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MONTGOMERY



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2013**

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MARCH 15, 16, 17

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Fe-Iron (\$150-\$499)	Anonymous Kate Baldwin, PhD Fitzgerald Auto Malls GenVec Edward & Miriam Kelty, PhDs Lerch, Early & Brewer, Chtd Ram Narula Gregory Neuschafer PH Rockwood, Dr. Roscoe M. Moore, Jr.
Friends of ScienceMONTGOMERY (Up to \$149)	Nuray and Yavuz Anahtar Chris Cochran Brett and Heather Huhman Anne Merrell Susan Baker, PhD

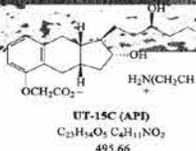
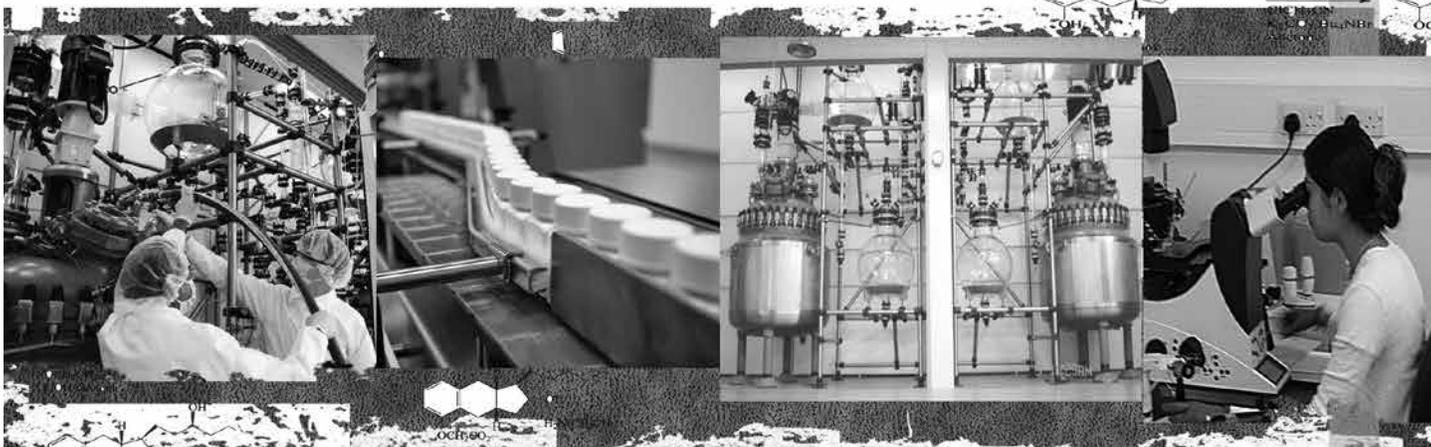
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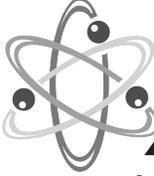
Helping people is the most satisfying aspect of our work, but it isn't the only reward.

A career in biotechnology and pharmaceuticals will give you fresh and exciting challenges, the chance to accomplish something truly remarkable with your talent, and opportunities for long term success that only a few industries offer.

This is why we are a proud sponsor of ScienceMONTGOMERY.





2013  **Science** Fair Schedule
MONTGOMERY

www.ScienceMONTGOMERY.org

Note New Location: Food and Drug Administration White Oak Campus
10903 New Hampshire Ave.
Silver Spring, MD 20993

FRIDAY, MARCH 15, 2013

4 PM – 9 PM **Student Project Set Up:** Set-up display boards and go through Safety Inspection at FDA White Oak Campus. Mentors, teachers, family members, and friends of Fair Participants are welcome to view the projects.

SATURDAY, MARCH 16, 2013

9:30 AM – 12:15 PM **Judges Preview Period** (No students present)

12:15 – 1:00 PM **Students admitted**

1:00 – 4:00 PM **Student Interviews:** All Judges , all grades

4:00 - 5:00 PM **Project Removal:** All projects must be removed by 5 PM or they will be discarded.

SUNDAY, MARCH 17, 2013

2:00 PM – 4:00 PM **Awards Ceremony** at Albert Einstein High School

4:00 PM – 5:00 PM Meeting with ScienceMONTGOMERY Senior High School International Science and Engineering Fair (ISEF) Winners about trip to Phoenix, Arizona for ISEF, Albert Einstein High School Auditorium Stage



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SCIENCE FAIR

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Montgomery County

Education Association

Is A Proud Sponsor of the 2013

Montgomery County Science Fair



MONTGOMERY AREA SCIENCE FAIR ASSOCIATION

Welcome to the Montgomery County Science Fair!

ScienceMONTGOMERY congratulates the students who are participating in the Fair and applauds them for their hard work. We hope that developing a Science Fair project was both enjoyable and a valuable learning experience.

We are most grateful for the parents, teachers and mentors who have supported and encouraged Fair participants. Adult sponsors are an essential part of the Fair program.

The Fair brings together scientists, engineers, mathematicians, educators, parents, and students from throughout the Montgomery County. ScienceMONTGOMERY provides a venue for competition among hundreds of students from public, private, and home school affiliations, in grades 6 through 12. We provide cash prizes for project excellence via our many Category Awards. Complementing these are the many Community Awards generously provided by various business, scientific, professional, and educational organizations and several US Government agencies. Students are competing for over \$40,000 worth of prizes: cash, scholarships, internships, travel, banquets, bonds, books, certificates, medals, and merchandise.

ScienceMONTGOMERY is a 501(c)3, nonprofit, all volunteer organization which relies on generous sponsors to fund the county-wide fair competition each year. MedImmune, for the ninth consecutive year, serves as our premier sponsor for which we are most grateful. We also are thankful for the generous support of [GlobalNet Services, Inc.](#), Northrop Grumman and the United Therapeutics Corporation. Other major sponsors are Lockheed Martin, the U.S. Nuclear Regulatory Commission and the Food and Drug Administration. All of our sponsors make the Fair possible and we thank you.

The all-volunteer ScienceMONTGOMERY Board of Directors wishes to thank each of the organizations and individuals listed in this program for making the Fair possible. Every year, we are indebted to the more than 200 volunteer judges, representing area business and professional organizations, who painstakingly evaluate projects, and perhaps more importantly, encourage students' further pursuit of scientific understanding.

I personally thank and acknowledge the ScienceMONTGOMERY Board members who have contributed significant talent, time, and resources, late at night, after work, on weekends, in good weather and bad to make the Fair happen.

As an affiliate of the Intel International Science and Engineering Fair (ISEF), ScienceMONTGOMERY follows the ISEF rules and guidelines to ensure the safety of our competing students. This year's top high school winners will be awarded a fully funded travel scholarship to present their projects at the 2013 International Science and Engineering Fair in Phoenix, AZ.

Kate M. Baldwin, Ph.D.

Fair Director

March 2013

ONE DAY SHE MAY LOOK BACK AND SAY THAT THE FUTURE STARTED HERE

At Lockheed Martin, when we envision the future, we see a world of never-ending possibility. But that future will never be realized unless we prepare today's students for tomorrow's challenges. That's why it is so vitally important for educators, parents, and companies like ours to encourage young people to study science, technology, engineering, and math. And it's also why Lockheed Martin is proud to support the Montgomery Area Science Fair.

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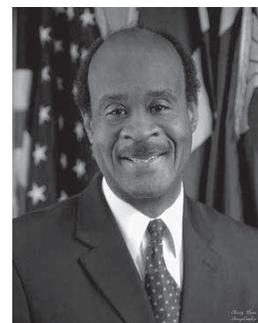
LOCKHEED MARTIN 



OFFICE OF THE COUNTY EXECUTIVE
ROCKVILLE, MARYLAND 20850

Isiah Leggett
County Executive

March 2013



Dr. Kate Baldwin, Fair Director
*Science*MONTGOMERY
Montgomery Area Science Association
6422 Kenhowe Drive
Bethesda, Maryland 20817

Dear Dr. Baldwin:

Montgomery County supports and applauds *Science*MONTGOMERY, 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 annually attracts over 300 Montgomery County public and private school students and we are very proud to support your mission to advance and celebrate performance in science education throughout our community.

Now more than ever, Montgomery County is doing all we can today to ensure a strong, vibrant economy as well as healthy and sustainable communities 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 *Science*MONTGOMERY make within the community, and applaud those businesses that, during these difficult economic times, pledged their support to recognize and honor the talents and achievement of our youth.

Sincerely,

Isiah Leggett
County Executive



MONTGOMERY AREA SCIENCE FAIR ASSOCIATION

57TH Montgomery Area Science Fair – 2013

FDA Science Center, White Oak Campus, 10903 New Hampshire Ave, Silver Spring, MD

OFFICERS AND BOARD, MONTGOMERY AREA SCIENCE FAIR ASSOCIATION

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Treasurer: Chris Cochran

Teacher, Hoover Middle School

Fair Director: Dr. Kate Baldwin

Howard University, Retired

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Anne Merrell
Resource Teacher, Ridgeview Middle School

Ram Narula
Narula Energy and Environmental Consultants

Persons interested in joining the Science MONTGOMERY Board should contact FairDirector@sciencemontgomery.org



AWARDS PROGRAM

2:00 P. M.

Sunday, March 17, 2013

Albert Einstein High School Auditorium

Opening of Awards Program and	Kate Baldwin, Fair Director
Welcome to <i>Science</i>MONTGOMERY	Montgomery Area Science Fair Association
Presentation of Community Awards:	<i>Science</i> MONTGOMERY Board Members Community Award Organizations Presenters
Presentation of Category Awards:	<i>Science</i> MONTGOMERY Board Members
Presentation of ISEF Awards:	Milton Axley, Ph.D.
Thank you and Adjournment	
ISEF Award Winners Meeting	4:00 – 5:00 PM

SPECIAL FAIR RESPONSIBILITIES:

Venue and Food: Kate Baldwin

Website Oversight: Kate Baldwin, Miriam Kelty, Jeanann Boyce

Category Awards: Kate Baldwin, Chair

Community Awards: Nuray Anahtar, Yavuz Anahtar *Co-Chairs*, James Douglas, Taylor Douglas,
William Kominers, Anne Merrell, Greg Neuschafer

Program: Susan Baker, *Chair*

Display and Safety Committee: Brett M. Huhman, *Chair*, Greg Neuschafer

Fund Raising: William Kominers, *Chair*

Scientific Review Committee: Laura Lee Johnson, *Chair*, Reuben Aronson, Milton Axley, Bridget Aylward,
Kate Baldwin, Susan Baker, David Bonnell, Christopher Cochran,
Kevin Connolly, James Douglas, Taylor Douglas, Deborah Pober Haase,
Brett M. Huhman, Ellen Kominers, William Kominers, Cathryne Manner,
Stephen Mason, Anne Merrell, Greg Neuschafer, Patricia Porter-Gill,
Elizabeth Vincent

ISEF Delegation Adults-in-Charge: Laura Lee Johnson, Ellen Dickstein Kominers



Community Organizations Presenting Awards

American Industrial Hygiene Society—Potomac Section
American Institute of Aeronautics and Astronautics
(AIAA)
American Meteorological Society—DC Chapter
American Nuclear Society, Washington, DC Section
American Physiological Society
American Psychological Association
American Society of Mechanical Engineers
ASM Materials Education Foundation—DC Chapter
Association for Women Geoscientists
Association of Practicing Psychologists of Montgomery
and Prince George's Counties
Biophysical Society
Broadcom MASTERS Competition
Bud Miller Associates
Central Intelligence Agency
Chesapeake Water Environment Association
Clean Air Partners
Discovery Education 3M Young Scientist Challenge
Federal Water Quality Association
Friends of Agricultural Research—Beltsville, Inc.
GENIUS Olympiad—SUNY Oswego
Geological Society of Washington
Graduate Women in Science
IEEE--Institute of Electrical and Electronics
Engineers, Inc.—Washington Section
IEEE Phototonics
Intel
I-SWEEEP
Izaak Walton League of America
Lockheed Martin
MIT Club of Washington DC
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National Capital Astronomers
National Society of Professional Engineers
National Space Club
National Oceanic and Atmospheric Administration
(NOAA)
Naval Research Lab
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Optical Society of America—National Capital Section
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Rockville Science Center
Rotary Club of Rockville
Sigma Xi—NIST Chapter
Society for In Vitro Biology
Society of Manufacturing Engineers (SME)—Chapter 48
Stockholm Junior Water Prize
Surfrider Foundation—DC Chapter
Team Results USA
United States Air Force
United States Army
United States Metric Association
United States Nuclear Regulatory Commission
United States Public Health Service--Commissioned
Officers Association, D.C.
Washington Statistical Society
Yale Science and Engineering Association, Inc.
Young Women in Biology of Winston Churchill
High School



ScienceMONTGOMERY 2013 Update

Congratulations to our 2012 *ScienceMONTGOMERY* Grand (ISEF) Prize Winners

Nina Jessica Lu	Biology
Pavleen Thukral	Computer Science
Vinay Sriram	Computer Science
David Zhang	Physics

We Proudly Announce that our Finalists were Recognized with these Grand Awards at ISEF 2012 (Pittsburgh):

Nina Lu:	Second Place, Biochemistry
Vinay Sriram:	Third Place, Computer Science
Pavleen Thukral:	Fourth Place, Computer Science

Kudos to these members of our *ScienceMONTGOMERY* family for their wonderful accomplishments:

Montgomery Serves Youth Service Award 2012:	Phanna Iamlek
Presidential Scholar 2012:	Ziyao Wang
Stockholm Junior Water Prize (Maryland State Winners):	Adam Berger and Colin Hambright
I-SWEEP: International Sustainable World (<i>Engineering, Energy & Environment</i>) Project Olympiad:	
Bronze Medal, Environment:	Adam Berger and Colin Hambright;
Bronze Medal, Engineering:	Caroline Park
Maryland Junior Science and Humanities Symposium (First Place):	Anuradha Banerjee
Greater Washington, DC Junior Science and Humanities Symposium (First Place):	Nina Jessica Lu
National Junior Science and Humanities Symposium (Third Place Winner):	Nina Jessica Lu
Junior Achievement 2012 Essay Competition (First Place Winner, Maryland):	David Zhang
Thiel Fellowship (20 under 20):	Kettner Griswold
Broadcom MASTERS Semi-finalists:	Griffin Shaw Badalamente, Siddharth Nayak, Ninad Ravindra Nirgudkar, James Ray Waychoff
Davidson Fellow:	Nina Jessica Lu
Siemens Competition in Math Science and Technology Semifinalists:	Jinhie Skarda, David Zhang
Intel Science Talent Search Semifinalists:	Jinhie Skarda, David Zhang, Joy Zheng
White House State of STEM Conference Student Representative:	David Zhang





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and advancement among young scientists by supporting
ScienceMONTGOMERY 2013.

- ODS Staff



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Office of Dietary Supplements
National Institutes of Health
U.S. Department of Health & Human Services
Bethesda, Maryland



2013 Category and ISEF Awards Judges

Name	Affiliation	Name	Affiliation
Ms. Abolade Adepiti	Battelle Institute	Ms Eleanor Gillette	University of Maryland
Mr. Jose Albarracin	QIAGEN	Dr. Quentin Glorieux	NIST
Mr. Kyle Anderson	NIST	Mr. Karl Goller	
Mr. Yezdi Antia	Hughes Network Systems	Mr. Jon Griffin	
Mr. Reuben Aronson	US Naval Research Lab	Ms Joy Gunter	University of Virginia
Dr. Milton Axley	MedImmune	Dr. Sonal Gupta	Johns Hopkins University
Ms. Lauren Aycock	Cornell University/NIST	Dr. Mohan Kumar Haleyyur Giri Setty	FDA/CBER
Ms. Jennifer Baer		Dr. Jonathan Hardis	NIST
Mr. John Bagnoli	MRIGlobal	Ms. Kneshay Harper	MRIGlobal
Dr. Kate Baldwin	Howard Univ. retired	Dr. Lijuan He	Johns Hopkins University
Dr. Amy M Belton	Johns Hopkins University	Ms Xiaoxiao He	
Dr. Denis Bergeron	NIST	Mr. Mahabal Hegde	
Ms Cathryn Blakley	University of Maryland	Dr. Steven Highfill	NIH/NCI
Ms. Amada Boggs	University of Maryland	Dr. J Terrell Hoffeld	USPHS, retired
Mr. Keith Bullock		Mr. Larry Hothem	USGS
Dr. Jeffrey Burke	Circulomics Inc	Dr. Brian Jackson	
Dr. King Chan		Dr. Muhammad Jamal	NIH
Dr. Prabha Chandrasekaran	NIH	Dr. John Jones	University of Maryland
Mr. Leon Chao	NIST	Dr. Smita Kakar	
Ms. Chaitali Chattopadhyaya	FDA	Mrs. Dipti Kalra	FDA
Dr. De Chen	FNLCR/SAIC - Frederick, Inc.	Dr. Miriam Kelty	
Dr. Swati Choksi	NIH	Dr. Edward Kelty	
Ms. Stacey Cole	NIH/NIDCD/SHG/LMG	Ms. Cara Kenney	NIH
Dr. Kevin Connolly	Independent consultant	Mr. Gokhul Kilaru	NIH
Dr. Hall Crannell	Retired	Dr. Keekwang Kim	NIH
Mr. Chris Crowley	NIST	Dr. Vipula Kolli	HJF
Mr. Jonathan Czisny	Group W Inc	Dr. Daniel Krainak	FDA/CDRH
Mr. George Daniello		Dr. Krishan Kumar	NIH
Dr. Mathew Daniels	NIH	Dr. Christiane Kuschal	NIH
Dr. Salil Das	Prince Georges Community College	Dr. Natalie Leach	NIH
Dr. Siddhartha Datta	NIH	Dr. William Lee	Naval Research Laboratory
Mr. Mark DeCotiis	NIH	Dr. Young Lee	NIST
Dr. Jana Delfino	FDA	Drl Sunil Lingayat	
Dr. Ranadhir Dey	FDA/CBER	Dr. Chunqiao Liu	NIH/NEI
Dr. Lena Diaw		Mr. Shubing Liu	QIAGEN
Mr. Jeffrey Durocher	QIAGEN	Dr. Namal Liyanage	NIH
Dr. Mohibullah Durrani	Montgomery College	Ms. Heidi Lovett	NOAA Fisheries
Mr. George Eastwood	HemaCare	Mr. Brian Lowe	
Dr. Ines Elakhal Naouar	FDA	Dr. Sabrina Lusvarghi	NIH/NIDDK
Dr. David Ennist	DLE Consulting	Dr. Jarrad Marles	NIH
Dr. Luis Espinoza	NIH	Dr. Philippe Marmillot	NIH
Dr. Gisela Ferreira		Mr. Stephen Mason	Johns Hopkins University
Dr. Andrew Flannery	University of Maryland	Mr. Joseph McKennan	NIH/DVR
Ms. Sarah Gaillot		Mr. Karl Means	Shulman Rogers
Dr. Harold Gainer	NIH	Ms. Chun-yan Mi	Defense
Mrs. Mary Galloway	FDA	Dr. Julia Michelotti	MRIGlobal
Dr. Adarsh Gandhi	NIH	Dr. Danilo Miguel	University of Maryland
Dr. Eric Garber	FDA	Mr. Scott Miller	QIAGEN
Dr. Nidhi Gera		Dr. Santosh Mishra	
Dr. Amber Giles	NIH	Dr. Bidyottam Mittra	University of Maryland

**2012 Category and ISEF Awards Judges (continued)**

Name	Affiliation	Name	Affiliation
Dr. Amie Moody	NIH	Mr. Malcolm Smith	MRIGlobal
Dr. Ram Narula	Retired	Mr. Tyranny Smith	University of DC
Dr. Kapinga Ngalula		Dr. Corey Stambaugh	
Dr. David Norris	NIST	Mr. Joey States	
Dr. Kevin O'Connell	NIH	Mrs. Susan Straus	
Mrs. Bernadette Owen		Dr. Daniel Stringer	NIH/NCI
Dr. Jeff Owrutsky		Dr. Hina Sultana	NIH
Dr. Gustavo Pacheco	NIH	Ms. Elise Sylar	NIH
Mr. Thomas Pak	Johns Hopkins University	Dr. Jennifer Taylor	NIH/NIDDK
Dr. Ruiqing Pamboukian		Dr. David Tomko	NASA
Dr. Disha Pant	University of Maryland	Dr. Gil Toombes	NIH
Ms. Amrita Paul		Dr. Anna Trofka Klee	NIH
Dr. Robert Peters	NASA	Dr. Nadra Tyus	USPHS
Dr. Roldan Pozo	NIST	Ms. Ekemini Udofa	University of Maryland
Dr. Savelas Rabb	NIST	Ms. Tania Ullah	NIST
Mr. Ramachandran Radhakrishnan	Landon IP	Dr. Jithesh Veetil	NIH
Ms. Suganthi Ramachandran	QIAGEN	Dr. Raghavan Venkat	MedImmune
Dr. Salvatore Rapisardi		Ms. Yorlery Vicioso	NIH/NCI
Dr. Kempaiah Rayavara Kempaiah	NIH/NIAID	Ms. Tresa Vidayathil	
Dr. Amit Raychoudhuri	NIH	Dr. Vijay Walia	Reserach fellow
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Ms. Karine Reiter	NIH	Ms. Nicole Webster	Smithsonian's National Museum of Natural History
Mr. Dushon Riley		Ms. Claire Weichselbaum	NIH/NIMH
Dr. Luz Rivera	USPHS	Dr. Ryan Wilson	NIST
Dr. Becky Robinson	FDA	Mrs. Maya Witten	
Dr. Jermaine Ross	NIH	Ms. Jie Zhou	University of Maryland
Dr. Tamika Samuel	University of Maryland	Dr. Thomas Zielinski	NASA
Dr. Sumona Sarkar	NIST		
Dr. Sanjiv Shresta			

ScienceMONTGOMERY Participating Schools-2013

School	Abbreviation	School	Abbreviation
Argyle Middle School	AGM	North Bethesda Middle School	NBM
Al-Huda School	AHH	Parkland Middle School	PLM
Bethesda-Chevy Chase High School	BCH	Poolesville High School	POH
Montgomery Blair High School	BLH	Roberto Clemente Middle School	RCM
Winston Churchill High School	CHH	Robert Frost Middle School	RFM
Eastern Middle School	ESM	Richard Montgomery High School	RMH
Forcey Christian Middle School	FCMS	St. Andrew Apostle School	SAA
Forest Oak Middle School	FOM	St. Catherine Laboure School	SCL
William H. Farquhar Middle School	FQM	Shady Grove Middle School	SGM
Gaithersburg High School	GBH	Sligo Middle School	SLM
Holy Cross School	HCS	Stone Ridge School of the Sacred Heart	SSH
Home Schooled	HS	Seneca Valley High School	SVH
The Heights School	HTS	Sherwood High School	SWH
Charles E. Smith Jewish Day School	JDS	Takoma Park Middle School	TPM
Julius West Middle School	JWM	Thomas S. Wootton High School	WHO
Kingsview Middle School	KIM	Walter Johnson High School	WJH
Lakelands Park Middle School	LPM	Walt Whitman High School	WWH
Col. Zadok Magruder High School	MGH		

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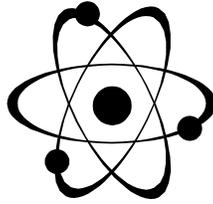
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Congratulations to *ScienceMONTGOMERY* 2013

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

INTERESTED IN NEXT YEAR'S SCIENCE FAIR?

Are you supporting students with projects?

**Check out the Intel ISEF Document Library for 2014 Rules,
Guidelines, and Resources!**

Documents are usually updated by the end of May for the coming year.

Email *ScienceMONTGOMERY's* Scientific Review Committee
src@sciencemontgomery.org any time with questions,
or to ask for comments on a proposed research plan.



EXHIBITORS

STUDENTS IN THE MIDDLE SCHOOL FAIR

BEHAVIORAL AND SOCIAL SCIENCES

M101	Does Your Mind Think Better in the Morning or the Afternoon?	Pamela Steimel	RCM
M102	The Effect of Personal Space on People	Julia Chien	TPM
M103	Fear Factor: Using Pulse Rate to Measure Emotion	Julia Condron	HCS
M104	Testing the Stroop Effect	Gabi Connor	HCS
M105	Music and Mood: How Does it Affect You?	Tashelle Davis	PLM
M106	The Effect of Color on Flavor Perception in Beverages	Serena Debesai	TPM
M107	Advertising and Obesity	Brittany Goldstein	TPM
M108	Does Your Picture Tell 1000 Words?	Isabelle Homan	HCS
M109	How People Make Decisions: Think Smart or Follow Your Heart?	Lucia Jiang	TPM
M110	The Effect of Peppermint on Reaction Times	Divya John Carissa Wu	TPM TPM
M111	The Effect of Color on Grade Given	Noah Kim	TPM
M112	Color: Should We Still Use Pencils? (The Effect of Color on Memory)	Laura Espinoza Esther Lee	TPM TPM
M113	The Effect of Suggestion on Memory	Hermela Mengesha	TPM
M114	Seeing vs. Being: The Effect of Gender on Experience-Taking in Adolescents	Brittany Menjivar	HCS
M115	Stop in the Name of the Law	Eleanor Nuckolls	HCS
M116	The Effect of Foreperiod Duration on Reaction Time	Irene Park	TPM
M117	And Don't Forget It!	Jagan Prem	RCM
M118	The Association of Sweets/Salty Snacks and Obesity	Katherine Wu	TPM
M120	Dreams	Dhanush Parasa	AGM
M121	The Effect of Distraction and Alcohol on Drivers	Jessica Bhattacharyya	RCM

BIOLOGY

M201	The Study of Plants with Added Vitamins	Antonella Malca	RCM
M202	Plant Growth in Different Types of Soil	Steven Lu	RCM
M203	How Frac Water Affects a Plant's Photosynthesis	Peregrine Lowe	FQM
M204	How Does the Acidity of a Liquid Affect the Speed of Seeds Germinating?	Max Rogal	JDS
M205	How Acid Rain Affects Plants	Nivedita Ravi	PLM
M206	Weather Forecasting	Joshua Park	RCM
M207	Basil in the Winter?	Christina Nguyen	RCM
M208	Plant Growth of Life	Eric Moreno	PLM
M209	How Effective Different Types of Fertilizer in Hydroponics Are	Claude Zou	RCM
M210	Watering Differently	Michael Zhan	RCM
M211	Magnetism vs. Plant Growth	Grace Wu	RCM
M212	Transpiration	Philip Wang	RCM
M213	Plant Growth with Soda and Other Liquids	Patrick Wang	RCM
M214	Recycling Greywater 2.0	Sunil Tohan	RCM
M215	Transpiration of Money Plant Leaves	Dona Thomas	PLM
M216	Hydroponics and Plants	Thandiwe Tembo	RCM
M217	Effect of Pesticides on Plant Growth	Sue Lee	RCM
M218	Acid Rain Affects Plants!	Shreya Khanna	PLM



M219	Musical Plants	Saichandra Katragadda	FOM
M220	How Do Different Concentrations of Fertilizers Affect Plant Growth?	Anjali Kalra	RCM
M221	Plants vs. Caffeine	Luke Inman	PLM
M222	The Effects of Soil on Plant Growth	Jason Hsu	RCM
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M224	May the Best Plant Win! Experiment with Genetically Modified Seeds	Stuti Ganatra	RCM
		Morgan Ross	RCM
M225	What Do Plants Grow Best In?	Heather Fitzgerald	PLM
M226	The Effect of the Amount of Smoke in the Air on the Rate of Transpiration in a Plant	Amelia Cherian	RCM
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M228	Dirty Dirty Plant Growth	Ian Atkinson	PLM
M229	pH of Liquids Affecting Growth of Plants	Hemon Asadi	PLM
M230	Can Plants Survive in Extreme Conditions	Daniel Quintanilla	SCL
		Robert Salerno	SCL
		Ahmad Luke	SCL
M231	Comparison Between Plant Growth Using Different Types of Liquid	Phoebe Qiu	RCM
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M233	How do Electromagnetic Fields Affect Bean Plants?	Fausto Zurita	PLM
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M242	Foot Pronation	Delia Chen	RCM
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		Matteo Patzy	SAA
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		Angela Blow	FCMS
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		Lallo Yadeta	FCMS
		Meghna Kurup	FCMS
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		Avik Barua	TPM
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		Mahlet Traore	SCL
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		Alana Ruiz	SCL
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		Daniel Zhu	TPM
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		Luxman Maheswaran	TPM
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		Kevin Merrell	RCM
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M504	Which Type of Wood is Most Affected by Moisture?	Edward Lee	RCM
M505	Viability Study of Renewable Energy Resources in Our Neighborhood	Kristina Znam	TPM
M506	Analyzing Projectile Motion, the Mechanics of Centripetal Force, and Real World Applications with a Slingatron	James Waychoff	PLM
M507	If Different Catalysts are Applied to a Water Splitting System, Which Catalysts Would Work the Most Efficiently?	Joshua Chen	RCM
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M509	How Do the Size, Shape, and Density of an Object Affect the Natural Frequency or Frequencies at Which it Resonates?	Logan Saar	RCM
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		Nicholas Hopwood	RCM
M707	The Effect of Ground Effect on Helicopters Carrying Payload	Richard Wang	RCM
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M710	Weight Distribution in Flight	Jose T. Da Silva Torres	PLM
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M713	The Effect of Heat on Acoustic Shadow	Sumin Goh	TPM
M714	The Effects Of Heat On A Rubber Band's Elasticity	Rohit Chari	RCM
M715	Light Liquids	Kameron Hnath	RCM
M716	Making Concrete	Rejoice Attor	PLM
M717	Muffling Sound	Kevin Boby	RCM
		Matthew VanBronkhorst	RCM
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M720	Does Temperature Affect the Strength of a Magnet?	Sriya Srikanth	RCM
M721	Color Heat Absorption	Aideen Hwang	SCL



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H507	The Effect of Temperature on Diode Function	Lucian Hodor	WHO
H508	Grandma's Tripped! Saving the Fall	Pei-Yi Lin Denise Alving Abhigya Giri	POH POH POH
H509	Measuring Atmospheric CO2 with a Miniaturized Laser Heterodyne Radiometer	André Guzmán	POH
H510	Solar versus Battery Power	Jackson Douglas	SVH
H511	Web Tools For Machine Tool Metrology	Stephen Lee	CHH
H512	Smart Sensor Networks for the Internet of Things	Anthony Caputo	POH
H513	Portable Stress Analysis of Collapsed Structures in Order to Aid Emergency Response Teams	Prajwal Keranahalli	POH



H514	Highly Sensitive and Rapid Detection in Diagnosis of Breast Cancer Based on Carbon Nanotube Field Effect Transistors	Yeonsuk Kim	HTS
H515	A Trend Analysis for Effect of Urbanization on Changes in Climate and Public Health in Washington D.C. Metropolitan Area Over Years	Shubham Chattopadhyay	BLH
H516	Nanoparticle Effect on <i>Saccharomyces cerevisiae</i>	Grace Cheung	RMH
H517	The Oxigenator	Reethika Maddineni Amy Hockman Molly Hierholzer	SWH SWH SWH
H518	Evaluation of Kitchen Stone Countertops for Environmental Trace Radioactivity	Max Niebylski	BCH
H519	Environmentally Friendly Water Purifier Constructed from Recycled Materials	Angela Zhou Amber Liu	POH POH
H520	Targeted Thermal Ablation of Cancer Cells Using Biosurfactant Coated Carbon Nanotubes	Joy Zeng	POH
H521	What is the Effect of Roll on the Lift Provided by Various Airfoils?	Declan Whitford Jones Seong Joon Yoo	POH POH
H522	Braces And Bridges: Can the Technology of Orthodontic Braces be Used to Strengthen Bridges Against Weathering and Natural Disaster?	Tanvi Shah	POH
H523	Crash Prevention in Cars	Dave Qin	POH
H524	Movement Efficiency of Multi-Wheeled Vehicles on Different Terrains	Mohamed Keita	GBH
H525	Elements of Propellor Design for a Submersible Aircraft	Steven Guo Kenneth Jiang	POH POH
H526	Portable and Disassemblable Buildings	Angeline King	POH
H601	Evaluating Risk Factors for Sickle Cell Disease Mortality	Pushkar Aggarwal	POH
H602	Lattice Points in Rational Polygons and Batting Averages in Baseball	Daniel Barg	BLH

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H603	Public-key Cryptography Using Groups Derived from Matrix Manipulation	Arvind Kannan	BLH
H604	Mathematically Speaking, What Makes a Good Photograph?	Gayane Matevosyan	POH
H605	Probabilistic Analysis of Quantum Error Correcting Codes	Charles Pasternak	BLH
H606	Understanding the Difference Between Natural and Manmade Randomness	Seung-Yeob Yang	POH
H607	On Improved Bounds for Bounded Degree Spanning Trees for Points in Arbitrary Dimension	Samuel Zbarsky	BLH

PHYSICS

H701	Remote Sensing Thermometry in Water for Radiation Dosimetry	Srirama Ayyagari	POH
H702	Field-aged Armor Material Properties	Zachary Watson	WWH
H703	Is Paintball Safe?	Robert Sood Greg Baek	POH POH
H704	Observing Solar Events Through the Use of the ARTEMIS-IV/HECATE Multichannel Radio Spectrograph and the Gerostathopoulio Observatory of the University of Athens, Greece	Foteine Dimitracopoulos	POH
H705	Analysis of Jovian Decametric Emission Using the Long Wavelength Array Station 1	Jinhie Skarda	BLH
H706	Living On Mars	Saimouli Katragadda	GBH
H707	Triboluminescence	Nitesh Sridhar	WHO
H708	Transmission and Reflectivity of Electromagnetic Radiation Through Different Colored Opaque Mediums as is Released as Infrared Radiation	James Rogers	POH
H709	Simulation of Optimal Holographic Environments	Suriya Kandaswamy	POH
H710	Determining Which 3-Dimensional Shapes Scatter the Most Light and Radio Waves	Jihoon Jang Alex Tolstoy Julian La Rosa	POH POH POH
H711	Effect of Water on the Color of an Object	Jacob Glueck	WHO
H712	Analysis of Friction Between Papers	Trishul Nagenalli	POH
H713	Do Different Pianos Sound Different, and if So, Why Do They Sound So?	Roger Guitart	POH
H714	Keeping Boards in Greater Condition for Longer	Lee Dodds	POH
H715	How Overblowing Changes the Pitch of a Woodwind Instrument	Xiaotian Fan Erik Hung	POH POH
H716	The Effect of Formal Track Training on Sprinters' Performance Times	Hallie Byles	WHO
H717	Conservation of Momentum and Energy in a Baseball Bat - Ball Collision	Katherine Brizzolara	WJH
H718	The Physics Behind the Backtuck	Annie Bao Sylvana Aho	POH POH
H719	The Effect of Hand Grip on Positions	Nisha Joshi	WHO
H720	The Effect of Standing Water on the Distance a Baseball Can Be Thrown	Matthew Yung	WHO
H721	The Effect of Hitting with Bats Made from Different Materials on the Distance a Ball is Hit	Toria Yan	WHO
H722	The Effect of Polygonal Structure on Surface Impact Resilience	Albert Jiang Eric Xu Hansheng Zhang	POH POH POH
H723	Under Pressure: The Influence of Foot Positioning on Stress and Pressure	Ankita Sharma Christina Lingfu Shirley Wolz	POH POH POH
H724	The Safety of Helmets in Relation to Head Injuries in Major Contact Sports	Anish Prasanna Ryan Lentz Paul Wrona	POH POH POH
H725	The Effect of Dimples on a Vehicle's Aerodynamic Efficiency	Andrew Sebastian	RMH



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The Montgomery Area Science Fair Association is the organizational vehicle for the annual county science fair, *ScienceMONTGOMERY*, for public, parochial and private schools students in Montgomery County, MD.

The goals of the Association are to:

- Encourage students to explore science through experimentation and to present their results.
- Produce a top quality, annual science fair.
- Raise funds to conduct the fair through personal and corporate contributions.
- Provide for the top high school winners to attend the Intel International Science and Engineering Fair.

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Please complete the form and return it to the address below. Your help is greatly appreciated.

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- Full page advertisement and prime location in event program
- Logo and link from ScienceMONTGOMERY.org
- 7 attendees for Awards Ceremony

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- Organization name listed on ScienceMONTGOMERY.org
- 5 Attendees at Awards Ceremony

Cu

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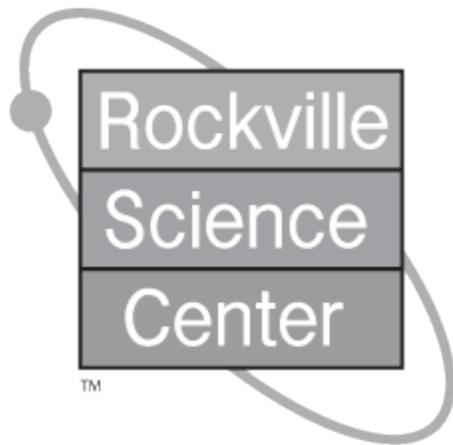
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