncontrolled Neuronal Firing**  
Beverly Canoy Casimero, 15, Freshman  
Kenneth Joseph Chan Bureros, 16, Freshman  
John Paul Lawas dela Cruz, 17, Freshman  
Bayugan National Comprehensive High School, Philippines  
T: Gregor Carpentero Burdeos
- ME304T Nature's Shield: The Protective Role of Cyanadin Against Cellular Deterioration due to Carcinogenic Elements**  
Christopher Jason Lorn, 18, Senior  
Sishira Mannuru, 15, Freshman  
Nina Ezinne, 16, Junior  
John B. Connally High School, Austin, Texas  
T: Rosendo Garcia
- ME305T The Effects of Gene Suppression and Exposure to MPTP on Dopamine Neurons of *C. elegans* as a Model for Parkinson's Disease**  
## Marilynn Tedja, 17, Senior  
## Elise Marie Adcock, 17, Senior  
## Elizabeth Nicole Monier, 17, Junior  
Keystone School, San Antonio, Texas  
T: Charles Scott Maderer
- ME306T Are Nanoparticles Toxic to Brain Cells?**  
Jonathan Wang, 14, Freshman  
Jared Vega Goodman, 15, Freshman  
Oak Hall School, Gainesville, Florida  
T: Sandra Swindler
- ME307T The Cytotoxic Implications of Titanium Dioxide Nanoparticle Penetration into Dermal Fibroblast Cells**  
Lauren Amanda Sipzner, 17, Senior  
Jaimie Stettin, 17, Senior  
Yeshiva University High School for Girls, Holliswood, New York  
T: Ruth Fried

- ME308T Gender Effects on Scent Recognition**  
Charlotte Ann Voss, 14, Freshman  
Lauren Paige Young, 14, Freshman  
Turpin High School, Cincinnati, Ohio  
T: Corey L. Mullins
- ME309T The Effect of Selected Ingested Plasticizers on the Growth and Development of *Drosophila melanogaster***  
Andrea Inez Simons, 16, Junior  
Jessica Brooke Nagy, 18, Senior  
North Toole County High School, Sunburst, Montana  
T: Lawrence Dexter Fauque
- ME310T The Effects of Green Tea and Traditional Chinese Herbs on the Inhibition of HMGB1: A Novel Mediator of Lethal Sepsis**  
Charlotte Yum, 18, Senior  
Xiaotian Chen, 18, Senior  
Ossining High School, Ossining, New York  
Stuyvesant High School, New York, New York  
T: Angelo Piccirillo
- ME311T Experimental Relation Between Dietary Intake of Fatty Acids and Onset of Asthma**  
Asif Ahsan Ali Jafferani, 17, Senior  
Asif Anwar Surani, 17, Senior  
Shahzad Mansoor Khoja, 17, Senior  
Aga Khan Higher Secondary School, Karachi, Sindh, Pakistan  
T: Mohammad Roohul Mobin Mohammad Deen Ansari
- ME312T Insulin Resistance, Part II: What Is the Role of p38MAPK in Insulin Signaling?**  
# Ariel Leigh Potter, 15, Sophomore  
Christine Minji Pak, 17, Junior  
Rio Rico High School, Rio Rico, Arizona  
T: Teresa Brown Potter
- ME313T The Etiology and Mass Distribution of Congenital Hypothyroidism in Infants: The Results in Henan Province, China**  
Shang Guo, 18, Senior  
Jin Wang, 18, Senior  
Zhengzhou Foreign Language School, Zhengzhou, Henan, China  
T: Bo Wang; T: Xu Li
- ME314T Calcium Supplementation Aggravates Vascular Calcification in Rats**  
ShaoYu Lin, 18, Senior  
Wei Li, 18, Senior  
Beijing No.166 Middle School, Beijing, China  
T: Lei Wang
- ME315T The Contribution of Therapy "X" in the Patients of Alzheimer's Disease**  
Vivian F. Irlanda, 14, Freshman  
Glorimar Santiago- Ruiz, 15, Freshman  
Sotero Figueroa School, Rio Piedras, Puerto Rico  
T: Maria E. Lopez
- ME316T The Effects of Variations in Dietary Fat Intake Using *Caenorhabditis elegans* as a Model Organism for Fat Storage**  
Whitney Strine Quackenbush, 16, Sophomore  
Erin Nicole D'Agostino, 15, Sophomore  
Manhasset High School, Manhasset, New York  
T: Peter Guastella
- ME317T Plastic Food Containers: An Unsafe Situation?**  
# Trisha Lea Schleich, 18, Senior  
# Terra Jo Toribio, 17, Senior  
Mitchell High School, Mitchell, South Dakota  
T: Julie Olson
- ME318T Oxidation of the Neuronal Protein SNAP-25 Protects It from Destruction by Botulinum Neurotoxin (BOTOX®)**  
Elizabeth C. Flores, 16, Sophomore  
Christina S. Izatt, 16, Sophomore  
Timpview High School, Provo, Utah  
T: Dixon Woodbury
- ME319T The Potential of Swamp Tea Tree Leaves Extract as Anti Monocellate Cobra Venom**  
Hidayah Hanim Hisham, 18, Freshman  
Rose Marhaini Haji Ismail, 18, Freshman  
Nur Farahin Ramdzan, 18, Freshman  
Maktab Rendah Sains Mara, Seriting, Negeri Sembilan, Negeri Sembilan, Malaysia  
T: Zaid Ali Bajunid Omar
- ME320T The Growth of Pathogenic or Allergenic Fungi in the *Columba livia* Excrement, Phase III**  
# Legna Figueroa, 15, Sophomore  
# Darlenne Torres, 16, Sophomore  
Maria Davila Semidey, Patillas, Puerto Rico  
Natividad Rodriguez Gonzalez School, Arroyo, Puerto Rico  
T: Teresa Cordero
- ME321T Effects of Plasticizer DEHP on Reproduction and Reproductive Fitness**  
# Sameer Gorav Gupta, 17, Senior  
# Brice Alfred Bongiovanni, 18, Senior  
Central High School, Macon, Georgia  
T: Tina Brigmond
- ME322T Use'em and Abuse'em: The Feeding Rituals of *Pseudomonas aeruginosa* in the Cystic Fibrosis Lung**  
Elaine Christine Owen, 16, Sophomore  
Shannon Kauikeolani Thorp, 17, Senior  
Saint Andrew's Priory School, Honolulu, Hawaii  
T: Joe N. Pacific
- ME323T Tissue Inflammation and Cytokine Expression During *Yersinia pestis* Pneumonia**  
Lin Chen, 17, Senior  
Andrew John Lechner, 18, Senior  
Parkway Central High School, Chesterfield, Missouri  
T: Adam Bergeron; T: Michael Herrmann
- ME324T A Study of Kaposi's Sarcoma Herpes Virus in Human B Cells**  
Evangelia Amigthalia Athanasoula, 16, Sophomore  
Thomai Gastopoulos, 15, Sophomore  
Central High School, Philadelphia, Pennsylvania  
T: Dennis Erlick
- ME325T *In vitro* Studies on How Properties of *Melastoma* sp. Methanol Extracts Inhibit the Calcium Oxalate Crystals (Kidney Stones) Growth**  
Fayadh Aiman Fauzi, 17, Junior  
Muhd Fakhurrazi Mohd Bakri, 18, Junior  
Mohd Irfan Syuhaidi Nasir, 17, Junior  
Sultan Mohamad Jiwa Science Secondary School, Sungai Petani, Kedah, Malaysia  
T: Harris Ganai Nainar
- ME326T Dystrophic Skeletal Muscle Cell Membranes Patched by Ploxamer 407**  
# Lalith Kumar Polepeddi, 17, Senior  
# Michael McCord Polmear, 18, Senior  
Cherry Creek High School, Greenwood Village, Colorado  
T: T.J. Donahue
- ME327T A Hybrid Reaction-Diffusion Cellular Automata Model of Glioblastoma**  
Hersh Vivek Goel, 17, Senior  
Corina I. Oprescu, 16, Junior  
Michael Allen Fan, 18, Senior  
Gilbert High School, Gilbert, Arizona  
Corona del Sol High School, Tempe, Arizona  
Dobson High School, Mesa, Arizona  
T: Alvin Bridges; T: Stan Bristol; T: Barbara Seibert
- MI301T Xylitol Xtreme Two: A Time Sequencing Study Assessing the Inhibitory Effect of Pentahydroxypentane (Xylitol) on the Bacterial Growth Curve of *Strep. mutans*.**  
## Justin A. Johns, 18, Senior  
# Christine E. Johns, 15, Sophomore  
Evangelical Christian School, Fort Myers, Florida  
T: Stephen F. Morris
- MI302T Decreasing the Microbial Contamination of an Oak Wine Barrel by Improving the Sanitation of *Brettanomyces bruxellensis* Using 254nm Ultraviolet Light and an Ultrasonic Bath**  
Arnaud Georges Sillis, 17, Junior  
Brian Furness Siperstein, 17, Junior  
Keenan Joseph Ferar, 17, Junior  
Oregon Episcopal School, Portland, Oregon  
T: Rosa Hemphill; T: Tanja Horvat; T: Peter Langely



- MI303T American Indian Medicine: An Analysis of Antiseptic Plants for Antimicrobial Effectiveness**  
## Shana Marie Wolff, 16, Junior  
# Elizabeth Jean Cochran, 16, Sophomore  
Cheyenne Central High School, Cheyenne, Wyoming  
T: Michael Wallace; T: Anne Marie Wolff
- MI304T Modulation of Quorum Sensing in *Pseudomonas aeruginosa***  
Kuan Yee Wong, 18, Junior  
Siew Han Wong, 18, Junior  
National Junior College, Singapore, Singapore  
T: Lai Yuen Chee
- MI305T *B. thurgiensis* Spore Destruction Utilizing a Fe-TAML, CTAB Catalyzed, TBHP Reaction**  
Gabby Stoner, 16, Sophomore  
Rana Gibson, 15, Sophomore  
San Jon Municipal Schools, San Jon, New Mexico  
T: Steve Goodgame
- MI306T Hamburger: Healthful or Hazardous? Ways to Decrease Microbial Contamination on Hamburger**  
Kristen Pamela Delwiche, 16, Sophomore  
Annika Marie Sullivan, 16, Sophomore  
Grant High School, Portland, Oregon  
T: John Thomas Kilkenny
- MI307T What Shares Your Air?**  
Kacie Barnett, 17, Junior  
David Jacks, 17, Junior  
Drew Central High School, Monticello, Arkansas  
T: Dennis Thurman
- MI308T The Effect of Electrode Materials on the Efficiency of a Microbial Fuel Cell**  
Jessica Hee Park, 14, Freshman  
Veronica Leigh Winget, 15, Freshman  
Gig Harbor High School, Gig Harbor, Washington  
T: Kristin Bergh
- MI309T A Comparison of Antibiotic Resistance in *Staphylococcus aureus* of Caucasians, African Americans, Asians, and Hispanics**  
Vyshak Chandra, 18, Senior  
Richard John Cassidy, 18, Senior  
Allen D. Nease High School, Saint Augustine, Florida  
T: Sally Mitalas
- MI310T Effects of Stream Hydrodynamics and Water Filtration Plant Discharges on the Colonization, Diversity and Biomass of Aquatic Fungi at Rio Sabana in Luquillo, Puerto Rico**  
# Zacha M. Ortiz-Correa, 17, Senior  
## Esteban Hernandez, 17, Senior  
Sylvanna D. Savona-Silva, 19, Senior  
Casiano Cepeda High School, Rio Grande, Puerto Rico  
Colegio Sonifel, Fajardo, Puerto Rico  
T: Angel L. Diaz-Rosario
- MI311T *Legionella* Monitoring of Industrial Water Systems by PCR: A Novel Must in Sustainable Development of Industrialization Worldwide**  
Omer Faruk Yuca, 14, Freshman  
Ahmet Faruk Kavak, 15, Freshman  
Private Fatih High School, Istanbul, Marmara, Turkey  
T: Irem Uzonur
- MI312T Multi-factor Optimization of *Saccharomyces cerevisiae* Gene Expression**  
Krystina Rose Daniels, 17, Senior  
Adeline Emily Wong, 17, Senior  
Milpitas High School, Milpitas, California  
Homestead High School, Cupertino, California  
T: Laurie Belanger
- MI313T Propionbacterium Acne? Not a Problem!**  
Victoria Hope Clunie, 18, Senior  
Moriah Anne Greenwood, 17, Senior  
Sweetwater High School, Sweetwater, Tennessee  
T: Jane Davenport
- MI314T Fish Mucus: Antibacterial Property Unique to the Hawaiian *Eleotris sandwicensis***  
# Genevieve C. Pang, 17, Senior  
# Alayna Rachelle Betsill, 17, Senior  
Henry Perrine Baldwin High School, Wailuku, Hawaii  
T: Stuart Donachie
- MI315T The Effect of the Green Tea Polyphenol, EGCG, on T Cell-Antigen Presenting Cell Interactions**  
# Yi Cai, 17, Junior  
Iddoshe Haile Hirpa, 16, Junior  
duPont Manual Magnet High School, Louisville, Kentucky  
T: Craig DaRif
- PH301T Synthesis of Clean Fuel from a Renewable Source**  
Ziyad Husni Abdel Khaleq, 17, Junior  
Amen Ali Modhafar, 17, Junior  
Modern Montessori School, Amman, Jordan  
T: Iman Moh As; T: Raed Shami
- PH302T Radiation Reduction of Cellular Phones**  
Samuel Joseph Tamo, 16, Sophomore  
Daniel Theodore Wallis, 16, Sophomore  
Wilbur D. Mills University Studies High School, Little Rock, Arkansas  
T: Gary A. Ealeywine
- PH303T Elastomeric Grating for Wavelength Switching in Optical Communication Systems**  
Maria Katrina Derez Guevara, 17, Sophomore  
Ace Fredric Resurreccion Palabrica, 17, Sophomore  
Nicole Andrea San Agustin Yazon, 16, Junior  
Philippine Science High School - Main Campus, Quezon City, National Capital Region, Philippines  
T: Edgar Naoe Tafaleng
- PH304T The Physics of Paintball: The Effect of the Pneumatic Ram on the Performance of a Paintball Marker**  
Kyle Heideman, 18, Senior  
Joseph Palmer Schafer, 17, Senior  
Buena High School, Sierra Vista, Arizona  
T: Joann Deakin
- PH305T An Approach to UAV Deployment with Water Rockets**  
Trent William Lukaczyk, 18, Senior  
Travis Weston Halbert, 17, Senior  
James W. Robinson Jr. Secondary School, Fairfax, Virginia  
T: Karen McLean; T: Jonathan L. Warner
- PH306T Development of Multipass Pulse Cleaner for Ultrafast High-power Lasers**  
# Alexander Chernyak, 18, Senior  
Pavel V. Chvykov, 15, Sophomore  
International Academy, Bloomfield Hills, Michigan  
T: David Lyons  
Lincoln Consolidated High School, Ypsilanti, Michigan  
T: Kathy Betrus
- PH307T Is There Torque in Your Toast? A Mathematical Analysis of a Falling Rectangular Object**  
## Adreanne Laree Brungardt, 16, Junior  
Nichole Byrldine Catlett, 16, Junior  
Brush High School, Brush, Colorado  
T: David Miner
- PH308T Thermal Effects on the Degeneration of Permanent Magnets**  
Danil Efron Smiles, 17, Junior  
Alan Hayden Cherney, 17, Senior  
Niles North High School, Skokie, Illinois  
T: Jacklyn Naughton
- PH309T A Comparative Analysis of Laser Efficiency: The Effect of Scattering Surfaces Inside a Diffuse Reflector Solid State Laser Pump Chamber**  
Bretton Skyler Griffin, 17, Senior  
Chelsey Lynn Webb, 16, Freshman  
Alexandra Morgan Smith, 16, Junior  
Hilton Head Preparatory School, Hilton Head Island, South Carolina  
T: Tina Webb-Browning
- PH310T The Relation Between the Time of Exposure and Its Distance on a Developing Process of a Homemade Pinhole Camera and 110 Film**  
Xavier Enrique Lozada, 17, Junior  
Omar Andres Rodriguez, 16, Junior  
Colegio de la Salle, Bayamon, Puerto Rico  
T: Maritza Rodriguez

- PH311T Liquid or String Elasticity and Sound Velocity**  
Yuji Sasabe, 17, Junior  
Kazuhiro Okumoto, 17, Junior  
Toshiya Kobayashi, 17, Junior  
Hiroshima Prefecture Daimon Senior High School,  
Fukuyama City, Hiroshima, Japan  
T: Jyunpei Okamoto
- PH312T Lift-Off! Working with Wings and Pressure**  
Minru Wong, 14, Freshman  
Abigail Cristine Khushf, 14, Freshman  
Dreher High School, Columbia, South Carolina  
T: David Nelson
- PH313T Factors Affecting the Tribological Properties of Carbon Nanotubes**  
Tirth Tarang Patel, 17, Junior  
Byron Henry Lowry, 17, Junior  
Spruce Creek High School, Port Orange, Florida  
T: Andrea Marie White ; T: Linda Kerney
- ZO301T Determining the Filtration Rate of the Mussel, *Elliptio complanata***  
Sarah Elizabeth Hall, 18, Senior  
Samantha Garvin Carson, 17, Senior  
Fayette County High School, Fayetteville, Georgia  
T: Warren James Bernard
- ZO302T How Does Caffeine Affect Hamsters?**  
Sarah Elizabeth Whiteside, 16, Junior  
Sarah Elizabeth Anderson, 17, Junior  
Charleston Catholic High School, Charleston, West Virginia  
T: Dorothy Scharf; T: Amy Arnold
- ZO303T Can Scented Oils Be Used as an Effective Pesticide?**  
# Leigh Taylor Wamble, 18, Senior  
Sheila Elizabeth Mitchell, 17, Senior  
David Kells Parker, 18, Senior  
West Lauderdale High School, Collinsville, Mississippi  
T: Faye D. Kinard
- ZO304T The Effects of Heated and Unheated Disaccharide Substitutes on Lifespan, Mortality Rates, and Gender Ratios of *Drosophila melanogaster* During the F-1 and F-2 Generations**  
Stephanie Marie Hicks, 15, Sophomore  
Sara Catherine Clark, 15, Sophomore  
Keystone School, San Antonio, Texas  
T: Scott Maderer
- ZO305T Tadpole Activity Changes of Emei Woodfrog *Rana omeimontis* Caused by Pesticide Pollution and Predation**  
Shan Yu, 18, Senior  
Xiao Liu, 18, Senior  
Ze Diao, 18, Senior  
Chengdu No.7 High School, Chengdu, Sichuan, China  
T: Zong Wen
- ZO306T The Behavioral and Biological Assessment at the Hunger-Barriers of Male and Female House Crickets (*Acheta domesticus*)**  
Thomas Kun Pak, 16, Junior  
Kwang Yul Kim, 16, Sophomore  
Duck Ju Kang, 16, Junior  
W. T. Woodson High School, Fairfax, Virginia  
T: Donna Marie West
- ZO307T Use of Nile Red in Determining Lipid Accumulation in Daf-2 and Wild Type *C. elegans***  
Vasudha Gupta, 16, Junior  
Lana Rachel Tolen, 16, Junior  
Forest Hills High School, Forest Hills, New York  
T: Brigitte Brady
- ZO308T Cadmium Effect on the *Holothuria glaberrima* Visceral Regeneration**  
Cesar Oscar Perez-Colon, 17, Junior  
Alexander Santiago-Llorens, 17, Junior  
Gerardo Manuel Guasp-Perez, 16, Junior  
Colegio San Ignacio de Loyola, San Juan, Puerto Rico  
T: Wilma M. Giol-Ruiz
- ZO309T Effect of Chinaberry Fruit Extract Oil on Feeding, Growth and Fecundity of *Plutella xylostella***  
Varun Mittal, 15, Senior  
Kanishka Tiwary, 16, Senior  
Sanatan Dharam Public School, Delhi, Pitampura, India  
T: Sonika Verma
- ZO310T Sexual Selection in *Drosophila*: A Behavioral, Morphological, and Geographic Study**  
# Benjamin Alan Pollack, 17, Senior  
Abhinav Khanna, 17, Senior  
Plainview Old Bethpage John F. Kennedy High School,  
Plainview, New York  
T: Mary Lou O'Donnell
- ZO311T The Effects of Tobacco Extract on Fires Ants**  
Mildelis Martinez, 17, Senior  
Bryan Garcia, 17, Senior  
Marcelino Rodriguez Roman, Moca, Puerto Rico  
T: Ana Cruz
- ZO312T Mathematical Analysis of the Web Structures in Orb-Web Building Spiders**  
Doo Young Lee, 17, Senior  
Gil Young Park, 17, Senior  
Korean Minjok Leadership Academy, Hoengsung-gun,  
Kangwon-do, South Korea  
T: Joo Pil Kim
- ZO313T Stochastic/Deterministic Analysis of Arboviral Transovarial Transmission in *Culicidae***  
## Gabriel Joel Mendoza, 17, Junior  
Fredrick Phillip Rojas, 17, Senior  
Americas High School, El Paso, Texas  
T: Craig Peters
- ZO314T Competition Between Co-Extensive Homologous Efferent Terminals During Synapse Maturation**  
Rupal Hiren Patel, 17, Senior  
Erin N. McCormick, 17, Senior  
Kalamazoo Area Mathematics and Science Center, Kalamazoo,  
Michigan  
T: John Jellies
- ZO315T Genetic Diversity of Rocky Mountain Goats (*Oreamnos americanus*) Through Noninvasive Microsatellite Genotyping**  
Jeremy Rosendo Reynoso, 17, Junior  
Forrest Connell Jessop, 17, Senior  
Alissa Raenelle Schlecht, 16, Junior  
Corvallis High School, Corvallis, Montana  
T: Jim F. Striebel
- ZO316T The Birds of the Paraguay River in the Province of Formosa, Argentina**  
Fabricio Carlos Gorleri, 15, Freshman  
Juan Gabriel Gonzalez, 14, Freshman  
Guillermo Rolon, 14, Freshman  
Gobernador Juan Jose Silva, Formosa, Argentina  
T: Luisa Margarita Murdoch

# ISEF AFFILIATED FAIRS

## Alabama

### Birmingham

Central Alabama Regional Science and Engineering Fair - Physical Sciences  
CH060 MA040

### Birmingham

Central Alabama Regional Science and Engineering Fair - Life Sciences  
BE046 ME085

### Huntsville

North Alabama Regional Science and Engineering Fair - Life Sciences  
MI015 ZO024

### Huntsville

North Alabama Regional Science and Engineering Fair - Physical Sciences  
CS021 EN041

### Huntsville

Alabama State Science and Engineering Fair - Life Sciences  
BE049 BI073

### Huntsville

Alabama Science and Engineering Fair - Physical Sciences  
CH071 MA046

### Livingston

West Alabama Regional Science Fair  
EV109

### Mobile

Mobile Regional Science Fair  
BE034 CH042

### Phenix City

Greater East Alabama Regional Science and Engineering Fair  
EN146 EV088

### Talladega

Northeast Alabama Regional Junior Academy Science Fair  
MA008 ME023

## Alaska

### Anchorage

Alaska Science and Engineering Fair  
ZO031 ZO032

### Juneau

Southeast Alaska Regional Science Fair  
BO014 EV312 PH017

## Arizona

### Mesa

Central Arizona Regional Science and Engineering Fair  
CS318 EN151 EV125

### Mesa

Central Arizona Regional Science and Engineering Fair  
BI078 BI079 ME327

### Mesa

Arizona American Indian Science & Engineering Fair  
EV039 ZO029

### Pima

Southern Arizona Regional Science and Engineering Fair  
BE035 MA027 ME312

### Pima

Southern Arizona Regional Science and Engineering Fair  
BI037 EN093 EV318

### Prescott

Northern Arizona Regional Science and Engineering Fair  
CS046 ME079

### Sierra Vista

Sulphur Springs Valley Electric Cooperative's Youth Engineering and Science Fair  
EN037 PH304

## Arkansas

### Arkadelphia

South Central Arkansas Regional IV Science Fair  
BO043 EA018 EN346

### Conway

Arkansas State Science Fair  
CH061 EN347 PH043

### Fayetteville

Northwest Arkansas Regional Science and Engineering Fair  
EN020 EV308 ME019

### Hot Springs

West Central Regional Science Fair  
CH064 CS042

### Jonesboro

Northeast Arkansas Regional Science Fair  
BE302 CH004 ZO007

### Little Rock

Central Arkansas Regional Science Fair  
ME016 ME017 PH302

### Monticello

Southeast Arkansas Regional Science Fair  
EV055 MI027 MI307

## California

### Alhambra

Alhambra Science and Engineering Fair  
BI081 BI309 ZO072

### Contra Costa

Contra Costa County Regional Science Fair  
BO044 CH070

### Fresno

Central California Regional Science, Mathematics and Engineering Fair  
BI022 CH025

### Livermore

Tri-Valley Science and Engineering Fair  
EA010 ME066

### Palos Verdes Peninsula

Palos Verdes Peninsula Unified School District Science and Engineering  
Fair  
ME038 PH019

### Sacramento

Sacramento Regional Science and Engineering Fair  
BI030 EN124

### Salinas

Monterey County Science and Engineering Fair  
EN059 EN061

### San Diego

Greater San Diego Science and Engineering Fair - 1  
MA036 ME083

### San Diego

Greater San Diego Science and Engineering Fair  
EN122 ME082

### San Francisco

San Francisco Bay Area Science Fair, Inc.  
MA048 ZO067

### San Jose

Synopsys Silicon Valley Science and Technology Championship presented  
by the Santa Clara Valley Science and Engineering Fair Association  
BI057 BI059 MI312

### San Jose

Synopsys Silicon Valley Science and Technology Championship II  
Presented by the Santa Clara Valley Science and Engineering Fair  
Association  
CS316 EN128 EN130

### San Jose

Synopsys Silicon Valley Science and Technology Championship III  
Presented by the Santa Clara Valley Science and Engineering Fair  
Association  
CH062 EN338 SP017

### Santa Cruz

Santa Cruz Science Fair  
BI301 CH012 ZO014

## Colorado

### Alamosa

San Luis Valley Regional Science Fair, Inc.  
BO007 EV108

### Aurora

Denver Metropolitan Regional Science and Engineering Fair  
EN141 EN142 ME326

### Boulder

Roche Colorado Regional Science Fair  
CS309 PH026

### Brush High School

Morgan-Washington Bi-County Science Fair  
EN026 PH307 ZO013

### Colorado Springs

Pikes Peak Regional Science Fair  
EN023 EN030

### Fort Collins

Colorado Science and Engineering Fair  
CH302 EN021 ZO034

### Grand Junction

Alpine Bank Western Colorado Science Fair  
MI018 ZO003

### Greeley

Longs Peak Science and Engineering Fair  
EV024 PH006

### La Junta

Arkansas Valley Regional Science Fair  
BO031 EV075

### Sterling

Northeast Colorado Regional Science Fair  
ME039 MI017

## Connecticut

### Hamden

Connecticut State Science Fair - Life Sciences  
BO013 ME037

### Hamden

Connecticut State Science Fair - Physical Sciences  
EN048 ME036

### Ridgefield

Science Horizons, Inc. Science Fair and Symposium  
EV035

## District of Columbia

### Washington

District of Columbia Mathematics, Science and Technology Fair  
EN068 SP013

# Florida

## **Bradenton**

Manatee Regional Science and Engineering Fair  
BE008 ME012

## **Bushnell**

Sumter County Regional Science Fair  
CS311 EN076 MA022

## **Crystal River**

Citrus Regional Science and Engineering Fair  
EN014 EV004

## **Daytona Beach**

Tomoka Region Science and Engineering Fair  
EN117 PH313

## **Fort Myers**

Thomas Alva Edison Kiwanis Science and Engineering Fair  
BE006 CS008

## **Fort Myers**

Thomas Alva Edison Kiwanis Science and Engineering Fair  
ME031 MI301 SP003

## **Fort Pierce**

Treasure Coast Regional Science and Engineering Fair  
BO005 CH002 EV306

## **Fort Walton Beach**

Northeast Panhandle Regional Science and Engineering Fair  
BO028 EN015

## **Fort Walton Beach**

Southeast Panhandle Regional Science and Engineering Fair  
BI007 MI005

## **Ft Lauderdale**

East Broward County Science Fair  
ME003 PH002

## **Ft Lauderdale**

West Broward County Science Fair  
EN002 ME006

## **Ft Lauderdale**

North Broward County Science Fair  
BI006 CH003

## **Gainesville**

Alachua Region Science and Engineering Fair  
BI018 ME306

## **Jacksonville**

Northeast Florida Regional Science and Engineering Fair  
EV001 ZO015

## **Jacksonville**

Northeast Florida Regional Science and Engineering Fair  
CS001 EN070

## **Kissimmee**

The Osceola Regional Science Fair  
BE032 CS014

## **Lake City**

Suwannee Valley Regional Science and Engineering Fair  
BE003 CS003

## **Melbourne**

South Brevard Science and Engineering Fair  
ME009 SP002

## **Merritt Island**

Brevard Intracoastal Regional Science and Engineering Fair  
ME001 PH001

## **Merritt Island**

Brevard Mainland Regional Science and Engineering Fair  
BE007 CS011 EN301

## **Miami**

South Florida Science and Engineering Fair - I  
BE015 BI012

## **Miami**

South Florida Science and Engineering Fair - II  
BO010 CH014

## **Miami**

South Florida Science and Engineering Fair - III  
EA004 ZO021

## **Miami**

South Florida Science and Engineering Fair IV  
EN032 SP006

## **New Port Richey**

Pasco Regional Science and Engineering Fair  
EN007 EV005

## **Ocala**

Big Springs Regional Science Fair  
EV003 ME005

## **Okeechobee**

Heartland Regional Science and Engineering Fair  
ZO001 ZO002

## **Orange Park**

Clay Rotary Regional Science and Engineering Fair  
EV116 ME094

## **Orlando**

Dr. Nelson Ying-Orange County Science Exposition - Physical Science  
CH048 EV074 EV323

## **Orlando**

Dr. Nelson Ying-Orange County Science Exposition - Life Sciences  
BO303 MI007 ZO019

## **Panama City**

Florida Three Rivers Regional Science and Engineering Fair  
CS012 ZO011

## **Pensacola**

West Panhandle Regional Science and Engineering Fair  
CH001 MA003

## **Pinellas Park**

Pinellas Regional Science and Engineering Fair  
CH010 EN016 EV307

## **Saint Augustine**

River Region East Science Fair  
MI309

## **Sanford**

Seminole County Regional Science, Mathematics and Engineering Fair  
BE312 MI001 ZO004

## **Sanford**

Seminole Science Festival  
CS002 CS301 ME004

**Sarasota**  
Sarasota Regional Science, Engineering and Technology Fair  
BI053 PH038

**Spring Hill**  
Hernando County Regional Science and Engineering Fair  
BE002 BE005

**Spring Hill**  
Hernando County Regional Science and Engineering Fair - West  
BE037 EV002

**Stuart**  
Martin County Regional Science and Engineering Fair  
BO301 EN001 MA001

**Tallahassee**  
Capital Regional Science and Engineering Fair  
BO001 EA001

**Tampa**  
Hillsborough Regional Science Fair  
EN095 ME051

**Tavares**  
Lake Regional Science & Engineering Fair  
MI004

**Vero Beach**  
Indian River Regional Science and Engineering Fair  
EV054 ZO039

**West Palm Beach**  
Palm Beach County Science and Engineering Fair - Region I  
CH039 ZO040

**West Palm Beach**  
Palm Beach County Science and Engineering Fair - Region II  
CS031 MA024

**West Palm Beach**  
Palm Beach County Science and Engineering Fair - Region III  
ME053 ME054

**West Palm Beach**  
Palm Beach County Science and Engineering Fair - Region IV  
BI034 MI028

**West Palm Beach**  
Palm Beach County Science and Engineering Fair - Region IV - 2  
BI044 MI032

## Georgia

**Albany**  
Darton College/Merck Regional Science Fair  
EN018 EV017

**Athens**  
Georgia State Science and Engineering Fair  
EN339 EV106 MA041

**Athens**  
Athens Technical College Regional Science and Engineering Fair  
EV040 MI021

**Atlanta**  
Atlanta Science and Mathematics Congress  
BE011 MA051

**Atlanta**  
DeKalb-Rockdale Science & Engineering Fair  
BI074 BO311

**Brunswick**  
Coastal Georgia Regional Science and Engineering Fair  
ME020 PH049

**Griffin**  
Griffin Regional Educational Service Agency Regional Science Fair  
MI002 ZO301

**Lawrenceville**  
Gwinnett Regional Fair  
CH305 EV042 MI023

**Milledgeville**  
Georgia College & State University Regional Science and Engineering Fair  
ME321

**Savannah**  
Savannah Ogeechee Regional Science and Engineering Fair  
BI031 EN150

**Stockbridge**  
Henry County Science and Engineering Fair  
EN031 EN321 ZO016

**Warner Robins**  
Houston Regional Science and Engineering Fair  
BO050 CS303 PH055

## Hawaii

**Honolulu**  
Hawaii Association of Independent Schools Science and Engineering Fair  
BI067 BO040 ME322

**Honolulu**  
Hawaii State Science and Engineering Fair  
MA043 MI314 SP022

**Kailua**  
Windward District Science and Engineering Fair  
ME028

**Pearl City**  
Leeward District High School Science Fair  
SP021 ZO065

**Wailuku**  
Maui Schools Science and Engineering Fair  
BE320 CS045

## Illinois

**Arlington Heights**  
Illinois Junior Academy of Science North Suburban Region 6 Science and Engineering Fair  
EV048 PH308 SP012

**Chicago**  
Chicago Public Schools Student Science Fair - Region I  
BI064 MI050

**Chicago**  
Chicago Public Schools Student Science Fair - Region II  
CS040 EN127

**Edwardsville**  
Illinois Junior Academy of Science Region XII Science Fair  
PH040

**Macomb**  
Heart of Illinois Science and Engineering Fair  
EN143 EV333 SP023

**Springfield**  
Illinois Junior Academy of Science Region X Science Fair  
BO033 ME067

## Indiana

**Angola**  
Northeastern Indiana Tri-State Regional Science Fair  
CH038 EN067

**Evansville**  
Tri-State Regional Science and Engineering Fair  
PH016 ZO026

**Fort Wayne**  
Northeast Indiana Regional Science and Engineering Fair  
EN049 EV038

**Gary**  
Calumet Regional Science Fair  
ME087 ZO060

**Hanover**  
Southeastern Indiana Regional Science Fair  
BE010 CH009

**Indianapolis**  
Central Indiana Regional Science and Engineering Fair  
EA011 EN101

**Indianapolis**  
Indiana Science and Engineering Fair  
EN131 ZO056

**Indianapolis**  
Indiana Science and Engineering Fair  
CH057 MA038

**Indianapolis**  
Indiana Science and Engineering Fair  
EV097

**Indianapolis**  
Indiana Science and Engineering Fair  
CH056 MI058

**Indianapolis**  
Indiana Science and Engineering Fair  
EN126 EN129

**Muncie**  
East Central Indiana Regional Science Fair  
ME010 MI003

**South Bend**  
Northern Indiana Regional Science and Engineering Fair  
EN089 EV065

**Terre Haute**  
West Central Indiana Regional Science and Engineering Fair  
EN053 ZO025

**Valparaiso**  
Northwestern Indiana Science and Engineering Fair  
ME046 ME055

**West Lafayette**  
Lafayette Regional Science and Engineering Fair  
EV029 ME025

## Iowa

**Ames**  
State Science and Technology Fair of Iowa  
EV092 EV328 MI046

**Cedar Rapids**  
Eastern Iowa Science and Engineering Fair  
ME043 PH023

**Indianola**  
South Central Iowa Science and Engineering Fair  
BI036 BO027

## Kentucky

**Bowling Green**  
Southern Kentucky Regional Science Fair  
CH311 EV122

**Highland Heights**  
North Area Counties of Kentucky Exposition of Sciences - Life Sciences  
EV112 ZO063

**Highland Heights**  
North Area Counties of Kentucky Exposition of Sciences - Physical Science  
EA020 PH051

**Lexington**  
Central Kentucky Regional Science Fair  
CH019 EV311 ME027

**Louisville**  
Louisville Regional Science Fair - Physical Science  
CH018 EN036 EN309

**Louisville**  
Louisville Regional Science Fair - Life Science  
BI016 CH303 ZO023

**Louisville**  
Dupont Manual High School Regional Biological Sciences Fair  
BI011 EV020 EV310

**Louisville**  
Dupont Manual High School Regional Physical Sciences Fair  
CS304 EA003 PH011

**Owensboro**  
Owensboro - Western Kentucky Regional Fair  
EN329 EV079

**Richmond**  
Kentucky Science and Engineering Fair  
EV105 MI315 PH042

**Richmond**  
Kentucky Science and Engineering Fair  
CH067 EV331 MI057

**Gaithersburg**  
ScienceMontgomery - I  
BI005 ZO010

**Gaithersburg**  
ScienceMontgomery - II  
EN319 EV013

**La Plata**  
Charles County Science Fair  
EN012 EV012

**Largo**  
Prince George's Area Science Fair  
EA014 EN337 SP019

**Towson**  
Baltimore Science Fair  
BI058 EN120

## Louisiana

**Alexandria**  
Louisiana Region IV Science Fair  
PH050

**Baton Rouge**  
Louisiana Science and Engineering Fair  
BI076 EN144

**Baton Rouge**  
Louisiana Region VII-Science and Engineering Fair  
BE022 EV315

**Bossier City**  
Bossier Parish Community College Louisiana Region I Science and  
Engineering Fair  
BI009 PH008

**Houma**  
Terrebonne Parish Science Fair  
EV014 EV015

**Lafayette**  
Louisiana Region VI Science and Engineering Fair  
BO008 EN306 EV016

**Lake Charles**  
Louisiana Region V Science and Engineering Fair  
BI035 EN044

**St. James Parish**  
St. James Parish Science Fair  
BO006 ME302 ZO038

**Thibodaux**  
Louisiana Region X Science and Engineering Fair  
BI075 EV071

## Massachusetts

**Andover**  
Massachusetts Region I Science Fair  
EN125 MA039

**Boston**  
Massachusetts Region VI Science Fair  
BE319

**Bridgewater**  
Massachusetts Region V Science Fair  
EV101 MI048

**Cambridge**  
Massachusetts State Science Fair  
BI060 BI063

**Fall River**  
Massachusetts Region III Science Fair  
BO038 EV104

**Somerville**  
Massachusetts Region IV Science Fair  
MI049

**Worcester**  
Massachusetts Region II State Science Fair  
BI061 CS315 EN123

## Maryland

**Baltimore**  
Morgan State University Science-Mathematics-Engineering Fair  
BI066 MI052

**Cumberland**  
Western Maryland Science Expo  
ZO058

**Edgewater**  
Anne Arundel County Regional Science and Engineering Fair  
EN043 ME030

**Frederick**  
Frederick County Science and Engineering Fair  
EV067 ME062

## Michigan

**Ann Arbor**  
Southeast Michigan Science Fair  
BI070 EA019 EN344

**Berrien Springs**  
Berrien County Regional Science Fair  
EV111 ME088

**Big Rapids**  
Mecosta-Osceola Science and Engineering Fair  
EN121 ZO057



**Detroit**

Science and Engineering Fair of Metropolitan Detroit, Inc. - #1  
BI023 MA042 PH306

**Detroit**

Science and Engineering Fair of Metropolitan Detroit, Inc. - #2  
CH026 MI020

**Detroit**

Science and Engineering Fair of Metropolitan Detroit, Inc. - #3  
EN054 EN055

**Detroit**

Science and Engineering Fair of Metropolitan Detroit, Inc. - #4  
MA015 ME040

**Detroit**

Michigan Science and Engineering Fair  
BI065 CS019

**Flint**

Flint Area Science Fair  
EN109 ME092

**Kalamazoo**

Southwest Michigan Science and Engineering Fair  
EN136 ZO314

**Port Huron**

St. Clair County Science and Engineering Fair  
EV103 EV330 ZO059

**Saginaw**

Saginaw County Science and Engineering Fair  
BI062 EV102

**Minnesota****Bemidji**

Northern Minnesota Regional Science Fair  
CH029 EV044

**Duluth**

Northeast Minnesota Regional Science Fair  
BE001 SP001

**Mankato**

South Central/North Minnesota Regional Science and Engineering Fair  
CH301 EN017 PH010

**Mankato**

South Central/South Minnesota Regional Science and Engineering Fair  
BO004 CH306 EN009

**Mankato**

Southwest/North Minnesota Regional Science and Engineering Fair  
BI004 EV011

**Mankato**

Southwest/South Minnesota Regional Science and Engineering Fair  
BI014 ZO009

**Minneapolis**

Twin Cities Regional Science Fair  
BE027 EV050

**Minneapolis**

St. Paul Science Fair  
ME007

**Minneapolis**

Western Suburbs Science Fair  
BI001 CH005

**Moorhead**

Western Minnesota Regional Science Fair  
EN008 EN311 EV031

**Rochester**

Rochester Regional Science Fair  
BE316 EV069 PH033

**Saint Cloud**

David F. Grether Central Minnesota Regional Science Fair and Research  
Paper Program  
ME301

**Saint Cloud**

David F. Grether Central Minnesota Regional Science Fair and Research  
Paper Program  
BE304

**St. Paul**

Minnesota Academy of Science State Fair  
BE322 CH068 ME093

**Winona**

Southeast Minnesota Regional Science Fair  
BE004 EN003 EV301

**Mississippi****Biloxi**

Mississippi Region VI Science and Engineering Fair  
ME033

**Booneville**

Mississippi Region IV Science Fair  
SP015

**Greenville**

Mississippi Region III Science and Engineering Fair  
ZO005 ZO006

**Hattiesburg**

University of Southern Mississippi Region I Science and Engineering Fair  
EV041 MI022

**Jackson**

Mississippi Region II Science and Engineering Fair  
BI045 EV320 ME059

**Mississippi State**

Mississippi Region V Science and Engineering Fair  
CH015 ME013 ZO303

**Oxford**

Mississippi Region VII Science and Engineering Fair  
BI040 BI308 ZO061

**Starkville**

Mississippi Science and Engineering State Fair  
BI069 EN343 MI061

## Missouri

**Cape Girardeau**  
Southeast Missouri Regional Science Fair  
EV036 MI011

**Fayette**  
Three Rivers Regional Science and Engineering Fair  
PH052 ZO068

**Hillsboro**  
Mastodon Park Science/Art Regional Fair of Jefferson County  
BI017 EA007

**Jefferson City**  
Lincoln University Regional Science Fair  
BE036 CH045

**Joplin**  
Missouri Southern Regional Science Fair  
EN102 ZO047

**Kansas City**  
Greater Kansas City Science and Engineering Fair  
ME063 MI031

**Saint Joseph**  
Mid-America Regional Science and Engineering Fair  
BI002 MA004

**Springfield**  
Ozarks Science and Engineering Fair  
BI072 ME095

**St. Louis**  
Greater St. Louis Science Fair  
BO041 ME089 ME323

**St. Peters**  
St. Charles-Lincoln County Regional Science and Engineering Fair  
BE025 BE310 EN062

## Montana

**Billings**  
Deaconess Billings Clinic Research Science Expo  
EN071

**Butte**  
Southwest Montana Regional Science and Engineering Fair  
CS027 ZO028 ZO315

**Great Falls**  
Montana Region II Science and Engineering Fair  
BO023 ME309 MI024

**Havre**  
Hi-Line Regional Science and Engineering Fair - MSU-Northern  
BO017 EV047

**Missoula**  
Montana Science Fair  
CH044 EV317 MI026

## Nebraska

**Nebraska City**  
Greater Nebraska Science and Engineering Fair  
BI056 ZO054

**Wilcox**  
Central Nebraska Science and Engineering Fair  
EN080 ME058

## Nevada

**Elko**  
Elko County Science Fair  
CH028 EV043

**Reno**  
Western Nevada Regional Science and Engineering Fair  
BI032 EN320 EV051

## New Jersey

**Jersey City**  
Hudson County Science Fair  
MA034 ME080

**Lawrenceville**  
Mercer Science and Engineering Fair  
EN042

**New Brunswick**  
North Jersey Regional Science Fair - Junior Division  
EN091 ZO045

**New Brunswick**  
North Jersey Regional Science Fair - Senior Division  
BI038 MI029

## New Mexico

**Albuquerque**  
Northwest New Mexico Regional Science and Engineering Fair  
CH021 EN039

**Albuquerque**  
National American Indian Science and Engineering Fair  
CH310 EV093

**Albuquerque**  
National American Indian Science and Engineering Fair  
EA012 ZO050

**Albuquerque**  
National American Indian Science and Engineering Fair  
BO030 EN108

**Albuquerque**

Northwestern New Mexico Regional Science and Engineering Fair  
EN132 MI012

**Albuquerque**

American Indian Science and Engineering Society  
MI040 PH036

**Farmington**

San Juan New Mexico Regional Science and Engineering Fair  
BI027 EA008

**Grants**

Four Corners Regional Science and Engineering Fair  
CS044 MI056

**Las Cruces**

Southwestern New Mexico Regional Science and Engineering Fair  
EN147

**Las Vegas**

Northeastern New Mexico Regional Science and Engineering Fair  
EN025 ME021

**Portales**

Southeastern New Mexico Regional Science and Engineering Fair  
BO022 MI305 ZO037

**Socorro**

New Mexico Science and Engineering Fair - Life Sciences  
EV028 ZO022

**Socorro**

New Mexico Science and Engineering Fair - Physical Sciences  
PH044 SP018

**Socorro**

New Mexico Science and Engineering Fair  
EN140

**Socorro**

New Mexico Science and Engineering Fair  
BE021 ME096

## New York

**Brooklyn**

Polytechnic University and New York City Department of Education Math,  
Science and Technology Fair - I  
BI024 BO015 ZO307

**Brooklyn**

Polytechnic University and New York City Board of Education Math,  
Science and Technology Fair - II  
BE019 BI025 EA302

**Brooklyn**

Polytechnic University and New York City Board of Education Math,  
Science and Technology Fair - III  
CH027 EN056 ME307

**Brooklyn**

Polytechnic University and New York City Board of Education Math,  
Science and Technology Fair - IV  
EV314 PH021 ZO030

**Brooklyn**

Polytechnic University and New York City Board of Education Math,  
Science and Technology Fair - V  
ME041 SP011

**Brooklyn**

Polytechnic University/NYC Board of Education, Math, Science and  
Technology Fair - VI  
EN057 ME042

**Long Island**

Long Island Science and Engineering Fair - I  
BE041 BE318 BI050

**Long Island**

Long Island Science and Engineering Fair - II  
CH051 EN332 ME071

**Long Island**

Long Island Science and Engineering Fair - III  
BI051 EN331 ME072

**Long Island**

Long Island Science and Engineering Fair - IV  
BE043 BE044 CH308

**Long Island**

Long Island Science and Engineering Fair - V  
BI304 EN107 MI041

**Long Island**

Long Island Science and Engineering Fair - VI  
BI303 ME073 ZO051

**Long Island**

Long Island Science and Engineering Fair - VII  
EV082 MA032 ZO310

**Long Island**

Long Island Science and Engineering Fair-VIII  
BE042 EN105 ME316

**Poughkeepsie**

Dutchess County Regional Science Fair  
MI051

**Rochester**

Central Western Section-Science Teachers Association of New York State  
Science Congress  
ME044

**Suffern**

New York State Science and Engineering Fair  
EN134 EN342 EV114

**Suffern**

New York State Science and Engineering Fair - II  
BI080 EA017 EN349

**Syracuse**

Greater Syracuse Scholastic Science Fair  
EV113 SP020

**Syracuse**

Suny College of Environmental Science & Forestry Science and  
Engineering Fair  
BE051 EN139

**Troy**

Greater Capital Region Science and Engineering Fair  
ME047 ME048

**Utica**

Utica College Regional Science Fair  
EN137

**Westchester**

Progenics Westchester Science and Engineering Fair  
BE033 BE314 EV059

**Westchester**  
Progenics Westchester Science and Engineering Fair  
BE029 CS028 ME310

**Westchester**  
Westchester Science and Engineering Fair  
BE030 BE313 CH036

**Westchester**  
Progenics Westchester Science and Engineering Fair  
MA047 MA309 ME057

## North Carolina

**Charlotte**  
Charlotte-Mecklenburg Regional Science Fair  
CS010 EN317 ME015

**Raleigh**  
North Carolina State Science Fair  
CH043 EN325 EV062

**Raleigh**  
North Carolina State Science Fair - II  
CS032 ME060

## North Dakota

**Devils Lake**  
Northeast Central North Dakota Science and Engineering Fair  
MI059 MI060

**Dickinson**  
Southwest North Dakota Regional Science and Engineering Fair  
BO052 PH054

**Fargo**  
Southeast North Dakota Regional Science and Engineering Fair  
BO045 ZO069

**Fargo**  
North Dakota State Science and Engineering Fair  
BO046 EV117

**Grand Forks**  
Northeast North Dakota Regional Science and Engineering Fair  
BI077 EV124

**Jamestown**  
Southeast Central North Dakota Science and Engineering Fair  
EN135 EV118

**Mandan**  
Southwest Central North Dakota Regional Science and Engineering Fair  
MA050 ME098

**Minot**  
Northwest Central North Dakota Regional Science Fair  
BO051 EN148

**Williston**  
Northwest North Dakota Regional Science Fair  
BE050 CH073

## Ohio

**Alliance**  
Ohio Region XIII Science and Engineering Fair  
CH059 CS039 MA307

**Archbold**  
Northwest Ohio Science and Engineering Fair  
BE307 MI009 SP008

**Athens**  
Southeastern Ohio Regional Science and Engineering Fair  
BO003 EA002

**Cincinnati**  
University of Cincinnati Regional Science Fair  
BO018 EV046 ME308

**Cleveland**  
Northeastern Ohio Science and Engineering Fair  
EV034 ME045

**Cleveland**  
Northeastern Ohio Science and Engineering Fair  
EN065 MA018

**Dayton**  
Montgomery County Science and Engineering Fair  
ME026 PH015

**Marion**  
Marion Area Science and Engineering Fair  
BE018 ZO027

**Shaker Heights**  
Hathaway Brown Upper School Fair  
BE040 BI048 EN334

**Upper Arlington**  
Central Ohio Regional Science and Engineering Fair  
BE013 EN305 ME018

**Wilberforce**  
Miami Valley Science and Engineering Fair  
EN072 EN075

## Oklahoma

**Ada**  
Oklahoma State Science and Engineering Fair  
BE047 EV096

**Alva**  
Northwestern Oklahoma State University Regional Science Fair  
MI019

**Bartlesville**  
Bartlesville District Science Fair  
CS004 ME008

**Edmond**  
Central Oklahoma Regional Science and Engineering Fair  
EA301 PH020

**Miami**  
Northeastern Oklahoma A&M Science and Engineering Fair  
EV006 EV007

**Muskogee**  
Muskogee Regional Science and Engineering Fair  
EN303

**Oklahoma City**  
Oklahoma City Regional Science and Engineering Fair  
EV018 MA007

**Seminole**  
East Central Oklahoma Regional Science and Engineering Fair  
EA009 ZO042

**Tulsa**  
Tulsa Regional Science and Engineering Fair  
CS016

## Oregon

**Beaverton**  
Beaverton-Hillsboro Science Exposition  
BE048 BE321 ZO008

**Beaverton**  
Beaverton-Hillsboro Science Exposition - II  
CS017 CS302 EN006

**Coos Bay**  
Southwestern Oregon Regional Science Exposition  
EV115 ZO066

**Gresham**  
Intel Northwest Science Expo At-Large Regional  
ME068 MI037 MI306

**Klamath Falls**  
Tech Challenge Science Expo  
MA002 ME002

**Monmouth**  
Central Western Oregon Science Expo  
BE303 CH006 ME011

**Portland**  
Intel Northwest Life Science Expo  
EV037 EV313 ME034

**Portland**  
Aardvark Science Exposition  
BI008 MI302 SP005

**Portland**  
Northwest Physical Science Expo  
CH024 EN313 PH029

**Wilsonville**  
CREST-Jane Goodall Science Symposium  
BE301 BO002 EN004

## Pennsylvania

**Carlisle**  
The Patriot-News Capital Area Science and Engineering Fair  
EN082 EN083

**Lancaster**  
Lancaster Newspapers Science and Engineering Fair  
EV086 MI043

**Philadelphia**  
Ben Franklin Science Fair  
EA016 ZO070

**Philadelphia**  
Benjamin Banneker Science Fair  
BO042 MI055

**Philadelphia**  
Delaware Valley Science Fair  
ME090 ME324 MI054

**Philadelphia**  
Marie Curie Science Fair  
BI068 ME091

**Pittsburgh**  
Pittsburgh Regional Science and Engineering Fair  
CS036 EN112

**Reading**  
Reading and Berks Science and Engineering Fair  
BI043 EN092

**York**  
York County Science and Engineering Fair  
BE014 EN028

## Rhode Island

**Warwick**  
Rhode Island Science and Engineering Fair  
CH020 EN038

## South Carolina

**Clemson**  
Anderson-Oconee-Pickens Regional Science Fair  
PH045

**Columbia**  
USC Central South Carolina Region II Science and Engineering Fair  
CH069 EV119 PH312

**Florence**  
Sand Hills Regional Science Fair  
MI053

**Greenville**  
Greenville County Science and Engineering Fair  
EV057 SP014

**Hilton Head Island**  
Sea Island Regional Science Fair - Junior Division  
BO308 EV090 PH039

**Hilton Head Island**  
Sea Island Regional Science Fair - Senior Division  
EN118 EV091 PH309

**Mt. Pleasant**  
Lowcountry Science Fair  
EN088 MA028

**Austin**  
Austin Energy Regional Science Festival  
BO009 EV021 ME304

## South Dakota

**Aberdeen**  
Northern South Dakota Science and Math Fair  
EV068 EV319 MI030

**Brookings**  
Eastern South Dakota Science and Engineering Fair  
EN330 ME070 PH035

**Mitchell**  
South Central South Dakota Science and Engineering Fair  
EN111 EV084 ME317

**Rapid City**  
High Plains Regional Science and Engineering Fair  
EA015 PH047

**Timber Lake**  
Northwest Area Schools Regional Science and Engineering Fair  
BE317 EV070 ME064

## Tennessee

**Chattanooga**  
Chattanooga Regional Science and Engineering Fair  
EN081 EN085

**Clarksville**  
Middle Tennessee Science and Engineering Fair  
EN133 ZO062

**Cookeville**  
Cumberland Plateau Regional Science and Engineering Fair  
CH058 EV329 MI047

**Jackson**  
West Tennessee Regional Science Fair  
EV083 ZO064

**Knoxville**  
Southern Appalachian Science and Engineering Fair  
EV098 EV099 MI313

**Memphis**  
Memphis-Shelby County Science and Engineering Fair - North Region  
BI041 ME061

**Memphis**  
Memphis-Shelby County Science and Engineering Fair - South Region  
BI042 EN087

## Texas

**Amarillo**  
High Plains Regional Science Fair  
MA021 ZO036

**Brownsville**  
Rio Grande Valley Regional Science and Engineering Fair  
EA303 EV094

**College Station**  
Brazos Valley Regional Science and Engineering Fair  
BE028 ZO046

**Dallas**  
Dallas Regional Science and Engineering Fair - Life Sciences  
BE315 EV063 ZO044

**Dallas**  
Dallas Regional Science and Engineering Fair - Physical Sciences  
CH307 EN084 MA026

**El Paso**  
Sun Country Science Fair  
CS047 EN152 ZO313

**Fort Worth**  
Fort Worth Regional Science Fair  
EV030 ME029

**Fort Worth**  
Fort Worth Regional Science Fair - Physical Science  
CS018 EN040

**Houston**  
Science Engineering Fair of Houston - Life Sciences  
BE045 ZO052

**Houston**  
Science Engineering Fair of Houston - Physical/Engineering Sciences  
CH050 EN106

**Kilgore**  
East Texas Regional Science Fair  
CS049 ZO071

**Laredo**  
United Independent School District Regional Science Fair  
CH054

**Lubbock**  
South Plains Regional Science and Engineering Fair  
EN086 EV066

**Odessa**  
Permian Basin Regional Science Fair  
BO312 ME086 PH041

**San Angelo**  
District XI Texas Science Fair  
BI010 BO026 EN307

**San Antonio**  
Alamo Regional Science and Engineering Fair I  
CH022 CH304 SP009

**San Antonio**  
Alamo Regional Science and Engineering Fair II  
BI015 ME305 MI008

**San Antonio**  
Alamo Regional Science and Engineering Fair III  
BO011 EV026 ZO304

**San Antonio**  
ExxonMobil Texas Science and Engineering Fair  
EN336 MA037 SP016

**San Antonio**  
ExxonMobil Texas Science and Engineering Fair  
BI306 ME084 ZO055

**Victoria**  
Texas Mid-Coast Regional Science and Engineering Fair  
MA030

**Waco**  
Central Texas Science and Engineering Fair  
BO016 EV045

**Wichita Falls**  
Red River Regional Science and Engineering Fair  
CH072 EN350 EV121

## Utah

**Cedar City**  
Southern Utah Science and Engineering Fair  
EA005 EV025

**Cedar City**  
Southwest Utah Science and Engineering Fair  
EN034 ME052

**Kaysville**  
North Davis Area Science and Engineering Fair  
BI003 MI006

**Ogden**  
Ogden Area I Science and Engineering Fair  
EN073 ME049

**Ogden**  
Harold W. & Helen M. Ritchey State Science and Engineering Fair of Utah  
- Life Sciences  
CH034 CH035

**Ogden**  
Harold W. & Helen M. Ritchey State Science and Engineering Fair of Utah  
- Physical Sciences  
EV052 ME050

**Ogden**  
Weber Area Science and Engineering Fair - #1 Life Sciences  
BO024 MI025

**Ogden**  
Weber Area Science and Engineering Fair - #2 Physical Sciences  
EN074

**Ogden**  
Weber Area Science and Engineering Fair - #3 General  
PH030

**Provo**  
Central Utah Science and Engineering Fair  
BI305 CH052 EN113

**Provo**  
Central Utah Science and Engineering Fair - North  
CS314 EN110 MI044

**Provo**  
Central Utah Science and Engineering Fair - South  
EV085 ME075 ME318

**Salt Lake City**  
Salt Lake Valley Science and Engineering Fair  
EN333 EV107 PH037

## Vermont

**Northfield**  
Vermont State Science and Mathematics Fair  
BO049 PH046

## Virginia

**Arlington**  
Northern Virginia Science and Engineering Fair  
BE016 EA006

**Ashland**  
Virginia State Science and Engineering Fair  
CS041 ME035

**Charlottesville**  
Piedmont Regional Science Fair  
MA029 MI010

**Dublin**  
Blue Ridge Highlands Regional Science Fair  
EN045 MI014

**Fairfax**  
Fairfax County Area I Regional Science and Engineering Fair  
BI021 EN052 ZO306

**Fairfax**  
Fairfax County Area II Regional Science and Engineering Fair  
BE017 MI016 PH305

**Fairfax**  
Fairfax County Area III Regional Science and Engineering Fair  
EN051 PH018

**Fairfax**  
Fairfax County Area IV Regional Science and Engineering Fair  
EN050 SP010

**Fairfax**  
Fairfax County Regional Science and Engineering Fair  
BI020 PH048

**Harrisonburg**  
Shenandoah Valley Regional Science Fair  
BO048 EV087

**Leesburg**  
Loudoun County Science and Engineering Fair  
EN060 PH022

**Lynchburg**  
Central Virginia Regional Science Fair  
EN090 EV064

**Manassas**  
Prince William-Manassas Regional Science Fair  
PH053

**Norfolk**  
Tidewater Science Fair  
BI039 BO305 EN094

**Richmond**  
Metro Richmond Science Fair  
ME069

**Roanoke**  
Western Virginia Regional Science Fair  
CH049 MI042

## Washington

**Bremerton**  
Washington State Science and Engineering Fair  
BO034 ME074

**Kennewick**  
Mid-Columbia Regional Science and Engineering Fair  
CH040 EV056

**Tacoma**  
South Sound Regional Science Fair  
EV060 ME056 MI308

## West Virginia

**Huntington**  
West Virginia State Science and Engineering Fair  
EV095 ZO053

**Keyser**  
West Virginia Eastern Panhandle Regional High School Science Fair  
EN324 ZO043

**Montgomery**  
Central and Southern West Virginia Regional Science and Engineering Fair  
ZO302

**Parkersburg**  
Mid Ohio Valley Regional Science Fair  
BE052 BO047

**West Liberty**  
West Liberty State College Regional Science and Engineering Fair  
MA010 MI013

## Wisconsin

**Glendale**  
Nicolet Science and Engineering Fair  
BE020 CS020

**Milwaukee**  
Badger State Science and Engineering Fair  
MA020 PH024

**Milwaukee**  
University School of Milwaukee - Science Fair  
CH011 EN029

**Milwaukee**  
Milwaukee Regional Science and Engineering Fair  
BI013 EN033

## Wyoming

**Cheyenne**  
Southeast Wyoming Regional Science Fair  
MI303

**Greybull**  
Northern Wyoming District Science Fair  
EN013 EN318 ME014

**Laramie**  
Wyoming State Science Fair  
EN027 EV019

## AMERICA SAMOA

**Pago Pago**  
American Samoa Science Fair  
BO021 ZO035

## ARGENTINA

**Formosa**  
National Science Fair of Argentina  
CH041 ZO316

**Formosa**  
National Science Fair of Argentina - II  
BE325 PH032

**Formosa**  
National Science Fair of Argentina - III  
BE323

**Formosa**  
National Science Fair of Argentina - IV  
BE324

**Juan Bautista Alberdi**  
Science and Technology - Toy Technology Fair  
BO035

**Tucuman**  
National Science Fair of Argentina - V  
EN322



## AUSTRALIA

**Sydney**  
Young Scientist  
EN323 EV058 ZO041

## AUSTRIA

**Vienna**  
Vienna International Science and Engineering Fair  
BI026 EN335

## BELARUS

**Minsk**  
BelJunior  
CS005 EV302 PH003

## BRASIL

**Campinas**  
Escola Americana De Campinas  
BI019 CS308 EV033

**Novo Hamburgo**  
International Fair of South America - MOSTRATEC  
BE309 EN046 ME032

**Novo Hamburgo**  
FECIT Feira Estadual de Ciencia e Tecnologia do RS  
BE012 BE308 EN022

**Novo Hamburgo**  
FENACITEC - National Science and Technology Fair  
BE306 PH009 ZO012

**Sao Paulo**  
FEBRACE-SP Feira Brasileira de Ciencias e Engenharia - Regional Sao Paulo  
EN098 EN099 EN327

**Sao Paulo**  
FEBRACE - Feira Brasileira de Cincias e Engenharia  
EN100 EN326 MI034

**Sao Paulo**  
FEBRACE-N-NE-CO Feira Brasileira de Ciencias e Engharia-Regioes  
CH046 EV321 PH034

## CANADA

**Hamilton**  
Bay Area Science and Engineering Fair  
CH047 EN328 EV072

**London**  
Youth Science Foundation Team Canada Zone 1  
EN066 EN069

**London**  
Youth Science Foundation Team Canada Zone 2  
EN079 MA023

**London**  
Youth Science Foundation Team Canada Zone 3  
BE024 EN341 EV100

**London**  
Youth Science Foundation Team Canada Zone 4  
BI046 BO037

**London**  
Youth Science Foundation Team Canada Zone 5  
BI028 PH028

**Montreal, Quebec**  
Montreal Regional SciTech Fair  
BI049 EV081

**Windsor**  
Windsor Regional Science, Technology and Engineering Fair  
BI052

## CHILE

**Antofagasta**  
Eagle Science Fair  
EV123

**Septima Region-South of Chile**  
Club de Ciencias Talca, Chile  
CH065

**Valdivia**  
6th EXPLORA National Youth Science Conference  
BO304

## CHINA

**Beijing**  
Children Science Fair of Beijing  
MA031 ME314 MI033

**Beijing**  
CASTIC( China Adolescents and Technology Invention Contest), Beijing  
BI033 BO025 ME313

**Fuzhou City**

CASTIC (China Adolescents Science and Technology Invention Contest),  
Huanan  
CH030 EN315

**Guangzhou**

CASTIC (China Adolescents Science and Technology Invention Contest),  
Xinan  
CH023 EV032 ZO305

**Shanghai**

CASTIC (China Adolescents Science and Technology Invention Contest),  
Shanghai  
EV023 ZO018

**Shanghai**

The Children Science Fair of Shanghai  
CS015 EN308 ME022

**Wuhan**

CASTIC: (China Adolescents Science and Technology Invention Contest),  
Huadong  
CH008 EN304 PH007

**CHINESE TAIPEI**

**Taipei**

Middle Taiwan Regional Science Fair  
CS306 MA009 PH012

**Taipei**

South Taiwan Regional Science Fair  
BO302 CH016 PH013

**Taipei**

National Science and Engineering Fair of Republic of China  
EN314 SP007 ZO020

**COSTA RICA**

**San Jose**

Feria Nacional de Ciencia y Tecnologia  
CS038

**San Jose**

Feria Nacional de Ciencia y Tecnologia-I  
EV076

**San Jose**

Feria de Tecnologia e Ingenieria  
EV324

**CZECH REPUBLIC**

**Opava**

Students' Professional Activities  
BE305 EN005 PH005

**Prague**

AMAVET Czech Republic Science Fair  
BO039 CH063 EN340

**DENMARK**

**Copenhagen**

Unge Forskere  
CH309 ME076

**EGYPT**

**Cairo**

Egypt Science Fair  
EN138 EV332

**GEORGIA REPUBLIC**

**Tbilisi**

Georgia Republic Regional Science Fair  
MA033 MA035 MA308

**GERMANY**

**Dortmund**

Jugend Forscht  
CS305 ME024

**GUAM**

**Mangilao**

Guam Island-Wide Science Fair  
ME097

**HONG KONG**

**Hong Kong, Region of China**

Hong Kong Science and Technology Invention Contest  
EN010 EN011 EV305

**HUNGARY**

**Budapest**

Innovation Contest for Young Scientists  
EN058

## INDIA

**Bangalore**  
Intel Science Talent Discovery Fair - North and Northeast  
EN077 EN078 ZO309

**Bangalore**  
Intel Science Talent Discovery Fair - West and South  
EV053 MA306 PH031

## IRELAND

**Dublin**  
ESAT BT Young Scientist and Technology Exhibition  
MA049

## ISRAEL

**Jerusalem**  
The Israeli Young Scientists Contest  
BE031 CS030

## ITALY

**Milano**  
I Giovani e le Scienze  
EN310

## JAPAN

**Tokyo**  
Japan Students Science Awards  
CS022 ZO033

**Tokyo**  
Japan Science and Engineering Challenge  
EV061 MA025 PH311

## JORDAN

**Amman**  
Science Fair of the Jordanian Ministry of Education  
CS009 EV008 PH301

**Amman**  
Science Fair of the Jordanian Ministry of Education - II  
EV009 EV303 SP004

## KAZAKHSTAN

**Astana**  
DARYN National Junior Science Projects Competition  
CS317 MA044 MA045

## MALAYSIA

**Kuala Lumpur**  
National Schools Science Innovation and Engineering Competition  
EN149 EV120 ME325

**Pontian, Johor**  
MRSM Young Scientist  
ME319

## MEXICO

**Monterrey**  
Gran Encuentro de Ciencia Joven  
CS312 ME065

**Monterrey, N.L**  
Mexico-ITESM National Fair  
CS034 CS313

**Puebla**  
Gran Encuentro Nacional de Ciencia Joven  
CS033 EN114 EV326

**Puebla**  
Gran Encuentro de Ciencia Joven  
BI307 EV078

## NIGERIA

**Edo State**  
Nigeria Science Fair  
EN019 EN024 EV309

## NORTHERN IRELAND

**Belfast**  
Seagate Young Innovators  
EN312

## NORWAY

**Oslo**  
Norwegian Contest for Young Scientists  
BI047

## PAKISTAN

**Islamabad**  
Pakistan Science Olympiad  
CH037 CS029 ME311

## PHILIPPINES

**Manila**  
Intel Basic Philippine Science Fair  
EV022 ME303 ZO017

**Manila**  
Intel Philippine Applied Science Fair  
CH013 CH017 PH303

## PORTUGAL

**Porto**  
Portuguese Contest for Young Scientists  
BO309

## PUERTO RICO

**Arecibo**  
Arecibo Regional Science Fair  
BO029 EV325 MI036

**Bayamon**  
Bayamon Regional Science Fair I  
BO032 EV327 ZO048

**Caguas**  
Caguas Regional Science Fair  
BE039 BO306 EN103

**Cayey**  
Radians Science and Engineering Fair  
EV073

**Fajardo**  
Fajardo Regional Science Fair  
BE038 MI310 ZO049

**Guaynabo**  
San Juan Archdiocesan Region I Science Fair  
CS025 MA019 ZO308

**Guaynabo**  
San Juan Archdiocesan Region II Science Fair  
EN063 EN316 EV049

**Guaynabo**  
San Juan Archdiocesan Region III Science Fair  
BE026 BE311 BI029

**Guaynabo**  
San Juan Archdiocesan Region IV Science Fair  
BO019 BO020 PH310

**Humacao**  
Humacao Regional Science Fair  
BI055 ME078 ME320

**Mayaguez**  
Mayaguez Regional Science Fair  
BI054 EN116 ZO311

**Mayaguez**  
Southwestern Educational Society Regional Science Fair  
CS007 PH004

**Morovis**  
Morovis Regional Science Fair  
EV089

**Ponce**  
Ponce Regional Science Fair  
CH055 ME077

**San German**  
San German Regional Science Fair  
BO307 EV080 MI038

**San Juan**  
Western Regional Mathematics Fair  
MA011 MA012 MA302

**San Juan**  
Eastern Regional Mathematics Fair  
MA013 MA014 MA303

**San Juan**  
San Juan Regional Science Fair  
EN104 ME315 MI039

## ROMANIA

**Iasi**  
Romania Science and Engineering Fair  
BE009 EN302 MA006

## RUSSIA

**Moscow**  
Junior - I  
CH031 CS023 MA304

**Moscow**  
Junior-II  
CH033 CS026 MA305

**Moscow**  
Junior 3  
CS310 MA016 MA017

**Moscow**  
Junior - 4  
CH032 PH027

**St. Petersburg**  
Intel Baltic Science and Engineering Fair  
CS006 MA005 MA301

## SINGAPORE

**Singapore**  
Singapore Science and Engineering Fair  
BO012 EN047 MI304

## SLOVAK REPUBLIC

**Bratislava**  
AMAVET-Slovak Association for Youth, Science and Technology  
CS043

## SOUTH AFRICA

**Pretoria**  
Expo for Young Scientists - South Africa  
CS307 EN035 PH014

## SOUTH KOREA

**Daejon City**  
Korea Science and Engineering Fair  
EN119 ME081 ZO312

**Seoul**  
Korea Olympiad in Informatics  
CS035 CS037

## SWEDEN

**Stockholm**  
Utställningen Unga Forskare  
EN348

## THAILAND

**Bangkok**  
National Science Projects Competition  
BO310

**Bangkok**  
National Electronics and Computer Technology Center  
CS024 EN064 EV316

## TURKEY

**Ankara**  
Tubitak fair  
CS048 EN145

**Istanbul**  
13th National Environmental Project Olympiad  
CH053 EA013 EV322

**Istanbul**  
11th International Environmental Project Olympiad  
BO036 EV077 MI311

## UKRAINE

**Kyiv (Kiev)**  
Intel - EcoUkraine  
CH007 EV010 EV304

## UNITED KINGDOM

**London**  
The British Association for the Advancement of Science  
CREST Science Fair  
BE023 PH025

**London**  
Exscitec Fair  
BI071 CH066 EN345

**London**  
Young Engineers for Britain  
EN096 EN115

## VIRGIN ISLANDS

**St. Croix**  
The Good Hope School Science Fair  
EN097 MI035

# ALPHABETICAL LIST OF FINALISTS

A 'T' after the booth ID number indicates a Team Project

., Anudeep	MA306T	Athreya, H.U.	CH304T	Bildirir, B.	EV322T
Abayev, J.N.	EN309T	Atluri, K.	BI304T	Bilkova, B.	CH063
Abbasi, G.J.	MA049	Attaby, A.M.	EV332T	Bionta, M.R.	EA010
Abd Elmonem, M.A.	EN138	Attarzadeh, D.O.	CS304T	Biskis, V.N.	BE320T
Abdel Khaleq, Z.H.	PH301T	Aube, A.H.	EV041	Bitker, G.P.	BI004
Abdul-Jaleel, D.J.	EV008	Aycock, K.I.	EN071	Blatz, A.M.	ME045
Abreu-Velazquez, J.Y.	BI055	Azadian, N.S.	EV307T	Blosser, C.A.	BE013
Abu Salem, A.F.	CS009	Babb, S.L.	EV085	Blumenthal, D.A.	MI050
Acevedo-Milan, C.	BO307T	Babcock, P.D.	BI026	Boardman, T.O.	EN034
Adams, R.M.	BE307T	Bachas-Daunert, S.M.	ME027	Boden, E.C.	ME086
Adcock, E.M.	ME305T	Badran, A.H.	BI037	Bongiovanni, B.A.	ME321T
Adcock, S.A.	PH043	Baiadze, I.	MA308T	Bonham, T.M.	EN320T
Agafonov, V.A.	MA304T	Bailey, E.B.	ZO016	Bonner, T.D.	CS003
Ahdout, Z.P.	CH308T	Baizhanov, B.	MA045	Bordelon, S.R.	BO006
Ahiska, K.	EN145	Bajraktari, I.	BI061	Borden, P.Y.	SP003
Ahmad, V.	MA306T	Baker, E.A.	BE035	Borthakur, G.D.	BI067
Al shogran, A.K.	SP004	Baker, J.L.	ZO047	Bosworth, E.L.	EV084
Aldaraghme, S.Y.	EV009	Baker, M.C.	BI017	Boulogny, I.M.	EN144
Alekhin, A.P.	MA305T	Baker, R.A.	EN317T	Bowman, J.D.	EV072
Alexander, M.R.	MI056	Bakshi, A.M.	EN331T	Boyd, N.C.	MI058
Alfert, R.E.	EN350T	Baliuta, A.A.	EV302T	Brandenburg, J.D.	CS011
Alger, G.D.	ME052	Banerjee, S.	BE045	Bratcher, D.M.	CS303T
Ali, D.H.	EV314T	Barbosa, W.L.	EN327T	Braulick, K.N.	BI014
Ali, H.K.	MI022	Barnett, A.C.	MA004	Brenner, N.R.	EN134
Ali, H.K.	ME019	Barnett, K.	MI307T	Brinkopf, B.L.	CS008
Alicea, L.D.	BO029	Baron, J.	BE019	Brinkopf, M.M.	BE006
Alvarez, W.F.	MA013	Barreto, J.A.	SP006	Briones Serna, J.d.	CS313T
Alzorgan, A.I.	EV303T	Baskaran, S.	CH040	Broderius, L.P.	EV011
Alzorgan, M.I.	EV303T	Basu, R.A.	MI042	Brogie, J.K.	BI056
Amos, R.	CH066	Basu, S.	MI002	Broussard, N.J.	CS302T
Amurao, R.S.	ZO017	Baxi, A.C.	BI042	Brown, L.A.	BI034
Anderson, B.N.	EV107	Baylon, M.Q.	BI013	Brown, M.W.	CH049
Anderson, K.S.	EN018	Bean, J.K.	CH052	Brown, P.C.	EV318T
Anderson, S.E.	ZO302T	Behringer, R.S.	EN306T	Bruce, F.M.	BE322T
Andrade, A.R.	CS315T	Belflower, M.J.	EN321T	Brungardt, A.L.	PH307T
Andreoli, G.M.	BE309T	Bell, J.B.	EN126	Buchanan, A.C.	CS010
Andriolla, L.L.	BE306T	Bell, N.K.	EV002	Budd, T.L.	EN096
Anello, A.G.	BE313T	Beller-Morales, W.O.	EN319T	Buenger, T.	CS305T
Anyan, M.E.	EV056	Bentley, F.R.	EV310T	Bureros, K.C.	ME303T
Aponte, A.A.	BO032	Berges, L.E.	BE311T	Burgess, H.M.	EV328T
Argo, K.N.	BE037	Berhe, F.	EV320T	Burk, D.C.	EN050
Arkfeld, E.K.	ZO054	Bernert, M.J.	BO002	Burlingame, K.E.	MI001
Arkipov, A.	MA034	Bethel, C.R.	CS301T	Burney, D.T.	MI028
Armella, J.H.	BE325T	Betsill, A.R.	MI314T	Burnham, J.L.	ZO001
Armstrong, A.L.	EN033	Bezler, R.J.	BE029	Burstein, C.A.	BI006
Arnold, C.J.	SP015	Bezchlebova, P.	BE305T	Busdicker, E.W.	EV330T
Arnold, L.	PH025	Bezdek, D.K.	MA023	Bustos, M.A.	EV114
Aron, A.M.	ME074	Bhalla, S.	CH002	Byun, K.	CS037
Arredondo, G.	MA007	Bhashyam, A.R.	EN112	Caballero, D.O.	EA303T
Arredondo, V.S.	BO304T	Bhaskaran, S.	CH045	Caduada, L.N.	CH013
Artiushin, G.S.	EV311T	Bhatia, A.D.	EV030	Cagle, D.C.	BO312T
Athanasoula, E.A.	ME324T	Bildirir, B.	EV322T	Cai, Y.	MI315T

Cain, B.J.	CS311T	Chimal, T.	EV326T	de la Garza, L.A.	CH022
Call, E.K.	EN120	Chinaroonchai, T.	BO310T	de Mello, B.D.	BE308T
Campbell, B.J.	PH030	Chow, M.Y.	ME057	De Obaldia, C.	MI055
Cannon, I.P.	EN323T	Christiaens, K.E.	MI024	dela Cruz, J.L.	ME303T
Cantarelli, P.	EN310T	Chu, C.	EV305T	Delano, M.	BE030
Cao, Y.	ZO008	Chuang, F.F.	CS316T	DeLeon, O.G.	CH036
Capecelatro, A.N.	EN048	Chulanon, P.	EV316T	Delevett, R.E.	BO311T
Cardman, Z.M.	BI039	Chunduru, M.	ME056	Delgado, E.N.	ME080
Carey, A.A.	EV115	Chvykov, P.V.	PH306T	Delwiche, K.P.	MI306T
Carlson, I.M.	EN330T	Clain, J.B.	ME037	DeNasha, A.E.	ZO050
Carlson, R.R.	CH006	Clark, R.J.	EV090	Dender, A.E.	BE042
Carole, P.A.	EN344T	Clark, S.C.	ZO304T	Denduluri, S.K.	MI012
Carole, R.G.	EN344T	Clark, T.J.	EN093	Denis, K.A.	CS002
Carson, J.	EN337T	Clary, S.L.	ZO022	Dennis, C.W.	BE303T
Carson, S.G.	ZO301T	Clement, B.E.	ME004	Desai, A.G.	EN342T
Carter, A.L.	MA046	Clement, E.M.	MI027	Desai, S.J.	BE032
Cary, L.L.	BO301T	Clement, K.C.	BI021	Dexter, J.P.	BO049
Casimero, B.C.	ME303T	Clewis, J.W.	ZO072	Diao, Z.	ZO305T
Cassidy, R.J.	MI309T	Clunie, V.H.	MI313T	Diaz, M.P.	BO035
Cassidy, S.M.	BE301T	Cochran, E.J.	MI303T	Diaz Suarez, H.	CS007
Casteel, L.B.	ZO024	Codrea, S.	BE009	Ding, K.	EN010
Castro-Nogueras, I.	MA303T	Coffin, L.A.	EN016	Ding, M.	CH051
Casurra, J.A.	EV022	Cohen, E.M.	ME054	Dmitriev, A.	MA301T
Catanach, T.A.	SP016	Cohn, R.B.	EV048	Dmytrenko, M.A.	EV304T
Catlett, N.B.	PH307T	Cole, S.M.	EV109	Doenlen, W.R.	MA003
Cepeda-Lopez, M.M.	BE038	Conlon, K.M.	EV098	Dohrenwend, M.M.	EV079
Chakkaphak, P.R.	ME094	Conner, J.J.	EN028	Dolan, R.G.	EV104
Chakraborty, R.	EN106	Cook, D.K.	EV074	Doll Requena, T.N.	BE311T
Chan, B.Y.	EV314T	Copeland, S.C.	EA008	Donnelly, K.C.	BE023
Chandra, V.	MI309T	Corbett, N.C.	EV101	Dorminy, J.W.	MA041
Chandrasekar, R.	EN042	Cornale, K.	BE024	Douglas, L.R.	EV087
Chang, B.M.	EN107	Corrigan, J.W.	BO033	Douglas, M.F.	BE318T
Chang, F.K.	BI050	Cossey, J.A.	EV077	Doyle, S.R.	ME008
Chao, Y.	ZO020	Cotelo, M.	ZO061	Drescher, Z.J.	CH301T
Chapman, A.L.	EN324T	Counsell, D.W.	EN101	Driskell, A.L.	ZO023
Charles, D.W.	EV318T	Coury, K.M.	EV103	Duan, X.	BE314T
Charoen, K.M.	BI080	Cox, D.M.	EA019	Duchi, A.J.	EN305T
Chary, M.C.	MI054	Cox, H.R.	BO003	Duenas, M.J.	ME097
Chassevent, R.C.	EV057	Crane, R.J.	ZO059	Duruz, M.C.	EN332T
Chavez, L.	EN108	Crivello, J.A.	EN029	Dyachenko, V.	CS006
Cheatham, K.C.	EN318T	Cromwell, M.E.	EN097	Dyer, C.W.	BI009
Chelliah, N.E.	MA029	Cruz, M.X.	EN051	Edgar, J.L.	EN001
Chen, D.	EN308T	Cruz, X.A.	ME077	Edlund, A.J.	BE316T
Chen, F.	ME034	Culler, E.S.	CS040	Efthymiou, A.	BI303T
Chen, G.	CS316T	Cumbie, A.D.	SP023	Ekladyous, N.S.	EN109
Chen, H.	SP007	Cummings, E.B.	EN073	El Boghdady, N.H.	EV332T
Chen, H.	CS306T	Cummings, I.D.	ME049	Elder, G.C.	EN132
Chen, J.	BE322T	Cunha, M.T.	EV321T	Elion, D.L.	MI061
Chen, K.	PH012	Czura, E.M.	BO308T	Ellsworth, D.M.	EN037
Chen, L.	ME323T	D'Abate, L.	BI049	Ennis, E.A.	CS301T
Chen, X.	ME310T	D'Agostino, E.N.	ME316T	Eppard, E.F.	EN151
Chen, Y.	EN314T	Daly, K.	CH062	Erlandson, K.L.	ZO004
Cherbak, B.M.	EN131	Daly, T.	SP017	Esquivel, M.	EV123
Cherney, A.H.	PH308T	Damodar, D.	EA003	Estey, C.A.	BI308T
Chernoby, G.F.	BE312T	Daniels, K.R.	MI312T	Evans, D.D.	EN312T
Chernyak, A.	PH306T	Davenport, K.M.	EN085	Evans, D.L.	EV021
Chesaneck, D.F.	ME012	David, E.E.	EV019	Evans, M.G.	ME075
Chiang, Y.P.	BI051	Davis, K.L.	MI004	Everett, M.B.	BE049
Chiardola, H.G.	EN046	Dawson, A.S.	ME059	Ezer, D.	BI038
Child, A.L.	CH047	de Klerk, D.N.	CS307T	Ezinne, N.	ME304T

Falco, X.J.	CS314T	Garcia, B.	ZO311T	Guo, S.	ME313T
Fan, M.A.	ME327T	Garciaarena, M.	BE323T	Gupta, M.	ME017
Fan, W.	EN313T	Garrett, A.K.	EV100	Gupta, S.G.	ME321T
Fan, Y.	MI047	Gasior, S.A.	EN079	Gupta, V.	ZO307T
Fang, K.Y.	BI070	Gastopoulos, T.	ME324T	Guptasarma, I.	PH024
Farris, J.N.	BE302T	Gates, S.R.	CH303T	Gurkan, H.A.	CS048
Fauzi, F.A.	ME325T	Gautam, M.	EN342T	Guthrie, L.T.	MI035
Feeley, K.A.	BO038	Gavin, M.E.	EV060	Gutormson, K.R.	MI060
Feller, A.K.	ME014	Gavini, M.P.	ME013	Guy, J.C.	ZO058
Femerstrom, D.R.	EN348T	Genc, H.	EA013	Hackbarth, J.K.	CH050
Fenska, K.E.	EV007	Gibson, R.	MI305T	Haffner, M.J.	EN322T
Ferar, K.J.	MI302T	Gilbert, A.A.	ME050	Hagen, A.R.	EN129
Fernandez, E.	PH004	Gilbertson, L.R.	EV043	Hagen, J.T.	SP008
Fernandez-Vidro, J.A.	ZO049	Gillespie, K.L.	BO023	Hailemariam, M.G.	EN343T
Ferreira, R.F.	MI034	Gillund, S.B.	BE050	Haji Ismail, R.M.	ME319T
Fields, K.L.	MI057	Ginsbach, M.L.	BO045	Hakova, P.	EN340T
Figueroa, L.	ME320T	Gintz, G.E.	PH039	Halbert, T.W.	PH305T
Figueroa-Bravo, Z.Z.	BI054	Glasgow, C.E.	ME002	Hall, S.E.	ZO301T
Fischell, E.M.	ME090	Glass, L.M.	ME096	Hall, S.A.	EV040
Fishel, H.R.	ZO011	Gleiber, M.R.	EV111	Hallet, S.T.	BE002
Flegiel, M.A.	EV307T	Glissmann, G.R.	CS309T	Hamm, S.E.	EV031
Fleming, B.J.	EN312T	Glissmann, R.V.	CS309T	Hamner, B.S.	MA028
Fleming, K.M.	CS016	Gloyna, T.E.	EV045	Hamraeva, S.N.	ZO065
Fleming, M.R.	EN009	Gnedenkov, A.S.	CH032	Hansen, C.J.	MI003
Fleming, T.D.	EN321T	Godinez, M.E.	CS033	Hanson, J.E.	PH033
Fletcher, L.L.	ZO066	Goel, H.V.	ME327T	Harper, C.J.	BO026
Fletcher, W.R.	CS027	Goettman, J.M.	EN350T	Harrison, B.A.	MA032
Flores, E.J.	EN337T	Goli, R.R.	ME085	Harshman, S.J.	MI013
Flores, E.C.	ME318T	Goma Pumarino, C.	CH065	Hartley, E.L.	MA027
Flores Galvan, O.F.	CS313T	Gonzalez, I.Z.	EV325T	Hasan, M.M.	EA302T
Fontanez, A.O.	MA014	Gonzalez, J.G.	ZO316T	Hasan, S.A.	ME067
Forbis, A.D.	EV066	Gonzalez Torres, M.E.	EN063	Hasbrook, N.T.	EA301T
Fortier, J.A.	EN038	Goodgame, K.A.	BO022	Hasbrook, S.E.	EA301T
Foss, C.T.	BO308T	Goodman, J.V.	ME306T	Hase, L.A.	MI017
Foster, C.A.	EN328T	Gopal, D.J.	BI030	Hatahet, Z.S.	BI023
Fowers, J.H.	EN032	Goreczky, S.A.	EN084	Hawes, S.A.	EV328T
Fox, C.H.	EN325T	Gorleri, F.C.	ZO316T	Heacock, C.S.	ZO044
Freeman, C.J.	BI002	Gotay, F.J.	BO019	Head, M.M.	EN346T
Freeze, E.B.	ZO037	Gotte, M.	BE309T	Hedrick, H.F.	EN007
Freitas, D.L.	PH034	Gottschalk, A.J.	PH038	Heeb, A.B.	MI011
Friesen, F.Q.	EN023	Gould, N.E.	MA309T	Heffern, K.C.	EV312T
Fritzler, R.R.	ME039	Gravois, L.M.	ME302T	Heideman, K.	PH304T
Frota, L.M.	EV321T	Greenwood, M.L.	PH052	Hein, E.R.	ME098
Fruits, B.R.	EV005	Greenwood, M.A.	MI313T	Heintz, A.M.	BE008
Fu, M.	EV032	Gregory, J.M.	CH043	Heintz, B.N.	EV312T
Fuentes-Payan, W.	EN103	Grelle, T.	CS305T	Heintzman, L.J.	EV319T
Fuhr, H.	EN326T	Grewal, A.S.	BI065	Helsper, T.E.	CS021
Fuhrmann, A.M.	PH022	Griffin, B.S.	PH309T	Hemmingsen, R.M.	CH301T
Fuller, I.M.	EN072	Grill, B.	CH021	Hennenfent, S.G.	BE310T
Futch, H.A.	ZO015	Grinovero, P.N.	BE309T	Henriques, D.S.	BO309T
Gabrielova, E.	ME025	Grint, K.A.	MI025	Henry, J.K.	EV323T
Gaglani, S.M.	ME009	Grubb, IV, F.L.	EN324T	Hernaez, O.V.	BO044
Gail, N.H.	EA012	Grytaa, H.	BI047	Hernandez, E.	MI310T
Gaimarri, A.	EN310T	Guan, C.M.	ZO062	Hersh, A.S.	EN057
Gallagher, M.S.	EN150	Guasp-Perez, G.M.	ZO308T	Hester, A.M.	CH311T
Gallegos, A.A.	CS312T	Guerra, J.E.	ME065	Hettmann, D.M.	PH053
Gamalski, A.D.	CS318T	Guevara, M.D.	PH303T	Hicks, S.M.	ZO304T
Gamber, J.M.	BE304T	Guillotte, T.B.	BO008	Hines, A.M.	EV038
Gamurot, R.	SP021	Gulak, B.P.	EN341T	Hinesley, J.L.	PH047
Ganapati, V.	CS017	Guo, C.	BI041	Hinig, B.A.	CS039



Hippalgaonkar, V.R.	BO303T	Jennings III, R.F.	MA051	Klar, P.	EN335T
Hirpa, I.H.	MI315T	Jensen, A.K.	EV050	Klein, A.d.	BE012
Hisham, H.H.	ME319T	Jentz, K.G.	EV117	Klein, S.L.	EN135
Ho Ching, K.M.	ME028	Jessop, F.C.	ZO315T	Knowles, C.R.	EV055
Hofer, M.E.	BE044	Jette, C.L.	CS045	Kobayashi, T.	PH311T
Hoffpauir, K.J.	EN306T	Jewell, M.E.	CH311T	Kodali, S.	ME084
Hofmeister, L.H.	EN133	Jiang, Y.	ZO018	Kohki, M.	EV061
Holcomb, F.T.	EN347T	Jimenez, J.A.	CS047	Koirala, P.	BO013
Holkesvik, K.A.	EV068	Jimenez Trigueros, J.P.	EV324T	Konermann, S.	ME024
Holz, D.S.	PH002	Jindal, G.A.	BE022	Koshino, S.	MA025
Homrighausen, J.D.	BO034	Joe, H.B.	BE046	Kosik, M.	CS043
Hope, E.A.	SP005	Johns, C.E.	MI301T	Kottapalli, A.P.	EN130
Horn, K.D.	ME001	Johns, J.A.	MI301T	Kozin, R.D.	MA305T
Horton, D.R.	ZO003	Johnson, A.K.	CH058	Krabs, O.	EN340T
Horton, K.A.	ME023	Johnson, B.B.	BE048	Krakauer, M.	CH302T
Hoskins, T.B.	BO005	Johnson, I.A.	EN311T	Krause, J.R.	PH018
Hovat, N.M.	EA005	Johnson, J.K.	BE027	Kravchenko, A.S.	CS023
Hovland, J.J.	MI059	Johnson, M.B.	EN146	Krell, J.M.	EN111
Hu, A.H.	MA030	Johnson, W.A.	BE034	Kreutzer, E.J.	EN305T
Hu, Y.	CH030	Jones, J.P.	ME058	Kugler, S.A.	EN349T
Huacuja, L.	CH054	Jones, R.B.	ME020	Kumar, V.	ME053
Huang, J.J.	BI069	Jones, R.P.	EN301T	Kumbhat, H.K.	EA017
Huang, M.	MA309T	Jonsson, G.A.	ME076	Kunaparaju, S.	ZO051
Hubley, L.M.	BI003	Joselow, S.B.	BE033	Kunding, D.P.	EN117
Hubrig, A.L.	ZO069	Juan-Martinez, J.E.	MI038	Kuo, P.	MA009
Huen, Y.	EN011	Juang, S.D.	BO302T	Kurbanov, A.	MA301T
Hulteng, M.A.	BE301T	Juang, T.C.	BO302T	Kuzin, Y.V.	CS310T
Huninghake, K.A.	EV310T	Jurick, K.J.	BE307T	Kuznetsov, G.	EN333T
Hurta, M.B.	EN307T	Kabinoff, M.P.	BI044	Kwan, J.Y.	BI052
Hurwich, J.A.	EN089	Kady, C.T.	ME079	Lack, J.A.	CH004
Hushebeck, K.M.	EA020	Kahn, S.M.	CS031	Lafer, J.M.	PH021
Hutchinson, D.W.	EN345T	Kaiser, M.K.	BO007	Lafer-Sousa, L.	BI015
Hutchison, J.J.	BO303T	Kakar, S.	EV331T	LaFromboise, A.J.	EV093
Huwe, E.L.	EN311T	Kamantsev, A.P.	PH027	LaGasse, M.K.	EN137
Huynh, R.K.	ME301T	Kamat, N.P.	EV065	Laing, E.B.	ME088
Huynh, R.K.	ME301T	Kang, D.	ZO306T	Lampert, C.A.	EV071
Ibasco, J.O.	BO021	Kao, S.	PH013	Lang, C.J.	BO042
Igbinsosa, O.C.	EV309T	Karakoc, A.Z.	CH053	Lange, A.M.	CH056
Ike-Nwosu, O.C.	EV309T	Karelskiy, A.	CS317T	Lansdowne, H.M.	BO024
Imoisili, O.I.	BI066	Kartoza, G.	MA035	Larrabee, K.J.	EN092
In, J.	EN346T	Kassa, B.T.	EN343T	Lashgari, Y.B.	CH307T
Indurkhya, S.	CS032	Katz, M.B.	BE041	Laviolette, J.L.	EN055
Irlanda, V.F.	ME315T	Kavak, A.F.	MI311T	Lawrence, S.K.	CH034
Itthipanyanan, S.	BO310T	Ke, B.	EN315T	Lechner, A.J.	ME323T
Ivanishvili, P.	MA033	Kebede, N.A.	EV320T	LeCroy, K.A.	CH060
Ivanou, A.O.	PH003	Keck, T.M.	EV108	Lee, A.	ME018
Izatt, C.S.	ME318T	Keeling, E.L.	EV075	Lee, C.	EN314T
Jachowski, D.K.	SP010	Kelly, J.R.	PH006	Lee, D.	ZO312T
Jacks, D.	MI307T	Ketcham, I.M.	BI027	Lee, E.	CH027
Jackson, J.L.	CH009	Khan, H.S.	EA302T	Lee, H.	CS035
Jafferani, A.A.	ME311T	Khanna, A.	ZO310T	Lee, J.S.	EN119
Jagadeesan, N.	ME087	Khezri, N.	EV082	Lee, J.J.	MA307T
Jain, I.H.	ZO070	Khoja, S.M.	ME311T	Lee, K.	CH024
Jamison, P.M.	CH015	Khushf, A.C.	PH312T	Lee, R.C.	EV329T
Janecka, A.	PH005	Khweis, J.Z.	ME021	Lee, S.J.	EN345T
Jang, S.	BE020	Kibby, D.D.	PH017	Lekavijit, T.	EV316T
Jeannet, K.L.	ZO031	Kim, K.	ZO306T	Lessen, M.A.	EV333T
Jeffries, E.C.	ME011	Kimbel, A.G.	EN062	Leung, W.	BE319T
Jenkins, A.R.	EN136	King, .C.	EA015	Leussink, F.	ZO052
Jenkins, C.M.	EN043	Klages-Mundt, A.A.	EN003	Levary, D.A.	BO041

Levin, R.E.	EV304T	Luyt, P.C.	EN035	Meineri, F.	BE323T
Levron, R.N.	EV017	Ly, H.T.	BE319T	Melero, R.W.	PH009
Levy, A.W.	EN004	Lyons, A.M.	ZO057	Meller, R.A.	MI009
Lew, B.T.	CH068	Ma, H.	CH008	Melton, C.M.	MI051
Lewis, G.D.	EN039	MacDonald, D.J.	EV124	Melton, J.L.	EN080
Li, C.W.	EV329T	Mace, Z.S.	BE052	Mendez Martinez, E.	BI307T
Li, L.	BI033	MacGregor, M.A.	PH026	Mendivil, A.J.	ZO029
Li, S.	PH007	Machorro, S.N.	BI307T	Mendoza, G.J.	ZO313T
Li, W.	ME314T	Macias, N.J.	EN152	Menezes, S.L.	EV033
Li, Y.	BI005	Macicasan, T.	EN302T	Menn, M.A.	CH042
Li, Y.	EV001	Mackey, S.D.	ZO021	Mercado Jimenez, S.A.	MI036
Liang, Y.	CH023	MacKinnon, R.A.	EN061	Mercado-Santiago, J.L.	BO307T
Liechty, J.A.	EN049	Maddox, L.M.	PH041	Meskhishvili, L.	MA308T
Liew, J.	BO012	Maddur, S.S.	MI020	Messick, C.D.	EN021
Lightfoot, J.K.	EV092	Madiraju, K.	EV081	Meyer, M.M.	BO046
Liles, L.M.	BO016	Magstadt, A.S.	EN318T	Michaels, Y.S.	BI028
Lim, C.C.	BO009	Makhni, S.	ZO039	Micinski, K.K.	CS018
Lin, K.J.	BE315T	Makuta, L.V.	EV302T	Mickelson, A.D.	EN020
Lin, S.	ME314T	Malach, A.M.	BE310T	Mikkilineni, S.V.	MA042
Lin, Z.	EN315T	Malcova, J.	BE305T	Miles, C.A.	BI305T
Lingus, K.J.	BO031	Malhotra, S.	CH067	Miller, D.A.	EV317T
Liodakis, E.G.	CS314T	Malin, J.J.	EN115	Miller, D.B.	EN142
Lisica, S.K.	MI029	Malitskaya, Y.	MA044	Miller, G.H.	ZO036
Lisson, R.J.	SP001	Malone, C.M.	EN312T	Miller, M.M.	EV044
Litt, D.A.	MA018	Malone, J.L.	EN065	Miller, S.L.	EV315T
Little, S.A.	EN307T	Malone, S.T.	PH044	Millmier, C.J.	MI046
Liu, A.W.	BE318T	Malz, A.I.	SP011	Milman, K.R.	EV012
Liu, C.	EN304T	Mandrov, D.V.	CS026	Minehart, R.F.	EN060
Liu, H.	EN308T	Manduca, R.A.	EV069	Mineiro, G.A.	EN022
Liu, L.	CS015	Manglik, G.	BE314T	Minoff, A.K.	BE016
Liu, M.	EN325T	Mann, J.W.	EV306T	Mishra, A.	EN078
Liu, X.	ZO305T	Mann, M.S.	MI048	Missbichler, B.	EN335T
Liu, Y.	EV015	Mannava, S.	EV018	Mistretta Jr., M.C.	PH001
Lloyd, H.	CH035	Mannuru, S.	ME304T	Mitchell, A.K.	EN303T
Lobo, C.D.	PH029	Manshad, A.S.	BE021	Mitchell, B.D.	BI075
Locke, IV, W.A.	BE025	Manzano, L.A.	EN316T	Mitchell, J.D.	MA039
Long, C.B.	EN045	Manzano, R.J.	EN316T	Mitchell, M.R.	BI079
Long, E.E.	MI014	Marelli, A.	EN310T	Mitchell, S.E.	ZO303T
Lookmanjee, N.A.	EV063	Marmel, D.I.	ZO055	Mittal, V.	ZO309T
Lopatin, I.D.	CS310T	Marrone, L.M.	ME035	Mittiga, III, R.A.	CS311T
Lopez, A.	EV094	Martarena, B.Z.	BE325T	Mocz, L.	MA043
Lopez, A.	EV325T	Martinez, M.	ZO311T	Mocz, P.	SP022
Lopez, A.M.	EV039	Martinez Bautista, D.	EN114	Modhafar, A.A.	PH301T
Lopez, C.E.	EN025	Martins Osorio, J.O.	EN326T	Mogan, C.L.	EV047
Lopez Nieves, S.	MA011	Mascharak, S.	CH012	Mohammed, M.K.	MI005
Lopez-Gonzalez, A.J.	MA302T	Masterman, M.	PH020	Mohammed, Y.M.	BI007
Lorn, C.J.	ME304T	Matheus, T.J.	EV051	Mohan, D.P.	ME029
Louque, I.J.	ZO038	Maturen, A.T.	EN344T	Mohanty, S.E.	CH020
Love, D.T.	ZO006	Mavrogordato, A.W.	EN118	Mohd Aseri, M.S.	EN149
Lowry, B.H.	PH313T	Mayer, B.L.	BE317T	Mohd Bakri, M.F.	ME325T
Loza, J.K.	ME046	McCormick, E.N.	ZO314T	Molina, K.E.	BO020
Lozada, X.E.	PH310T	McCoy, D.T.	SP018	Mollen, C.C.	EN348T
Lu, X.	EN304T	McCuskee, S.L.	PH028	Moller, R.B.	CH309T
Lu, Y.	MI032	McDonald, J.B.	ZO053	Molloy, A.J.	EN341T
Lucier, M.H.	EV121	McGuire, C.C.	EN333T	Monier, E.N.	ME305T
Luger, R.	CS308T	McKinney, M.A.	EV313T	Monosov, D.M.	CH007
Lukaczyk, T.W.	PH305T	McReynolds, A.C.	EV036	Mooney, J.E.	CS315T
Luo, J.	EV125	Medina Hernsandez, A.	CS034	Moore, IV, J.P.	EN075
Luther, M.S.	BE320T	Meier, M.J.	PH054	Moorthy, G.S.	MI019
Lutz, J.T.	EN008	Meigh, K.M.	MA010	Morales Delgado, J.A.	CS038

Morgan, R.B.	EN026	Novoa, A.K.	EV122	Perez-Colon, C.O.	ZO308T
Morgan Jr., S.A.	EV014	Nyanti, L.E.	EV120	Perez-Diaz, F.	BO306T
Morgenstern, K.A.	EN332T	O'Donnell, A.L.	EN012	Perry, A.P.	CH028
Morikawa, E.T.	EN122	O'Neal, P.L.	EA018	Peters, C.E.	MI053
Morris, Q.A.	EN325T	Obrebski, C.E.	BO018	Peterson, B.J.	EN110
Morris, III, G.R.	CH072	Odaro, D.O.	EN019	Petry, B.M.	EN326T
Moulding, M.	EV052	Odell, B.A.	EN303T	Pezzino, J.J.	CS020
Mount, G.	ZO014	Oetker, E.G.	CS042	Pfeifer, K.B.	EA009
Mousa, S.S.	ME048	Ogieva, O.	EV309T	Pfeifle, J.R.	BE317T
Moustafa, Z.D.	ZO040	Okumoto, K.	PH311T	Phare, C.T.	CH071
Munday, E.S.	ZO028	Olejar, M.	EN005	Phelps, K.G.	CH044
Muralidhar, V.	CS318T	Oliveras, L.	EV327T	Phillips, J.B.	MI006
Muresan, F.P.	EN302T	Olsen, C.J.	EN139	Phillips, K.M.	EV070
Murillo Fernandez, J.R.	EV076	Ong, S.	EN047	Pian, R.E.	EV059
Murray, C.	PH037	Oosthuizen, D.J.	CS307T	Piehl, K.A.	ZO009
Musser, M.L.	EV083	Oprescu, C.I.	ME327T	Pierce, A.G.	CS302T
Myneni, A.	BO305T	Orellana, L.A.	BO304T	Pietsch, C.E.	CS028
Mysula, N.I.	EV010	Ortiz, A.J.	EV073	Pilishvili, A.	BO015
Naber, J.J.	PH040	Ortiz, G.P.	CS312T	Piyapramote, N.	CS024
Naegeli, K.M.	ME010	Ortiz-Correa, Z.M.	MI310T	Pizer, M.J.	CH011
Nag, S.	MI023	Osawaru, U.B.	EN024	Plaza, N.Z.	EN116
Nagel, J.L.	CH038	Otero, L.A.	EV049	Pogudin, G.A.	MA017
Nagy, J.B.	ME309T	Otis, J.T.	BI064	Polepeddi, L.K.	ME326T
Naik, T.U.	ME091	Ouzan, R.	CS030	Pollack, B.A.	ZO310T
Naja, N.N.	CS019	Ovaitt, E.K.	ME063	Pollock, A.L.	ZO013
Nam, B.H.	ME081	Overby, C.B.	MA008	Polmear, M.M.	ME326T
Nam, S.H.	CH010	Owen, A.H.	BE014	Polu, A.F.	ZO035
Nanayakkara, A.T.	BI040	Owen, E.C.	ME322T	Poole, P.M.	MA040
Nanney, J.D.	MA026	Ozer, J.A.	CH304T	Porter-Gill, S.S.	EV013
Nasir, M.S.	ME325T	Pa'ahana, J.K.	BO040	Potter, A.L.	ME312T
Nasir, M.	CS029	Padmanabhan, H.	PH031	Potter, K.E.	EA002
Nasybullin, R.F.	CH033	Paek, S.	BE303T	Potter, S.	EV025
Nazarov, A.M.	CS310T	Paietta, G.E.	ME026	Pourkaviani, S.	BE312T
Neary, C.A.	BO014	Pak, C.M.	ME312T	Powell, L.S.	BO311T
Neilson, H.J.	BE028	Pak, T.K.	ZO306T	Powers, T.E.	EN036
Neiswanger, W.D.	EN006	Palabrica, A.R.	PH303T	Prabakaran, S.L.	ME031
Nelson, C.K.	CH029	Palmer, P.E.	ME016	Prescott, B.M.	EN100
Nelson, K.A.	EV333T	Panchal, S.J.	EV003	Priester, J.I.	BI045
Neslund, A.K.	BE304T	Pandit, C.M.	EA011	Prouty, E.W.	BI068
Newcomb, M.B.	EV042	Pang, G.C.	MI314T	Purgin, D.	CS317T
Nguyen, A.D.	SP013	Panthani, T.R.	EV034	Purtee, R.E.	BE302T
Nguyen, E.C.	EN313T	Pardini, E.C.	PH023	Pustil'nik, E.	BE031
Nguyen, H.P.	CH026	Parham, W.A.	PH045	Pynn, C.D.	CH308T
Nguyen, M.K.	EV315T	Parikh, S.B.	EV004	Qazi, S.S.	ME092
Nguyen, P.B.	EN015	Parisien, T.J.	PH036	Qiu, S.	ME095
Nguyen, T.T.	EN338T	Park, G.	ZO312T	Quackenbush, W.S.	ME316T
Nguyen, Y.N.	EN338T	Park, J.H.	MI308T	Racigh, V.E.	CH041
Nguyen-McCarty, M.A.	ME047	Parker, B.S.	ZO010	Rafes, C.A.	EN040
Nida, B.A.	EV320T	Parker, D.K.	ZO303T	Ragatz, C.N.	ME062
Niedbalski, S.D.	CH057	Parliament, T.J.	PH035	Raimundo, A.P.	BO309T
Nieves Diaz, M.N.	EV327T	Parries, J.R.	MI037	Ram, A.	EN336T
Nigro, M.A.	BE323T	Parrish, R.M.	EN095	Ram, L.M.	EN014
Nik-Ahd, F.	ME066	Parrott, D.J.	CS004	Raman, A.M.	BI060
Nix, K.J.	MI040	Patel, R.H.	ZO314T	Ramdzan, N.F.	ME319T
Nixon, F.	CS049	Patel, T.T.	PH313T	Ramesh, V.	EN124
Noh, G.A.	CH069	Patterson, K.L.	BE036	Ramey, S.J.	EV099
Noh, J.P.	BE321T	Paulk, K.L.	CH003	Ranelli, L.B.	BE001
Northcut, B.E.	EN086	Pavlicek, J.C.	MA050	Rangel, S.	EV326T
Norvell, A.L.	PH049	Pelton, J.M.	BE307T	Rangi, M.S.	EV105
Notwell, J.H.	EN305T	Perez, C.	EV326T	Ranjan, S.	SP012

Ranney, A.M.	EV016	Rutenberg Schoenberg, M.L.	ME068	Shi, A.	ME042
Rapoport, S.K.	ZO030	Ruyten, B.T.	EN081	Shia, V.A.	CS316T
Raskumandrin, V.	MA301T	Saavedra, D.M.	EN322T	Shieh, A.D.	BI078
Ravn, S.	CH309T	Saijo, K.	CS022	Shields, K.A.	BI305T
Ray, R.A.	CH070	Salvesen Von Essen, B.A.	BI029	Shimoyama, S.	ZO033
Read, W.C.	BO301T	Sandoval, Z.M.	BO010	Shiple, A.R.	BI301T
Reavis, B.L.	EN027	Sangha, H.K.	ZO032	Shrestha, A.	EA014
Reddy, R.B.	EV330T	Santiago- Ruiz, G.	ME315T	Shrestha, A.D.	EV102
Reese, K.I.	BI032	Santiago-Llorens, A.	ZO308T	Shrinath, K.	ME005
Register, J.J.	BO004	Saraf, S.V.	BI035	Shukla, A.A.	EN087
Reid, H.E.	BE018	Sarma, N.	MI031	Shung, D.E.	CH307T
Reinbold, E.D.	ME064	Sasabe, Y.	PH311T	Siares, N.A.	BE324T
Rekow, B.R.	EV118	Satcher, M.F.	BE051	Siares, R.A.	BE324T
Remsberg, J.R.	EV067	Sauer, D.J.	EN309T	Sichanugrist, C.	EV316T
Rence, C.L.	BI053	Sautin, Y.Y.	BI018	Sider, G.	CS308T
Renck, C.T.	BE308T	Savaiko, R.B.	EN323T	Siler, A.L.	ME015
Reyes-Olivo, K.K.	ZO048	Savona-Silva, S.D.	MI310T	Sillis, A.G.	MI302T
Reynoso, J.R.	ZO315T	Sayed, J.A.	ZO056	Simoes, M.A.	EV307T
Rittle, J.D.	BI043	Scaggs, A.P.	ZO063	Simons, A.I.	ME309T
Rivera, J.A.	CH055	Schafer, J.P.	PH304T	Sims, A.L.	EN121
Rivera, O.A.	MI039	Schaffer, T.E.	ZO026	Singer, J.R.	EV086
Rivera-Morales, M.L.	MA019	Schaffhouser, J.	EN329T	Singhal, S.	ZO067
Roach, W.A.	EN329T	Schexnayder, G.A.	ME302T	Singla, N.	EN054
Roark, B.J.	EV317T	Schindler, J.M.	MI041	Singleton, B.	EN074
Roark, M.M.	MI030	Schlecht, A.R.	ZO315T	Siochi, A.L.	EN094
Robel, A.A.	EA004	Schleich, T.L.	ME317T	Siperstein, B.F.	MI302T
Roberts, II, J.	ME051	Schmidt, P.J.	EN069	Sipzner, L.A.	ME307T
Robinson, J.G.	ZO041	Schock, E.V.	ZO019	Sircar, S.	ME069
Rocco, A.L.	ME033	Schoenhals, J.A.	BE047	Sitler, P.M.	EN125
Rochet, J.	CS025	Schoenian, R.A.	EV097	Sivakumar, L.	CS036
Rodgers, W.C.	EN339T	Schuessler, P.R.	EN307T	Skelley, L.M.	EN102
Rodriguez, C.L.	PH008	Schultz, M.A.	CH306T	Skjorshammer, D.V.	MA001
Rodriguez, H.E.	MA303T	Schulz, Z.R.	EV319T	Slane, G.C.	CH048
Rodriguez, M.V.	CH017	Schwank, B.A.	MI016	Smette, M.M.	EN148
Rodriguez, M.G.	BE039	Schwarber, A.K.	EV112	Smiles, D.E.	PH308T
Rodriguez, O.A.	PH310T	Schwob, A.E.	BI063	Smith, A.M.	PH309T
Rodriguez-Torres, K.J.	MA302T	Seals, C.M.	EV064	Smith, D.S.	CS001
Rohret, S.A.	SP009	Sears, C.R.	EV308T	Smith, E.A.	EN301T
Rojas, F.P.	ZO313T	Sears, C.R.	EV308T	Smith, K.A.	BO017
Rojas Caracheo, Y.	CS312T	Sebrechts, P.N.	EN319T	Smith, K.M.	ZO064
Rolon, G.	ZO316T	Seda, L.	BE026	Smith, L.W.	EV106
Roman, A.	EV327T	Sefton, P.J.	BO047	Smith, M.A.	EN002
Romasanta, S.G.	EN338T	Seibert, I.G.	ZO012	Smith, S.M.	EV315T
Romero, B.B.	EN147	Sellon, J.B.	ME036	Smith, S.M.	BE321T
Romney, T.A.	EN113	Serkina, A.S.	MA304T	Snyder, K.V.	EV037
Rondao, A.B.	BO309T	Sevim, H.	BO036	Snyder, M.L.	EV096
Roots, L.W.	MA048	Shadfan, R.H.	EV026	Sodre, L.R.	EN327T
Rosado-Soto, A.N.	EV080	Shaeffer, K.M.	BI001	Soleimani-Meigooni, N.J.	PH042
Rosales, N.	ME003	Shah, A.	BI303T	Solomon, J.M.	CS041
Rosario-Torres, D.M.	MA012	Shah, M.V.	MA015	Solomon, Z.S.	ME072
Rosenberg, J.A.	BE314T	Shaha, M.A.	ME073	Soltys, M.K.	PH051
Rosengard, J.E.	EN349T	Shaket, L.A.	BI074	Soman, S.	EV053
Rosenwasser, E.W.	EN083	Shandell, M.A.	CH039	Song, Y.	BI031
Rosoff, M.S.	EN091	Shaw, C.E.	ME060	Soni, A.	MA047
Rousseau, I.M.	PH046	Shaw, T.	EN128	Soto, N.	EV089
Rowland, T.R.	BO001	Sheikh, H.	CH037	Souza, C.S.	CH046
Rozansky, A.	EN098	Shephard, K.A.	BI077	Sperry, E.D.	ZO025
Ruch, A.	CH302T	Sherman, C.F.	BI072	Spindola, A.B.	BE306T
Rugh, L.E.	MI018	Sherman, E.A.	MI043	Strivali, N.	BI058
Russ, D.C.	CH303T	Sheu, E.J.	MA307T	Stable, T.M.	EN345T

Stagg, M.C.	EN066	Thorp, S.K.	ME322T	Varela, J.	MA021
Stanley, M.L.	BE007	Thurmon, A.L.	ZO068	Varga, R.	EN058
Stanton, J.C.	BE003	Tillman, L.D.	MA022	Vasishtha, D.	BI304T
Steed, J.B.	ZO027	Tinder, P.C.	EV054	Vega, L.	ME078
Steele, T.R.	MI052	Tinker, N.M.	EN041	Vega, P.R.	BO304T
Steen, M.K.	EV006	Tiwari, M.V.	EN077	Velarde Rodriguez, M.R.	EV078
Steinmetz, L.E.	EV311T	Tiwary, K.	ZO309T	Venkatraman, A.	EN336T
Stepusin, E.J.	CS014	Tjoe, B.	EN334T	Veres, A.	BI046
Stettin, J.	ME307T	Todorov, D.	MA005	Vidrighin, M.D.	EN302T
Stevenson, T.C.	BI076	Tolen, L.R.	ZO307T	Viegas, R.G.	EN347T
Steward, D.G.	EN347T	Toll, M.L.	EN082	Viscardi, M.A.	MA036
Stewart, A.J.	EV058	Tomlinson, H.M.	ZO046	Vishnevetsky, M.	BI025
Stewart, L.M.	BO030	Tomsheck, A.R.	MI026	Vitale, M.A.	EV020
Stoffella, A.J.	EV306T	Toner, A.A.	EA006	Vitale, R.J.	BI011
Stoner, G.	MI305T	Toribio, T.J.	ME317T	Voss, C.A.	ME308T
Stoughton, S.A.	BI306T	Torres, D.	ME320T	Wade, J.D.	BO048
Strait, C.M.	EV113	Torres, L.	EA303T	Wage, N.M.	MA020
Strauss, J.A.	EN105	Torres, P.	EN104	Wagner, S.L.	EN319T
Streiff, C.T.	EV313T	Townley, J.A.	BO028	Waite, S.M.	ME070
Strickland, Z.C.	BI016	Townsend, J.A.	EN317T	Wakulyaka, E.	MI049
Strike, G.M.	BO305T	Trader, A.S.	BI301T	Walker, J.R.	EN320T
Strouse, D.M.	EN141	Trambaiolli, L.R.	EN099	Walker, J.A.	CH305T
Strube, M.A.	BO052	Tran, H.H.	SP014	Walker, J.E.	SP019
Stunzi, J.R.	MI021	Tran, L.C.	BI073	Walker, M.S.	ZO002
Subramanian, S.	ME043	Travaini, A.E.	PH032	Walker, Q.M.	BI062
Sugg, D.E.	BO312T	Trettel, S.J.	PH010	Wallace, K.A.	MI008
Suh, C.Y.	ME038	Tripuraneni, N.	CH025	Wallis, D.T.	PH302T
Sullivan, A.M.	MI306T	Tripuraneni, V.	BI022	Wamble, L.T.	ZO303T
Sullivan, E.M.	BE316T	Trusheim, M.E.	ME093	Wang, D.Z.	MA037
Sultan, M.I.	ME041	Trussell, M.B.	CH305T	Wang, D.J.	BO037
Sung, J.C.	EN123	Tsai, C.W.	CH016	Wang, D.	EV311T
Surani, A.A.	ME311T	Tse, L.W.	ME040	Wang, J.Z.	CH059
Sussman, M.V.	ME071	Tsedilin, A.M.	CH031	Wang, J.	ME313T
Sussman, M.A.	CH014	Tsyporyn, A.L.	CS005	Wang, J.H.	EN334T
Sutterer, B.J.	EN053	Tu, C.C.	BE043	Wang, J.	ME306T
Suwanasri, K.	BO310T	Tucker, M.L.	EA007	Wang, T.	PH011
Swenson, L.L.	EV331T	Tupikina, L.V.	MA304T	Wang, Y.	MA031
Swift, M.W.	CS046	Turner, C.A.	EN017	Wang, Z.	BI020
Swoyer, L.A.	BE005	Turner, J.C.	EA001	Wannenmacher, S.	EN335T
Sylvester, M.L.	EN013	Turner, J.R.	EN339T	Warkander, M.E.	CS012
Szvarca, T.P.	MA024	Tvaruzkova, Z.	BO039	Warren, A.D.	MI007
Tadena, N.F.	BE313T	Tyle, S.	ME044	Warrener, S.G.	EN067
Takacs, R.L.	ME055	Uduehi, E.O.	PH016	Watson, C.G.	BI308T
Tam, D.W.	BI081	Ulanov, M.A.	MA016	Weaver, A.M.	CH310T
Tam, R.W.	BI309T	Ulate Segura, D.G.	EV324T	Webb, C.L.	PH309T
Tamo, S.J.	PH302T	Umez-Eronini, I.U.	EN068	Webb, M.J.	ZO043
Tan, R.	EV046	Unsworth, B.T.	EN044	Webb, R.M.	PH050
Tao, D.J.	EV029	Upadhyaya, S.N.	ME006	Weegman, M.M.	EV301T
Tarleton, J.C.	EN031	Uyesugi, E.M.	BE010	Weegman, M.D.	EV301T
Taylor, A.J.	EV035	Vaccaro, A.I.	ZO060	Weiss, M.B.	CH005
Taylor, J.A.	MI015	Vaden, S.N.	EN090	Welcker, K.E.	EV095
Taylor, S.L.	EV062	Valdez, K.A.	EV028	Wells, V.A.	ZO045
Teague, Z.E.	ZO007	Valdivia, A.S.	CS044	Welty, S.G.	EN127
Tedja, M.	ME305T	Valente, A.B.	BI019	Wentz, T.L.	EN140
Termer, K.E.	EV116	van Dijk, M.S.	MI044	Wheeler, V.A.	ZO005
Termotto, E.N.	EV091	Van Galen, A.B.	CH001	Whelchel, J.D.	CS304T
Terry, S.L.	EN076	van Lier, C.J.	BI048	Whisenhunt, C.J.	ZO071
Thangada, N.D.	BO011	Van Schaik, G.W.	EV119	White, K.N.	ZO042
Thomas, D.E.	ME030	Vande Pol, B.W.	MI010	Whiteside, S.E.	ZO302T
Thompson, L.L.	EN070	Vardhana, A.A.	MA002	Wieder, M.S.	BI024

Wiles, N.H.	EN088	Zaytsev, Y.Y.	EV304T
Wilkason, C.A.	PH055	Zbrozek, A.D.	CH019
Wilkerson, A.C.	BE017	Zelnio, H.K.	PH015
Williams, J.L.	BE011	Zenisek, S.M.	BI008
Williams, M.A.	EV323T	Zhang, J.Y.	ME082
Williams, S.D.	CH310T	Zhang, N.Y.	BI071
Willig, L.A.	BI010	Zhang, P.Y.	ME083
Willis, J.K.	EV088	Zhang, Y.	EN143
Willmott, R.G.	EN052	Zhang, Z.	SP002
Willson, L.E.	EV024	Zhao, D.C.	BE315T
Wilson, A.R.	BI036	Zhao, D.	ME061
Wilson, B.D.	BO027	Zhao, E.	MA038
Wilson, S.E.	BE317T	Zhao, L.	ME022
Winget, V.L.	MI308T	Zhao, L.	ME089
Winson, I.M.	PH014	Zhao, X.	EN328T
Winter, P.C.	BE015	Zheng, D.	ME007
Winterton, A.P.	EN330T	Zhong, Y.	BO025
Witt, A.R.	ME032	Zhu, R.	MI033
Wittmer, A.K.	CH306T	Zhu, Y.	SP020
Wolf, H.L.	EA016	Zhu, Z.	EV023
Wolff, S.M.	MI303T	Zubiel, M.	EN030
Wolpert, M.N.	BE040		
Wong, A.E.	MI312T		
Wong, K.	MI304T		
Wong, K.	EV305T		
Wong, M.	PH312T		
Wong, N.O.	BI012		
Wong, S.	MI304T		
Wong, W.C.	EN331T		
Woo, G.H.	PH019		
Woodall, M.L.	BO051		
Wright, R.G.	EN059		
Wrolson, C.M.	CH073		
Wu, J.	CH064		
Wu, M.Y.	BI306T		
Wu, X.	EN315T		
Wu, Y.Y.	CH018		
Xu, S.	BE004		
Xue, L.	EN333T		
Yan, W.X.	PH048		
Yang, M.	BO043		
Yang, M.	CS306T		
Yau, K.	EV305T		
Yaung, S.J.	BI057		
Yawn, K.J.	BO050		
Yazon, N.S.	PH303T		
Yee, H.	EN056		
Yeh, D.	BI309T		
Yen, J.	CH061		
Yew, H.	BI059		
Yoosuk, P.	EN064		
Young, L.P.	ME308T		
Young, M.B.	ZO034		
Yu, S.	ZO305T		
Yuan, Y.K.	CS303T		
Yuca, O.F.	MI311T		
Yum, C.	ME310T		
Yuts, O.V.	EV324T		
Zabala-Casillas, E.	BO306T		
Zahariuc, A.I.	MA006		

# FINALIST STATISTICS

CATEGORY	TOTAL FINALISTS	PREV ISEF	-- SEX --		----- GRADE -----			
			M	F	9	10	11	12
Behavioral and Social Sciences	107	9	32	75	16	22	32	37
Biochemistry	97	23	40	56	10	16	28	43
Botany	79	15	36	43	18	21	15	25
Chemistry	95	16	52	43	10	15	35	35
Computer Science	87	18	68	19	7	12	23	45
Earth Science	26	5	11	15	4	5	7	10
Engineering	267	46	194	72	16	54	75	122
Environmental Sciences	200	34	92	108	30	50	52	68
Mathematics	71	12	57	14	8	7	26	30
Medicine and Health	159	35	63	95	19	23	48	69
Microbiology	92	20	34	58	18	20	29	25
Physics	84	13	56	28	11	10	35	28
Space Science	23	8	13	10	1	7	4	11
Zoology	110	19	45	65	15	19	42	34
Team Project Finalists*	537	76	305	231	70	98	147	222
---- TOTAL ----	1497	273	793	701	183	281	451	582

\* There are 240 total team projects.