

*Bringing the wisdom of practice from teachers to the National Academies*

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## TAC Receives Grant for Summer Workshop

Since its inception in 2002, the Teacher Advisory Council has, on many occasions, been asked to review and provide advice about educational studies, reports, or derivative products coming from various Academies divisions and program units. Program officers have typically sought advice about how to make the content and formats of educational products most useful for teachers. At the February meeting, the members of the Council agreed that discussion with other Academies staff could be

richer and more targeted if the most basic facts about teachers' needs and how to reach them effectively could be made available through a short print and online publication easily accessible by Academies staff.

The TAC recently received funding from the Presidents' Circle Communication Initiative (an internal source for supporting innovative projects) to hold a two-day meeting at the Keck Center in August 2008. Up to six TAC members and/or associates

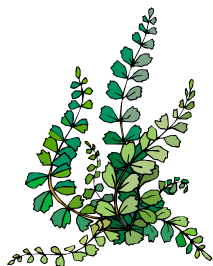
will work with Betty Carvellas (Teacher Leader) and Jay Labov (TAC Staff Director), communications/marketing personnel from the Academies and from one of the major professional organizations for teachers, and possibly a representative from a commercial distributor of products for teachers. Their goal will be to discuss and clarify production and dissemination strategies for products from the National Academies that could be developed to be useful for teachers.

## iPlant Collaborative provides exciting opportunity

The iPlant Collaborative (<http://iplantcollaborative.org/home>) is a great opportunity for science, math and technology educators and their students to be involved in original research and work with real data. The iPlant Collaborative (iPC) is developing a national center to provide the world with cyberinfrastructure tools to address "grand challenge" questions in plant biology, from molecules to ecosystems. Plant scientists, computational scientists, and mathematicians nationwide will identify the grand challenge research questions in plant biology that require computational approaches, collaborate with

the iPC team to develop and build the supporting cyberinfrastructure, and educate the next generation to work on multidisciplinary projects using computational strategies. The iPlant Collaborative was developed in response to the National Science Foundation's Plant Science CyberInfrastructure Collaborative (PSCIC) program, which is intended to create a new type of organization – a cyberinfrastructure collaborative for the plant sciences – that will enable new conceptual advances through integrative, computational thinking.

iPC offers an unprecedented opportunity to involve educators in 21<sup>st</sup> century biological and computational research. The vision is to put the same data and tools used by scientists into the hands of educators and their students via the cyberinfrastructure's user-friendly "Discovery Environments" thereby creating a community of "amateur plant biologists" performing original research in classrooms across the country. In pilot activities at the University of Arizona this summer, high school biology, mathematics, and technology educators will participate (*continued on page 2*)



## iPlant Collaborative (cont.)

in research experiences at the interface of plant biology and computer science, and collaborate with the iPC team to develop curricula designed to engage students in classroom research. Research topics, which reflect the breadth of plant biology, may include ecosystem modeling, analysis of genome sequence

data to examine genome structure and evolution, or plant imaging to explore cellular processes or plant development. In coming years, opportunities for K-12 educators and college educators, as well as their students, will be offered at locations around the country.

## Award Winning Education Site at the National Academies

[A website from the National Academy of Sciences](#) offers "first person accounts of the lives and work" of some of its members. Members of NAS have distinguished themselves in a number of fields from agriculture to physics and visitors to this site can listen to audio interviews in which members talk about their research, why they became scientists, and other aspects of their research and careers. The site is simple in design and easily navigated. The site provides valuable information for students, their parents and teachers, who may be looking

at a career in the sciences or perhaps just for some inspiration. The interviews are about an hour long and provide some insight into the reasons these people chose their careers as well as the kind of work they do on the job. The NAS has over 2000 members who have distinguished achievements in original research. Each interview is accompanied by a brief summary and photograph of the scientist. Listen as Bruce Alberts, former president of NAS, discusses ways to improve science education at

the college level; Wendy Freedman, one of the three principal investigators on the Hubble Space Telescope Key Project, talks about turning her hobby into a career; Erin O'Shea tells how a summer job in a laboratory led her to study biochemistry.

[http://www.nasonline.org/site/PageServer?pagename=INTERVIEWS\\_Main](http://www.nasonline.org/site/PageServer?pagename=INTERVIEWS_Main)

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*Website offers first person accounts of the lives and works of members of the National Academy of Sciences*

## Report from the California Teacher Advisory Council (Cal TAC)



The California Council on Science and Technology (CCST) created the California Teacher Advisory Council (Cal TAC) to enable a cadre of outstanding K-14 science and mathematics teachers to serve as a resource to other teachers, educational leaders in school, district, and college or university settings, business and industry leaders, and

policymakers on topics related to the promotion of quality, effective, and innovative mathematics and science education. Cal TAC is modeled, in part, after the National Academies' Teacher Advisory Council (NTAC). In the past year, Cal TAC members took part in a strategic planning retreat which

provided the opportunity for Cal TAC to reflect on early accomplishments and choose priorities on which to focus in the next 12 – 24 months. Of the five identified priority areas, the group chose to focus initially on professional development, and Cal TAC (continued on page 3)

## Report from Cal TAC (cont.)



is currently planning a conference focused on professional development for the fall of 2008. A founding premise of Cal TAC was to involve teachers, educators, industry leaders, educational administrators, policymakers, and legislators in its activities and developmental discussions. Because of the importance of corporate involvement, Cal TAC has made special efforts to strengthen its relationship with the policy, business and industry communities. Cal TAC has worked to link teachers to

industry and national laboratories, and to support outreach and professional development efforts that result in teachers having a real world understanding of business and industry needs.

In a recent report from CCST, it was noted that In the last few years, CCST has begun to fully realize how few opportunities expert teachers have throughout their careers to share their experiences and wisdom with others teachers, administrators and policymakers. As Bruce Alberts

noted in his opening remarks at a national workshop last year, it is striking how non-obvious it is to policymakers that teachers' "wisdom of practice" should be considered in making decisions about what happens in classrooms. Cal TAC is working diligently to make that need more obvious. Within Cal TAC, the common theme has become "no decision about us without us." That sounds like a great motto!

More information about Cal TAC is available at <http://www.ccst.us/ccstinfo/caltaac.php>.

## America "COMPETES"

In August 2007, Congress passed, and the President signed, the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (America COMPETES) Act (H.R. 2272). The Act implements many recommendations in the Academies' report [Rising Above the Gathering Storm](#). The act reauthorizes NSF for three years at funding levels to double its budget in seven years.

The act codifies the NSF data-sharing policy into law, specifying that an investigator will be ineligible for future awards if the director determines that he or she has failed to comply with the policy (Sec. 7011).

Another section of the act states that NSF, in carrying out its research programs on science policy and on the science of learning, "may support research on the process of innovation and the teaching of inventiveness."

The act specifically calls for a number of National Academies studies or other activities of interest to DBASSE (Division of Behavioral and Social Sciences and Education):

- An Academies study through the Office of Science and Technology Policy (OSTP) on barriers to innovation
- An Academies study through OSTP on federal support of "service science," defined as education and research to encourage innovation through the synergy of various disciplines

-For a President's Council on Innovation and Competitiveness, the Academies are to recommend

a list of 50 advisors to the council

- An Academies study through the Department of Energy to assess the performance of the department's science, engineering, and mathematics education programs

- An Academies study through the Department of Energy to review the performance of Discovery Science and Engineering Innovation Institutes, which the act establishes for research and education on emerging technologies deemed essential to global competitiveness

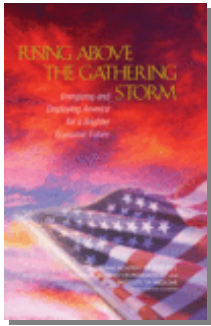
- An Academies study through the Department of Education to

*(continued on page 4)*

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*"The Act implements many recommendations in the Academies' report [Rising Above the Gathering Storm](#)."*

## America Competes (cont.)



[Rising Above the Gathering Storm, NRC, 2007](#)

“identify promising practices for improving teaching and student achievement in science, technology, engineering, and mathematics in kindergarten through grade 12” The DBASSE Center for Education is specifically named to conduct the study. -An Academies study through NSF to increase

the number of underrepresented minorities in the workforce employing science, technology, engineering, and mathematics -An Academies study through the Department of Education on how to develop and maintain with private funding free access to online educational materials as part of a degree program. In addition, the act calls for the

Bureau of Economic Analysis to report on the feasibility of collecting and analyzing data on the export and import of services. The DBASSE Committee on National Statistics anticipates being asked for advice on this matter.

## Grand Challenges of Engineering and other websites

On February 15 of this year, the NAE (National Academy of Engineering) unveiled the **Grand Challenges for Engineering**. ([www.engineeringchallenges.org](http://www.engineeringchallenges.org)). The fourteen Grand Challenges of engineering were identified by an international committee of leading technological thinkers who were asked to identify the grand challenges facing engineering in the 21<sup>st</sup> century. The website is highly informative and interactive. Those who access the site can post comments about each challenge and enter their vote for the greatest engineering challenge of the 21<sup>st</sup> century. Results are posted on the site regularly. Perhaps the most exciting portion of the website for teachers is a short (approximately 6.5 minutes) video. It explains the focus of the Grand Challenge Study – the committee looked not what could be invented but what needed to be invented. It’s a great way to interest students in engineering by relating engineering to very real world issues, both current and future.

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### *Messages from the Engineer Your Life website:*

- *Creativity has its rewards*
- *Explore the possibilities*
- *Make a world of difference*

### Engineer Your Life: A Guide to Engineering for High School Girls - [www.engineeryourlife.org](http://www.engineeryourlife.org)

In 2004, members of the engineering community formed a coalition to encourage academically prepared girls to enroll in engineering programs. After extensive research revealed some of the reasons girls were not interested in pursuing engineering, the coalition developed and tested new messages that emphasized how varied and creative engineering can be and what a difference engineers make in the lives of others. The messages are now part of a national campaign designed to encourage college bound girls to explore engineering.

The *Engineer Your Life* web site, from the National Academy of Engineering, is a great resource for high school girls and the adults in their lives (parents, counselors, teachers, and other educators) who want to learn more about what life and work are like for engineers. The messages on the site, *creativity has its rewards*, *explore the possibilities*, and *make a world of difference* introduce young women to engineers who embody these messages. The site includes stories, photos, and videos of women in a variety of engineering careers.

### More websites of interest...

The **National Center for Ecological Analysis and Synthesis** <http://www.nceas.ucsb.edu/> and the **National Evolutionary Synthesis Center** <http://www.nescent.org/index.php> are but two web sites that provide opportunities for students to look directly at scientific data and crunch the numbers right along with the scientific community. If you are looking for ways to integrate research into your course, or make use mathematical skills, then you might want to spend some time looking at these web sites and allow your students to ask questions of the data therein.

## Highlights of the TAC's February 2008 Meeting

At our February meeting, the TAC welcomed two new members:

**Jennifer Sinsel**, elementary science (moving to middle level science in the fall) in Wichita, Kansas, and

**Steve Long**, high school science in Rogers, Arkansas

During the meeting, we met with representative from the Ocean Sciences Board, the Division of Earth and Life Sciences, the Board on Chemical Sciences and Technology and the Institute of Medicine's Food and Nutrition Board.

We heard from Center for Education staff about progress on two consensus studies, *Effectiveness of National Board*

*Certification and Teacher Preparation*. We heard an update about the work of the Board on Science Education and discussed dissemination strategies for *Ready, Set, Science*, a practitioner's edition of the report, *Taking Science to Schools*. Bruce Alberts joined us for our discussion of short and long term goals for the TAC. Barbara Schulz facilitated the first day of the meeting and then turned over the Teacher Leader duties to Betty Carvellas, the Council's new Teacher Leader. Betty recently retired from 39 years of teaching science, and she is

a Past President of the National Association of Biology Teachers. Since Barb has been out of the classroom for more than 6 years, her decision to move on was based, in part, on making room for a new teacher leader with more recent classroom experience. She felt that the timing was ideal for a change in leadership with new initiatives being developed and new opportunities for the teacher voice to be heard. Barbara said of her departure, "It has been an honor and a pleasure to serve as the Teacher Leader for the Teacher

Advisory Council and to take the TAC from an idea to reality, from identification of Council members through to approval of the TAC by the Governing Board of the National Academies. It is exciting to have the voice of teachers be heard and to have respect given to the wisdom of practice from teacher leaders across the nation. We have Dr. Bruce Alberts to thank for providing this amazing opportunity for teachers. I know the TAC will continue to flourish under the leadership of Betty Carvellas and I look forward to being an associate member of the Council."

## TAC says goodbye to Barbara Schulz

It is difficult to thank Barbara Schulz enough for all that she has done for the Teacher Advisory Council. When Dr. Bruce Alberts, then president of the National Academies, made the decision to move forward with the Council, he turned to Barb for her advice, expertise and ability to make it happen. During the first years of the TAC, Barbara's determination, skill and consummate professionalism allowed the Council to flourish. There is no question that the TAC would not be what it is today without Barbara's leadership and

guidance, first to help establish the Council and subsequently to formalize its position within the Academies. Barbara let nothing interfere with her determination to have the voice of teachers heard. Members and staff of the National Academies and teachers throughout the country have benefited from her tireless work to bring the wisdom of practice to educational discussions at all levels.

*Bruce Alberts expressed our thanks best in his poem honoring Barbara (see right panel).*

### *Hurray for Barb!*

*From Seattle to Antarctica  
and everywhere in between,  
You have proven to all comers  
that a teacher is a queen,*

*Your energy and enthusiasm  
have lit a million lights,  
From students who love science  
to teachers with raised sights.*

*Your love of science radiates  
to everyone you meet,  
And your wisdom and good judgment  
are impossible to beat.*

*Decisive and forceful  
you leave others with no choice,  
Except to respect and value  
the crucial teacher voice.*

*Oh, if someday teacher pay  
is double that of law clerks,  
And each school district  
focuses on what works.*

*Causing all children to learn  
and love their schools,  
Discarding their Gameboys  
as useless tools.*

*It will be because of what you started  
- great Barbara, the lion-hearted!*

*With our thanks, Bruce Alberts*

## Teacher Advisory Council

National Academies  
Keck Center  
500 Fifth Street, NW  
Washington, DC  
20001



### Members and Friends of the National Academies Teacher Advisory Council:

**Back:** Albert Einstein (World Citizen), Betty Carvellas (Teacher Leader, VT)

**Row 4:** Steve Long (AR), Roberta Tanner (CO), Roxie Albrecht (SD)

**Row 3:** Mike Koehler (KS), Barbara Schulz (former Teacher Leader, OR), Mario Godoy-Gonzalez (WA),  
Juliana Jones (CA), Ed Nolan (MD)

**Row 2:** Jennifer Sinsel (KS), Darren Wells (MA)

**Row 1:** Bruce Alberts (former President, NAS, ex-officio member, CA), Robert Willis (TAC Chair, DC)

**Not in Photo:** Dwight Sieggreen (MI), Jay Labov (TAC staff director, DC)

We're on the Web!

See us at:

[www7.nationalacademies.org/tac](http://www7.nationalacademies.org/tac)