

# Science Teachers' Association

April 2013

Vol. 128

*From the President's Desk*

"The Spring" by Thomas Carew  
Now that the winter's gone, the earth hath lost  
Her snow-white robes, and now no more the frost  
Candies the grass, or casts an icy cream  
Upon the silver lake or crystal stream;  
But the warm sun thaws the benumbed earth...

**Happy Spring** to all SDSTA!! First and foremost...a very huge "Thank You" to everyone who participated in our 21<sup>st</sup> Annual SDSTA Conference in Huron this year! Warm hearts and smiles radiated the conference halls as Mother Nature rallied her storms around us and kept everyone on their toes. As always, we asked for comments on the conference, and I am proud to announce that once again, the overall consensus is that the presentations were powerful and professionally motivating! Your board of directors works very closely with the SDCTM board to plan and prepare the conference for you. Your input is precious and drives our intentions to make this time the best for your professional development and enjoyment! This newsletter encapsulates conference happenings, science awardees and recognitions, and meeting minutes. I encourage you to read it, become enthused for what is happening in science both in our state and our nation, and begin plans now to attend next year's conference in Huron on February 6-8.

It is with a saddened heart that I share the news of the loss of a fellow SDSTA member. Betsy Ann Koenig of South Central School in Bonesteel, recipient of the Kelly Lane Earth & Space Science Grant (see page 2), lost her life in an automobile accident. Her beautiful smile and warm personality will be missed by many, and we are sorry for the loss.

As I write this letter, I am packing my bags to travel south to San Antonio, Texas for the NSTA National Conference on Science Education from April 11-14. The theme of this year's conference is *Next Generation Science: Learning, Literacy,*

*and Living.* I am looking forward to immersing myself in NGSS workshops and sessions in hopes to gain further understanding of what is to be in science education! This is an exciting time to be a science teacher, and I hope you are all ready to grab hold of your professional practices and reflect on where they have been and where they are going. We are fortunate to teach in a dynamic field where laminated lessons simply cannot exist! Every day is a new adventure we journey on with our students as technology and engineering pave new pathways in science and math education. I would like to thank Sam Shaw for his efforts in helping define these pathways and offering direction to South Dakota teachers in the NGSS process.

I look forward to sharing my insights from the national conference with you all in my next letter. I am a new fan of *Edmodo.com* and wonder if there would be an interest to open an account for SDSTA members to share their questions/concerns about NGSS? It may be a great venue to hold conversations, clarify conceptions, and gain insights from fellow teachers from across the state. I know the middle school teachers have been introduced and inducted, and high school teachers are planning to spend time this summer. Let me know your thoughts about *edmodo* at [brenda.murphey@k12.sd.us](mailto:brenda.murphey@k12.sd.us)

Until next time...enjoy the contents of this newsletter, and keep the sciences soaring!!

*Brenda Murphey*

SDSTA President—Feb. 2012-Feb. 2014

# SDSTA 2013 CONFERENCE

## Awards:



Friend of Science Anne Lewis and SDSTA president Brenda Murphey



SD PAEMST Finalists —  
Ann Anderson, Michelle Bartels & Amber Stout.



Daniel Svets Award - Tom Durkin of the SD Space Grant Consortium (center) presents one of the four 2013 "Dan Swets Robotics Materials Awards" to Aren Field (left) and John Madison (right) of the 4-H program in Huron, SD



Distinguished Service Award—Ramona Lunderberg with SDSTA President Brenda Murphey



Outstanding Physical Science Awardee Lisa Cardillo



Jan Palmer—2012 SD Outstanding Biology Teacher



Tom Durkin presents the 2013 "Kelly Lane Earth & Space Science Grant" to Betsy Ann Koenig (left) of South Central School in Bonesteel (left) and Amber Stout (center) of Jefferson Elementary School in Pierre, SD



## PD Opportunities

### Modeling Method Workshop for All South Dakota! July 2013

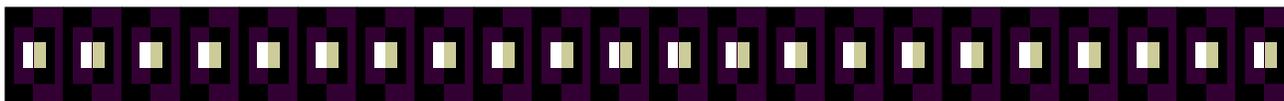
A workshop on the renowned Modeling approach to teaching science and math is planned for this summer. Taught by Rose Emanuel, Dr. Andy Johnson, and others, this workshop will be held in Madison, SD July 8-12 and possibly June 24-28. Participants will learn fundamentals of physics and develop new skills in teaching students to understand physics. The Modeling method, recognized as effective by the the US Dept. of Education, really works! Modeling students achieve vastly better on tests of understanding compared with students in a traditional physics class. And students enjoy it!

If funded, we will offer lodging and stipends for attending. Contact Andy Johnson (andy.johnson@bhsu.edu) for more details.

### ED 639 –Physical Science Concepts for Teachers

This 2-credit course focuses on Physical Science concepts that build from middle through high school as described in the Framework for K-12 Science Education and the Next Generation Science Standards. Scientific investigations will center on waves and their applications as well as matter and its interactions, specifically nuclear processes. The science and engineering practices and cross-cutting relationships will also be emphasized. This course fulfills requirements for the Science Specialist Endorsement at BHSU. Facilitators: Dr. Andy Johnson and Dr. Janet Briggs

\*Pending Funding - Meets face-to-face at Black Hills State University



### BRING LOCAL EARTH SCIENCE INTO YOUR CLASSROOM!

The Museum of the Earth welcomes your application to participate in a professional development program that is focused on learning and teaching about the Earth system science of the Rocky Mountain region of the United States. Spend time in the field with scientists and fellow educators, learning how to bring fieldwork to the classroom through Virtual Fieldwork Experiences and the Teacher-Friendly Guides to the Geology of the US. We are seeking K-16 teachers and informal educators from the Rocky Mountain (ID, MT, WY, SD, ND, NE) region of the US.

• The Rocky Mountain Region (ID, MT, WY, SD, ND, NB) workshop will be June 17 - 19, at Badlands National Park in Interior, South Dakota with classroom space in the Kadoka School District. The application deadline for the Rocky Mountain Program is April 20.

**NSTA Web Seminars** are free, 90-minute, live professional development experiences that use online learning technologies to allow participants to interact with nationally acclaimed experts, NSTA Press authors, and scientists, engineers, and education specialists from NSTA partner organizations

### The Physics of Atomic Nuclei



The Physics of Atomic Nuclei (PAN) workshop is a conceptual introduction to topics of modern physical science and astronomy. Areas of focus include atoms and their constituents (nuclei and particles), the origin of the elements, cosmic rays and dark matter. This one-week workshop will include connections to the science and engineering practices, core disciplinary ideas and cross-cutting concepts in the Next Generation Science Standards.

Grade 5-12 educators who work with students in either formal or informal science education programs are eligible to apply. Pre-service teachers with an interest in teaching in the physical sciences are also encouraged to apply.

The workshop is limited to 25 participants. A \$500 stipend plus a travel allowance will be awarded to all South Dakota participants. Lodging is available in the campus apartments at BHSU in Spearfish. Two hours of graduate (or undergraduate) credit will be available through BHSU at a reduced rate.

Applications (available soon—see flyer) are due March 27<sup>th</sup>.



# PD OPPORTUNITIES



## 2013 Middle/High School (6-12) Science Academies Registration Now Open!

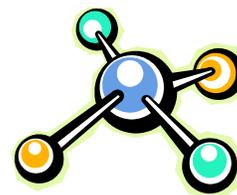
South Dakota Teachers, as trainers, will model 3-dimensional instruction (3 Dimensions: Scientific and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts from the *Framework for K-12 Science Education* and NGSS) through activities and provide video evidence of this instruction occurring in South Dakota classrooms. The video footage is based on model lessons that have been aligned to the Next Generation Science Standards and South Dakota Science Standards. Teachers will leave with 3-dimensional lessons that can be immediately implemented and will gain an understanding of the vision for science education in South Dakota. Teachers will also leave with knowledge of the 3-dimensional lesson-building process, which they can use to advance their curriculum.

This is a two day regional training for middle school and high school science teachers. There are 10 locations with up to two trainings occurring per location. At each location, one training will be for middle school and one training will be for high school. Up to 60 teachers will be accommodated at each location, with 30 at each training. Stipends of \$125/day will be paid to each attending science teacher, for no more than two days of training. Therefore, teachers should only sign up for one training. A minimum of 20 teachers will be required to host a training.

Graduate Credit will be available. More information will be sent out, post-registration, including “what to bring,” graduate credit information, specific location details, etc.

### Calendar of Training Dates for Middle and High School Science Academies

Middle School Location	Date	High School Location	Date
Aberdeen	June 12-13	Aberdeen	June 12-13
Mitchell	June 19-20	Mitchell	June 19-20
Mobridge	June 19-20	Mobridge	June 19-20
Pierre	June 19-20	Pierre	June 3-4
Rapid City	June 12-13	Rapid City	June 12-13
Rapid City	July 10-11	Rapid City	July 10-11
Sioux Falls	June 12-13	Sioux Falls	June 12-13
Sioux Falls	July 10-11	Sioux Falls	July 10-11
Watertown	June 26-27	Watertown	June 26-27
Yankton	June 26-27	Yankton	June 26-27



For more details, visit the Department of Education website: <http://doe.sd.gov/secretary/investinginteachers.aspx>

Click here to register: <https://docs.google.com/spreadsheets/viewform?formkey=dFF2dHJoZXhmUDE3S3pfVUZyTHNMY0E6MA>

### NSTA New Science Teacher Academy

It's that time of year again! The NSTA New Science Teacher Academy is now accepting applications for the 2013-2014 program. New this year, we have opened the program up to 2<sup>nd</sup> through 5<sup>th</sup> year science educators (middle and high school). The deadline to apply is August 1, 2013. <http://www.nsta.org/academy/>

This FREE program provides each participant with:

- An e-pedagogy mentor and an e-content mentor. These mentors work with the new teacher on a weekly basis.
- An opportunity to participate professional development web seminars with their cohort group from around the country throughout the school year.
- The opportunity to attend the 2014 NSTA National Conference in Boston to meet face-to-face with their cohort colleagues, their e-mentors, and experience the National Conference.
- Full membership to the NSTA (all expenses covered by the Academy).



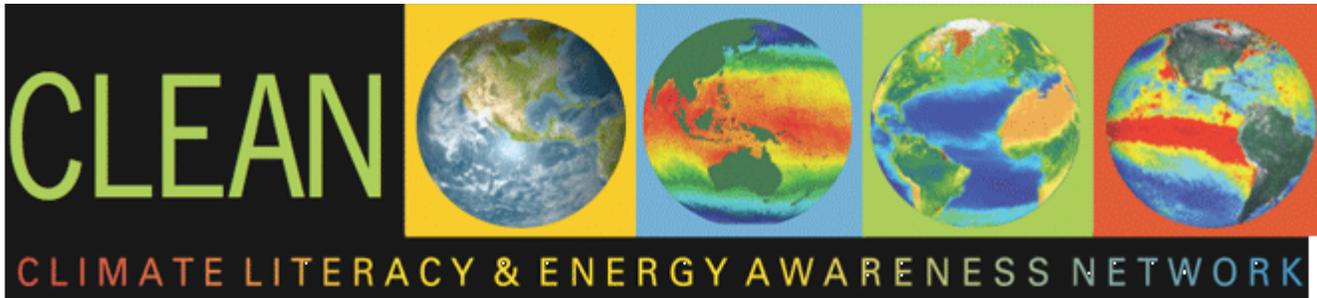
# TEACHING RESOURCES



## Climate Literacy and Energy Awareness Resources

This digital collection of 500+ vetted teaching materials for grades 6 - 16 includes activities, visualizations, and videos on climate science, climate change, and energy concepts. These free resources are appropriate for courses in biology, chemistry, physics, environmental science or engineering, geology, and geography. Only materials accepted by our review panels of scientists and educators are included. [Search the collection](#) by topic, resource type, or grade level. [Learn about how to teach](#) concepts in climate and energy using literacy principles. This amazing resource was created with NSF funding.

Share this resource with your colleagues and students! [cleanet.org](http://cleanet.org)



## Student Opportunity—Art and Science

We are very excited to announce the start of our GPM Anime Character Challenge (<http://pmm.nasa.gov/education/anime>). Global Precipitation Measurement Mission (GPM) and our partners at the Japan Aerospace Exploration Agency (JAXA) are holding a design challenge for people around the world to develop an Anime character for GPM. You will need to learn about the GPM mission and science themes, including the water cycle, weather and climate, technology, and societal applications, and incorporate them into your Anime character design. The winning character will star in a comic series that will teach the public about GPM and precipitation science!

### Challenge Details:

- \* The contest will run from 2/25/2013 - 4/30/2013
- \* Anyone age 13 and older is invited to submit a design
- \* There are 3 submission categories (Ages 13-15 - Middle School, Ages 16-18 - Secondary/High School, and 19 years and older (above high school))
- \* There will be one grand prize winner whose character will be used in future GPM educational and outreach materials, and 2 runners up in the three categories who will also receive prizes.
- \* The main judging criteria will be how well the character demonstrates GPM and precipitation science themes as well as originality and uniqueness and the quality of the artwork and character story
- \* Please find all submission details at <http://pmm.nasa.gov/education/anime>

A Message from Janet Wagner—  
SDSTA Liason

What's new for 2014 Conference?

With the 2013 State Science Conference behind us and what a wonderful conference it was, we are looking forward at making the 2014 conference even better. With the Next Generation Science Standards on the forefront, we are looking to provide conference sessions which are orientated to activities for a specific grade level. What fun! We have several new presenters who are willing to take on the challenge and be ready to present at the 2014 conference.

With the inclusion of engineering into the new science standards we will be seeing more hands on activities being incorporated into the cross cutting curriculum. One new standard for 3<sup>rd</sup> -5<sup>th</sup> grades is "The effect of unbalanced forces on an object results in a change of motion. Patterns of motion can be used to predict future motion". A proposed session to deal with this standard could be "It's Elementary My Dear Newton!" Get ready for the fun.

## The Science Spot— materials for every grade level and science area

<http://sciencespot.net/Pages/refdeskelemsci.html> - Elementary resources

<http://sciencespot.net/Pages/startersgensci.html>—Physical Science

<http://sciencespot.net/Pages/startersbiology.html>—Biology

<http://sciencespot.net/Pages/startersearth.html>—Earth Science/Astronomy





## Activities for the classroom

### The Effects of Sidewalk Salt on Grass Seed Germination

**Purpose: Weigh the pro's and con's of sidewalk salt by engaging in scientific experimentation.**

Procedure: (can be adjusted for 3rd up to 12th grade—Life Science, Environmental Science, Chemistry)

Obtain 4 film canisters and rinse them out thoroughly. They do not need to be dried.

Label them 0, 1%, 5%, and 10% salt solution. (teacher can make the salt solutions for younger students)

Place 2 mL of each solution into the proper canisters.

Cut 4 filter paper strips 2" x 1/2".

Obtain 40 grass seeds.

Carefully wet the filter paper strips and place 10 grass seeds on each.

Place this carefully along the inside of a film canister so that the grass seeds stay trapped between the wall of the canister and the filter paper. They must NOT drop into the salt solution. The end of the filter paper needs to be in the salt solution. Place the lid onto the canister so that a small portion of the filter paper strip may stick out of the top.

Observe the seeds every class day for germination and then growth.

Extensions: Test several kinds of ice melters and alternatives (i.e. kitty litter). Students can look at the costs of the salts, the costs of medical care should someone slip and break something, the cost of re-planting grass, or use different kinds of grass seed. To engage in NGSS practices: 1) Planning and carrying out investigations. 2) analyzing and interpreting data

NGSS Cross-cutting concept:: Cause and Effect

Core English: Engage in argument and presenting a point



### Human Population Studies—Interactive web-site <http://www.pbs.org/wgbh/nova/worldbalance/>

Click on each of the following sections and launch the interactive and information to answer the questions. Human Numbers Through Time

1. Begin going through the series of slides. In the first three slides – What are the three countries that have the most concentrated populations?
2. Are the populations inland or more by the coast? Why do you think so? In 1927, what advances led to an increase in the world's population?
3. In 1974, there were new reproductive technologies to limit reproduction yet the population continued to grow. Why?
4. 1999 – What two countries hold most of the world's population?
5. List two countries that still will have room for people in the year 2050.

Global Trends Quiz – take the quiz

1. What is the current rate for the United State?
2. Why is 2.1 considered replacement level and not 2.0?
3. What is the life expectancy of a Japanese girl?
4. Life expectancy is most likely a reflection of:
5. What will happen to the size of the elderly population over time?
6. Do more or less people live with their extended family than a century ago?
7. By 2035, how many working age adults will there be to support the elderly?
8. Will payroll taxes go up or down to help support the elderly population?
9. The human population growth rate is below replacement level but our population is not going down. Why?
10. If fertility rates do not go down, what will be the population in 2050?
11. Are fertility rates going up, down, or staying the same? What % of people live in urban settings (cities)?

Who has more cars per 1000 people – China or USA?

Can poverty lead to environmental damage?

Undernourished means:

As population levels rise, pollution levels:

Define “carrying capacity”:

Be A Demographer – you will match countries with different demographic statistics such as birth rate/death rate/infant mortality. Give a brief summary of the United States.

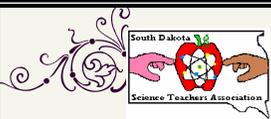
Earth In Peril – a series of interactive maps. Use them to answer the following questions:

1. What did they use to “see” where the cities are?
2. Is the most growth in the USA occurring on the east or west coast?
3. Is Europe “growing” in any areas?
4. How much of the earth's water is freshwater?
5. List two countries that are short of water according to the information and map.
6. Are high amounts of air pollution located in the northern or southern hemisphere?
7. Worldwide, are climate temperatures going up or down?
8. In the USA, are the forests “pristine” or “transformed”?
9. The ocean tends to be warming up or cooling down?

Population Campaigns – Describe the population control campaigns for the following three countries: China, India, Kenya

The Material World – Compare a family in China and America on the kinds and numbers of their possessions.





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## Your Daily Dose of Astonishment

By Diane K. Fisher (Propulsion Laboratory, California Institute of Technology)



As a person vitally interested in astronomy, you probably have the Astronomy Picture of the Day website at [apod.nasa.gov](http://apod.nasa.gov) set as favorite link. APOD has been around since practically the beginning of the web. The first APOD appeared unannounced on June 16, 1995. It got 15 hits.

The next picture appeared June 20, 1995, and the site has not taken a day off since. Now daily traffic is more like one million hits.

Obviously, someone is responsible for picking, posting, and writing the detailed descriptions for these images. Is it a whole team of people? No. Surprisingly, it is only two men, the same ones who started it and have been doing it ever since.

Robert Nemiroff and Jerry Bonnell shared an office at NASA's Goddard Space Flight Center in the early-90s, when the term "World Wide Web" was unknown, but a software program called Mosaic could connect to and display specially coded content on other computers. The office mates thought "we should do something with this."

Thus was conceived the Astronomy Picture of the Day. Now, in addition to the wildly popular English version, over 25 mirror websites in other languages are maintained independently by volunteers. (See [http://apod.nasa.gov/apod/lib/about\\_apod.html](http://apod.nasa.gov/apod/lib/about_apod.html) for links). An archive of every APOD ever published is at <http://apod.nasa.gov/apod/archivepix.html>. Dr. Nemiroff also maintains a discussion website at <http://asterisk.apod.com/>.

But how does it get done? Do these guys even have day jobs?

Dr. Nemiroff has since moved to Michigan Technological University in Houghton, Michigan, where he is professor of astrophysics, both teaching and doing research. Dr. Bonnell is still with NASA, an astrophysicist with the Compton Gamma Ray Observatory Science Support Center at Goddard. APOD is only a very small part of their responsibilities. They do not collaborate, but rather divide up the calendar, and each picks the image, writes the description, and includes the links for the days on his own list. The files are queued up for posting by a "robot" each day.

They use the same tools they used at the beginning: Raw HTML code written using the vi text editor in Linux. This simple format has now become such a part of the brand that they would upset all the people and websites and mobile apps that link to their feed if they were to change anything at this point.

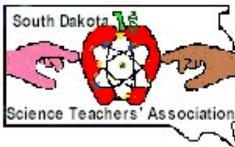
Where do they find the images? Candidates are volunteered from large and small observatories, space telescopes (like the Hubble and Spitzer), and independent astronomers and astro-photographers. The good doctors receive ten images for every one they publish on APOD. But, as Dr. Nemiroff emphasizes, being picked or not picked is no reflection on the value of the image. Some of the selections are picked for their quirkiness. Some are videos instead of images. Some have nothing to do with astronomy at all, like the astonishing August 21, 2012, video of a replicating DNA molecule.

Among the many mobile apps taking advantage of the APOD feed is Space Place Prime, a NASA magazine that updates daily with the best of NASA. It's available free (in iOS only at this time) at the Apple Store.



# South Dakota Science Teachers' Association

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## Calendar of Events      Calendar of Events

- April 11-14      NSTA National Conference, San Antonio
- April 30      Submission deadline for Art and Science—[pmm.nasa.gov/education/anime](http://pmm.nasa.gov/education/anime)
- May 15-18      NSTA STEM Forum & Expo—St. Louis, Missouri
- June & July      NGSS Academies across the state ( [doe.sd.gov](http://doe.sd.gov) )
- June 17-19      Earth Science Workshop in the Badlands National Park
- July      Modeling Physics workshop at BHSU—[Andy.Johnson@bhsu.edu](mailto:Andy.Johnson@bhsu.edu)
- August 1      NSTA New Science Teacher Academy—[www.NSTA.org/academy](http://www.NSTA.org/academy)
- December 12-14      NSTA Area Conference—Denver, Colorado

**February 6—8, 2014**      22nd Annual Joint Math & Science Conference - Huron, SD

Homepage Located At      <http://www.sdsta.org>