



INDIANA ACADEMY OF SCIENCE NEWSLETTER

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Note from the President's Corner

Dear Colleagues,

It is hard to believe that my year as president has come to a close. I have certainly enjoyed working with my IAS colleagues in this role. The last few months have been busy with a successful fall meeting at Ball State, an academically stimulating Junior Academy Science Talent Search at IU Kokomo, and the budget committee meeting (about to take place in a week).

I would be remiss if I did not thank a number of people for their contributions to the society this year. First among them is **Don Ruch** from Ball State University. Don contributed an enormous amount of time and talent as the program and local arrangements chair in organizing and running of both the spring and fall meetings. It was certainly an advantage to having the primary organizer of the meeting in my home department at Ball State as we could communicate easily concerning issues and questions. The success of the meetings was because of his dedicated efforts.

Others who have helped the year to run smoothly for me include **Ed Frazier** who has provided advice on financial issues but many other topics as well, **Jim Bandoli** who assumed the role of Research Grants Chair and has administered this program efficiently this year, and **Brent Summer** and **Jennifer Metzler** who have stepped forward to fill the roles of AAAS Liaison and Co-Chair of the Youth Activities Committee when I asked for help in those areas. I would also like to thank **Uwe Hansen** for his leadership as Past President of the Academy and **Nelson Shaffer**, our Executive Director, who has helped to keep me organized and on task this year. I am grateful to all who contribute to the smooth running of the Academy.



Clare Chatot
President, IAS 2006

The IAS Fall meeting was a great success. I had numerous members comment on the quality of the presentations. We were able to sponsor Dr. **Fred Case** as a Keynote speaker in the Botany/Plant Systematic and Biodiversity areas as part of our Technical Initiatives. We enjoyed an interesting presentation on the physics of the piano by our IAS Speaker of the Year, Dr. **Nick Giordano**, from Purdue, at the Annual Luncheon. We approved the Resolution on the Teaching of Intelligent Design in the public schools and we honored four members as Fellows of the Academy. Congratulations to **Jeffrey Hughes**, **Thomas Simmon**, **Robert Rhykerd**, and **Ekpo Ossom** on receiving this recognition.

I had the pleasure of attending the IAS High School Science Talent Search at IU Kokomo at the end of October. This was a wonderful event that once again confirmed for me that quality science is being taught in many of our high schools in Indiana. The level of understanding and the complexity of the student projects were very impressive. I thank **Marcia Gillette** at IU Kokomo for the excellent job that she does in organizing and running the Talent Search for the Academy. There is an article about the Talent Search later in the newsletter!

John Schutte and I have been working to provide a smooth transition as he assumes the role of President for next year. I hope that all of you have had a chance to recharge over the holidays. My hope for all of you is a happy, healthy and productive 2007!

Warmest Regards,
-- *Clare Chatot*
Outgoing IAS President

Greetings from the Incoming President

Thank you for the opportunity to serve you as president in 2006! It truly is a privilege. As I have gotten more involved with the IAS over the years, I have realized that many women and men work selflessly to make the IAS the great organization that it is. Clare Chatot is one such person. I truly appreciate the help and guidance this past year. Thank you, Clare!



John Schutt
President, IAS 2007

How can the IAS become even better?

We are a strong organization, but we have room to grow. How could we further our mission to, “promote scientific research and to encourage communication between Indiana scientists and others conducting research pertaining to Indiana?” How could we increase our name recognition? How could we increase participation at our fall meeting? How could we increase the number of our organizational and corporate sponsorships? These are bigger issues than any one of us could tackle. However, we can work together to make the IAS even stronger. Do you have an idea how we can do this? I want to hear your ideas. Send them to me by e-mail at jhschutt@tayloru.edu or give me a call at **260-744-8624**.

Can you tell someone else about our great organization?

When I’m excited about something, I want to tell others about it. The best and easiest way for IAS to grow is if we tell someone else about the IAS. That is how I learned about the IAS - Ed Squires told me about it. I attended my first fall meeting and got hooked on our organization. How about you? How did you hear of IAS? Did someone tell you? If is, then it’s now our time to tell others. There are many ways to do so. The easiest is, well, simply to tell someone else! Tell them in the hall. Tell others at your next

department meeting. Take a membership brochure and pass it on to someone. Have your departmental web site link to the IAS home page at www.indianaacademyofscience.org. Let’s share the good word.

Can you give a membership to someone else?

Remember when you were a struggling undergrad or grad student? I do. Shelling out money to join an organization just wasn’t in my plans. So how about giving

a membership as a gift to a student? They will appreciate it. As Nike says, “Just Do It!”

Student Paper Competition Winners. Congratulations go out to each student who gave a paper at the fall meeting. These papers are one of the strengths of the IAS. Keep it up! Talk with your friends and encourage them to give a paper next year. The winners of the 2006 IAS student paper award are Leo Stellwag of the Entomology section and Brandy Wren of the Anthropology section. Leo is an undergraduate student at Ball State University and worked with Gary Dodson. His paper was titled, Cues Utilized by Male Crab Spiders (*Misumenoides formosipes*) in Navigation During Mate-Searches. Brandy is a graduate student at Purdue University, West Lafayette. Her paper was titled Gastrointestinal Parasites of the Vervet Monkey (*Chlorocebus [Cercopithecus] aethiops*) at a Sanctuary in Limpopo Province, South Africa. Each student wins a one year membership in AAAS and a subscription to Science Magazine. Congratulations!

With gratitude,
-- *John Schutt*
2007 IAS President

Congratulations
Brandy Wren and Leo Stellwag
Winners of the IAS Oral Presentation Competition
Fall 2006

(For details see Greeting from the Incoming President above)

A Report on the 2006 Indiana Academy of Science Talent Search

Marcia L. Gillette, Indiana University Kokomo, Kokomo, IN

The 2006 Indiana Academy of Science (IAS) Talent Search Honors Weekend was held on October 27-28, 2006 at Indiana University Kokomo. Fourteen students representing six high schools from around the state were selected from a field of twenty seven applicants to compete in this year's round of interviews and research presentations. The weekend also included a holography and laser workshop and visit to the IU Kokomo laser laboratory led by IU Kokomo physicist Dr. Richard Steldt, and a workshop involving "The Joys of Cognitive Dissonance" for students conducted by IU Kokomo geologist Lea Gilbertson.

Judges for the 2006 Talent Search, each of whom spoke briefly about their judging experience and impressions of the student group, were Dr. Kari Clase of the Department of Industrial Technology at Purdue University, Dr. Mark Davis of the Department of Biology at the University of Evansville, Dr. Jack E. Leonard, President of the Environmental Management Institute of Indianapolis, who also talked at the luncheon on "Brave New World", Dr. Howard L. McLean of the Department of Chemistry at Rose Hulman Institute of Technology, and Dr. Maarj Syed of the Department of Physics and Applied Optics at Rose Hulman Institute of Technology.

The judges' decisions were as follows: Seven students were declared 2005 IAS Talent Search Finalists. Each of these students received a certificate, a medal, and fifty dollars to help defray the cost of their research. The names

of these students, the titles of their research papers, their high schools, and the names of their sponsoring teachers follow.

NYSSA C. BOYD

"A Study of the Anti-microbial Effects of Honey on *Escherichia coli*."

Eastern High School, Pekin

Sponsoring teacher/mentor: Sharon A. McElroy

DEANNA M. LIND

"Verification and Characterization of Mutant and Wild Type BRCA1-pCR3.1 Constructs for Expression Studies."

Marian High School, Mishawaka

Sponsoring teacher/mentor: Kenneth Andrzejewski

JENNY L. NEWLON

"The Effects of Excitotoxins on *Daphnia magna*."

Northwestern High School, Kokomo

Sponsoring Teacher: Patricia Zeck

ADAM J. RECTOR

"Investigations of Electrical Power Production from Aquatic Sediment Power Systems."

John Adams High School, South Bend

Sponsoring Teacher: Nevin Longenecker

JAMIE M. SCOTT

"Environmental Effects of Rural and Urban Ponds on *Daphnia magna*."

Marian High School, Mishawaka

Sponsoring teacher: Kenneth Andrzejewski



The fourteen students invited to the 2006 Science Talent Search held at Indiana University Kokomo.

MICHAEL P. SMYTHE

“Improving the Design and Efficiency of a Novel, Prototype Enzymatic Fuel Cell Using an Enzyme Biocatalyst Embedded on the Anode.”

John Adams High School, South Bend
Sponsoring Teacher: Nevin Longenecker

BEATRICE ZOVICH

“Investigating Possible Improvements in Cognitive Function Due to Ingestion of Juice Plus™.”

John Adams High School, South Bend
Sponsoring Teacher: Nevin Longenecker

Seven students were declared 2006 IAS Talent Search Winners. The names of these students, the titles of their research papers, their high schools, and the names of their sponsoring teachers follow.

PAUL F. BARANAY

“The Anti-Carcinogenic Effect of Histone Deacetylase Inhibitors on HDAC6.”

Marian High School, Mishawaka
Sponsoring Teacher: Kenneth Andrzejewski

JONATHAN B. BELL

“Design, Development, and Application of a Computer Controlled Acoustically Driven Portable Biaxial Shake Table System.”

R. Nelson Snider High School, Fort Wayne
Sponsoring Teacher: Barbara Gabet

EMILY M. COOK

“The Fabrication and Testing of a Luminescent Oxygen Sensor.”

Marian High School, Mishawaka
Sponsoring Teachers: Kenneth Andrzejewski and
Doug Sisk

SARA D. NIEDBALSKI

“The Influence of Reference Power on Calorimetrically Determined Thermodynamic Parameters.”

Marian High School, Mishawaka
Sponsoring Teacher: Kenneth Andrzejewski

JOSEPH G. O’ROURKE

“Investigating the Effects of Various Factors Including Carbon Nanotube Supported Catalysts on the Performance of the Direct Methanol Fuel Cell.”

John Adams High School, Southbend
Sponsoring Teacher: Nevin Longenecker

ETHAN D. SPERRY

“A Molecular Analysis of Variation within Microsatellite Loci of a Controlled Population of White-tailed Deer from Southern Maryland.”

Terre Haute South Vigo High School, Terre Haute
Sponsoring Teacher/Mentor: Dr. Rusty Gonser,
Indiana State University

EMILY ZHAO

“Understanding the Relationship between Protein Essentiality and Protein Interaction Networks Using Mathematics.”

Terre Haute South Vigo High School, Terre Haute
Sponsoring Teacher: Melanie Huber

PAUL BANANAY, EMILY COOK, and JOSEPH O’ROURKE received a certificate, a medal, and fifty dollars to help defray the cost of their research; **SARA NIEDBALSKI** received a \$300 scholarship to an Indiana college or university, fifty dollars to help defray the cost of her research, a medal, and a certificate; and **EMILY ZHAO** received a \$600 scholarship to an Indiana college or university, fifty dollars to help defray the cost of her research, a medal, and a certificate. **JONATHAN BELL** and **ETHAN SPERRY** and their teachers/sponsors, Dr. **RUSTY GONSER**, and **ANDREW BELL** were recipients of paid trips to the American Junior Academy of Science (AJAS) meeting that is being held in conjunction with the American Association for the Advancement of Science (AAAS) and the National Association of Academies of Science (NAAS) meetings in San Francisco, CA in February, 2007. The students also received fifty dollars to help defray the cost of their research, a medal, and a certificate.

To receive information about the **2007 Indiana Academy of Science Talent Search** or application materials, contact Dr. **Marcia L. Gillette** at mgillett@iuk.edu or 765-455-9369. The application deadline is June 8, 2007 and the Honors Weekend is scheduled for October 26-27, 2007 at Indiana University Kokomo.



Indiana Junior Academy of Science -- Report for 2006

Tina Gilliland, Indiana University, Bloomington, IN

Approximately 152 students and teachers representing 13 schools attended the annual fall meeting of the Indiana Junior Academy of Science held at Indiana University Bloomington on November 13, 2006. The day started with an Opening Ceremony where an undergraduate student in the IU Science, Technology, and Research Scholars Program gave a research talk on the "Abnormal Basal Ganglia Output in a Mouse Model of Huntington's Disease." Biotechnology was the focus of our keynote speaker, Dr. Nancy Magill who addressed the students just after lunch.

The following seven activities comprise the major portion of the Junior Academy meeting:

1. The Problem Solving Exam

This exam provides students with a fun and meaningful exercise in scientific knowledge and problem-solving skills. Two students from each school who are selected by their sponsoring teacher take the exam. Plaques are awarded to the top two individual winners and certificates are given to the students who placed 3rd & 4th.

This year's individual student winners were:

- 1st Place – **Bryan Foster**, East Noble High School
- 2nd Place – **David Yang**, Brebeuf Jesuit High School
- 3rd Place – **Jonathan Bell**, Snider High School
- 4th Place – **Matthew Lash**, East Noble High School

Top School (from each school, their two students' scores are combined and the top school is recognized):

- 1st Place – East Noble High School

2. The Issues Presentation Competition

This competition encourages students to learn about the political, social, and scientific issues surrounding the selected topic. This year, the topic was "**Coal-fired or Nuclear? Discuss the environmental ramifications of each type of power plant and identify which you would consider a safer neighbor.**" Each competitor gives a five minute presentation on the topic without the use of visual aids. The students are judged by a panel of peers, and the finalists are then judged by a panel of undergraduate students. A plaque is awarded to the top two students, all finalists receive a certificate.

This year's winners were:

- 1st – **Emily Schubert**, Northwestern High School
- 2nd – **Esther Volmer**, Christian Academy of Indiana
- 3rd – **Paul Baranay**, Marian High School
- 4th – **Blane Lawyer**, North Daviess High School
- 5th – **Jessica Jackson**, Eastern High School

3. Science Olympiad Competition

This year we held one Science Olympiad competition called "Road Scholar" where students were tested on their knowledge of map reading.

This year's winners were:

- 1st Place – **Andi Judt & John Lash**, East Noble High School
- 2nd Place – **Michael Vas & Blake Merrell**, Northwestern High School
- 3rd Place – **Melissa Baranay & Mark Fraser**, Marian High School
- 4th Place – **Thomas Curtis & Andrew Bergman**, Noblesville High School
- 5th Place – **David Yang & John Parish**, Brebeuf Jesuit High School

4. The Research Paper Competition

This competition allows students who have carried out an original scientific investigation the opportunity to present their work publicly. Students who wish to compete in this event submit an abstract of their work to the IJAS Director in early October. The abstracts are reviewed by a panel of impartial judges, and thirteen student finalists are selected. At the IJAS meeting, these students give a 10-minute poster presentation to a panel of judges who evaluate them on originality, research procedures, and presentation skill. The second and third place winners receive a plaque. The first place winner receives a plaque and a \$1,000 scholarship from the Hoosier Association of Science Teachers to attend any Indiana College or University.

This year's winners were:

- 1st Place -- **Sara Niedbalski**, Marian High School
- 2nd Place -- **Jonathan Bell**, Snider High School
- 3rd Place -- **Nyssa Boyd**, Eastern High School
- 4th Place -- (tie) **Paul Baranay**, Marian High School
Jessica Jackson, Eastern High School
- 5th Place -- **Janelle Thixton**, Eastern High School

5. The Outstanding Junior Scientist Competition

This event recognizes those students who are exemplary in overall scholarship as well as scientific ability and achievement. Each school may nominate two students for this competition. The top ten nominees are then selected to compete at the IJAS meeting, where they are interviewed by a panel of judges. The Outstanding Junior Scientist is selected based upon his/her academic record, involvement in original research and extracurricular scientific activities, and the

interview. The second and third place winners receive plaques and the Most Outstanding Junior Scientist receives a plaque and a \$1,000 scholarship from the Indiana Academy of Science to attend any Indiana College or University.

This year's winners were:

- 1st Place: Sara Niedbalski, Marian High School
- 2nd Place: Jonathan Bell, R. Nelson Snider High School
- 3rd Place: Paul Baranay, Marian High School
- 4th Place: Allison Lange, Noblesville High School
- 5th Place: Colleen Courtney, Paoli High School
- 6th Place: Stacy Vosters, North Daviess High School
- 7th Place: Nyssa Boyd, Eastern High School
- 8th Place: Edie Uyesugi, Paoli High School
- 9th Place: Jessica Jackson, Eastern High School
- 10th Place: Shawna Doty, Christian Academy of Indiana

6. The Outstanding School Award

The Outstanding School Award is given to the school with the most participation points. To calculate this score, credit is given for every abstract submitted, more credit for those abstracts accepted for the Research and for Outstanding Junior Scientist competitions, and finally for rank scores for the top presentations. Each school received credit for entering students in the Issues Competition, for having a judge at the Issues presentations, and for entering students in the Problem Solving Exam. More credit was given to the winners.

The top three schools and the teachers representing them today are:

- 1st Place 48 pts. Marian High School
- 2nd Place 33 pts. Eastern High School
- 3rd Place 24 pts. Northwestern High School

Indiana Academy of Science Research Grants for the Winter of 2006

Listed below are the recipients of IAS Research Grants for winter 2006. The following information is included for each recipient: Name, Institution, Amount of Award, and Title of the Proposal.

Ranjith S. Wijesinghe; Ball State University; \$3,000
Magnetic and electric measurements of nerve functions.

Carolyn Vann; Ball State University; \$2,200
Characterizing the native Americans of Windsor Mound via cloning and sequencing of variable regions of the mitochondrial and Y-chromosome DNA.

Jonathan W. Atwell; Indiana University; \$3,000
Hormones, plasticity and evolution following colonization of a novel anthropogenic environment.

Amanda Brothers; Indiana University; \$2,746
A test of Haldane's rule in two dioecious plant species.

Dawn O'Neal; Indiana University; \$1,612
Consequences of global warming on differential migration in the dark eyed junco.

Swapna Mohan; Indiana State University; \$2,995
EEG patterns in the brown bat (*Eptesicus fuscus*) during normal sleep, daily tuper and hibernation.

Justin G. Boyles; Indiana State University; \$2,740
The thermal benefits of clustering in the federally endangered Indiana bat.

Dale Edwards; University of Evansville; \$1,992
Phylogenetic relationships among North American mussel-mites of the genus *Unionicola*: inferences from morphology and mitochondrial cytochrome oxidase subunit gene sequences.

Lynne C. Cary; Bethel College; \$3,000
Nano-mechanical profiling of antineoplastic agents on BRCA1 expression in estrogen-responsive and non-responsive human breast and cervical epithelial cell monolayer.

Jeffrey P. Osborne; Manchester College; \$3,000
Biodegradation of styrene oligomers.

IAS Spring Meeting
University of Indianapolis
13 - 14 April 2007

From the Fall 2006 IAS Meeting



Photographs provided by John Schutt

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Deadline for submission of material for the March issue of the IAS Newsletter is February 20, 2007

Send copy to Donald G. Ruch at druch@bsu.edu

For IAS information, go to: www.indianaacademyofscience.org