New Mexico Academy of Science

Volume 97 Numbers 1,2&3 Fall 2011

2011 The International Year of Chemistry

NMAS 2011 Annual Banquet, Outstanding Science Teacher Awards and Distinguished Lecturer

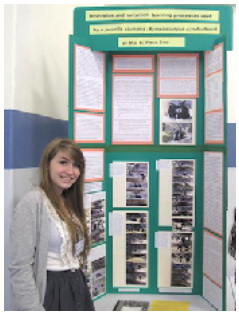
Saturday, November 19

Dr Mark Boslough,
Sandia National Laboratory
"Impact Craters: Supercomputer Simulations, Desert Glass, and Space Tourism on Earth"
See more on Dr. Boslough's lecture on page 5

Dinner will begin at 6pm with the 2011 NM Outstanding Science Teacher awards and lecture following.

The evening will be held at the New Mexico Museum of Natural History and Science, 1801 Mountain Rd. NW, Albuquerque, NM.
See page page 8 for the banquet/lecture registration.

2011 New Mexico Junior Academy of Science Paper Competition Winners



Each year NMAS promotes student research and participation in science fairs by awards to high school and middle school students who compete in the scientific paper competition held in conjunction with the Regional and State Science and Engineering Fairs.

This year, NMAS is proud to announce that we have "covered the state" with award winning students from Las Cruces, Rio Rancho, Albuquerque, Aztec, Tijeras, Farmington, and Los Alamos!

See the details and complete list of student award winners on page 6

NMAS Names Outstanding New Mexico Science Teachers for 2010

NMAS recognized two Outstanding New Mexico Science Teachers at the annual banquet held in November, 2010. These teachers were chosen from nominations statewide for best High School, Middle School, or Elementary teachers.

Cash awards were generously contributed by the American Chemical Society and NM Optics

Outstanding High School Science Teacher
Bonnie Dodge,
Infinity High School
Belen

Outstanding Middle School Science Teacher
Damian Armijo
Alta Vista Middle School
Carlsbad

See Pages 4 & 5 for more information on these outstanding teachers!

Please Pay your 2011 Membership Dues (and plan ahead for 2012)!

The last year you paid dues is on your mailing label. If you have not yet paid dues for 2011 or 2012, please fill out the form on page 7 and send your dues to NMAS.

New Mexico Academy of Science Board Members

Members - note that NMAS has reinstated the popular Life Membership category. Check it out on page 7.

NMAS MEMBER NEWS..

Thank you to these NMAS members who have made donations this year to the NMAS general fund or to the NMAS Endowment Fund.

Marvin Moss

Mel Eisenstadt

Jim Goodding

United Way Donations

NMAS Past-President and current board member, Jayne Aubele, has been elected as a Fellow of the Geological Society of America and will be honored at the GSA 2011 annual meeting.

NMAS Member, Tish Morris, was the winner of the first annual Dr. Richard W. Becker Award of Excellence in Environmental Education, given at the Leopold Education Project Annual Conference in July 2011. Tish retired this year, after 27 years as a science educator at the New Mexico Museum of Natural History and Science.

National Youth Science Camp

Do you know a graduating high school senior with an interest in pursuing a career in science, engineering or medicine? Each spring, NMAS selects 2 graduating seniors from New Mexico to join other graduating seniors from around the country to attend the National Youth Science Camp, all expenses paid. Students are chosen on their academic record, essays, and recommendations of their teachers and principals. It is a wonderful opportunity for students to meet and learn from eminent professionals in their future careers.

To apply, contact Richard Nygren at
renygre@sandia.gov
Information on the NYSC is available at
http://www.nysc.org/w/welcome.html

NMAS Newsletter
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Fall, 2011

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NEW MEXICO ACADEMY OF SCIENCE

Founded in 1902 to foster scientific research and scientific cooperation, increase public awareness of the role of science in human progress and human welfare, and promote science education in New Mexico.

The Academy has been in continuous existence since 1915, and became formally associated with the New Mexico Museum of Natural History and Science in 1995.

Affiliated with the American Association for the Advancement of Science (AAAS)

Member of the National Association of the Academies of Science (NAAS)

President's Message - September 2011

Marvin Moss

Founded in 1902, the New Mexico Academy of Science (NMAS) is a member of the National Association of Academies of Science and an affiliate of the American Association for the Advancement of Science. Its mission includes helping the establishment of appropriate standards for the teaching of the sciences, providing verifiable scientific advice to groups and individuals, promoting scientific research and cooperation, and fostering public awareness and understanding of the role of science in human progress and welfare. In implementing the last-named function, the Board of Directors of NMAS has recently approved a continuing plan to invite speakers to address members of NMAS and the public on topics of science and science education. Such a plan began this year with a public presentation on the assessment of the near-term risk of climate uncertainty followed by one on the prospects of nuclear fusion energy.

It is troubling that well-tested conclusions arrived at by qualified scientists are today being denigrated by those who claim that such conclusions are merely "theories" and not to be taken seriously. The realities of evolution and anthropogenic climate change are being obscured to the detriment of scientific progress and public welfare. National Geographic News reported in 2010 that since 1985 only 14 percent of adults in the U.S. thought that evolution was "definitely true," while about a third firmly rejected it. The roles of educational institutions, scientific organizations such as NMAS and informed individuals are more important than ever in countering misinformation and apathy.

NMAS activities include the Visiting Scientist Program, the Junior Academy of Science and associated science fairs, the New Mexico Journal of Science, selection of New Mexico delegates to the National Youth Science Camp, and the annual honoring of New Mexico science educators with its Outstanding Science Teachers Award. Student research, research fairs, paper competitions, and symposia are also conducted under Academy auspices. It is unfortunate that the long-standing NMAS Visiting Scientist Program, that was managed out of Highland University and reached schools statewide, has not been funded for two years, appeals to the New Mexico State Legislature notwithstanding.

Bonnie Dodge, Infinity High School, Belen

I am Bonnie Dodge and I am a math and science teacher at Infinity High School in Belen, New Mexico. This is an alternative high school for at-risk students, which means these students have been turned off to education at some point in their school lives. Some have dropped out of school, dropped out of life, and become invisible except when they commit some unconventional and often unacceptable action against society. Others did not receive their high school diploma for whatever reason and now realize the importance of that certificate. These students are intelligent and have overcome many odds in their quest to better themselves.

I have a degree in education, majoring in math with a minor in science. I taught in Connecticut for nine years in grades kindergarten to middle school. I was a partner in an art and framing business and worked in the aerospace industry for many years. I did not expect to return to teaching, but while I was in Connecticut I was asked to teach an after-school math enrichment program in the local middle school. This reignited my passion for teaching. I enjoyed working with the students, finding activities which related math to the world around them, and seeing their enthusiasm as they worked through their problems.

About seven years ago I moved to New Mexico and was presented with the opportunity to teach science and math. I had been out of education for several years and needed licensure in New Mexico; this started my journey to enhance my formal science background. Since then I have received my Level II Licensure and am certified as highly qualified in math and science. I received my Masters of Science for Teachers and Green Technologies Certificate from New Mexico Tech. I am an avid seeker of knowledge and attend many teacher workshops and professional development programs, many of which are on weekends or during the summer. I greatly appreciate the numerous opportunities New Mexico offers its teachers and young people. The outreach programs made available by state and federal agencies, businesses and corporations, communities and institutions of higher education are priceless assets which can to be used to excite and motivate students as well as teachers.

I am especially proud of my students who have been in or are presently in my Advanced Applied Science class. This class meets for a four-hour block of time on Friday mornings. The first class was three years ago, entitled "Mining for Energy in New Mexico." With the help of experts from the New Mexico Bureau of Geology and Mineral Resources (NMT) and help from mining companies within the state, students were able to realize the importance of mining, because they visited an operating mine, an abandoned mine, and an historical mine site. Last year we studied the "Geology of New Mexico" as it related to earthquakes and volcanoes. Students visited and hiked all types of volcanoes in the state including lava flows and volcanic plugs. I depended on the support of BLM staff, IRIS PASCAL staff at NMT, Senior Geologists, U.S. Forest Rangers, and the US Army Corp of Engineers to allow us on their lands and share their expertise with us. This year we are studying "Water as a Resource." We are participating in a monthly monitoring program: the Bosque Ecosystem Monitoring Program (BEMP) in conjunction with UNM. We are also cooperating with the staff (US Department of Fish and Wildlife Service) at Sevilleta National Wildlife Refuge to design an outdoor class room at our school using native plants and xeriscaping. Working with personnel from the Whitfield Wildlife Conservancy Area, students are learning about wetlands. As a community outreach students will donate a work day to help keep clean the Whitfield site. With the help of the USDA, Natural Resource Conservation Service (NRCS) and input from other professionals in the field , the students have designed and are now implementing an erosion-control project at our new school (Infinity High School) to be completed shortly. They have also made a landscape design and have chosen vegetation for planting in the spring to complete our water-conserving xeriscape landscape.

I AM VERY PROUD OF MY STUDENTS FOR ALL OF THE HARD WORK THEY HAVE PUT INTO THIS PROJECT SO FAR.

I want to thank all of you for your support, too. The inspiration for teaching subjects like these comes from the information and activities I have gleaned from workshops, classes, and conferences I have attended and still attend on a regular basis. I especially want to thank my school and district administration for allowing me to teach outside the box in order to stimulate students to learn.

I believe a teacher's goal is to SPARK the curiosity within a student enough to KINDLE the student's desire to learn and IGNITE the FLAME that lights the pathway to knowledge. We are all teachers; be it in a classroom, outside in a field, within a giant corporation, in our communities, or in our own homes. We all have the responsibility as Shirley Garrett says, "[To] teach from the top of [our] lungs and bottom of [our] hearts!" SO FIND THAT SPARK THAT WILL KINDLE AND IGNITE THE FLAME OF KNOWLEDGE: OUR FUTURE DEPENDS ON IT!

2011 Outstanding New

By Harry

Cash awards from

AJAS/NAAS/AAAS Annual Meeting Washington D.C. February 2011

Lynn Brandvold, NMAS Junior Academy of Science Coordinator, attended the joint annual meetings as the New Mexico Academy representative. Accompanying her was the 2010 Senior Division First Place NMJAS winner, Laura Lane, from Aztec High School, Aztec NM. Laura presented her research "Formulating Trends of Nematode Distribution, at the meeting and participated in the student activities.

Mexico Science Teachers

Pomeroy, Award Coordinator
the American Chemical Society

Damian Armijo, Alta Vista Middle School, Carlsbad

Damian Armijo was born in Albuquerque, New Mexico, where he resided for most of his life. He is married to Cheryl, and has four children, Lydia, Jaccob, Domilyse, and Simon. Damian and his family currently reside in Carlsbad, NM.
Damian graduated from West Mesa High School in 1988. After graduation he joined the United States Air Force and served as a Security Policeman for two years. Upon exiting the military he moved to Edgewood, New Mexico with his family and spent several years seeking his life's profession.
In April of 2001 Damian decided to pursue a degree in Elementary Education. He minored in science and Teaching English as a Second Language (TESOL). In December of 2005 he completed his Bachelor's degree and graduated with honors, Suma Cum Laude, from the University of New Mexico. After a brief respite Damian returned to school in October 2006 to further his education. He graduated from the University of Phoenix in December of 2007 with a Master's degree in Curriculum and Instruction.
Damian has now been teaching for five years. He taught for one year with Albuquerque Public Schools, and is now in his fourth year with Carlsbad Municipal Schools. He is currently teaching 8th grade science at Alta Vista Middle School.
Damian enjoys using inquiry and hands on exploration to introduce students to the natural phenomena that exist all around them, and to encourage their curiosity. Through inquiry based activities, and a high enthusiasm for science, students are led to not only make observations but, to question what they observe and seek answers to their questions. "The universe lies before you, waiting to be explored. I have opened the door; all you need to do is walk through."

NMAS Distinguished Lecturer 2011

"Impact Craters: Supercomputer Simulations, Desert Glass, and Space Tourism on Earth"

by *Dr. Mark Boslough, Sandia National Laboratory*

There are more than 170 known impact craters around the world. It is often said that the Earth's atmosphere protects us from small asteroids because they burn up before they reach the surface. However, supercomputer simulations show that small asteroids can be more dangerous than crater-forming impacts because they are capable of incinerating everything beneath them when they explode in the air with more power than the largest nuclear weapons. I will describe expeditions with film crews to the Libyan Desert in search of a rare and beautiful yellow-green glass that resulted from such a cosmic explosion and was prized by the Ancient Egyptians, and to the site of the 1908 Tunguska explosion in Siberia that blew down trees over an area spanning 2000 square kilometers. Calculations suggest that there should be many more undiscovered "ground zeros" from past explosions in the sky. The evidence may already be documented, but simply not recognized for what it is. Finally, I will propose a new form of space tourism that would give scientists and adventurers the opportunity to witness explosions in the sky from a safe distance, when collisions are predicted in advance.

***Mark Boslough** is a physicist who has studied shocked minerals and solid crater-forming impacts. He has collected and analyzed samples from impact sites, and has used hypervelocity cannons and high explosives to generate his own shocked minerals. His current impact research is focused in computational modeling of low-altitude airbursts and their effects. His work has been featured in more than a dozen recent television documentaries.*

DID YOU KNOW?

2011 is the International Year of Chemistry. Celebrate the achievements of chemistry and its contributions to the well-being of mankind. For more information about activities planned, and things you can do yourself, go to
http://www.chemistry2011.org/

2011 State NMJAS Paper Competition Winners

By Lynn Brandvold, NMJAS Coordinator

Cash awards for NMJAS winners were provided by a grant from Sandia-Lockheed Martin.

Senior Division

First Place
Fiona McCrossin
Innovation and Imitation: Learning Processes Used By Juvenile Siamang
Las Cruces High School
Las Cruces, NM

Second Place
Jordan Grainger
Fighting Bac!! Phase IV
Rio Rancho High School
Rio Rancho, NM

Third Place
Elias Clark
The Effect of Elemental Abundances on Stellar Evolution
Cibola High School
Albuquerque, NM

Honorable Mention
Laura Lane
Monitoring the Disturbance of Soil Microsystems in Dormant Topsoil
Aztec High School
Aztec, NM

Junior Division

First Place
Jessie Linder
Are you Stronger than an Icosahedron
Roosevelt Middle School
Tijeras, NM

Second Place
Vlad Sevostianov
Changes in bone Strength Due to Decalcination
Sierra Middle School
Las Cruces, NM

Third Place
Megan Risner
Can You Teach an Old Dog New Tricks?
Heights Middle School
Farmington, NM

Honorable Mention
Chloe Keilers
Factors Affecting Aerodynamic Drag on a Sphere
Los Alamos Middle School
Los Alamos, NM

Innovation and Imitation: Learning Processes Used By Juvenile Siamang

Fiona McCrossin, Las Cruces High School, Las Cruces, NM

In order to determine whether gibbons (lesser apes) are cognitively more similar to apes or monkeys, I examined processes of learning in a young siamang. If social learning of a customary complex behavior is observed, then siamangs would be interpreted as intellectually more like great apes. Forty-six observation hours were made of the juvenile siamang at the El Paso Zoo over 21 days during a three year period (2008-2011). The customary complex adult behavior I focused on is the use of a particular set of logs over a moat as a latrine. Latrine use is not observed in wild siamangs (not instinctive) and was not taught to them by humans. As a 25 month old the baby siamang expressed great curiosity toward latrine use and toward the water, and would join her mother on the latrine, but did not use it. As a 36 month old she accomapnied both parents to the latrine and used it when they do. On one occasion she went to the latrine on her own but could not go, then went to her father who she brought back to the latrine where they used it simultaneously. On another occasion the father pulled the juvenile to the latrine and made her sit on it alone. Such behaviors and others are interpreted as active teaching and learning of a complex family tradition. This is viewed as strong evidence of social learning in siamangs in a manner typeical of great apes and humans rather than monkeys.

Photo of Fiona McCrossin, with her research poster, on page 1. Photograph by Lynn Brandvold.

Winners - Rio Grande Chapter AVS Science & Technology Society

The AVS Science & Technology Society, formerly the New Mexico Chapter of the American Vacuum Society, sends judges and selects its own winners in the paper competition and awards prizes to these winners as well as to their teachers/sponsors. The New Mexico Academy of Science is very grateful for their support.

Senior Division

First Place
Hellen Chiou
Carlsbad High School
Sponsor: Deborah Haggerton

Second Place
Jordan Grainger
Rio Rancho High School
Sponsor: Bob Keeney

Junior Division

First Place
Jon T. Goodart
Los Alamitos Middle School
Sponsor: Dan Cunningham

Second Place
Jessie Linder
Roosevelt Middle School
Sponsor: Janine Sears

Membership Form
New Mexico Academy of Science

New Member [ ] Renewal 2011 [ ] Renewal 2012 [ ] Renewal Year?__ [ ] Publications [ ] Donation [ ]

Date _____ Name _____

Employer/Firm/Affiliation _____ Title _____

Primary Interest (geology, biology, chemistry, physics, science education, etc.)_____

Mailing Address: _____

_____

Phone _____ FAX _____ email _____

Check if your address is different from that on the mailing label of this newsletter [ ]

NMAS PUBLICATIONS

New Mexico Journal of Science Set of all available pre-1992 back issues	$10 _____
From Sundaggers to Space Exploration (NMAS/Sigma Xi, 1986)	$4 _____
Dinosaurs of New Mexico (NMAS Journal v. 32, 1992)	$10 _____
The Importance of Agricultural Science in New Mexico's Economy (NMAS Journal v. 34, 1994	$10 _____
Astronomy in New Mexico: Past, Present and Future (NMAS Journal v. 35, 1995)	$10 _____
New Mexico's Natural Heritage: Biological Diversity in the Land of Enchantment (NMAS Journal v. 36, 1996)	$10 _____
Environmental Management: Current and Future Needs (NMAS Journal v. 37, 1997)	$10 _____
Water Resource Issues in New Mexico (NMAS Journal v. 38, 1998)	$10 _____
Ensuring Sustainable Development of Arid Lands Through Time (NMAS Journal v. 39, 1999)	$10 _____
NMAS Journal v. 40, 2000	$10 _____
NMAS Journal v. 41, 2001	$10 _____
NMAS Journal v. 42, 2002 (Centennial CD)	$10 _____
NMAS Journal v. 43, 2003	
Science on the Border (NMAS Journal v. 44, 2006)	**$10_____**
NEW..Energy in the Southwest **(NMAS Journal v. 45, 2008)**	***Online at www.nmas.org/NMJoS-Volume-45.pdf***
Subtotal:	$ _____
+ Handling:	$ 2.00
TOTAL	$ _____

Membership Class (check one)

[ ] Member $25/year

[ ] Student $15/year

[ ] Life Member $400
(3/4 of this amount goes to the NMAS Endowment)

[ ] Subscription $30/year
(Libraries only)

[ ] Contribution to the NMAS Endowment $_____

Membership Subtotal: $_____
Donation Subtotal: $_____
Publication subtotal: $ _____

Total: $ _____

Membership includes newsletters. and occasional special Journal of Science volumes (sent to life members and members who have paid their annual dues during the volume's year of publication).

Send check payable to NMAS, to:
New Mexico Academy of Science
1801 Mountain Rd. NW
Albuquerque, NM 87104
And make a donation to the NMAS Endowment

NMAS Newsletter
Volume 97 no. 1,2&3,
Fall, 2011

MEMBERS:
The NMAS needs a new Vice President and a new Director at Large. If you are interested in either of these positions, please contact any officer or board member.

Registration Form

NMAS 2011 Annual Banquet, Awards, and Lecture
6pm, November 19, 2011
Registration for NMAS banquet/lecture evening event
$36.00 (banquet and lecture)

NOTE: this registration is for the NMAS annual banquet, awards, and distinguished lecture

Name: _____
Mailing Address: _____
Email address or phone number: _____
Registration for banquet/lecture for _____persons = $_____(@$36.00 each)
Total Amount Enclosed = $_____

Please mail (or email or phone) your registration (for the banquet/lecture event) by November 10 to:
New Mexico Academy of Science
P.O. Box 13071
Albuquerque, NM 87192-3071
ATTN: David Duggan
To register for the banquet/lecture evening event by email (and pay with a check made out to NMAS when you arrive) contact nmas@nmas.org

Don't Delay....Registration must be received by November 14th.

NEW MEXICO ACADEMY OF SCIENCE | Newsletter

1801 Mountain Rd NW
Albuquerque, NM 87104