

Jan. 2011

Vol. 119

Science Teachers' Association Greetings Friends & Colleagues

Greetings Everyone,

As we close out 2010 and begin 2011, I wish you all happiness, prosperity and good health. It is hard to believe that the school year is half over but it is nice to know that the days are getting longer again. South Dakotans have survived a tough year with seven presidential disasters declared even before the Christmas storms. We were blessed with ice storms, blizzards, floods and hailstorms. But, South Dakota people are tough and resilient and we will endure whatever Mother Nature brings us. I know that the meteorologists get a bad rap most of the time but my hat goes off to them. I do not make any winter travel plans without checking the weather report. I think they do an amazing job.

Plan to attend the 19th annual math/science conference in Huron February 3rd-5th. There are over 100 presentations scheduled. Both executive boards have been working hard to insure that we will have a great conference. Not only will there be a wide variety of presenters but the vendor list continues to grow thanks to Mark Farrand. Special thanks to Jean Gomer for all of the hard work she does for this conference. We are so thankful she has continued to organize this conference even though she is now retired. Some things to look for at the conference include several sessions by Peggy Norris on the DUSEL project. She will be talking about what is happening now and what is planned for the future. Also, Ed Sobey from the kidsinvent.org will be doing four sessions on

creative learning projects for kids. We are thankful to the Discovery Center in Pierre for helping us bring Ed to South Dakota.

If you are a new teacher in SD, apply for the Jim Goehring/Ann Veitz Future Leaders Scholarship. It is open to teachers in the first year of teaching in South Dakota. It provides a **free** conference registration to SDCTM and SDSTA members. For more information, go to either the SDCTM or SDSTA website.

Also, nominations are now open for Jr-Sr high school teachers for the 2011 PAEMST awards. One can now nominate oneself so don't hesitate to apply. We have many deserving teachers in our state but you can't win if you don't apply. For more information, see the SDSTA website.

With that, I will close and wish you all a Happy New Year. I hope to see you at the February conference. Get your registration in early to save some money. Let's hope that Mother Nature cooperates with us that week-end.

Stay Warm,

Molly TenBroek - President, SDSTA
Feb. 2010-Feb. 2012

You will receive a printed booklet when you arrive in Huron to pick up your name tag, receipt, membership card, etc. A quick first draft of the schedule-at-a-glance & times or the conference booklet can be found at SDSTA.org Use the link at left that says Conference. Also included on that page are links to a map of Huron, the Goehring / Veitz scholarship form, etc.

Professional Development, Funding, and Idea sources

Exploring the Past: Archaeology in the Upper Mississippi River Valley

Walking beside thousand-year-old burial mounds, flaking raw stone into tools, learning how potsherds tell us about human behavior, and understanding how humans adapt to complex, ever-changing environments- our 2011 NEH Summer Institute features all this and more.

The Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse will offer a three-week NEH Summer Institute on July 11–29, 2011. This dynamic learning experience for K-12 teachers will explore how Native Americans and Euro-Americans have adapted to the Upper Mississippi River Valley over the past 13,500 years, and how archaeology leads to an

understanding of how human cultures change and adapt through time.

The Institute will feature a one-day excavation experience, field trips to archaeological sites, hands-on laboratory and workshop activities, demonstrations, and classroom activities. Individual projects will help participants tailor the content to their own teaching areas. Participants receive a \$2,700 stipend to help offset their expenses.

Application and other information on the Institute is available online at <http://www.uwlax.edu/mvac/neh.htm>. The deadline for applications is March 1, 2011.



NSTA's Shell Science Lab Make-Over

NSTA's Shell \$20,000 Science Lab Makeover Opportunity

Middle and high schools with limited laboratory resources are invited to apply for a chance to win a \$20,000 lab makeover through NSTA's Shell Science Lab Challenge. If this is of interest to you and your audience, we ask that you kindly distribute this information through your networks.

A copy of the application is attached. The application, prize structure for 18 winners, and more information can be found at <http://shellsciencelab.nsta.org>.

NEH Summer Institute 2011

In 2011, Crow Canyon will again offer a three-week summer institute, funded by the National Endowment for the Humanities (NEH). The institute, titled Bridging Cultures: Diversity and Unity in the Pueblo World, will introduce 25 schoolteachers to the history and culture of the Pueblo Indians. The institute takes place in Cortez, Colorado, on Crow Canyon's beautiful

campus, and teachers travel to a number of other locations in the Southwest. The institute will be directed by Dr. Elaine Franklin and Marjorie Connolly.

July 17–August 6, 2011

Application deadline: March 1, 2011 (postmark) For more information about this program, please e-mail us at NEHsummer2011@crowcanyon.org

OBTA—Outstanding Biology Teacher Nominations being sought!

Nominees must have consistently taught Life Sciences for at least the last three years (not necessarily a majority of their schedule—as this would be very difficult in a small school). Please email Julie Olson at Julie.olson@k12.sd.us with the name and email of the nominee. State winners will receive \$1000 courtesy of Sanford Health.





Astronomers Stumble onto Huge Space Molecules

By Trudy E. Bell and Tony Phillips

Deep in interstellar space, in a the swirling gaseous envelope of a planetary nebula, hosts of carbon atoms have joined together to form large three-dimensional molecules of a special type previously seen only on Earth. Astronomers discovered them almost accidentally using NASA's Spitzer Space Telescope.

"They are the largest molecules known in space," declared Jan Cami of the University of Western Ontario, lead author of a paper with three colleagues published in *Science* online on July 22, 2010, and in print on September 3.

Not only are the molecules big: they are of a special class of carbon molecules known as "fullerenes" because their structure resembles the geodesic domes popularized by architect Buckminster Fuller. Spitzer found evidence of two types of fullerenes. The smaller type, nicknamed the "buckyball," is chemical formula C_{60} , made of 60 carbon atoms joined in a series of hexagons and pentagons to form a spherical closed cage exactly like a black-and-white soccer ball. Spitzer also found a larger fullerene, chemical formula C_{70} , consisting of 70 carbon atoms in an elongated closed cage more resembling an oval rugby ball.

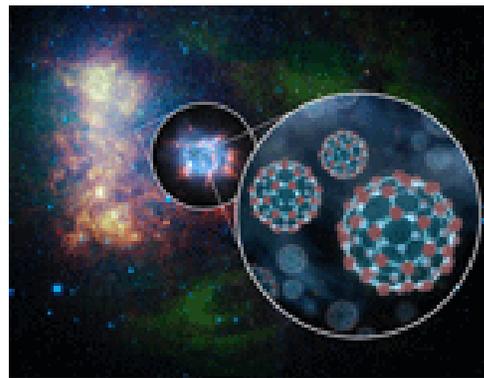
Neither type of fullerene is rigid; instead, their carbon atoms vibrate in and out, rather like the surface of a large soap bubble changes shape as it floats through the air. "Those vibrations correspond to wavelengths of infrared light

emitted or absorbed—and that infrared emission is what Spitzer recorded," Cami explained.

Although fullerenes have been sought in space for the last 25 years, ever since they were first identified in the laboratory, the astronomers practically stumbled into the discovery. Co-author Jeronimo Bernard-Salas of Cornell University, an expert in gas and dust in planetary nebulae, was doing routine research with Spitzer's infrared observations of planetary nebulae with its spectroscopy instrument. When he studied the spectrum (infrared signature) of a dim planetary nebula called Tc 1 in the southern-hemisphere constellation of Ara, he noticed several clear peaks he had not seen before in the spectra of other planetary nebulae.

"When he came to me," recounted Cami, an astrophysicist who specializes in molecular chemistry, "I immediately and intuitively knew it I was looking at buckyballs in space. I've never been that excited!" The authors confirmed his hunch by carefully comparing the Tc 1 spectrum to laboratory experiments described in the literature.

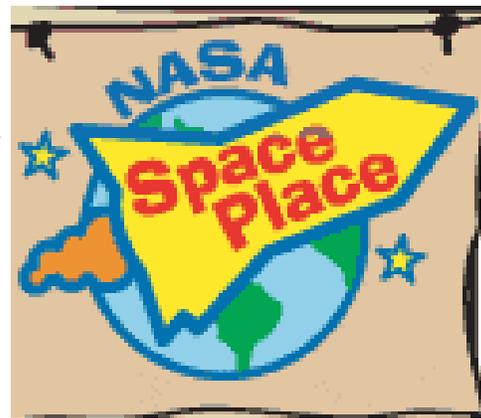
"This discovery shows that it is possible—even easy—for complex carbonaceous molecules to form spontaneously in space," Cami said. "Now that we know fullerenes are out there, we can figure out their roles in the physics and chemistry of deep space. Who knows what other complex chemical compounds



Superimposed on a Spitzer infrared photo of the Small Magellanic Cloud is an artist's illustration depicting a magnified view of a planetary nebula and an even further magnified view of buckyballs, which consist of 60 carbon atoms arranged like soccer balls.

exist—maybe even some relevant to the formation of life in the universe!"

Stay tuned!



SD-AAPT Photo Contest

<http://sdsta.k12.sd.us/sdaapt/contest.htm>
South Dakota's Am Assn of Physics Teachers is sponsoring a photo contest for HS physics students. Black-and-white or color photos must be trimmed to no larger than 8.5" x 11". A 250 word or less typed essay describing the physics in the photo must accompany the photo. Only one submission per student. Forms & additional information may be found at SDAAPT.SDSTA.org Entrant grants SDAAPT all rights to photo & submissions will not be returned..



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February 3-5, 2011 - Professional Development Conference at Huron Convention Ctr

There will be over 100 sessions and graduate credit will be available through DWU.

The conference begins at 7 PM Thursday evening with Math & Science sharing sessions.

If you are a Promethean or Smart Board user, bring a lesson on a USB flash drive to share. You will then be able to get copies of all lessons shared during the Promethean and Smart Board Sharing sessions that take place on Friday. Both organizations will have business meetings at 4:30 and the Friday night banquet starts at 6:30 PM

Saturday sessions include a follow-up for people who .

attended the Cosmic Math workshop in the summer of 2010. Besides several hands-on sessions, there will also be a session on Presidential Awards that is sponsored by the White House and the National Science Foundation. Hope to see you there.

OPSTA—Outstanding Physical Science Teacher Award

Teachers in the areas of physical science, physics, chemistry, meteorology, and astronomy including grades 7-12, are eligible for the award. The required forms are available from the SDSU Physics Department website: www.engineering.sdstate.edu/~physics/OPSTA.htm or by e-mailing Sally.Krueger@sdstate.edu.



The SDSTA Newsletter is published four times a year. The December issue (this one) is mailed to 200 paid members & science organizations & a few schools.

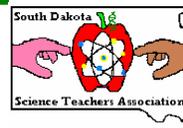
The Membership year in SDSTA starts with the February conference and ends the first of February. Dues are due at each conference for member discount rates.

SDSTA members may give a one year free membership to their student teachers by submitting the student teacher's name & address.

One free conference registration is given away to the SDSTA member that has made a submission to the newsletter (or given a presentation at the conference) and has referred at least three new members.

Members may also earn a 10% finders fee for any science related ads placed in the newsletter. Our rates are \$75 per page (or 3 to 4 quarter pages) or insert per issue or \$225 per page for four consecutive issues.

Mail to: James Stearns, SDSTA Treas
15 North Fifth Street
Groton, SD 57445



\$ 5 Student
\$ 5 K - 6
\$ 5 Retired
\$ 20 All Others

Name _____ Home Phone _____ - _____
Home Address _____ E-mail: _____
City _____ State _____ Zip _____

Your School _____ School Phone _____ - _____
School Address _____
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Nomination

The deadline for nominations is April 1, 2011. The nomination form should be completed early enough to ensure that the nominated teacher is given enough time to thoroughly prepare an application that reflects exemplary teaching prior to the application deadline. Applications are due by May 2, 2011.

Nominate outstanding secondary, grades 7-12, mathematics and science teachers now for the 2011 awards. (Nominations for elementary school teachers, grades K-6, will be accepted next year.)

Who is Eligible for 2011?

The following are eligibility criteria for applicants. They must:

- Teach mathematics or science at the 7-12th grade level in a public or private school.
- Hold at least a Bachelor's degree from an accredited institution.
- Be a full-time employee of the school or school district as determined by state and district policies, and teach K-12 students at least 50% of the time.
- Have at least 5 years of full-time, K-12 mathematics or science teaching experience prior to the 2010-2011 academic school year.
- Teach in one of the 50 states or the four U.S. jurisdictions. The jurisdictions are Washington, DC; Puerto Rico; Department of Defense Schools; and the U.S. territories (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands).
- Be a U.S. Citizen or Permanent Resident.
- Not have received the PAEMST award at the national level in any prior competition or category.

State coordinators for the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) Program are available to answer questions about the awards program and provide assistance and mentoring to the nominees and awardees. For South Dakota Science, contact:

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