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MONTGOMERY

**MONTGOMERY  
COUNTY  
SCIENCE FAIR  
2009**

MARCH 20, 21, 22  
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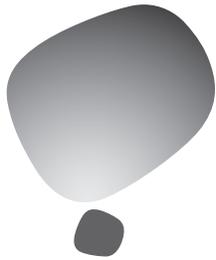


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<b>Cu-Copper (\$500-\$999)</b>	Biotechnology Industry Organization Drs. Jay and Pepper Buckley Gary and Christine Cahn GenVec, Inc. Institute of Electrical and Electronics Engineers Inc. Ellen and Bill Kominers Montgomery County Teachers Federal Credit Union Bill Rock Sanaria, Inc. Social and Scientific Systems Technical Resources International, Inc., Anthony Lee Memorial Fund Qiagen
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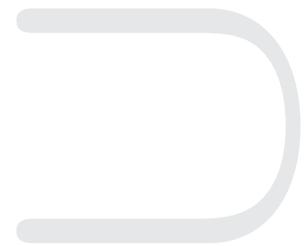


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to human happiness  
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**2009**  **Science** Fair Schedule  
MONTGOMERY

[www.ScienceMONTGOMERY.org](http://www.ScienceMONTGOMERY.org)

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**Friday, March 20, 2009**

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**4:00 PM - 9 PM**

**Student Project Set Up:** Students set-up display boards and go through Safety Inspection at the Reckord Armory Building, University of Maryland, College Park, MD.

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**Saturday, March 21, 2009**

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**8 AM - 12 Noon**

**Judges' Project Preview Period**

**12 Noon – 3:00 PM**

**Students Grades 9-12 Interviews** by Judges and Community Awards Organizations

**2:30 PM – 5:30 PM**

**Students Grades 6-8 Interviews** by Judges and Community Awards Organizations

**5:30 PM - 7 PM**

**Open House for the General Public**, at the Reckord Armory Building at the University of Maryland, College Park. Students should remove their projects at 7 PM.

**7:00 PM-8:00 PM**

**Project Removal**

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**Sunday, March 22, 2009**

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**2 PM - 4 PM**

**Awards Ceremony** at the Gaithersburg High School Auditorium, Gaithersburg, MD.

*(Any projects not removed by 8 PM Saturday, March 21 will be discarded.)*

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Office of Undergraduate Admissions



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## MONTGOMERY AREA SCIENCE FAIR ASSOCIATION

March, 2009

Welcome to ScienceMONTGOMERY, a celebration of science in its 53rd year.

A not-for-profit, independent organization, ScienceMONTGOMERY is dedicated to promoting an interest in science in the youth of our area. The Fair brings together scientists, engineers, mathematicians, educators, students, and parents from throughout the county. ScienceMONTGOMERY provides a venue for over 500 students, grades 6-12, with recognition and cash awards to the best in each category. Community Awards from area businesses, scientific, professional and educational organizations, and the United States Government, include cash, scholarships, trips, bonds, banquets, certificates, medals, merchandise and books. In total, \$45,000 in prizes is awarded to inspire our young scientists.

Generous community sponsors fund ScienceMONTGOMERY. MedImmune returned for a fifth year as our top level sponsor. Human Genome Sciences, Lockheed Martin, NIST and Otsuka have been annual supporters since the Fair became contingent on community support. Over 200 volunteer judges, representing area businesses and professional organizations talk with these outstanding students about their projects.

ScienceMONTGOMERY is affiliated with the Intel International Science and Engineering Fair (ISEF) and follows the Intel ISEF rules and regulations to assure the safest scientific research methods. The top senior high school ScienceMONTGOMERY winners will be fully funded to the Intel International Science and Engineering Fair 2009, in Reno, NV.

The all-volunteer ScienceMONTGOMERY Board and officers wish to thank the organizations and individuals you see in this program, for bringing you this 53rd Fair. This magnificent Board of hard working men and women has been a joy to lead through the evolution of the Fair.

ScienceMONTGOMERY congratulates the students who prepared projects for the 2009 Fair. Celebrate Science and be very proud!

Pepper D. Buckley, Ph.D., Fair Director 2003-2009  
*President, Montgomery Area Science Fair Association*



OFFICE OF THE COUNTY EXECUTIVE  
ROCKVILLE, MARYLAND 20850

Isiah Leggett  
*County Executive*

March 2009

Pepper D. Buckley, Ph.D.  
Fair Director  
Montgomery Area Science Fair Association  
*ScienceMONTGOMERY*  
8613 Fenway Drive  
Bethesda, Maryland 20817

Dear Dr. Buckley:

Montgomery County supports and applauds *ScienceMONTGOMERY* and your ongoing efforts to encourage interest in science throughout the County. Programs like yours help nurture and expand Montgomery County's longstanding national and international prominence in the life sciences and technology fields. The countywide Science Fair, conducted as part of the Montgomery Area Science Fair Association, attracts over 1,500 Montgomery County public and private school students and we are proud to support your mission to advance and celebrate outstanding performance in science education throughout our community.

Now more than ever, Montgomery County is doing all we can to ensure a strong, vibrant economy and healthy, sustainable communities today and for future generations. Maintaining one of the nation's highest performing K-12 public school systems is essential to these goals, and the talented and dedicated students being recognized this year illustrate our success in this area.

I commend the important contributions you and *ScienceMONTGOMERY* make within the community, and applaud those businesses that, during these difficult economic times, pledged their support to help recognize and honor the talents and achievements of our youth.

Sincerely,

Isiah Leggett  
County Executive



## **MONTGOMERY AREA SCIENCE FAIR ASSOCIATION**

53<sup>rd</sup> Montgomery Area Science Fair – 2009  
Reckord Armory, UMDCP College Park, Maryland

### —Officers and Board, Montgomery Area Science Fair Association—

**President:** **Dr. Pepper D. Buckley**  
Psychologist

**Vice President:** **Greg Neuschafer, USN**  
Office of Naval Research

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National Strategies, Retired

**Treasurer:** **Dr. Jay L. Buckley**  
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Parent

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Parent, Science Resource Teacher  
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**Anne Merrell**  
Teacher, Bethesda-Chevy Chase High School

**John A. Grobe, Assoc. Dir. for Engineering**  
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**Dr. Janet E. Nelson**  
Biotechnology Industry Organization

*Persons interested in joining the ScienceMONTGOMERY Board should contact SciMONT@aol.com*



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# AWARDS PROGRAM

2:00 P.M.

Sunday, March 22, 2009

Gaithersburg High School Auditorium

<b>Opening of Awards Program &amp; Welcome to ScienceMONTGOMERY</b>	Pepper D. Buckley, Ph.D. <i>President, Montgomery Area Science Fair Association</i>
<b>Congratulations to Student Scientists:</b>	Toni Stiefel <i>Director, Internal Communications &amp; Community Relations MedImmune, Inc.</i>
<b>Presentation of Community Awards:</b>	Pepper D. Buckley, Ph.D. <i>Fair Director</i> William Kominers, Esquire <i>Board Member</i>  Community Award Organizations Presenters
<b>Presentation of Category Awards:</b>	Pepper Buckley & ScienceMONTGOMERY Board Members <ul style="list-style-type: none"> <li>• Medicine and Health Category Awards Sponsored by MedImmune</li> <li>• Engineering Category Awards Sponsored by Northrop Grumman</li> <li>• Biology Category Awards Sponsored by Unither</li> </ul>
<b>Presentation of ISEF Awards:</b>	Pepper Buckley Toni Stiefel
<b>Thank you &amp; Adjournment:</b>	Pepper Buckley
<b>Special Fair Responsibilities:</b>	
<b>Tees &amp; Website Oversight:</b>	Gary Cahn
<b>Community Awards:</b>	Janet Nelson, <i>Chairperson</i>
<b>Display and Safety Committee:</b>	Brett M. Huhman, David W. Bonnell, <i>Co-Chairs</i>
<b>Fund Raising:</b>	Pepper Buckley, Jay Buckley, William Kominers, Ellen D. Kominers
<b>Scientific Review Committee:</b>	Laura Lee Johnson, <i>Chairperson</i> Milton Axley, David Bonnell, Jay Buckley, Pepper Buckley, Gary Cahn, Kevin Connolly, Jim Douglas, Ellen Dickstein Kominers, Stephen Mason, Anne Merrell, Janet Nelson, Greg Neuschafer, Patricia Porter-Gill
<b>Venue and Food:</b>	Greg Neuschafer
<b>Program:</b>	Ellen Dickstein Kominers
<b>Program Cover Artist:</b>	Bill Rock
<b>Fair Director:</b>	Pepper Buckley



National Institutes of Health

# OFFICE OF DIETARY SUPPLEMENTS

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*- ODS Staff*

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Office of Dietary Supplements  
National Institutes of Health  
Bethesda, Maryland



# Community Organizations Presenting Awards

ASM Materials Education Foundation  
 ASM International—Washington, DC Chapter  
 Aerospace Corporation  
 American Industrial Hygiene Society  
 American Institute of Aeronautics and Astronautics (AIAA)  
 American Meteorological Society—DC Chapter  
 American Nuclear Society, Washington, DC Section  
 American Psychological Association  
 American Society of Mechanical Engineers  
 American Society of Naval Engineers/Society of Naval  
     Architects and Marine Engineers  
 American Society of Safety Engineers  
     —National Capital Chapter  
 Association for Women Geoscientists  
 Association of Practicing Psychologists of Montgomery and  
     Prince George’s Counties, Inc.  
 Association for Computing Machinery  
     —Washington, DC, Chapter  
 Central Intelligence Agency  
 Chemical Society of Washington  
 Commissioned Officers Association, District of Columbia,  
     Public Health Service  
 Discovery Education Young Scientist Challenge  
 Federal Water Quality Association  
 Friends of Agricultural Research—Beltsville, Inc.  
 Geological Society of Washington  
 Graduate Women in Science  
 Intel  
 Institute of Electrical and Electronics Engineers, Inc.

Institute of Food Technologists—DC Section  
 International Sustainable World Energy, Engineering &  
     Environment Project Olympiad  
 MedImmune  
 Montgomery County Energy and Air Quality  
     Advisory Committee  
 Mu Alpha Theta  
 National Capital Astronomers  
 National Oceanographic and Atmospheric Administration  
 National Society of Professional Engineers  
 National Space Club  
 Office of Naval Research  
 Optical Society of America—National Capital Section  
 Ricoh Corporation  
 Rotary Club of Rockville  
 Sigma Xi—FDA Chapter  
 Sigma Xi—NIST Chapter  
 Society for In Vitro Biology  
 Stockholm Junior Water Prize  
 Surfrider Foundation—DC Chapter  
 Towson University  
 United States Air Force  
 United States Army  
 United States Metric Association  
 United States Nuclear Regulatory Commission  
 United States Public Health Service  
 Washington Statistical Society  
 West Montgomery County Citizens Association  
 Yale Science and Engineering Association, Inc.

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Congratulations to the Scientists of the  
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## 2009 Category and ISEF Awards Judges

Ms. Abolade Adepiti		Dr. Susan Klauda	University of Maryland
Dr. Leye Aina	Epitaxial Technologies, LLC	Mr. Jesse Kornblum	ManTech
Mr. David Alexander	BBN Technologies, Inc.	Mr. Dean Larios Berlin	University of Maryland
Ms. Mary Anderson Galloway	Digene-QIAGEN	Mr. Chun Lau	Booz Allen Hamilton
Dr. C. Thomas Avedisian	Department of Energy	Dr. Christopher Lawson	Synexxus
Mr. Muminu Badmus	DC Water and Sewer Authority	Dr. Lyle Levine	NIST
Dr. Susan Baker	NOAA	Dr. Teri Levitin	
Dr. Dilip Banerjee	NIST	Dr. John Lewis	WOOD Consulting
Dr. Afua Banful	International Food Policy Reas Inst	Dr. Xiang-Ning Li	
Dr. Rasmus Birn	NIH	Ms. Ivy Liu	Lockheed Martin Corp.
Mr. Raul Blazquez	Texas Instruments Inc.	Dr. Corey Love	U.S. Naval Research Lab
Dr. David Bonnell	NIST- retired	Dr. Erin Luetkemeier	NIH
Mr. Christopher Brown	Johns Hopkins-Applied Physics Lab	Dr. Li Ma	NIST
Mr. Matthew Brumberger		Mr. Jonathan Marcus	
Dr. Jay Buckley	JLB Associates	Dr. Jeremy Martin	Union of Concerned Scientists
Dr. Pepper Buckley	Psychologist	Mr. Stephen Mason	Johns Hopkins-Applied Physics Lab
Dr. Tom Burns	SET Corporation	Mr. David Meshel	The Aerospace Corporation
Mrs. Anne Burns	American Pharmacists Assoc	Mr. Scott Miller	QIAGEN
Ms. Mitsy Canto-Jacobs	CUH2A / AIA	Mr. Mark Morita	Bechtel/Engineering & Construction
Dr. Bishwanath Chatterjee	NIH	Mr. Dustin Muniz	Engineering consulting/mgmt
Mrs. Chaitali Chattopadhaya	USDA	Dr. Jeff Owrutsky	Naval Rearch Laboratory
Ms. Veronica Chau	International & Economic Development	Ms. Rachana Oza	
Mr. Robert Colton		Dr. Dipak Oza	CSC
Dr. Kevin Connolly	Novavax	Mr. Don Palathinkal	Booz Allen Hamilton
Dr. Hall Crannell	Catholic University (Retired)	Ms. Meredith Peck	ENSR / AECOM
Dr. Cory Cress	U.S. Naval Research Lab -Retired	Dr. Joseph Pellettieri	Human Performance Wing/ComSci Fellow
Dr. Nicholas Dagalakis		Dr. Robert Peters	NASA
Mr. George Daniello		Mr. Nicholas Pillitteri	Northrop Grumman
Dr. Mathew Daniels	NIH	Dr. Steven Pincus	Novavax Inc.
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Mr. Edmund Habib	Retired	Dr. Kenneth Schatten	ai-solutions
Dr. Jonathan Hardis	NIST	Ms. Jane Shershenovich	QIAGEN
Dr. Matt Hart	Naval Research Laboratory	Dr. Sanjiv Shresta	The MITRE Corporation
Dr. Shannon Hill	NIST	Dr. David Siegel	NIH
Dr. Mi Hillefors	NIMH/NIH	Dr. Ray Skarda	Nuclear Regulatory Commision
Dr. J. Terrell Hoffeld	U.S. Public Health Service (Retired)	Mr. Gary Spindler	BearingPoint
Mr. Sam Hong	National Cancer Institute	Mr. John Starke	
Dr. Renee Howell	SeraCare Life Sciences	Dr. Diane Stassi	NIH; ComSci Fellow
Ms. Carrie Hunter	Leading Sustainability, Principal	Dr. Yee San Su	CNA
Ms. Carol Hutchinson	AT&T Government Solutions	Mr. Brook Susman	U.S. Naval Research Lab
Dr. Daya Jirage	Walter Reed Army Inst of Research	Ms. Tresa Vidayathil	Attorney
Mr. Thomas Johnston	Health Physics Society	Ms. Kim Volkert	
Dr. John Jones	Georgetown University	Mr. Frederick Wang	NIH-NIDCD
Dr. Shoshana Kahana		Mr. Marc Willis	Lab Products, Inc
Dr. Robert Kahn	USDA - APHIS, Retired	Dr. David Winfield	
Mr. Charles Kaprielian	ATK		
Dr. Sun Kim	Walter Reed Army Medical Center		



## ScienceMONTGOMERY Update

### Congratulations to our 2008 ScienceMONTGOMERY Grand (ISEF) Prize Winners:

<b>Re-I Chin</b> (Walter Johnson HS)	Biochemistry
<b>Benjamin Hoffman</b> (Georgetown Day School)	Microbiology
<b>James Iocozzia</b> (Sherwood HS)	Medicine and Health
<b>Paul Kominers</b> (Walt Whitman HS)	Mathematics

### At ISEF 2008, our ScienceMONTGOMERY Students Were Winners:

- Benjamin Hoffman: First Place** · Microbiology Grand Awards, United States Army, United States Air Force, Florida Institute of Technology
- James Iocozzia: Third Place** · Medicine and Health Grand Awards
- Paul Kominers: Third Place** · American Mathematical Society Karl Menger Prize

### Congratulations to These ScienceMONTGOMERY 2008 Participants for Their Wonderful Accomplishments Since Last Year's Fair:

- Intel Science Talent Search Semifinalists:** Benjamin Hoffman, Re-I Chin, Sikandar Porter-Gill
- Siemens Competition in Math, Science and Technology Semifinalist:** Benjamin Hoffman
- Davidson Fellows Laureate:** Sikandar Porter-Gill
- Society for Science and the Public Middle School Program Finalist:** Eric Keen
- Society for Science and the Public Middle School Program Semifinalists:** Michael Keen, Bruce Yuen, Andrew Zhang, Jack Zhu
- I-SWEEEP Award Winners:** Sikandar Porter-Gill, A.Yashodhara Rao, A. Sarada Rao, Thomas Blackmon, Kyle Le, Daniel Choquette

### Finally, Kudos to These Members of our ScienceMONTGOMERY Family:

- James Douglas** (Board Member): Distinguished Service Award (Montgomery County Public Schools) (for contributions to ScienceMONTGOMERY)
- Melis Anahtar** (Grand Prize Winner, ScienceMONTGOMERY 2004): Rhodes Scholarship (2008)



**ScienceMONTGOMERY Participating Schools-2009**

<b>School</b>	<b>Abbr.</b>	<b>Teachers &amp; Sponsors</b>
A. Mario Loiederman Middle School	MLM	Shaver, Swati Josi
Benjamin Banneker Middle School	BAM	Whitmore
Bethesda-Chevy Chase High School	BCH	Bliskovsky, Bloch, Creager, McDonald, Massey, Merrell, Thale, Wheatly
Cabin John Middle School	CJM	Geer, Goldfarb, Hinkle, Kumar, Patwardhan, Pivinski
Charles E. Smith Jewish Day School	JDS	Glaser, Gupta, Harrold, Munteneau
Col. Zadok Magruder High School	MGH	
Earle B. Wood Middle School	EWM	Blair, Durbin, Jones, Roddy, Shim
Eastern Middle School	EMS	Day
Forcey Christian Middle School	FCM	Conroy
Gaithersburg High School	GBH	Mazer
Holy Cross School	HCS	Brach, Connor, Hand, O'Connor
Holton-Arms School	HOA	Hwang, Smuth
Home Schooled	HS	Keen
John H. Poole Middle School	JPM	
Lakelands Park Middle School	LPM	Wolfgang
Martin Luther King Middle School	MKM	Jenkins
Montgomery Blair High School	BLH	Haigh, Liu, Ragan, Richards
Mother of God School	MGS	Kottooran
Muslim Community School	MCS	Rehman
Neelsville Middle School	NEM	Rajaram
Newport Mill Middle School	NMM	Mucklow
North Bethesda Middle School	NBM	Aaron, Cameron, Macedonia, Reed
Northwest High School	NWH	Fortier
Paint Branch High School	PBH	Leffler
Parkland Middle School	PLM	Gopalaswamy, Janney, Reeder, Mayo, Sturges
Poolesville High School	POH	Curran, Petralli-Mallow
Redland Middle School	RLM	Kurtz, Lugo, Wartella
Roberto Clemente Middle School	RCM	Brady, Fairbains, Young
Robert Frost Middle School	RFM	
Rockville High School	ROH	Bonney, Hollies, Merrill
Rocky Hill Middle School	ROM	
Rosa M. Parks Middle School	RPM	
Sherwood High School	SWH	Douglas, Kenton, Miehl



School	Abbr.	Teachers & Sponsors
Sligo Middle School	SLM	Kempf, McGill
St. Andrew Apostle School	SAA	Breen, Deere, Flechsig, Paul, Primrose, Stacey, White
St. Catherine Laboure School	SCL	Nava
St. Jane de Chantal School	JCS	Durkin, Michel
Takoma Park Middle School	TPM	Epling, Goehring, Phelan
Thomas S. Wootton High School	WHO	Adler, Gannavaram, Herzon, O'Donovan, Nagajaru
Thomas W. Pyle Middle School	TPM	Lee, Wallis
Tilden Middle School	TIM	
Walt Whitman High School	WWH	Hudock, Ferraris, Montague
Walter Johnson High School	WJH	Safford
Watkins Mill High School	WMH	Shivacharan
Westland Middle School	WEM	Rabbat
White Oak Middle School	WOM	Shaffer
Winston Churchill High School	CHH	Acharya, Blazer, Brown, Buel, Ernst, Horvath

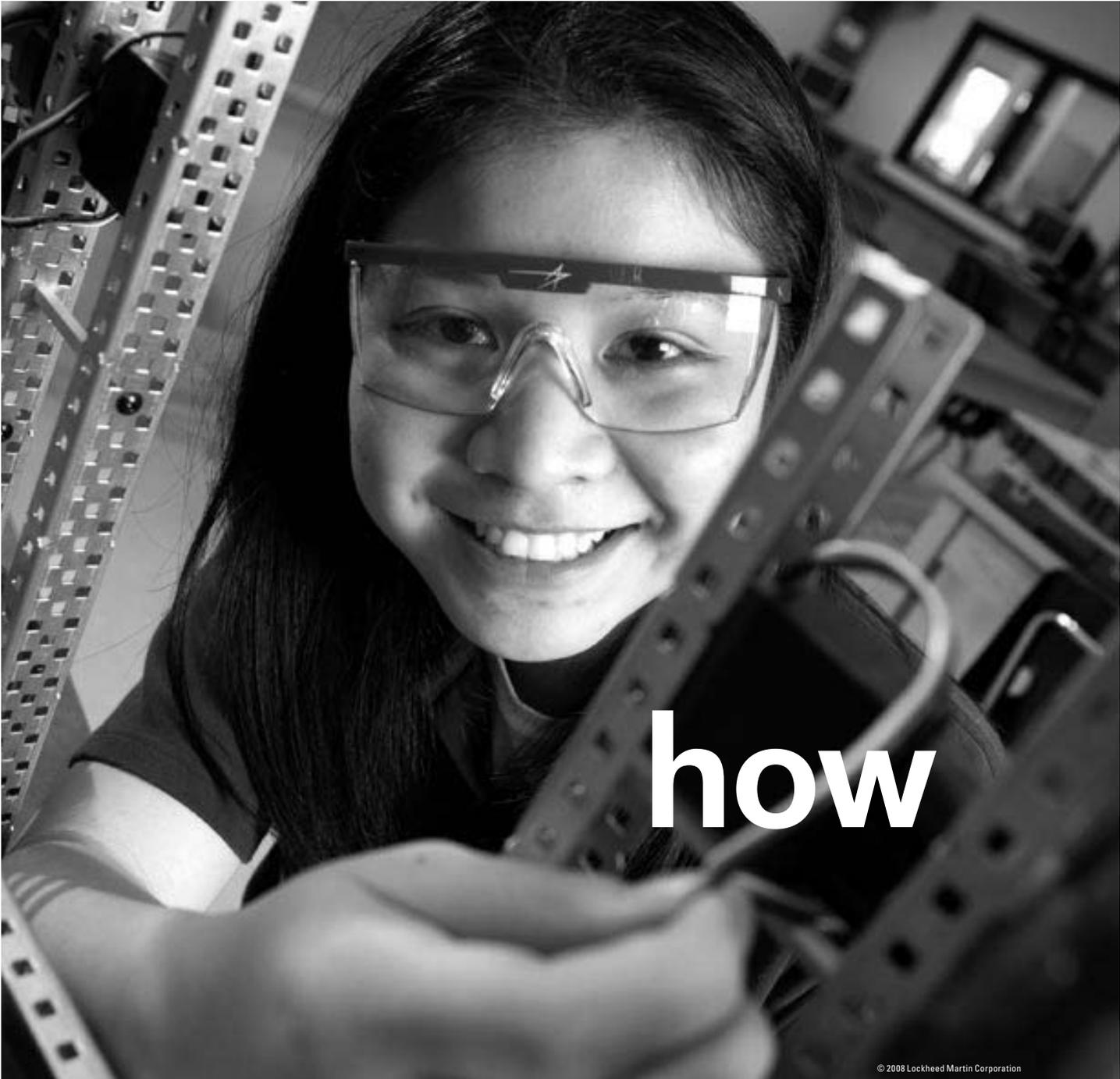
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**QIAGEN congratulates all participants  
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# EXHIBITS

## STUDENTS IN THE JUNIOR FAIR

### BEHAVIORAL AND SOCIAL SCIENCES

J101	Effect Of Music Tempo On Video Game Performance	Santiago Vanegas	RCM
J102	Do Different Kinds Of Video Games Increase Or Decrease Human Reflexes?	Daniel Chu	FCMS
J103	Effects Of Playing Video Game On Reflex, Concentration And Alertness	Jerry Zhang	RCM
J104	How Does Age Affect Optical Illusions?	Muhammad Hamza	RCM
J105	How Does Music Tempo And Rhythm Affect Game-play?	Flavius Mastacaneanu	RCM
		Franco Frega	
J106	How Does The Diameter Of A Guitar String Affect Its Ability To Stay In Tune?	Ruben Carlo	EWM
J107	How Video Games Affect Academic Performance	Pierson Higareda	RCM
J108	The Stroop Effect	Nikhil Tangirala	RCM
		Jookwang Lee	
J109	Visual Search	Yvonne-Crystal Monterrosa	RCM
		Nicole Cheng	
J110	Which Is More Effective, Audio Or Visual Recall?	Michelle Poon	FCMS
J111	What Is The Effect Of Changing Pseudo Sites Vs. Real Sites On How People Will Interpret Which Is Real And Which Is Fake?	Eunice Chung	RCM
J112	The Reflex Changes Through Age	Philbert Hwang	RCM
J113	Memory Vs. Age	Jada Washington	RCM
		Channing Kimble-Brown	
J114	How Age Affects Perceiving An Optical Illusion	Jordan Washington	RCM
J115	The Effect Of The Positive Or Negative Connotation Of A Series Of Words On The Ability Of A Student To Memorize It	Daniela Ganelin	TPM

### BIOCHEMISTRY

J201	Can Vegetables Conduct Electricity?	Tim Hedrick	FCMS
J202	Effect Of pH On Dye Diffusion In Flowers	Idrys Rudnick-Cohen	EWM
J203	Effects Of Potato Dextrose Agars pH On Weakened Chestnut Blights Growth	Chris Shirven	RCM
J204	Electrolysis Of Water And Fruit	DeVaughn Huntoon	RCM
		Gordy Scofield	
J205	Fire Resistant Properties Of Various Plants	Phillip Christman	PLM
J206	Fruits And Vegetables - Voltage	Neel Virdy	RCM
		Maxim Gorlenko	
J207	How Do Different Types Of Flour Affect a Cake?	Rochelle Parry	FCMS



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J208	How Is A Baby Plant's Growth Affected By The Environmental Settings?	Sruthi Vijayakumar	PLM
J209	Osmosis Jones: Neutral, Shrink, Or Explode?	Kyle Starost	RLM
J210	"phyte" Back: Plants Can Use Chemistry To Clean Up A Mess	Miranda Lingenfelter	NBM
J212	Role Of Substrate Concentration In Enzyme Kinetics	Rahul Menon	RCM
J213	Soil As An Electrical System	Sohini Kundu	RCM
		Sriramya Ayyagari	
		Impana Shetty	
J214	The Effect Of Calcium Carbonate On Lipid Metabolism	Myles Wagner	TPM
J215	The Effect Of Different Biomaterials On Production Of Ethanol In The Fermentation Reaction Of Yeast?	Nadiya Kutishcheva	RCM
J216	The Effect Of Different Levels Of Sugar, Temperature, And pH On The Fermentation Rate Of Yeast	Nadia Alam	TPM
		Sagarika Das	
J217	The Effect Of pH On Dissolving Ibuprofen	Natasha Virjee	MLM
J218	The Effect Of Temperature On The Enzymatic Function Of Lactase	Sarah Wagner	TPM
J219	The Effect Of The Type Of An Onion On The Mass Of Its DNA	Dhruv Shankar	RCM
J220	The Effect Of Type Of Cheese On Mold Growth	Taran Carim	RCM
J221	The Effect Of UV Radiation On Plant Growth	Vincent Hsiao	RCM
J222	The Effects Of Gibberellic Acid On Spinacea Oleracea	Ashton Webber-Deonauth	CJM
J223	Vitamin C Over Time	Annie Chu	RCM
		Joy Zeng	

### BIOLOGY

J301	Amount Of Moisture Vs. Type Of Apple	Jonaton Baginski	EWM
J302	Do Coffee Grounds Or Eggshells Added To Soil Help Plants Grow Better?	Joy Matthews	FCMS
J303	Does Sugar Water Benefit Plant Growth More Than Salt Water?	Eric Ho	FCMS
J304	Does The Weight Of An Organism Affect The Number Of Chromosomes, Nucleotides, Genes, Or Proteins?	Sajjad Soltanmohammadi	MCS
J305	Effect Of Electrical Current On Planaria Regeneration	Alex Han	RCM
J306	Finding Foods With Power	Christine Allaire	HCS
J307	How Different Soils Affect Plant Growth	Amy Bao	RCM
		Adrianna Lee	
J308	How Do Roots Grow When The Direction Of Gravity Changes?	Erika Espinoza	RCM
J309	How Does Changing The Color Of An Egg Affect How Much Weight It Can Hold?	Gina Malfatti	MLM
J310	How Does Colored Light Affect Plant Growth ?	Matthew Konapelsky	NBM
J311	How Much Iron Is There In Ferritin?	Radina Mutskova	TPM
J312	How To Make Unreadable Fingerprints	Eli Griff-McMahon	PLM
J313	In Which Colors Of Light Do Plants Grow Best?	Nina Simpkins	JDS
J314	Look At That Plant Grow!	Weilee Wu	RCM
J315	Natural Or Artificial Gardening?	Carla Cornejo	SCL
J316	Plants On Vitamins	Tej Joshi	MLM
J317	Salty Sea	Alejandra Torres-Diaz	RCM
J318	Shake Them Bones	Babette Sanmartin	RCM
J319	Sharks	Esteban Caballero	RCM
J320	The Effect Of Different Water Sources On The Potato	Yuka Koyama	RCM
J321	The Effect Of Light On The Growth Of Plants	George Wu	RCM
J322	The Effects Of Sugar Liquids On The Growth Of Grass	Connie Xu	TPM
J323	The Freshwater Adapted Lloydia Plant Is Not Able To Survive In Water As Salty As Brackish Or Seawater	Sarah Harper	NBM

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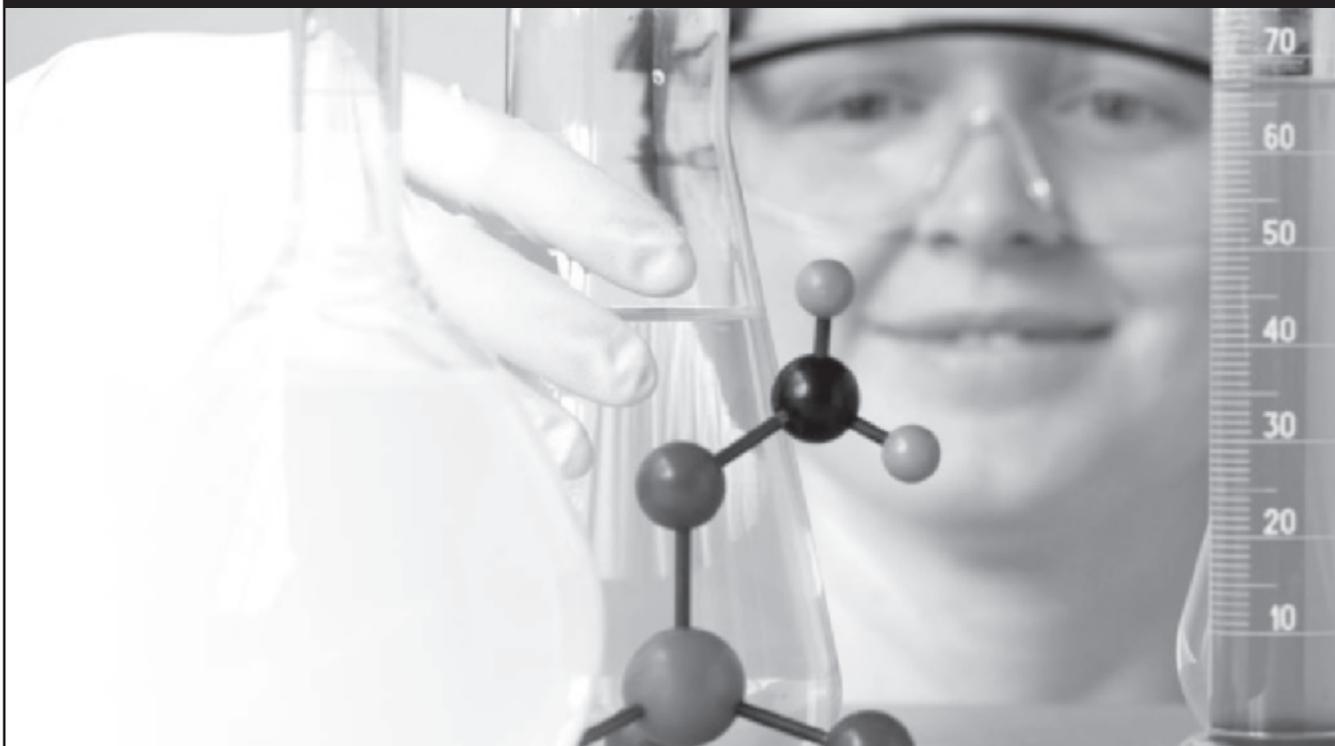


J324	The Things You Can Never Change Are The Things You Can Never See: Fingerprints	Ana Vlajnic	RCM
J325	What Effect Does Ultraviolet Light Have On The Growth Of Plants?	Tobi Aladesuru	FCMS
J326	What Is The Effect Of An Owl Decoy On The Amount Of Consumed Bird Feed?	Eileen Liu	RCM
J327	Will A Plant With Rocks In It Grow Better Than One Without?	Michael Frimpong	FCMS
J328	The Effect Of Changing The Dominant Hand On Memory	Claudia Xie	RCM
J329	To Resist Or Not To Resist	Jixuan Wang	RCM

### CHEMISTRY

J401	Boiling Water Times With Different Substances	Brian Sistani Kuang-Heng Hsiao	RCM
J402	Chemicals vs. Ideas	Justin Young	FCMS
J403	Chromotography	Megan Anderson	EWM
J404	Crystal Growing	Michael Torres	RCM
J405	Does The Size Of The Beaker Containing A Candle Affect The Length Of Time The Candle Continues To Burn?	Christen McWithey	FCMS
J406	Do The Substances Added To Water Alter The Boiling Point?	Ruchi Agnihotri	PLM
J407	Effect Of Surfactants On The Surface Tension Of Water.	Sophie Colle	TIM
J408	Fashions On Fire: Flammability Of Fabrics On Focus	Michael Gemunder	JCS
J409	How Does Salt Affect Crystal Growth?	Katie Zimmerman Leila Ettehadieh	RCM
J410	How Permanent Are Permanent Markers?	Aniudh Neti Jeffrey He	RCM
J411	Invincible Paper!	Christy Kawa Tsahai Crawlle	WEM
J412	Is Juice Better For You Than Soda?	Henry Blanco Chandler Tucker Thomas Mackell	SCL
J413	Is Your Favorite Soda Too Acidic?	Gerardo Varela Loren Brill	SCL
J414	Non-newtonian Fluids	Andrew Lai	PLM
J415	Ph (Acid And Alkaline)	Lisa Seo Jennie Seo	RCM
J416	Plop, Plop, Fizz, Fizz, Does It Matter How Hot the Water Is?	Christina Hnatov	CJM
J417	Softening Abilities Of Different Lip Glosses	Savita Potarazu Jackie Spang Savita Potarazu	CJM
J418	The Colors Of Fire	Alexandra Lechner Esther Lee	RCM
J419	The Duration Of Bubbles	Aparna Kaliappan	RCM
J420	The Effect Of Objects On The Acidity Of Soil	Guillermo Casay	RCM
J421	The Fountain Of Youth, For Apples	Erica Vinson	NBM
J422	The Ultimate Race Between Fruit Oils : Who Will Win?	Jorge Rivas Julio Fuentes Carlos Carhuas	SCL
J423	Water Cars- Catalytic Effect On Proton Release In A Hydrogen Fuel Cell	Nivetita Ravi	NEM
J424	What Is The Effect Of Changing The Type Of Invisible Ink On The Ability To Read It After It Is Developed?	Alex Dang	RCM
J425	What Is The Effect Of Temperature On The Life Of A Battery?	Jake Rubenstein	RCM
J426	What Is The Effect Of The Filter On The Water Quality?	Andrew Jordan	RCM
J427	Which Ingredient Would Stop A Fire Best?	Eunice Lee	FCMS

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J428	Which Juice Cleans Pennies Better?	Andres Gonzalez	MLM
J429	Will Levels Of Dissolved Oxygen Vary In Water Of Different Temperatures?	Aviva Braier	JDS
J430	Will Varying Temperatures Affect The Amount Of Rust Gathered On a Nail, Paperclip, and Needle When Submerged In Different Liquid Environments?	Lizamaria Arias	FCMS

**COMPUTER SCIENCE**

J501	Computational Complexity Of Algorithms In Java	Matthew Das Sarma	TPM
J502	Quantum Simulation Of A N-v Center	Avikar Periwal	TPM
J503	Signature Encryption	Jessica Shi	TPM
J504	The Comparison Among The Algorithms To Solve The Tower Of Hanoi Problem	Charles Yin	TPM
J505	The Effect Of Learning Algorithm On Maze Navigation	Samuel Zbarsky Charlie Pasternak	TPM
J506	The Effects Of Terrain On The Speed Of A Robot	Mohamed Keita	RCM
J507	Traits And Their Effects On Natural Selection.	Matthew Wade	RCM

**EARTH AND SPACE SCIENCE**

J601	Black Holes	Carlos Gonzales	RCM
J602	Can Certain Water Types Affect Plant Growth?	Walter Gray	FCMS
J603	Can Humans Really Create A Black Hole?	Kathy Zhang	BAM
J604	Cross-staff Accuracy	Alexandra Nelligan	RCM
J605	Fangfeis Amazing Blue Crystal Growings	Fangfei Yin	RCM
J606	How To Grow A Crystal Farm	Ishaan Parikh	RCM
J607	Liquefacting Soils	David Alcantara	RCM
J608	Minerals	Alyssa Hu	RCM
J609	Modeling Glacial Moraines With Chaotic Mixing	Emily Lathrop	WOM

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J610	Plant Oil That Kills Plant Leaves	Nicole Moore	FCMS
J611	Rocket Fuel	Palak Desai	RCM
J612	Sink! Soil Liquefaction	William Durr	JPM
J613	Testing The Effect Of Soil Microbes On Soil Fertility	Michael Keen	HS
J614	The Buoyancy Of Objects	Katelyn Knopf	RCM
J615	The Effect Of A New Environment	Julian Figueroa	RCM
J616	The Effect Of Different Chemicals On Crystal Growth	Eshwar Manoharan	RCM
J617	The Effects Of A Tsunami On Different Shaped Buildings	Jonathan Zhang	RCM
J618	What Is The Effect Of Changing The Day You Look At The Sun On Seeing How Many Sunspots Are On The Sun?	Paola Peredo	RCM
J619	What Is The Effect Of Solar Activity On The Earths Magnetic Field?	Juan Rodriguez	RCM
J620	What Is The Effect Of The Planet On How Well A Mars Rover Works?	Mihir Khetarpal	RCM
J621	What Is The Effect Of The Tilt Of A Solar Cell And The Time Of Day On The Speed Of A Solar Car.	Bowen Lian	RCM
J622	Using The Voyager Space Mission To Determine The Edge Of Our Solar System	Elizabeth Meier	PLM

### ENGINEERING

J701	Hovercraft Efficiency	Michael Tucker	RCM
J702	A Study Of Drag Coefficients And Aerodynamic Car Body Designs	Ally Flechsig Camaryn Kerns	SAA
J703	Airplane Wing Design And Safety	Waliullah Rifai	RLM
J704	Alternative Energy And You	Benjamin Strouse	PLM
J705	Blade Configuration vs. Power Generated On A Windmill	Nikhil Perincherry	CJM
J706	Bridge Design In '09	Ryan Dunlow	SAA
J707	Bridge Strength Put To The Test	Jennifer Arai	NBM
J708	Earthquake Resistant Foundations	Thomas McHale	NBM
J709	Efficiency Of Structures	Devin Luce	PLM
J710	Faster...or Slower?	Andy Sebastian	RCM
J711	FoilSim II Version 1.5a Flight (lift) Simulator	Jon Xia	RCM
J712	Hovercrafts	Jonathan Ibers Clayton Smith	RCM
J713	Hovercrafts	Emily Jiang Shaun McGovern	RCM
J714	How Does The Material Of A Windmill's Blade Affect How Much Weight It Can Lift?	Jonathan Zisk	NBM
J715	How Will The Shape Of The Wings Affect The Distance A Wooden Airplane Can Fly?	Brian Schonfeld	JDS
J716	Iglide	Daniel Leptoukh	CJM
J717	Magnetic Hover Craft	Pablo Lopez	HCS
J718	Making Paper	Rayna Cook	MLM
J719	Mass On Bridges	Noah Dinardi	PLM
J720	Model Rockets: Altitude Vs. Body Length	Ollen Douglass	CJM
J721	Onion Skins And Recycled Paper: A Good Mix For Green Paper?	Megan Rider	EWM
J722	Shape Of Bridge Supports Vs. Strength Of Bridge	Catherine Nguyen	EWM
J723	The Best Paper Airplane Wing Shapes	Brandon Sheridan	CJM
J724	The Effect Of Changing Environmental Conditions (Time Of Day And Temperature) On Power Generated By Different Types Of Solar Panels	Vinay Sriram	RCM
J725	The Effects Of Ballasting On Submarines	Kaelyn O'Neill	RCM
J726	The Effects Of Wing Shape Against Flight	Kaiwen Wang	RCM



J727	The Paper Airplane Project	Jim Liu	RCM
		Valentina Romantchikova	
J728	Using Motor Sound To Measure Rpm.	Christian Schmidt	RCM
J729	Weight Placement On Airplanes	Steven Chen	RCM
		Blake Sha	
J730	When Dry Ice Sublimates Into CO <sub>2</sub> , Can The Resulting Pressure From The Expanding Gas Cause Air-tight Containers To Rupture?	Marcus Benyamin	FCMS
J731	Veggie Power	Aaron Evans	SAA

**ENVIRONMENTAL SCIENCES**

J801	Best Green Roof Plant That Keeps The Right House Temperature	Soo Yeon (Nancy) Kim	HOA
J802	Can The Sun's Energy Be Trapped?	Taylor Mason	EWM
J803	Do You Know What You Are Drinking: The Effects Of Different Types Of Water Pollution On Bodies Of Water	Sharon Chen	TPM
		Audrey Shi	
J804	Does A Magnet Affect The Growth Of Plants?	Shelby Cotone	FCMS
J805	Global Warming	Susan Xiao	RCM
J806	Global Warming's Effect	Modibo Toure	RCM
J807	How Does Salinity Affect Brine Shrimp?	Seung Yang	RCM
		Tommy Donoghue	
J808	How Does Sunlight Affect Plants Germination?	Allison Yang	CJM
J809	How Does The Process Of Liming Soil Help A Plant Affected By Acid Rain?	Aparna Natarajan	PLM
J810	How Octane Affects Mpg	Jason Lazar	CJM
J811	Investigation Of Moss In Three Different Types Of Growth Material	Daniel Leung	NBM
J812	Kill Your Kilowatts	Nolan Yager	NBM

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J813	Organic Vs. Inorganic Fertilizer	Kaelyn Cummins Meghan Chamberlain Shreya Barthwal	RCM
J814	Our Earth's Water: How Best To Purify	Michal Shafrir	NBM
J815	Rainbowsynthesis	Aaron Renberg	CJM
J816	Rainforest Rain Simulation	Jessica Law	RCM
J817	Silt Settles In Rainwater Runoff: Not So Fast!	Paul B. Ellis	SLM
J818	Solar Cells	Prashan Dharmasena	EWM
J819	The Effect Of Adding Fertilizer To Different Types Of Earth On The Level Of Nitrates In The Nearby Body Of Water	Joie Chang Lisha Ruan	TPM
J820	The Effect Of Co2 On The Growth Of Mint Plants	Brendan Lawler	RCM
J821	The Effect Of Different Shapes Of Solar Panels On The Amount Of Energy Received	Vy Tran Carol Shou	TPM
J822	The Effect Of Habitat On Bean Germination And Agricultural Applications	Michael Vetter	RCM
J823	The Effect Of Household Cleaners On Plant Growth	Rachel Harris	RCM
J824	The Effect Of Humidity On Relative Temperature	Alexander Lu	RCM
J825	The Effect Of Modifying Stream Water To Make It Safe For Drinking	Samuel Kebede	SLM
J826	The Effect Of Solar Energy Concentration On Solar Module Output	Katherine Silberholz	RCM
J827	The Effect Of Temperature And Spins On Water On The Time It Takes To Empty Out Of A Bottle	Carolina Zarate	RCM
J828	The Greenhouse Effect: How Atmospheric Temperature Changes With Carbon Dioxide Exposure	Ankit Sarkar	CJM
J829	The Levels Of Nitrates And Phosphates Of The Potomac River Compared To The Chesapeake Bay	Olivia Chao	CJM
J830	What Is The Effect Of Electromagnetic Radiation On Plant Growth?	Anthony Gonzalez	RCM

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J831	Which Natural Material Works Best To Insulate a Homemade Cooker: Paper, Cloth, or Hay?	Brooklyn Holloway	FCMS
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**MATHEMATICS**

J901	Determining The Ideal Formula To Calculate The Volume Of An Irregular Solid	Aanchal Johri	TPM
J902	The Relationship Between OPEC Prices And The Pump Prices	Anastasia Laurenzo Christine Junod	PLM
J903	Using Strategic Algorithms To Solve The Rubiks Cube	Alessandra Breen	SAA
J904	Statistical Analysis Of Immune System Strength	Alan Du	TPM

**MEDICINE AND HEALTH**

J1001	Can Mountain Dew Increase The Amount Of Push-ups You Can Do In a Minute?	Garrett Smith	FCMS
J1002	Do Energy Drinks Affect Stamina In A 1/2 Mile Run?	Addisu Mesfin	FCMS
J1003	Do Restaurants Really Clean Their Tables?	Kristina Lowe	FCMS
J1004	Do You Need Antibacterial Soap To Get Rid Of Bacteria In Your Hand?	Trinish Chatterjee	RCM
J1005	Does Eye Color Affect Peripheral Vision?	Emily Gates	FCMS
J1006	Does Heating Or Cooling an Onion Prevent You From Crying When You Cut It?	Shayla Friesen	FCMS
J1007	Gatorade vs. Water vs. Mountain Dew	Nathaly Aramayo Taylor Simpson	RCM
J1008	How Caffeine In Soda Affects The Heart Rate	Nathan Adal	FCMS
J1009	How Do Video Games Affect The Human Body?	Anna Taylor	FCMS
J1010	How Does Blood Pressure And Heart Rate Change With Different Activities?	Cecilia Kwakye	FCMS
J1011	How To Solve A Hairy Situation	Anne Deere	SAA
J1012	Measurement Of Changes In Blood Oxygenation Levels in Sample Population Traveling Between Urban And Rural Areas	John Anderson	TPM
J1013	Nutrition Content Of Different Foods	Ankita Reddy Aditi Subramaniam	ESM
J1014	Obese Heart	Anicca Harriot	RCM
J1015	Rainbow Fire	John Kim	FCMS
J1016	Red Riding Wolf Experiment	Claudia Adjou	RCM
J1017	Target Your Heart Rate	Lauren White Madeleine Boies	SAA
J1018	The Game, The Brain, And The Dynamo	Chris Fuster Andrew He	RCM
J1019	The Leukemia Survey	Melanie Chang	RCM
J1020	What Is The Effect Of Changing The Amount Of Gatorade On A Human's Pulse Rate After Exercising?	Joshua Villanueva	RCM
J1021	What Substance Is Most Effective For Cleaning Teeth?	Sajidah Arefian	MCS
J1022	Which Aerobic Exercises Increases Your Heart Rate In A Prescribed Time Limit?	Brinton Amobi	FCMS
J1023	Get Juiced	Emily Durr Reagan Holston	JPM

**MICROBIOLOGY**

J1101	Bacteria In Water	Jennifer Wang	RCM
J1102	Best Soaps For Hand Washing	Meral Culver	CJM
J1103	Cancer Cells Glow!	Michael Liu	RCM
J1104	Comparing Lipid Contents Of Various Types Of Algae	Eric Yi William Cai	TPM
J1105	Effectiveness Of Various Disinfectants On Normal Mouth Flora	Marcus Fernandez	RCM
J1106	Garlic & Rubbing Alcohol Vs. E. Coli Bacteria	Sofia Hu	RCM



J1107	Investigating Anti-bacterial Properties Of Herbs And Spices	Kevin Nuckolls	HCS
J1108	The Amount Of Bacteria In Different Water Around The School	Genevieve Bauroth Ryann Bright	CJM
J1109	The Effect Of Milk Fat On Bacteria Growth	Joel Thomas	RCM
J1110	The Effect Of Yeast On Viability Of Lima Beans Grown In The Presence Of Motor Oil	Alexandra Boukhalova Ariel Hsu Danting Liu	TPM
J1111	Washing Your Hands, What Works The Best?	Jeffrey Falgout	RCM

### PHYSICS

J1201	Batter Up!	Nathan Lester	SAA
J1202	Brightness Of Different Types Of Lightbulbs (in Lumens)	Val Opfermann	RCM
J1203	Can Bees Fly?	Sasha Maldonado	RCM
J1204	Colorful Prisms	Aesha Doshi	RCM
J1205	Does My Violin Need A Tune-up?	Jinhie Skarda	PYM
J1206	Does The Temperature Of A Rubber Band Affect Its Elasticity?	Matthew Kaiser	SLM
J1207	Does The Thickness Of A Copper Wire Affect The Nail's Magnetic Force?	Danny Warner	FCMS
J1208	Effects Of The Properties Of Projectiles On The Distance A Catapult Can Launch The Projectile	Erik Irikura	RCM
J1209	Electromagnets	Benjamin SanNicolas	RCM
J1210	Heat Capacity	Eric Arai	NBM
J1211	How Do Materials Affect Cell Phone Interference?	Raymond Macedonia	NBM
J1212	How Does Camera Feedback Change Or Adjust With Different Camera Positions?	Loza Taye	PLM
J1213	Is Magnetism Created From Electricity?	Deborah Wu	FCMS
J1214	Levitation vs Wheels	William Miyashita	SCL

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J1215	Light Reflectance Of Metals And Glass	Nathan Schilling	PLM
J1216	Lighted Fog	Ryan Wong	RCM
J1217	Making Electricity From Natural Products	Conrad Smith	NBM
J1218	Marble Gun	Nate Keninitz Jack O'Keefe	RCM
J1219	Pucx-periment: How Do Different Materials Affect How Far A Hockey Puck Travels?	Lucy Andrews	NBM
J1220	Rc Cars & Radio Waves	Justin Kim	RCM
J1221	Ripstik Vs Fusion: Which Is More Efficient, Going Down The Hill With A Fusion Or Going Down A Hill With A Ripstick?	Samantha Bauer Cassidy Lankler	EWM
J1222	Rolling Cans	Marc Cioffi	MLM
J1223	Science Expo : How Does The Medium Affect The Angle Of Refraction?	Sumon Bhattacharyya	NBM
J1224	Surface Area Alteration Of Aluminum Foil On A Leyden Jar	Jonathan Fink	PLM
J1225	Temperature Affects On How High A Basketball Can Bounce	Robby Siu Ram Singh	PLM
J1226	Temperature And Magnets	Eduardo Lopez	MLM
J1227	The Effect Of Changing The Temperature Of A Liquid Medium On The Refraction Of Light	Lily Xu	RCM
J1228	The Effect Of Color On The Amount Of Electricity Converted In A Solar Panel	David Zhang	RCM
J1229	The Effect Of Different Materials On Sound	Youngwook Kim	RCM
J1230	The Effect Of Heat On The Strenth Of Rubber Bands	Vasily Baffes Daniel Rivers	PLM
J1231	The Effect Of Slit Spacing On The Interference Of Light	Edward Liang	RCM
J1232	The Effect Of Temperature On The Height A Baseball Bounces Stright Up	Tingchen Shi	CJM
J1233	The Effects Of Electric And Magnetic Fields On Light	Manuel Guillen	RCM
J1234	The Relationship Between Luminosity And Distance: An Experiment In Photometry And The Inverse Square Law	Oscar Mujica	EWM
J1235	The Tape Thesion And Stress Test	Donovan Mack Chase Meadows	SCL
J1236	The Truth About Static Electricity	Jenna Welkie	MLM
J1237	The Workings Of Fibre Optic Cables.	Neelanjan Lahiri	PLM
J1238	Trebuchet: Ready For Battle	Deirdre McGovern Melissa Morella	EWM
J1239	Water Fountains	Michael Kopinetz	NMM
J1240	What Is The Effect Of Changing The Temperature Of A Magnet's Environment On Its Magnetic Field?	Xiaoyu Yin	RCM
J1241	What Is The Effect Of The Angle Of A Potato Launcher On The Distance Of A Tennis Ball Being Shot From It	Sidd Singal Matt Szwerc	RCM
J1242	What Is The Effect Of The Wavelength Of Visible Light On The Amount Of Electricity Produced By A Solar Panel?	Brian Liu	RCM
J1243	What Materials Affect A Magnet's Polarity?	Tope Olunuga	FCMS

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### BEHAVIORAL AND SOCIAL SCIENCES

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S101	Background Music And Memory	Matt Chiogioji Kaitlin Berry	SWH
S102	Brain Boost	Lindsey Morrison Maria Romas	SWH
S103	Can You Remember?	Samantha Smith Kelly Stout	SWH

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S104	Color-number Synesthesia	Gwendolyn Mills	SWH
S105	Colors Affect On Memory	Melanie Kim Ian Chan	SWH
S106	Don't Stress It's Just A Test	Cassandra Benjamin Thanuja Rajapakse Jared Duran	SWH
S107	Listen To This	Beyhan Ibici	BLH
S108	Listening To Music While You Study! Does It Really Matter?	Luc Sebrechts Simon Kolbeck Nathan Resnick	BCH
S109	Personality Vs. Body Movements	Alyssa Porter Sammy Wool Jes Rodas	SWH
S110	Reaction In A Fraction	Kathleen Wortmann Tanya Abraham	SWH
S111	The Effect Of Videogames On The Mind	Sandeep Kurapati Jonathan Yee Khawar Hamid	SWH
S112	The Magic Number	Eric Kim Suyoung Cho	SWH
S113	Time Flies	Geoffrey Herman Colin Vale Joe Szewczyk	SWH
S114	To Believe Or Not To Believe: Temperature Sensations And Susceptibility To Persuasion	Caroline Diehl	BCH
S115	We See You When You're Sleeping	Susan Peters Allison Lederer Daniel Portner	SWH

$$\frac{\text{Study} + \text{Vision} + \text{Work}^2}{\text{You!}} = \text{The Future}$$

Wishing each and every 2009 Montgomery Area Science Fair contestant the very best of success—now, and in the future!





S116 What Is The Color Of Your Mood? Vivianne Alves de Sa SWH  
Zachary Mercer

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**BIOCHEMISTRY**


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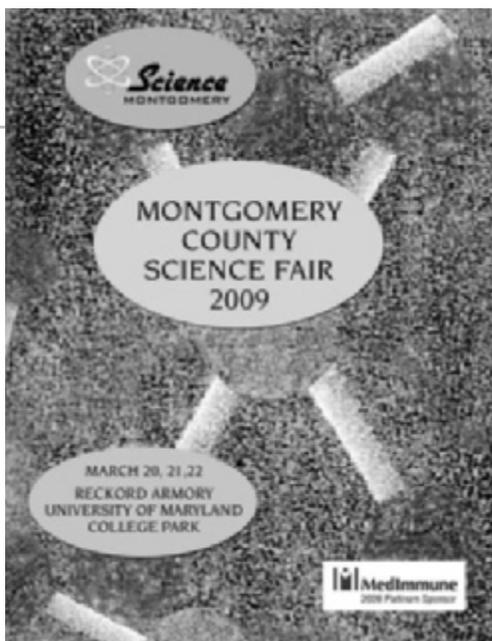
S201 Anticancer Effects Of Vitamin C In Vitro Cancer Cells Daiki Okazaki CHH  
S202 Better Than Corn? Elliott Levine SWH  
Josh Weinstein  
S203 DNA Extraction Dina Yared ROH  
S204 Phosphodiesterase 11a (pde11a) Genetic Variants In Children With Cushing Disease Maria Dagalakis CHH  
S205 Predicting Albinism-causing Mutations By Studying The Evolution Of The Tyrosinase Protein Melodi Anahtar BLH  
S206 Prevalence Of Rickettsia Spp. Other Than Rickettsia Amblyommii In Amblyomma Americanum Ticks Melissa Truong BLH  
S207 S. Typhimurium Flagellin Increases Endocannabinoid Anandamide Levels In Macrophages Through The Activation Of Tlr5 Receptor Xin Shan BLH  
S208 Self Contained Algae Biofuel Generator Julia Hardgrove BCH  
S209 Synthesis Of Cathepsin B Degradable Peptidic Dendrimers Sneha Kannan BLH  
S210 Ubiquitin Like Modifiers In Protozoan Human Parasite Leishmania: A Chink In The Armor? Sonya Davey WHO

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**BIOLOGY**


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S301 Developing A High-throughput Screen To Identify Small Molecules That Reverse Anti-cancer Drug Resistance: Bfl-1 As A Molecular Target Rachael Lee WWH  
S302 Elodea Growth Katie Carswell SWH  
Surafel Makonnen  
S303 Follow The Leader Lauren Honig SWH  
Shannon Kindred  
S304 Get Back Gerald Francis Jr SWH



**THIS YEAR'S COVER ART WAS CREATED BY ARTIST BILL ROCK.**

Currently the Director of Creative Media for United Therapeutics in Silver Spring, Maryland, Bill exhibits his work internationally as well as nationally. He is currently collecting short video and film segments for public presentation on United Therapeutics Biowall. The focus of the Biowall content is Science and Art subject matter. Anyone interested in contributing work to this project can contact Bill by email at [billrock4@gmail.com](mailto:billrock4@gmail.com)



Congratulations to exhibitors at this celebration of science, and to the volunteers, judges, parents, science teachers, mentors and sponsors whose gifts of time, knowledge, guidance, and support renew the spirit of scientific discovery and bring the promise of an exciting future to mankind.

*ScienceMONTGOMERY, 2009*

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S305	How Much pH Can Elodea Handle?	Daniel Fleming	SWH
S306	Hunting Instinct In Domesticated Cats	Erin Edwards Beth Mcginty Claire Hambright	SWH
S307	Identification Of Cancer Stem Cell Inhibitors Using Fruit Flies	David Hou	CHH
S308	Longitudinal Study Of Goose Creek In Middleburg, Virginia, December 2008-March 2009 To Determine Changes In Health	Amy Miller	BCH
S309	The Correlation Between Leaf Size And Water Absorption In Plants	Randall Hoffmann	SWH
S310	Voltage Vs. Plant Growth	Kelsey Lynn Natalie DeNigris	ROH

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**CHEMISTRY**


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S401	CO2 Storage In Novel CO2-H2O Phases At High Pressures	Benjamin Shih	BLH
S402	Combating Cancer: Design and Synthesis of [11C]-Labeled DHA-Taxoid for Studies of Drug Pharmacokinetics	Re-I Chin	WJH
S403	Concentration Of Nitrate And Phosphate In Anacostia Tributaries	Amare Tola Eyerusalem Feleke	BLH
S404	Controlling The Diameter Of Single-wall Carbon Nanotubes During Growth	Eric Chen	CHH
S405	Development Of Electrochemical (ec)Sensors Using Metallic Nano-structures	A. Yashodhara Rao	WWH
S406	Drug Solubility	Brittany Benjamin Prerna Sikri	SWH
S407	Lead Digestion	Anh Truong Elaine Nghiem Mellownie Ho	SWH
S408	Ph Of Milk vs. Rate Of Coagulation	Andy Schmitt	ROH
S409	Preparation And Analysis Of Uranium Standard Solutions	Madara Jayatilake	WWH
S410	Preventing The Rotting Of Fruits	Daniel Thale-Galat	BCH
S411	Saturated Solution: Measuring Solubility	Manju Shivacharan Kelvin Chang Richard Nam	WMH MGH MGH
S412	Testing The pH Of Fermenting Apple Cider	Claire Dudek	BCH
S413	The Dissolving Of Plastics In Mildly Acidic Liquids	Ariel Gewirtz	BCH
S414	The Effect Of Salinity On Dissolved Carbon Dioxide	Brina Seidel	BCH
S415	Titrating the Amount of Vitamin C in Orange Juice	Wesley Harris Ryland Bursaw	SWH

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**ENGINEERING**


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S701	Archimedes Screw Pump	Parinaz Fathi	MCS
S702	Can You Text Me Now?	Austin Gentry Travis Hyams Joyce Nam	SWH
S703	Characterization Of Flow Table Reference Material	Mona Mohseni	WWH
S704	LED Flashlight	Philip Massey Davidson Girard	BCH
S705	Playing Card Durability	Teddy Weisman Julien Kilian	BCH
S706	Solar Water Heater	Minna Jacobson	BCH
S707	The Effect Of Shingle Color On Ground Temperature	Colin Versteeg	BCH
S708	The Impact Of The Incorporation Of Local Energy Storage Into A Representative Model Power Grid	Kevin Hogan Manpreet Khural Scott Hoffer	SWH



**T**he National Institute of Standards and Technology (NIST) is proud to be celebrating its 36th year as a sponsor of the 2009 Montgomery Area Science Fair.

Established in 1901, NIST is the federal government's first physical science laboratory. NIST promotes innovation and industrial competitiveness by developing measurements, standards, and technologies that enhance economic growth and improve the lives of U.S. citizens.

Events such as the Montgomery County Science Fair give tomorrow's scientists and engineers, their teachers and parents, volunteers, judges, and business and government leaders the opportunity to learn from and inspire one another. We congratulate this year's group of gifted young scientists on their achievements and look forward to seeing the discoveries they have made.





S709	The Shape Of Solar	Kiernan Hahn	BCH
S710	Voltage V Lift	Alex Sax Ian Weaver Scott Bradley	BCH
S711	Windmill Efficacy	Kevin Murray	BLH
S712	Wing Sweep In Wind Tunnel	Jake Ullman	BCH
S713	Wingtip Efficiency	Giulian Garruba	BLH

### ENVIRONMENTAL SCIENCES

S801	Effect Of Changing pH Level Of Soil On Growth Of Grown Gall In The Lycopersicon Esculentum	Lilay Gebreselassie Ashley George	BLH
S802	Limiting Thigmomorphogenesis In Pea Plants	Alyssa Puritz	BCH
S803	Oil In Soil	Jessie Karp Katie Koren	SWH
S804	Species Of Plant Vs. CO2 Uptake	Nicholas Chisholm	ROH
S805	The Effect On pH By Soap	Hyeon Kim Joshua Witt	SWH
S806	The Effects Of Certain Pesticides And Herbicides On The Germination Of Bean Seeds	Elizabeth Himwich	BCH
S807	The Effects Of Flat Mirrors Angles On Solar Cells Electrical Output	Tiffany Le	POH
S808	The Effects Of Temperature Of Sodium Hydroxide On Its Ability To Absorb Carbon Dioxide: The Pathway To An Efficient Air Purification System On A Global Scale	Ben Lewis Sam Hendel	WHO
S809	The Purity Of Water	Matt Dutko Tony Hoang	BCH
S810	The Rate Of Decomposition Of Paper Bags On Different Environmental Surfaces	Yvonne Chan Nancy Chen Bethany Siu	SWH



**Celebrating 125 Years**  
*of Engineering the Future*

congratulates Science Fair participants  
for their achievements



S811	Water Quality Throughout The Maryland Chesapeake Watershed	Daniel Nola Kevin Takiar	SWH
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**MATHEMATICS**

S901	A Combinatorial Optimization Of A Flood-fill Algorithm	Alexander Bliskovsky	BCH
S902	How To Solve A Rubiks Cube	Daniel Salus	BCH
S903	Weinreichs Conjecture	Spencer Weinreich	BCH

**MEDICINE AND HEALTH**

S1001	Body Position Affects Heart Rate Recovery After Exercise	Matthew Williams	CHH
S1002	Clot Or Not?	Chelsea Jacobs Mia Woldoff Nicole D'Amato	SWH
S1003	Comparison Of Pharmacokinetic Profiles Of Artesunate Following Single Intravenous Doses At 2, 4, And 8 Mg/kg In Volunteers By Model-independent And Model-dependent Analyses	Surbhi Agrawal	WWH
S1004	Effect Of Processed vs. Organic Food On Heart Rate After Exercise.	Zuleika Bouzeid Rinu Ramesh	SWH
S1005	Genetic Diversity In The Celts Gene Of Malaria Parasites From Around The World	Eric Ockenhouse	BCH
S1006	Glucosamine Vs. Omega-3 Fatty Acids	Justin Gorinson Leigh Harrison	SWH
S1007	How Energy/ Sports Drinks Affect Reaction Time.	George Kotsiras	SWH
S1008	Is Cold Medicine Really The Best Way To Treat A Cold?	Madison Yeutter	BCH
S1009	Seroprevalence Of Scrub Typhus Infection In U.S. Military Personnel Deployed To South Korea	Krista Caroline Fryauff	POH
S1010	Sports Injuries In Children In The U.S: Where Are They Treated, What Are The Injuries And Have The Numbers Of Injuries Changed By Age Group Or Gender From 1993-2006?	Adela Miller	CHH
S1011	The Effect Of Different Concentrations Of Capsaicin On Breast Cancer Cells	Julius Vazquez	WHO
S1012	The Effects Of Caffeine On Athletic Performance	Ariel Nicholas	SWH
S1013	To The Left Or To The Right?	Emily Witt	SWH
S1014	Weight On The Autistic Mind	Maria Correa	SWH
S1015	Your Sleep Your Weight	Tsion Zewdie Adey Worku	SWH

**Congratulations to the  
Mathematicians, Scientists, and Engineers of  
ScienceMONTGOMERY 2009**

**Best Wishes from the  
Kominers Family:  
Bill, Ellen,  
Scott (ScienceMONTGOMERY 2005), and  
Paul (ScienceMONTGOMERY 2006-2008)**



**MICROBIOLOGY**

S1101	Analysis Of Functional Categories Of Proteins In Bacteria	Praveen Bachoti	NWH
S1102	Analysis Of Upstream Sequences For Frequency Of Motif Occurrences	David Tao	BLH
S1103	Effect Of Environmental Stressors On The Rate Of Bacterial Plasmid Transfer	Eric Keen	HS
S1104	Five Second Rule	Alec Renz Colin Bonhag	SWH
S1105	Infrared Photosynthesis In Shewanella Oneidensis	Kettner Griswold	WWH
S1106	Regulation Of OmpT, An Outer Membrane Protease Involved In The Pathogenesis Of Bacteria	Alisa Lu	BLH
S1107	Sexual Dichotomy Of Gene Expression In Innate Vs. Adaptive Immunity	Samir Kumar Devalaraja	WHO
S1108	What's In Your Child's Mouth?	Nailah Harper-Malveaux	BCH

**PHYSICS**

S1201	Biketricity!	Aaron Plave Stoff Scott Jack Baer	BCH
S1202	Bubble Mania	Amanda Nardone Katie Shoemaker	SWH
S1203	Dive Right In: Approach Speed vs. Entry Distance In Springboard Diving	Natalie Snyder	ROH
S1204	Effects Of Different Sized Wing Profiles On The Lift And Drag Of Unmanned Aerial Vehicles	Victor Santos	SWH
S1205	Remote Determination Of Velocity From Optical Doppler Shifts Of Spectral Lines	Molly Grossman	SWH
S1206	Sonoluminescence: Getting To The Bubble	Rolando Masís	RMH
S1207	The Factors That Affect Air Resistance	Shiyang Li	ROH
S1208	The Voltage Effect	Niti Dharwadkar Anuradha Banerjee	POH
S1209	Asymmetrical Protostellar Jets For Star Mwc 480	Aditi Shenoy	WHO
S1210	Magnet Strength	Vanessa Harrison	ROH

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ScienceMONTGOMERY wishes to thank all the teachers, administrators, and other school staff, for their unstinting contributions to the students in our 2009 Fair. We especially thank New Hampshire Estates Elementary School and the Montgomery Count Public Schools Office of Science Curriculum and Instruction for their support of this 53<sup>rd</sup> annual Fair!



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# NOTES

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