



## **Iowa Science Teachers Section Iowa Academy of Science**

**May 15, 2008**

Nadine Weirather, Editor

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### **A Message From the ISTS Chair, Morgan Masters:**

This past month the ISTS leadership team met in Cedar Rapids during the Academy of Science Spring Meeting. The team worked on evaluating the past year and making plans for the coming year. The “gavel” and responsibilities of chairing the Iowa Science Teachers Section was passed on to me from Traci Maxted. Congratulations to Traci as she has brought many new ideas and has set goals that are leading us in a very positive direction. These will most certainly be tough shoes to fill. Now Traci moves to taking the lead as the ISTS conference chair. She, along with

many others, are in the midst of planning a great conference at the Polk County Convention Complex in Des Moines this coming October.

I want to thank all of our members on their continued effort to improve science teaching in the State of Iowa. We have so many talented and professional educators who are willing to share their talents, philosophy and activities. I invite you to share YOUR talents and ideas by presenting at our Fall Conference. You will find more information on how easy it is to present in another section of this newsletter. If you have ever received good ideas from others, maybe it's your turn to share your successes at the conference. It is a stimulating and rewarding experience. I always find new ideas and I am always willing to share what works with others. There is still plenty of time to submit a proposal for presenting at this year's conference. You will find the forms by going to the Iowa Science Teachers Section home page and it only takes a few minutes to complete the needed information. Present alone or make plans to present with a colleague; the experience can be very rewarding.

Morgan Masters ISTS Chair 2008-2009

## From the Fall Conference Chair, Traci Maxted

Hi there! I am pretty excited about the 2008 Fall Conference. I hope a lot of you get a chance to attend. Our theme this year is "Science, Our Past and Future". As a celebration of the 200<sup>th</sup> anniversary of the birth of Charles Darwin, our keynote speaker is the young Charles Darwin as portrayed by well-known story teller Brian "Fox" Ellis. From the voyage of the Beagle to mankind's voyages into space, science has come a long way. I'm sure Darwin never conceived of something like the human genome project, but his were the first steps.

Our strands this year include *Differentiated Learning*, the *STEM initiative* and *Inquiry*, along with the discipline areas. We've also added strands for opportunities. *Opportunities for Students* include Physics Olympics, science fairs, Iowa Junior Academy of Science and a host of others. Come and learn what is available for your students. And how about YOU? *Opportunities for Teachers* include online classes, research projects, summer workshops and many other possibilities.

Are you already in the know about these areas? **Be a presenter!** Share your expertise with others. Let other science teachers learn about your favorite lesson plans. Successes shared with others are good for all - new knowledge for the audience and a sense of satisfaction for you.

Traci Maxted, 2008 Conference Chair

**Be a presenter! Be a presenter! Be a presenter! Be a presenter!**

For a form go to <http://ists.pls.uni.edu/forms/fall-conf/present/index.html>

## **Message from your Vice Chair, De Anna Tibben:**

Hello and greetings to you! I'm sure this newsletter is finding you at a busy time of year- grades due, graduation parties, and planning for next fall! During the 2008-09 school year, I will be serving as your ISTS vice-chair. The following year, I have the privilege to further serve you, the ISTS membership, as your chair. Together we can make a difference in our own classrooms, our districts, and our state. I thought I would share with you my views on the teaching of science, and my personal teaching goal as a means to introduce myself.

### **Why I Think Science Should Be Taught:**

*Some important themes pervade science, mathematics, and technology and appear over and over again, whether we are looking at an ancient civilization, the human body, or a comet. They are ideas that transcend disciplinary boundaries and prove fruitful in explanation, in theory, in observation, and in design.*

*- Science for All Americans*

Man has always desired to understand the world in which he lives. Science is a way of knowing in which we can explain the natural world around us. To me, there is a comfort in science; the logical, systematic approach to understanding the natural world linked with the creative and imaginative ways to explore it. I feel it is crucial for students to gain knowledge of how science is different from other disciplines, yet is applicable to their daily lives. I feel it is critical for my students to be able to distinguish science from other ways of knowing and from other bodies of knowledge. **So how do my students view science and the nature of science?** In a world where every gadget, vaccine, or improvement to everyday living is advertised with "latest scientific research" or "scientifically proven results" why wouldn't students view science as technology? In a research project undertaken by Mackay (1971) eight categories of

insufficient science knowledge were defined. These eight categories are:

1. the role of creativity in science
2. the function of scientific models
3. the roles of theories and their relation to research
4. the distinctions among hypotheses, laws, and theories
5. the relationship between experimentation, models and theories, and absolute truth
6. the fact that science is not solely concerned with the collection and classification of facts
7. what constitutes a scientific explanation
8. the interrelationships among and the interdependence of the different branches of science (Lederman, 1992, p. 333)

My goal for the 2008-09 school year is to “filter” my lessons through these eight categories to check for student misconceptions. Am I allowing the students to be creative, or am I telling them what to do and how to do it? When lab lessons are presented, am I reinforcing the wrong idea of science by focusing on the end product, rather than helping my students think about the process they've gone through? Just this change in thought will help me improve my lessons.

I feel my teaching has evolved, if you will, over my fourteen classroom years. My memberships in Iowa Academy of Science and Iowa Science Teachers Section have given me opportunities for positive change. I encourage you to continue your IAS-ISTS membership and to invite a colleague to join. Do you have a new science teacher in your building? Invite him or her to join with you in the benefits from IAS-ISTS. I have benefited from the many years of attending IAS-ISTS Fall Conferences. From each Conference, I have come away with meaningful, applicable, and do-able science lessons. Enjoy the rest of your school year, and I will see YOU at the 2008 Fall ISTS Conference!

Take care, De Anna

## Observations of a Well-Seasoned Middle School Science Teacher

As I was sorting through the third drawer of file cabinet number two, I came across a folder titled “Good Questions”. It was some notes about a presentation I made with Colleen Anderson about 15 years ago. Sometimes old notes look like new ideas to me. As I looked through the old notes, I decided I needed to review these ideas and should post them along side my desk to remind me to make an emphasis on asking those good questions. By the way, I need lots of reminding, so posting notes is a big help to me.

My first note included the phrase “Good questions are everyone’s responsibility.” How true this is, I believe great lessons are the result of students being stimulated by good questions early in the class period. Good questions set the tone for the day. Good questions from the instructor stimulate good questions from students.

This reminded me to write my second note, “Listen closely to student questions.” Some of the very best ideas that “I” ever had were not really mine but were ideas brought up by great student questions. Listen to your students and be aware of the effects of your questions and how they stimulate discussion and student questions. I remember a lesson where we were studying flight and a student asked the question, “Who owns the airport?” I didn’t have any idea so I sent two students to the office to start making phone calls to find the answer. We found out it was the City of Chariton and they invited us out to the airport. This was just the beginning of a great unit of study. One great question from a student opened the door to many more questions and explorations.

So what do you do when good questions start popping up in class? Note number three: “Recognize good questions with lots of positive reinforcement.” Let students know that their questions are relevant and important. I get effective results and an increase in student involvement when I respond with a positive statement, “Whoa!, great question,” or help redirect the question in another direction by asking a follow-up question.

And the fourth note is a follow-up to an earlier article I wrote about wait time. “Give students enough time to think about the question and construct a good answer”. Allow time for all students to think about what has been said, especially if it is an on target question.

This brings me to my last note, “Questions should be opportunities, not punishment.” Even if questions are a little off target, try to stay positive and get everyone involved. Ask students to elaborate or explain if it is not clear or at least nod with approval rather than turn off student involvement. Once the ball gets rolling and students are not afraid to get involved, the real teachable moments and lessons occur more frequently.

I know there are only a few weeks left but take a closer look at how you ask questions, how you respond to student questions and how you listen to student responses in your classroom.

I have lots of experience and the opportunity to “re-experience” many things as well. I think I am going to put an emphasis on questions this next week and take a look at my effectiveness in this area of teaching.

One final thought from one of my favorites:

“Savor the questions and the quest.” -A. Einstein

Morgan Masters,  
Northview Middle School, Ankeny, Iowa (2008-09 Chair ISTS)

## Announcements

- [Reserve this Date!! A Message from Jeanne Rogis](#)

*Reserve this date . . .*

*Thursday, October 23, 2008*

*ISTS Fall Conference*

*Polk County Convention Center*

*Des Moines, Iowa*

*Science: Our Past and Future*

*Join Science educators from throughout Iowa for the ISTS annual fall conference beginning on Wednesday evening, October*

*22nd and continuing throughout the day on Thursday, October 23rd. There will be several pre-conference workshops offered on Wednesday evening. Thursday morning will begin with several section breakfasts with speakers geared to that section's interests.*

*Throughout the day there will be presentations given by teachers and business leaders discussing areas affecting Science Education in Iowa.*

*The noon luncheon will recognize this year's award winners and will be highlighted by a visit from Charles Darwin impersonator and storyteller Brian "Fox" Ellis as we celebrate Darwin's 200th birthday.*

*The afternoon will continue with more opportunities to attend presentations as well as time to browse our commercial exhibit area. Don't forget to stop by the ISTS bookstore where many books will be available. The afternoon concludes with our traditional raffle.*

*Presentation proposal forms may be found on the ISTS web-page: <http://ists.pls.uni.edu> We are especially looking for presentations in the areas of inquiry, technology and differentiation as well as subject area strands. Please note the proposal submission deadline is Sunday, June 15, 2008. On-line registration will be available on the web page soon.*

*Please join us for a day of professional development, renewing old friendships, and just plain fun!*

- **[Think About It.... by De Anna Tibben](#)**

***"To facilitate learning in the areas of Science by providing for and encouraging students to create and use productive and positive life-skills."***

This statement is written on my resume and as a sign above my classroom desk. It is my professional objective. My guidepost, if you will. I'm sure your professional objective is very similar. As we move through our teaching professions we are seeing changes in technology and changes in how we facilitate our students' learning. Everything is "on the web" (grade and attendance reporting, curriculum mapping, classroom presentations) allowing us "instant" communication with parents, staff, administrators, and of course, our students. Cell phones, email and instant messaging are further ways to "instantly" be in communication. These technologies are wonderful in getting out information, but sometimes we lose the "message" of what is being said. There

is nothing that can replace face-to-face, person-to-person, communication.

Where better to share your professional ideas, lessons, activities, have discussions, make connections, and gain opportunities than at the ISTS Fall Conference? You will be able to gain from and share with over a hundred other science educators, just like you! I encourage you to register today – of course, we have a website so you can “instantly” do this! <http://ists.pls.uni.edu/> “Science our Past and Future” will be an opportunity for you at the Des Moines Polk County Convention Center on Thursday, October 23, 2008. There are section breakfasts planned, superb presentations, keynote speakers, an award-winning luncheon, and many, many door prizes. I encourage you to register today and mark it in your daily planner.

- **lowan One of the Winners of the 2008 NSTA/Vernier Technology Award**

***Awardees win funding for science equipment, Vernier data-collection tools, and professional development***

Beaverton, OR — April 16, 2008 – The National Science Teachers Association (NSTA) and Vernier Software & Technology announce that one of the seven winners of the 2008 NSTA/Vernier Technology Award is from Iowa!! Winning entries were selected by a panel of experts, appointed by NSTA, and chosen for creating innovative data-collection lessons and programs in their classrooms.

Each winner received \$1,000 in cash, \$1,000 in Vernier products, and up to \$1,000 toward expenses to attend the 2008 NSTA National Convention in Boston, MA, March 27-30, 2008. For more information see: [www.vernier.com](http://www.vernier.com)

***Danielle Spaete, Physics Teacher at Pleasant Valley High School in Bettendorf represented Iowa well with this fantastic project:***

Using lab activities to teach difficult physics concepts is the hallmark of Danielle's physics program. Learning in this way, students can construct their own understanding of these complex concepts. Danielle has designed “A New Voice for an Electronic Keyboard,” which is an activity that starts with her students investigating the sounds created by different band instruments and then choosing an instrument to study further. They collect data for several notes and analyze the frequency and intensity of the notes and overtones unique to that instrument. The students then “teach” an electronic keyboard to play each overtone with the right intensity to match their instrument. A successful project results in the keyboard accurately mimicking the intended instrument.

## • An Alliance for Your Elementary Schools

**NSTA Introduces: The Science Alliance for Elementary Schools (Article reprinted from *NSTA Express*, April 24, 2008.)**

The Science Alliance for Elementary Schools is an easy to implement, professional development opportunity that will provide administrators and up to five of their faculty with tools to ensure that they are well-prepared to teach science.

Offering all the benefits of a one-year electronic NSTA membership, elementary schools can participate in *The Science Alliance* for a fee of only \$100 a year per school! Other benefits include:

- | Huge savings on [NSTA conference](#) registration
- | 20% discount on more than 200 books in the [NSTA Science Store](#)
- | Free, unlimited electronic access to NSTA's award-winning elementary journal [Science and Children](#)

For more information go to <http://www.nsta.org/sciencealliance> or find the form at [https://secure.nsta.org/membership/new\\_science\\_alliance\\_member.aspx](https://secure.nsta.org/membership/new_science_alliance_member.aspx) to apply for the Science Alliance! If you're at the middle, high, or college level, please go to <http://www.nsta.org/membership/> for information on NSTA's other membership categories.

## Opportunities

### • Journalism Contest

#### **Journalism Contest: Scholarship/Trip to Sweden for Student & Advisor**

Have any star student journalists on your school paper who are interested in environmental issues? If so, we've extended the deadline for the ITT Award for Excellence in Student Water Journalism, an award recognizing outstanding high school journalism on an environmental water issue. The new deadline to receive entries is **Wednesday, May 28, 2008**.

#### **Winning prize includes:**

- | **\$1,000 Scholarship**
- | **All expense-paid trip to Stockholm, Sweden to attend World**

**Water Week in August of 2008 for winning student AND advisor  
Opportunities for publication in water-related media**

Additionally, entrants will gain exposure to seasoned environmental journalists serving on the 2008 judging panel from **National Geographic**, **MSNBC.com**, **Scientific American**, and **Water Environment and Technology**.

To enter, please visit <http://itt.com/news/global-activities/water-journalism/> to download the submission form, or contact Janice Gatti at [jgatti@peppercom.com](mailto:jgatti@peppercom.com).

- **Robotics Opportunity**

ISU College of Engineering with the support of Rockwell Collins is working to grow opportunities for Iowa youth with Robotix.

Through a gift to FIRST of over \$1.3 million, Rockwell Collins has teamed with FIRST and ISU Engineering Precollegiate Programs to promote FIRST LEGO League (FLL) and FIRST Tech Challenge (FTC) across Iowa. This exciting news allows FIRST programming to reach even more students and spread that engineering fever! We encourage you to go to [www.isek.iastate.edu](http://www.isek.iastate.edu) and look under the FLL tab and click on "Start a Team" to learn more about a grant opportunity for new FLL teams. We thank Rockwell Collins for their generosity and taking a leadership role in making engineering opportunities accessible to so many Iowans.

Camille Sloan Schroeder, Director, Iowa FIRST LEGO League  
Manager, Iowa State University Engineering Precollegiate Programs  
515-294-9965 phone

- **Notice for Biology Teachers**

Outdoor Education in the Tropics (Rainforest, Coral Reefs, Sea Turtle Camps):

Since 1990 Save The Rainforest (STR) has been sending groups of high school and middle school students to the rainforest reserves it helped create with donations from school children. Many of the biology teachers who have led these groups are retiring and STR is looking for a new generation of biology teachers to take their students on field courses to the Galapagos, Amazon, Costa Rica, Belize, Panama and Mexico. For more information contact Bruce Calhoun at **608-729-4877** or [saverfn@cybermesa.com](mailto:saverfn@cybermesa.com), or view STR's website at [www.saverfn.org](http://www.saverfn.org). STR is a non-profit organization.

- **AAS Project 2061 Professional Development**

Do you want to learn more about AAAS's new *Atlas of Science Literacy, Volume 2* and how to put it to use to improve curriculum, instruction, and assessment in your science program? AAAS Project 2061 is offering another session of its popular professional development workshop "Using *Atlas of Science Literacy*" in Washington, DC, in 2008: October 15-17. Now is the time to register for low earlybird rates.

Designed for K-12 science teachers, curriculum specialists, and other educators, the workshop demonstrates how participants can use the conceptual strand maps in *Atlas 1* and *Atlas 2*, along with other Project 2061 resources, to enhance their own understanding of science literacy and take a benchmarks-based approach to helping all students achieve literacy in science, mathematics, and technology. *Atlas of Science Literacy* is co-published by AAAS and NSTA.

For more details and a registration form, please visit our [workshop information page](http://www.project2061.org/events/workshops/default.htm), at <http://www.project2061.org/events/workshops/default.htm>. Additional workshops will be scheduled throughout the year and around the country. Check this page often or sign up (<http://www.project2061.org/about/feedback.asp>) for the free e-newsletter and receive automatic updates on workshops and other news about Project 2061.

- **Education Forum on Place-based Education**

**When: Monday, June 9, 2008    Where: Iowa 4H Center, near Madrid**

We are hosting a forum designed to bring together teachers, school administrators, CCB naturalists, AEA consultants, and university faculty to discuss the best ways to help schools across the state engage youth in place-based education that incorporates natural, built, and human components of communities. Our initial focus is to identify needs, constraints and opportunities for place-based approaches for middle-school audiences to learn about local waters and the landscapes connected to them (watersheds).

The place-based education forum will be held from 10:00 am – 5:00 pm on Monday, June 9, 2008, at the Iowa 4H Center near Madrid. The collective perspectives and wisdom of those of you who work with youth and/or formal education is essential to developing a sustainable support system for local efforts.

The day's activities will include an overview of models of place-based activities and support systems; facilitated discussions of formal education requirements,

constraints, and opportunities related to place-based education; and development of next steps for on-going collaboration to implement and sustain place-based approaches.

The cost of the forum is being covered by the DNR Aquatic Education Program. Limited funding is available to reimburse participants for mileage.

**Please invite a friend, come, and share your insights. Contact the Aquatic Education Program ([AquaticEd\\_Info@dnr.iowa.gov](mailto:AquaticEd_Info@dnr.iowa.gov); 641/747-2200) for an electronic registration form.** (Space is limited, so the sooner the better.)

- **[Mickelson ExxonMobil Teachers Academy Opportunity](#)**

**The Mickelson ExxonMobil Teachers Academy Expands Opportunities for Teachers to Attend the 2009 Program (Article reprinted from *NSTA Express*, April 24, 2008.)**

The Mickelson ExxonMobil Teachers Academy recently announced a new way for elementary school teachers to get a chance to attend the 2009 Mickelson ExxonMobil Teachers Academy and improve their math and science teaching skills.

Students can nominate teachers from Grades 3, 4, and 5 or urge them to apply for an all-expense paid trip to the Academy!s math and science professional development program by logging on to [www.sendmyteacher.com](http://www.sendmyteacher.com), an interactive website.

Developed in conjunction with the National Science Teachers Association and Math Solutions, the Mickelson ExxonMobil Teachers Academy enables teachers to hone their science and math teaching skills, enhance their curricula, and discover innovative new ways to inspire students.

The teachers will spend five days next July at the Liberty Science Center in Jersey City, NJ, deepening their understanding of mathematics and science content, building expertise in facilitating student learning through problem solving and inquiry, and using links between math and science that support student learning and understanding in the classroom.

Teacher applications are due by October 31, 2008. The National Science Teachers Association and the National Council of Teachers of Mathematics will convene a panel of math and science experts to evaluate the entries and announce the selections in February 2009.

The 2008 Mickelson ExxonMobil Teachers Academy will host more than 600 teachers in Houston, Texas; Baton Rouge, Louisiana; and Jersey City, New Jersey. To date, nearly 1000 teachers have attended the Mickelson ExxonMobil Teachers Academy.

To nominate a teacher or to learn more about the program, visit [www.sendmyteacher.com](http://www.sendmyteacher.com).

## • Energy Educators of Iowa Conference (You!!)

The Iowa Energy Center is teaming with the National Energy Education Development (NEED) Project to host the 2008 Energy Educators of Iowa Conference, **June 29 - July 2, 2008**, in Ames. Since 2004, the Energy Center has sponsored Iowa teachers at NEED's National Summer Conference. The feedback from teachers who attended was so favorable we're bringing it to Iowa.

More details... [www.energy.iastate.edu/Funding/NEED\\_2008.htm](http://www.energy.iastate.edu/Funding/NEED_2008.htm)

There is space for 50 educators who will be selected based upon:

- Geographical distribution across Iowa (no more than 2 from each district)
- First time participants (haven't attended the national summer conference)
- 5th - 12th grade Iowa science teachers

All are welcome to apply, and **applications will continue to be accepted** as spots remain.

### **Cost...**

The Iowa Energy Center is funding much of the cost of the four-day, three-night conference. Teachers are responsible for a \$100 registration fee, which secures his/her space at the conference and includes lodging, most meals, and energy resources (materials and curriculum).

By registering, teachers are committing to attend the conference, incorporating NEED activities in the classroom, and completing a brief evaluation and report forms prior to April 2009.

## • Biotech Summer Teaching Institute

BioPharmaceutical Technology Center Institute is offering summer Biotechnology Teacher Courses July 21st- August 1st.

### **BIOTECHNOLOGY: THE BASICS**

July 21-25, 2008

Course Fee: \$400 (Viterbo University or Edgewood College credits available for additional fees paid directly to the selected institution.)

This course is designed to introduce teachers to the fundamentals of biotechnology. The course will begin with a review of DNA structure and function. From there we will explore how different tools are used to investigate and analyze DNA. Topics include DNA extraction, micropipetting, gel electrophoresis, restriction enzyme digestion, polymerase chain reaction (PCR), and bacterial transformation. In addition, there will be opportunities to discuss bioethics,

develop your laboratory preparatory skills, and collaborate with other teachers to integrate biotechnology into your curriculum. If your knowledge of biotechnology is limited or you want to brush up on basic biotechnology techniques, this is the course for you!

### **BIOTECHNOLOGY: BEYOND THE BASICS**

July 28 - August 1, 2008

Course Fee: \$400 (Viterbo University or Edgewood College credits available for additional fees paid directly to the selected institution.)

This course is designed to help teachers bring advanced biotechnology concepts to the classroom by focusing on gene expression. Topics include: reverse transcription polymerase chain reaction, ligation, microarrays, and protein purification. Pre-requisites: Biotechnology: The Basics or a working knowledge of micropipetting, gel electrophoresis, bacterial transformation, and polymerase chain reaction. In addition, there will be opportunities to discuss bioethics and collaborate with other teachers to integrate biotechnology into your curriculum. If you feel comfortable with basic biotechnology techniques, but want to learn advanced concepts from this rapidly developing field, this is the course for you!

See our Website for more details [www.btc.org/k12/twc/twc.html](http://www.btc.org/k12/twc/twc.html)

### • **World Wide Wolves Essay Contest**

The International Wolf Center ([www.wolf.org](http://www.wolf.org)) is holding a World Wide Wolves Essay Contest to celebrate the addition of two new wolf pups to their Exhibit Pack this Spring. The contest is for classes around the world. Entries will be accepted beginning 6/1/2008 with final submissions accepted at the end of Wolf Awareness Week on 10/25/2008.

There is no cost to enter.

Students are invited to learn more about wolves by observing the pups (beginning late May) via 24 hour webcam at [www.wolf.org](http://www.wolf.org) and read the online wolf logs describing the pup behavior and development.

Contest is open to students ages 10-14 and 15-18.

**Some great gifts and prizes will be awarded** including a free Distance Learning program for the class with the winning entry in each age category and the chance to see winning entries published on the International Wolf Center Web site and in the prestigious, International Wolf Magazine.

For more details on contest rules, entry requirements, and prizes, and for essay questions watch for details coming soon to our website at [www.wolf.org](http://www.wolf.org). Or email Sharon Reed at [sreed@wolf.org](mailto:sreed@wolf.org).

## • Modeling Workshops

Modeling Workshops in high school physics, chemistry, and/or physical science will be held in summer 2008 in Birmingham (two), Mobile (1-week), Arizona (seven!), Georgia (for middle school teachers), Miami (two), Chicago (two), Maine, New York (two), North Carolina (pending funding), Ohio (three), Philadelphia (two), Pittsburgh (five 1-week), Dallas (two), and Wisconsin.

For details, visit <http://modeling.asu.edu>. Click on "Modeling Instruction Workshops Nationwide in Summer 2008".

Modeling Workshops are peer-led. Modeling Instruction is the only high school science program recognized by the U.S. Department of Education as EXEMPLARY. At some sites, stipends and/or free tuition are available for in-state teachers. (Teachers from any state can apply for a stipend at Miami.)

Teachers greatly value Modeling Instruction. Teachers all over the nation have written many unsolicited laudatory e-mails; for example:

- \* The modeling workshop I attended at ASU was the most valuable professional development I have ever had as a physics teacher. [She attended in 1992. Wow!]
- \* I attended a workshop in St. Louis, Missouri in 2000. Hal Harris of UMSL and Rex Rice were coordinating. I have been using modeling ever since - love it!
- \* I am a true believer. And so are my students. They have said on numerous occasions that they have learned more this year than they ever did in all of the other science classes. [A chemistry teacher in Wisconsin]
- \* I'm in my first year of using the Modeling curriculum (after eight years of conventional physics teaching). What a pleasure it is to be Modeling :-)

Jane Jackson, Co-Director, Modeling Instruction Program  
480-965-8438/fax: 965-7565

## • Free Weekly Science Puzzlers

Each week, share with your students a FREE thought-provoking science puzzler, drawn from the award-winning Cogno science board games. You'll receive a

weekly e-mail with a fully illustrated one-page puzzler about astronomy, forces & motion and/or life sciences, ready to be photocopied for students. The e-mail message includes the answer and explanation, allowing you to facilitate as much or as little discussion as you like. Recommended for grades 3-8. For information, samples, and to register, see [www.cogno.com/puzzlers](http://www.cogno.com/puzzlers).

- **Discovery Education/3M Young Scientist Challenge**

Reaching out to middle school students during the critical years when research indicates their interest in science begins to fade, Discovery Education and 3M have released a call for entries to the 2008 Young Scientist Challenge. Officially open for submissions through June 15, 2008, Discovery Education has broadened this year's competition to include all 5th, 6th, 7th, and 8th graders nationwide. In addition, students will be challenged to create a 1-2 minute video about a specific scientific concept, which they will select from a list of concepts provided by YSC judges and all concepts will relate to the 2008 YSC theme, "The Science of Space."

- **Evolution 101 Workshop**

Evolution 101 Workshop for K-12 Educators  
Friday, June 20, 2008  
Bell Museum of Natural History, University of Minnesota

The EVOLUTION 101 workshop provides K-12 educators with information to effectively teach evolutionary biology in public and private school science classrooms. The workshop provides teachers the opportunity to interact with professional scientists who are eager to encourage evolutionary pedagogy. With one \$20 registration, K-12 teachers will also have access to presentations by the professional organizations, as well as keynote speakers for the full conference, June 20-24.

A certificate of completion and .625 Continuing Education Units will be awarded for attendance at this workshop.

For more information about this workshop and to register on-line, please visit:  
[http://www.cce.umn.edu/conferences/evolution/evolution\\_101.html](http://www.cce.umn.edu/conferences/evolution/evolution_101.html)

The workshop is sponsored by the Society for the Study of Evolution (SSE), Minnesota Citizens for Science Education (MnCSE), and the Bell Museum of Natural History, with the generous financial support of the ADC Foundation. The University of Minnesota is an equal opportunity educator and employer.

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## News

- [News from The Space Place at NASA](#)

### **1. Free Resources on The Space Place**

We have published our first .pdf issue of a bi-monthly newsletter for formal and informal educators. The newsletter is all about the many useful and--it goes without saying--free resources on The Space Place website that can be helpful to classroom and home school teachers, after-school program directors, museum and library program directors, and other informal educators.

Download it today from: <http://spaceplace.nasa.gov/en/educators>.

### **2. "Stellar Compass for Space Explorers"**

by Patrick L. Barry

In space, there's no up or down, north or south, east or west. So how can robotic spacecraft know which way they're facing when they fire their thrusters, or when they try to beam scientific data back to Earth?

Without the familiar compass points of Earth's magnetic poles, spacecraft use stars and gyros to know their orientation. Thanks to a recently completed test flight, future spacecraft will be able to do so using only an ultra-low-power camera and three silicon wafers as small as your pinky fingernail.

"The wafers are actually very tiny gyros," explains Artur Chmielewski, project manager at JPL for Space Technology 6 (ST6), a part of NASA's New Millennium Program.

Traditional gyros use spinning wheels to detect changes in pitch, yaw, and roll--the three axes of rotation. For ST6's Inertial Stellar Compass, the three gyros instead consist of silicon wafers that resemble microchips. Rotating the wafers distorts microscopic structures on the surfaces of these wafers in a way that generates electric signals. The compass uses these signals--along with images of star positions taken by the camera--to measure rotation.

Because the Inertial Stellar Compass (ISC) is based on this new, radically different technology, NASA needed to flight-test it before using it in important missions. That test flight reached completion in December 2007 after about a year in orbit aboard the Air Force's TacSat-2 satellite.

"It just performed beautifully," Chmielewski says. "The data checked out really well." The engineers had hoped that ISC would measure the spacecraft's rotation with an accuracy of 0.1 degrees. In the flight tests, ISC surpassed this goal, measuring rotation to within about 0.05 degrees.

That success paves the way for using ISC to reduce the cost of future science missions. When launching probes into space, weight equals money. "If you're paying a million dollars per kilogram to send your spacecraft to Mars, you care a lot about weight," Chmielewski says. At less than 3 kilograms, ISC weighs about one-fifth as much as traditional stellar compasses. It also uses about one-tenth as much power, so a spacecraft would be able to use smaller, lighter solar panels. Engineers at Draper Laboratory, the Cambridge, Massachusetts, company that built the ISC, are already at work on a next-generation design that will improve the compass's accuracy ten-fold, Chmielewski says. So ISC and its successors could soon help costs-and spacecraft-stay on target.

Find out more about the ISC at [nmp.nasa.gov/st6](http://nmp.nasa.gov/st6). Kids can do a fun project and get an introduction to navigating by the stars at [spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml](http://spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml).

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### **3. Get Your Gummy Greenhouse Gases!**

Making science edible--and sweet--is a reliable way to attracts kids' interest. The new "Gummy Greenhouse Gases" activity on The Space Place web site makes it fun and easy to learn a bit of chemistry and to find out why too many of these kinds of molecules in the air are likely to cause Earth to get warmer. At [spaceplace.nasa.gov/en/kids/tes/gumdrops](http://spaceplace.nasa.gov/en/kids/tes/gumdrops), kids use gumdrops and toothpicks to make simple molecules of ozone, nitrous oxide, carbon dioxide, water vapor, and methane. The curious can go on to [spaceplace.nasa.gov/en/kids/tes/gases](http://spaceplace.nasa.gov/en/kids/tes/gases) to learn more about the greenhouse effect and about the "good and bad" roles of ozone. A short video shows how new space technology can literally paint a 3-D picture of these gases all around the globe. Afterwards, the ghastly gases can be consumed (mind the toothpicks!), thus helping the environment.

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### **Iowa Academy of Science Mission:**

- **Promote scientific research and its dissemination**
- **Improve instruction in the sciences**
- **Promote public understanding of science**
- **Recognize excellence in science and science teaching**

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(We are always looking for good people. Send an e-mail to [scihawk@aol.com](mailto:scihawk@aol.com) if you wish to be more involved.)

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How best can this newsletter serve you? Do you have something to contribute for the good of the ISTS membership? Zing a line at [nweirather@central-lee.k12.ia.us](mailto:nweirather@central-lee.k12.ia.us) or [scihawk@aol.com](mailto:scihawk@aol.com).