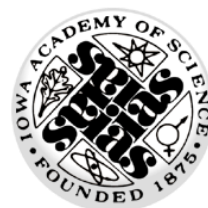


Iowa Academy of Science

The New Bulletin

Volume 8 Number 4 Winter 2012



The Iowa Academy of Science is established to further scientific research and its dissemination, education in the sciences, public understanding of science, and recognition of excellence in these endeavors.

Message from the Executive Director

As 2012 comes to a close, on behalf of the Academy I would like to wish you a peaceful and enjoyable holiday season. Thank you for your support of the Academy during 2012. Academy members step forward in many ways during the year to help facilitate academy programs and help run the organization. From mentoring students to judging for the Junior Academy to serving in leadership roles (and more) IAS members volunteer their time and expertise to advance science in Iowa.

As the year closes I would like to share a few thoughts. The Academy is in the midst of many opportunities and challenges. With the increased interest in science, technology, engineering, and mathematics education we are in an era of opportunity. The Academy, as a general science organization, through its membership of scientists and science educators, institutions, corporations, and students, is especially suited to help facilitate a renaissance across the STEM disciplines.

We also face important challenges. In many ways we are a microcosm of what faces the STEM community. The health of a general science organization like IAS reflects the health of the STEM community as a whole. While individual entities may be strong without a strong sense of community with other disciplines the community is weak and unprepared for broader societal changes that impact STEM excellence. A strong sense of community translates into a vibrant general science organization. IAS may well act as the canary in the coal mine.

If we were to sit down and invent a way to improve communication and cooperation across STEM disciplines, the most likely model would be IAS. It exists to encourage interdisciplinary communication and cooperation. If it functions as intended the organization is a strong voice for science and science related disciplines and it helps build community. It offers efficient ways for STEM interests to cooperate.

As we look forward to 2013 let us remember we are working in a climate of opportunity for promoting science research, science education, the public understanding of science, and recognizing excellence in these endeavors. The Academy is here to advance science and science related disciplines. Again I hope you enjoy your holiday season and then let's do our part toward making 2013 a success for IAS and the entire STEM community.



Craig Johnson, Executive Director



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ISTS Fall Conference Photo Album



Clockwise from top left—Quintet provides a relaxing backdrop for the PAEMST celebration at Reiman Gardens; ISTS officers Adam, De Anna, and Eric; Friend of Science Award presented to the Blank Park Zoo; participants browse the exhibit hall; keynote speaker William McComas. Photos by Tom Ervin.

New Energy Research Program Creates Educational Opportunities

The Iowa NSF EPSCoR project received a \$20 million, five-year grant from the National Science Foundation to build Iowa's research capacity in wind energy, bioenergy, and energy efficiency. It's a statewide effort involving all three Iowa Regent universities as well as other educational institutions, government agencies, and industry.

In addition to scientific research, Iowa NSF EPSCoR's mission is to increase the participation of all students in science, technology, engineering, and math fields through education and training, as well as increasing the percentage of under-represented groups in STEM careers. Toward that end, the program sponsors and organizes programs for both science teachers and students. Teachers' professional development needs are addressed in terms of content knowledge, delivery of inquiry-based curricula, and in under-

standing the nature of scientific research. For students, the program involves them in workshops, events, internships and research, where they learn about renewable energy, energy utilization, the general nature of scientific research, and other STEM topics.

To keep abreast of the both the educational opportunities as well as the important scientific research being conducted in Iowa NSF EPSCoR, you can subscribe the *Energy Innovator*, its email newsletter. For more information, visit the Iowa NSF EPSCoR website at www.iowaepscor.org. To sign-up for the newsletter, go to the website and click on the subscribe to newsletter link at the top of the page.



125th Annual Meeting of the Iowa Academy of Science

We are looking forward to our 125th Annual Meeting on April 19-20, 2013 at Simpson College in Indianola. General session speakers include Jennifer Pruitt from NASA's Environmental Control and Life Support System Development Facility at NASA's Marshall Space Flight Center in Huntsville, Alabama. Pruitt, a native of Moscow, Pennsylvania, is the engineering lead on the International Space Station's urine processor. She trends in-orbit data and monitors system health to ensure the system is operating properly, works with the engineering and operations teams to resolve problems or implement changes to the system, and performs ground tests to improve the system for ISS and future space missions.



Jennifer Pruitt

Dr. John Haught, Senior Fellow, Science and Religion, Woodstock Theological Center at Georgetown University is an internationally known speaker on issues related to science and religion. Dr. Haught has a particular interest in issues related to science, cosmology, evolution, ecology and religion. He has authored numerous books and testified for the plaintiffs in the "Intelligent Design trial," (Ktzmiller et al. vs the Dover Board of Education). Dr. Haught will address General Session II on "Einstein and Religion."

Dr. Jerry Hatfield is the Laboratory Director at the National Laboratory for Agriculture and the Environment in Ames. Dr. Hatfield's research emphasis is on the interactions among the components of the soil-plant-atmosphere continuum and their linkage to air, water and soil quality. His research accomplishments include the development of the National Laboratory for Agriculture and the Environment research program which is regarded as one of the premier laboratories in soil management and environmental quality in the United States. He is also well known for the evaluation of farming practices on water quality, soil-plant-atmosphere interactions, cropping-livestock systems research, and climate impacts on agriculture.



Jerry Hatfield

The abstract deadline is February 8th. Check the IAS website for updates and look for the Advance Program Guide with more information on meeting activities in your mailbox in January.

The New Bulletin is a publication of the Iowa Academy of Science and is distributed to current IAS members 3-4 times per year.

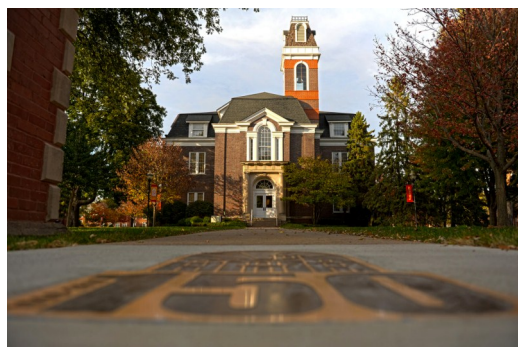
Volume 8 Number 4 Winter 2012
also available online at:
<http://www.iacad.org>

Managing Editor: Craig Johnson
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Article Submission: The deadline for submission of articles for Vol. 9 #1 is February 1, 2013. Articles must be pre-approved. For more information contact Craig Johnson, IAS Executive Director, at craig.johnson@uni.edu

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Simpson College Campus





SIMPSON COLLEGE

Call for Papers

125th Annual Meeting

Iowa Academy of Science
April 19 & 20, 2013
Simpson College
Indianola, Iowa

Iowa scientists, engineers, science educators and science students are cordially **invited to submit abstracts to be considered for poster or oral presentation** at the 125th Annual Meeting of the Iowa Academy of Science. Whether your work is in progress or complete, you are encouraged to submit an abstract. Presenting at the IAS Annual Meeting is an excellent opportunity for you and your colleagues to interact with other Iowa scientists.

Our meeting offers a friendly atmosphere for undergraduate and graduate students to gain experience in presenting their research to others. *You do not need to be a member of the Academy to present at the Iowa Academy of Science Annual Meeting.*

Abstract submission is open through February 8th, 2013.

Abstract Submission

Includes publication of your abstract in the *Proceedings of the Iowa Academy of Science*, a complimentary conference registration for the primary presenter including access to more than 120 scientific presentations by Iowa scientists, keynote speakers, symposia presentations and more.

Submit an abstract today!



Visit www.iacad.org.

Click on the Submit Abstract button.



Abstract Submission Deadline is Friday, February 8th, 2013.

eCYBERMISSION Seeks Volunteers—Partners with IAS

eCYBERMISSION is a free, web-based science, technology, engineering and math (STEM) competition for 6th-9th grade students. Sponsored by the U.S. Army and supported by a diverse group of volunteers, eCYBERMISSION promotes the importance of STEM education to students across the country.

IAS Members can assist eCYBERMISSION and the Academy by volunteering for one of three adult volunteer opportunities:

Ambassadors—Serve as the “face of eCYBERMISSION” by promoting the competition and recruiting both students and volunteers in your community.

CyberGuides—Provide online assistance to eCYBERMISSION students through the use of Discussion Forums, Chat Rooms, Instant Messaging, and interactive webinars.

Virtual Judges—Evaluate and score team Mission Folders via the eCYBERMISSION website.

In partnership IAS and NSTA, NSTA will make a small donation to ISTS for the first 30 Iowans who volunteers with the “state chapter” registration code listed below. ISTS also earns a small donation for each Iowa student who registers and completes in eCybermission as a part of a team that registers with the NSTA “state chapters” code. ISTS can earn between \$750 and \$2000 to use toward other efforts to support students in STEM!



Register as a volunteer today to help encourage and support America's next generation of leaders.

Encourage your colleagues to register too!

www.ecybermission.com.

Enter registration code: NSTA: Referred by NSTA State Chapter

See an example of how eCybermission works: youtube.com/ecybermissionteam

Like eCybermission on facebook.com and be sure to let them know you are an IAS member!

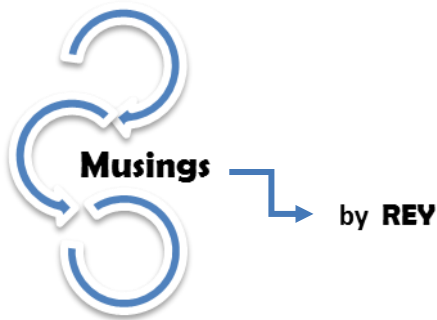
For additional information about the eCYBERMISSION Volunteer Program, please contact the Volunteer Program Coordinator at volunteerprogram@ecybermission.com or 1-866-GO-CYBER (462-9237).



Iowa NASA EPSCoR News

Congratulations to Dr. Steve Martin of Iowa State University's Department of Materials Science and Engineering! Dr. Martin's project, *Next Generation Lithium Sulfur Batteries for Mission Enabling Energy Storage Systems*, is the third Iowa NASA EPSCoR research project to be funded. The sponsor, NASA, is supporting this project with a grant of \$750,000 to the INE.

Learn more about Iowa Space Grant Consortium: www.iaspacegrant.org



Using Constructivist Theory: The Next Generation of Standards for K-12 Science

The people involved with the Next Generation Science Standards (NGSS) have indicated that they plan not to “mess” with goals, professional development, and the ways teachers teach as included in the 1996 Science Standards. However, more is needed for the New Standards other than supporting STEM (Science, Technology, Engineering, and Mathematics) as the heart of alternating needs for 2013 and beyond!

The National Governors Association report calls for needed “training” for teachers -- but many professionals find the word “training” of teachers as an example of failure to indicate teachers and their teaching as “professional”. The report focuses on career pathways without adequate evidence for achieving the reforms; nor does it suggest the need for collaboration among teachers, administrators, parents, and community leaders.

When the 1996 NSES were released, the four goals for school science were indicated for producing students who: (1) Experience the richness and excitement of knowing about and understanding the natural world; (2) Use appropriate scientific processes and principles in making personal decisions; (3) Engage intelligently in public discourse and debate about matters of scientific and technological concern; and (4) Increase their economic productivity through the use of the knowledge, understandings, and skills of the scientifically literate person in their careers (NRC, 1996, p. 13).

The teaching section of the Standards began with major ways science teaching should improve. The changes in teaching advocated were the easiest to assess and to develop (with little debate or objections). These Standards called for changes in teaching with “Less Emphasis” on: (1) Treating all students alike and responding to the group as a whole; (2) Rigidly following curriculum; (3) Focusing on student acquisition of information; (4) Pre-

senting scientific knowledge through lecture, text, and demonstration; (5) Asking for recitation of acquired knowledge; (6) Testing students for factual information at the end of the unit or chapter; (7) Maintaining responsibility and authority; (8) Supporting competition; and (9) Working alone.

Conversely the nine “More Emphasis” focuses for teaching were elaborated as:

1) Understanding and responding to individual student interests, strengths, experiences, and needs; 2) Selecting and adapting curriculum; 3) Focusing on student understanding and use of scientific knowledge, ideas, and inquiry processes; 4) Guiding students in active and extended scientific inquiries; 5) Providing opportunities for scientific discussion and debate among students; 6) Continuously assessing student understanding (and involving students in the process); 7) Sharing responsibility for learning with students; 8) Supporting a classroom community with cooperation, shared responsibility, and respect; and 9) Working with other teachers to enhance the science program.

Interestingly, there has been little progress with actually changing these nine features from the “Less” to “More” features. Unfortunately, the Less Emphasis conditions remain largely unchanged with respect to the changes advocated. The Governors Association report does not seem to help with the reforms and the actual changes needed in teaching for the reforms to succeed! They ignore the Wiggins and McTighe recommendations for “Backward Design”! The stages in the Backward Design process are: identify desired results, determine acceptable evidence, and do both before planning learning experiences and lesson planning.

***Looking for a way to
contribute to science?***

In your backyard this January:
<http://www.globeatnight.org>

Sipping cocoa, at your computer on a
chilly winter night:
<http://eyewire.org/>

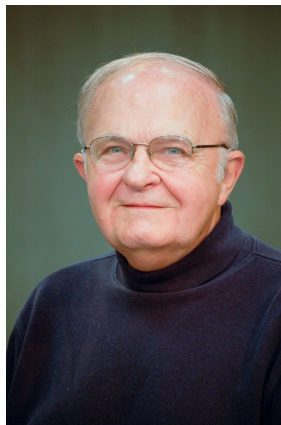


It has been 50 years since Vygotsky offered the Constructivist Learning Theory. It essentially included encouragement to students to construct their own interpretations of actions as they explored the environment they were in and offered their own ideas for explaining the objects and events encountered. The constructivist practices have been described as: (1) Posing problems of emerging relevance to learners; (2) Structuring learning around "big ideas" or primary concepts; (3) Seeking and valuing varied student points of view; (4) Adapting curriculum to address students' suppositions; and (5) Assessing student learning in the context of reform teaching.

Constructivist theory influenced Carl Sagan's statement that all humans start out as scientists who are, curious, seek explanations, collaborate with others concerning questions and ideas about their current and daily lives. Constructivist practices encourage all to explore the explanations that were

personally offered by others! Better understanding of the universe is seldom an accomplishment for K-12 students of science! How to get more involved with correcting the real problems?

More teachers and education leaders should become more active regarding the reforms called Next Generation Science Standards (NGSS). The



early drafts focus too much on what teachers should teach (i.e., exciting STEM efforts). These efforts ignore most ways teaching can and should change at all levels K-16!

*By Robert E. Yager
Professor of Science Education
University of Iowa*

IAS Awarded Environmental Literacy Capacity Grant

The 4 state alliance of EE associations from Iowa, Kansas, Missouri, and Nebraska have awarded the Academy \$4,947 to host a new Project WET facilitator conference in Iowa. The conference will certify 15 new Project WET facilitators and build capacity to provide quality water resource and watershed education across the state, especially within Iowa's preservice education programs. Most of Iowa's Project WET preservice workshop participants report that their Project WET workshop is their only exposure to Environmental Education activities, pedagogy, and natural resources content. The ELC mini-grant will ensure that many more preservice educators can enter classrooms with some exposure and experience in EE.

Contact Marcy Seavey at seavey@uni.edu for information about how to apply to participate in the facilitator conference.

Announcements, Events & Deadlines

ISF Grant Proposals

Proposals Due: January 31, 2013

ESTA Nominations

Due: January 31st, 2013

Distinguished Awards Nominations

Due: February 1st, 2013

Abstract Submission Due, IAS Annual Meeting
February 8th, 2013

Advance Registration Deadline,
IAS Annual Meeting, April 5th, 2013

135th Annual Meeting of the Iowa Academy of Science

April 19 & 20, 2013

Simpson College Campus, Indianola



ISTS Fall Conference

October 22-23, 2013

Scheman Center on the ISU Campus, Ames

Do you have know of an event that should be listed in here? Contact iascience@uni.edu and let us know!

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