Project 2061
AAAS

Leadership for Science Literacy

Center Prepares New Curriculum Materials Leaders

Their science specialties span astronomy, biology, chemistry, and physics, anthropology, geology, marine science, and the learning sciences. They have taught in K–12, university, and informal education settings and in urban, suburban, and rural areas. They hail from all over the United States and from abroad. Yet the diverse graduate students and postdoctoral fellows of the Center for Curriculum Materials in Science (CCMS) share a common goal: to support the development of excellent K–12 science curriculum materials.

When AAAS Project 2061 launched CCMS in 2002, a key part of the Center's mission was preparing a new generation of leaders to help develop innovative science materials and put them into use. Studies by Project 2061 and others have identified the need for curriculum materials that align with recognized science education standards and that take into account what is known about pedagogical principles that foster science learning for all students. CCMS, funded by the National Science Foundation's Centers for Learning and Teaching program, supports the design, selection, and use of such high-quality science materials through research, its doctoral and postdoctoral programs, and teacher development activities.

The Center partners Project 2061 with Michigan State University, Northwestern University, and the University of Michigan, and with school districts in Detroit, Chicago, and Lansing. Each university offers CCMS graduate and postdoctoral programs, while Project 2061 hosts a postdoctoral fellow at AAAS headquarters in Washington, DC. The programs, now in their second year, currently support 18 doctoral students and 8 postdoctoral fellows. Through CCMS, these young scientists and educators participate in groundbreaking research and collaborate with faculty and students across the partner institutions.

A Rich Research Environment

Because curriculum materials have such a powerful effect on what science is taught and how it is taught, efforts to improve them intersect with many key aspects of science teaching and learning. CCMS research addresses questions related to curriculum materials for all children, teacher learning and educative materials, the curriculum development process, assessment, and policy. CCMS graduate students and postdoctoral fellows participate in a wide variety of research projects informed by the Center's guiding principles:

- Centrality of science learning goals
- Importance of pedagogical supports
- Value of student investigations
- Usefulness of learning technologies
- Need to serve diverse learners
- Attention to teacher learning
- Awareness of policy context

Projects include studying how to develop students' use of evidence and reasoning in writing scientific explanations, integrating the nature of science into curriculum and teaching, and helping teachers develop an effective lens for examining curriculum materials and teaching.

"The CCMS graduate students and postdoctoral fellows have really surpassed our expectations these first two years," said Dr. Jo Ellen Roseman, director of Project 2061 and of the Center. "Along with energy and fresh perspectives, they have brought sophisticated

continued on page 2

2061 today

Science Literacy for a Changing Future

Mathematics
Natural Sciences
Social Sciences
Technology

Spring 2005
Volume 15, Number 1

Leadership for Science Literacy *from page 1*

subject matter knowledge that is invaluable to our work. They have much to contribute to the Center and the future of curriculum materials in science."

In addition to conducting research at their home institution, the graduate students and postdoctoral fellows have the chance to participate in regular cross-campus discussions about their research and about science education issues more broadly. Inter-institutional graduate seminars provide another forum for sharing ideas. With the help of videoconferencing, researchers from all four Center partners are currently enrolled in a seminar led by Dr. Daniel Edelson of Northwestern that examines historical perspectives on science curriculum materials design.

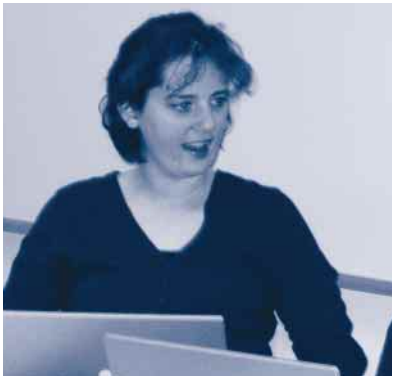
Ravit Golan Duncan and Leema Kuhn, both graduate students at Northwestern, appreciate the networking opportunities and exposure to multiple perspectives made possible by the collaboration of the CCMS partner institutions. "My professional peers now include students and postdocs at three institutions outside of Northwestern. This, more than anything else, will have an impact on my career and research as I move forward," said Kuhn, whose work looks at how curriculum design can support student engagement in scientific inquiry. Golan Duncan values the chance to gain insight into the "inner workings" of academe. "As a student it is a great learning experience to see how senior faculty across institutions handle various aspects of academic life such as grants, conferences, publications," said Golan Duncan, who investigates students' understanding of complex systems, particularly in genetics. "CCMS also provides a sense of a larger community—you feel that you belong to something that is greater than your own limited research agenda and interests."

Graduate students and postdoctoral fellows participate in CCMS's annual Knowledge Sharing Institute, which convenes researchers and curriculum materials developers from within and outside the Center, and organize their own annual retreat. The 2004 retreat at the University of Michigan oriented new participants to the Center and provided an opportunity for students and fellows from different institutions to meet and discuss mutual research and career interests. Several participants have even taken the initiative and started the Center's first special interest group, focused on diversity. Along with Center faculty, students and fellows regularly present their work at national and international conferences (see box).

Addressing Teacher Needs

A number of CCMS participants have found their work related to teacher learning to be especially engaging. This work includes researching the best ways to support teachers in implementing high-quality science curriculum materials, and developing and testing curriculum modules for use in pre-service science methods courses. Postdoctoral fellow Mark Enfield and graduate student Kristin Gunckel, both of Michigan State University, contributed to the development of the CCMS Elementary Science Methods Module (available at **http://ed-web2.educ.msu.edu/CCMS/**). The module helps teacher educators introduce pre-service teachers to Project 2061's criteria for evaluating curriculum materials. Student-teachers learn to analyze and adapt curriculum materials in ways that enhance the support materials provide for standards-based science teaching and learning.

"One of the most interesting things I have learned from working with the module is that teacher educators have widely varying ideas about the role and importance of curriculum materials in teaching and in learning to teach elementary science," said Gunckel, a geologist who is also involved in the development of a



CCMS graduate students (G) and postdoctoral fellows (P) gathered for a retreat in November 2004 at the University of Michigan. From left: Dean Grosshandler (P, MSU) and Deirdre Black (P, AAAS); John Lockhart (G, MSU), Rebecca Forthoffer (G, MSU), and Blakely Tsurusaki (G, MSU); Leema Kuhn (G, NU); Felicia Moore (Columbia University; former P, MSU), Magnia George (P, UM), and Aaron Rogat (P, UM).

high school unit on the water supply. "We need to understand better how teacher educators think about and teach about curriculum materials in their own courses. Helping teachers learn to use curriculum materials may include convincing teacher educators that teaching teachers how to use curriculum materials effectively is important." For Enfield, too, the module project highlighted the great need to attend to teacher education. "Curriculum materials in teacher education is somewhat of a forgotten orphan of the process," Enfield noted. "However, since curriculum materials are a primary means of communication with teachers and a primary mechanism for disseminating research knowledge in teaching and learning, it seems vital that we attend to them in teacher education."

Magnia George, a postdoctoral fellow at the University of Michigan, agrees. Her experience teaching elementary level science

continued on page 4

CCMS Researchers Share Their Work

National Association for Research in Science Teaching (NARST), Annual Meeting, Dallas, TX, April 4–7

Papers

Designing for Complex System Understanding in the High School Biology Classroom
Ravit Golan Duncan (G) and Brian J. Reiser (F), NU

Including Students and Teachers in the Co-Design of the Enacted Curriculum
Kristin L. Gunckel (G; MSU) and Felicia M. Moore (Columbia University)

Learner-Centered Design of Chemation: A Handheld Tool for Middle-School Chemistry
Lisa Scott Holt (P), Hsin-Yi Chang, Chris Quintana, and Joseph Krajcik (F), UM

Students Constructing and Defending Evidence-Based Scientific Explanations
Leema Kuhn (G) and Brian Reiser (F), NU

Students' Developing Understanding of Data: Affordances and Constraints of First and Second Hand Experiences
Barbara Hug (University of Illinois-Urbana-Campaign, ERCA) and Kate L. McNeill (G; UM)

Students' Epistemologies of Science and Their Influence on Inquiry Practices
Lisa O. Kenyon (P) and Brian J. Reiser (F), NU

Teacher Practices around Visual Representations in a Middle School Chemistry Unit
Aaron D. Rogat (P) and Joseph Krajcik (F), UM

Posters

The Embodiment of Violence in Collaborative Inquiry Learning at an After-School Science and Design Lab
Dean Grosshandler (P; MSU)

Reading Science: A Culturally Responsive Approach to Developing Scientific Literacy
Magnia A. George (P) and LeeAnn M. Sutherland, UM

We Have to Explain How to do Things Before We Can Explain Why Things Happen: Joint Construction of Accounts in Elementary Science
Mark Enfield (P; MSU)

American Educational Research Association (AERA) Annual Meeting, Montréal, Canada, April 11–15

Sessions/Symposia

Sorting it Out: Building a Lego-Logo Culture with Young Children
Dean Grosshandler (P; MSU)

Teachers' Use of Text to Support Students' Science Literacy Learning in symposium titled "Exploring the relationships between teacher practice and student learning in inquiry-based science classrooms"
LeeAnn M. Sutherland and Magnia A. George (P), UM

Papers

Comparing Teachers' Adaptations of an Inquiry-Oriented Chemistry Unit
Jay Fogleman (G) and Kate L. McNeill (G), UM

Exploring the Relation Between Teachers' Practices Around Visual Representations and Student Learning in an Inquiry-Based Chemistry Unit
Aaron D. Rogat (P), Mary Heitzman (G), and Joseph Krajcik (F), UM

Identifying Teacher Practices that Support Students' Explanation in Science
Kate L. McNeill (G) and D. J. Lizotte, UM

The Role of Domain-Specific Knowledge in Reasoning about Complex Systems
Ravit Golan Duncan (G) and Brian J. Reiser (F), NU

Poster

The Darker Side of Inquiry: The Construction of a Fantasy Torture Device in a Science Lab
Dean Grosshandler (P; MSU)

Note: Researchers are identified as graduate students (G), postdoctoral fellows (P), or faculty (F) and by their affiliations with Michigan State University (MSU), Northwestern University (NU), and University of Michigan (UM).

Leadership for Science Literacy *from page 3*

"Teachers need to see themselves as 'designers' of science instruction, rather than just 'vessels' of science knowledge."

methods courses for undergraduate and graduate students has deepened her understanding of the need teachers have for support in making decisions about curriculum materials. "I strive to impart to the teachers the importance of understanding the rationale of their own decisions about how and when to use certain curriculum materials to achieve the desired learning outcomes for the students they teach," said George. "Having a clear vision of the link between standards and the learning outcome and then selecting activities and instruction that support their vision is an essential step towards seeing themselves as 'designers' of science instruction, rather than just 'vessels' of science knowledge. This should be considered a norm of their practice, not an exception."

As the CCMS graduate students and postdoctoral fellows move on to leadership roles after their time with the Center, they will be able to apply what they have learned to curriculum development, education research, teacher education, and policymaking. Darlene Slusher, a former postdoctoral fellow at Northwestern, is now assistant professor of chemical education at Coastal Carolina University, and Felicia Moore, a former Michigan State postdoctoral fellow, is on the faculty at Teachers College, Columbia University. Through their one-of-a-kind experience with the Center, CCMS participants are well prepared to lend their talents to making high-quality curriculum materials a priority in science education.

For more information about CCMS and its graduate and postdoctoral programs, including how to apply, visit **www.ScienceMaterialsCenter.org**.

New Digital Library Project Underway

For time-pressed teachers, sorting through the many curriculum resources on the Internet to find ones that address content standards and are likely to help students learn is a tall task. To help make that task easier, Project 2061 is collaborating in a new three-year project with the Maine Mathematics and Science Alliance, a nonprofit science education reform organization established in 1992 as a National Science Foundation (NSF) statewide systemic initiative. Phenomena and Representations for the Instruction of Science in Middle Schools (PRISMS) is using Project 2061's research-based criteria for analyzing curriculum materials to identify high-quality Web-based resources that will be organized into an easily accessible online collection.

Funded by the NSF's National Science, Technology, Engineering, and Mathematics Education Digital Library (NSDL) program, PRISMS aims to increase the amount of standards-based and pedagogically useful science content available in the NSDL and other digital libraries for middle school teachers and students. A cadre of middle school teachers will be trained in Project 2061's curriculum-materials analysis procedure so that they can evaluate approximately 1,000 phenomena and representations and determine whether they are

- aligned with state and national content standards;
- informed by cognitive research; and
- likely to improve the quality of middle school science instruction.

Each phenomenon or representation included in the collection will be accompanied by teacher-prepared annotations detailing classroom experiences with using the item, suggestions on how to make it more effective, and questions that can guide its instructional use.

PRISMS is the latest of several NSDL collaborations involving Project 2061. For more details on PRISMS, please see **www.project2061.org/prisms**. More information about the NSDL is available at **www.nsdl.org**.

Work Begins on New NAEP Science Framework

AAAS Project 2061 is lending its expertise to the development of a new framework for a national testing program that surveys how well students in the United States are performing in science. In collaboration with other science and education organizations, Project 2061 is helping to create a framework and specifications that will guide development of the National Assessment of Educational Progress (NAEP) science assessment to be administered beginning in 2009. Since 1969, NAEP—often called "The Nation's Report Card"—has conducted regular assessments of the nation's public and private school students.

Under a new $1.3 million contract awarded by the National Assessment Governing Board (NAGB), WestEd (a nonprofit research organization) and the Council of Chief State School Officers are leading the effort to design the new framework. In addition, AAAS, the National Science Teachers Association, and the Council of State Science Supervisors are collaborating in the project. Contributing to the framework development are scientists, science teachers, test and measurement experts, and others, including parents, local and state policymakers, and representatives of business and the general public.

NAEP surveys science achievement of nationally representative samples of students in grades 4, 8, and 12, and of state-level samples in grades 4 and 8. The current NAEP science framework was adopted by NAGB in 1991 and served as the basis of NAEP science assessments administered in 1996, 2000, and 2005. With the standards-based reform movement of the 1990s have come advances in what is known about science learning that will need to be considered in designing the new framework.

Putting Project 2061 Resources to Work

Contributing to the 2009 NAEP framework is a natural extension of Project 2061's long-standing commitment to meaningful assessment. In concert with educators and assessment specialists, Project 2061 has developed a set of criteria and a procedure for analyzing the alignment of assessment items to the precise ideas and skills targeted by standards. That procedure is being used to develop an online collection of assessment resources, including more than 300 high-quality assessment items for middle and early high school science and mathematics. In addition to its experience analyzing science assessment, Project 2061 brings specific resources to the NAEP framework effort:

- item-by-item comparisons between Project 2061's *Benchmarks for Science Literacy* and the National Research Council's *National Science Education Standards*;
- new and revised strand maps from *Atlas of Science Literacy*;
- customized maps for curriculum and assessment design; and
- written clarifications of benchmarks.

"Having information about how well students understand and can use important ideas in science is a critical first step in the design of solutions to improve science learning for all," said Dr. Jo Ellen Roseman, Project 2061 director. "We are pleased to be a part of this new NAEP venture, which allows us to contribute our resources and expertise to a project aimed at strengthening science education at the national level."

The framework developers are paying careful attention to the areas of overlap in *Benchmarks for Science Literacy* and the *National Science Education Standards*; considering the kinds of performances or tasks that can effectively assess important ideas in life, physical, and earth science; and looking at how such performances at the same time assess students' understanding of the nature and practice of science and technology. The framework will recommend priorities for the science content to be covered by NAEP and also deal with how to approach public policy issues involving science. The NAGB plans to act on the new framework in late 2005, after it has held hearings and solicited comments via the Internet on the framework recommendations.

Contributing to the 2009 NAEP framework is a natural extension of Project 2061's long-standing commitment to meaningful assessment.

The NAEP program has produced more than 200 reports in 11 instructional areas and is administered by the National Center for Education Statistics, an agency in the U.S. Department of Education's Institute of Education Sciences. More details about NAEP, including the results of the 2000 science assessment, are available at **http://nces.ed.gov/naep**.

Project 2061 Celebrates 20th Anniversary

In 1985, Mikhail Gorbachev became the reform-minded leader of what was then the Soviet Union, scientists reported a large hole in the earth's ozone layer over Antarctica, and IBM developed a scanning tunneling microscope that could visualize atomic-scale images on metal surfaces. For AAAS, another notable occurrence was the appearance of Halley's Comet traveling past earth on its 76-year orbit. The next return of Halley's Comet in 2061 inspired the name of a new AAAS effort to reform K–12 science education: Project 2061. The name signaled a long-term focus on achieving science literacy and recognized that children would need an education that prepared them for profound scientific and technological change as they came of age in the 21st century.

In each of the following four areas, AAAS Project 2061 has made much progress over the past 20 years and continues to lead the way on behalf of science for all:

- **Creating Resources for Educators:** *Science for All Americans* (1989) and *Benchmarks for Science Literacy* (1993) are the foundation for Project 2061's ongoing work to create a set of reform tools to help educators meet science learning goals in their districts. Among these tools are *Blueprints for Reform* (1998), *Dialogue on Early Childhood Science, Mathematics, and Technology Education* (1999), and *Designs for Science Literacy* (2001). The popular *Atlas of Science Literacy* (2001) and related professional development workshops have shown the value of strand maps for understanding connections among learning goals. A second volume of *Atlas* is in development and several collaborations explore strand maps as interfaces for browsing digital library resources.
- **Improving Curriculum Materials:** Project 2061's studies of science and mathematics textbooks revealed that, with only a few exceptions, today's texts do little to help students learn key ideas found in national and state standards. Tools now in development—including an online collection of curriculum components aligned to standards and a book about curriculum materials evaluation and design—will help create the next generation of science and mathematics textbooks. A study of middle grades mathematics looks at how curriculum materials, teaching practices, and professional development can be coordinated to improve student learning. Through the Center for Curriculum Materials in Science (**www.ScienceMaterialsCenter.org**), Project 2061 is collaborating with Michigan State University, Northwestern University, and the University of Michigan to advance high-quality materials. Project 2061 has also worked with the developers of *Constructing Ideas in Physical Science* (*CIPS*) and *Investigating and Questioning our World through Science and Technology* (*IQWST*) to help them to focus curriculum materials on a coherent set of standards and to provide support for students and teachers.
- **Evaluating and Developing Assessment:** Project 2061 developed a set of criteria and a procedure for evaluating how well assessment items—such as those in local and state tests—align with national and state content standards. Building on this work, we are creating an online collection of high-quality middle and early high school science and mathematics assessment items linked to standards.
- **Building Public Support:** Project 2061 and the AAAS Directorate for Education and Human Resources have created a public outreach initiative to help build support for science literacy among parents, especially in minority communities. Working with science centers and museums across the country, the award-winning Partnership for Science Literacy reaches out to communities through public science events; TV, radio, and print ads; an English/Spanish *Family Guide to Science*; and its **www.ScienceEverywhere.org** Web site. Next steps include brochures that link local community resources to specific science standards.

As we look ahead to the next twenty years, and beyond that, to the return of Halley's Comet, Project 2061 keeps its vision of science literacy grounded in a commitment to clear and specific learning goals; a coherent K–12 curriculum; teachers with resources and skills to teach effectively; and communities committed to excellence.

About AAAS and Project 2061

Publisher of the peer-reviewed journal *Science*, the American Association for the Advancement of Science (AAAS) is the largest general scientific organization in the world. Its education initiative, Project 2061, has been at the forefront of the K–12 reform movement

- Defining science literacy and promoting it as a goal for all Americans;
- Developing K–12 benchmarks for student learning in science, mathematics, and technology;
- Producing a wide range of innovative tools for educators—books, CD-ROMs, and online resources—to guide their reform efforts; and
- Conducting research on the design and use of curriculum materials, assessment, professional development, and other areas of science teaching and learning.

AAAS gratefully acknowledges the following Project 2061 supporters over the past 20 years: Carnegie Corporation of New York, Hewlett-Packard Company, John D. and Catherine T. MacArthur Foundation, Andrew W. Mellon Foundation, Noyce Foundation, David and Lucile Packard Foundation, Pew Charitable Trusts, Siemens Foundation, and the National Science Foundation.

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www.project2061.org/order.

Director's Notes

Looking Out for Tomorrow's Leaders

On February 7, the release of the fiscal year (FY) 2006 proposed budget brought a rising tide of uncertainty to the science, mathematics, and technology education communities. While the overall budget requested by the National Science Foundation (NSF) showed a modest increase, the funding proposed for its Education and Human Resources (EHR) Directorate showed a drop of $104 million or 12.4%. Among the EHR divisions with substantial decreases is the Division of Elementary, Secondary, and Informal Education (down $41 million or 22.6%). This drop means that few new awards will be given to support instructional materials and teacher development, and no new awards or renewals will be given for the Centers for Learning and Teaching (CLT) program—a concern for Project 2061 as an NSF grantee, to be sure. Of greater concern to us—and to others in the reform community—is the message this shift in funding priorities sends to talented young educators and researchers considering careers in science education.

One of the primary purposes of the CLT program was "to renew and diversify the cadre of leaders in science, technology, engineering, and mathematics education." Since 2000, NSF has funded 18 collaborative Centers, including the Project 2061-led Center for Curriculum Materials in Science (CCMS). According to a 2005 report by the CLT program evaluators, the Centers currently support 260 doctoral students, about a third of whom report that they would not have attended graduate school without the CLT program. The students surveyed overwhelmingly value the broader professional community provided by a center that includes multiple institutions. Our CCMS students value this cross-campus collaboration as well (see lead article).

Because few CLT students have completed their dissertations, it is too soon to tell what contributions they will make to reforming science and mathematics education. Moreover, it is unreasonable to expect that doctoral studies alone will produce seasoned leaders in their field. They will need additional opportunities to engage in exciting R&D projects—such as the curriculum and teacher development projects noted below—and to work alongside the best minds. NSF's proposed budget reductions put such R&D projects at risk.

A Wise Investment

The post-Sputnik era ushered in a huge national investment in science and mathematics education. From 1958 to 1978, NSF's commitment motivated discipline-based researchers to invest their time and talent in K–12 curriculum and teacher development. Many of today's science education leaders got their start working with these curriculum and teacher development projects and with the great minds they attracted (Jerome Bruner, Jerrold Zacharias, Fletcher Watson, Bentley Glass, John Moore, Joseph Schwab, Robert Gagne, Robert Karplus, David and Frances Hawkins, to name a few). According to Peter Dow, "What was so unique about the Sputnik era was that it mobilized the best minds in every field, and engaged them in thinking about educational reform. For those of us who had the privilege of working with these people it was a life-changing experience."

Unfortunately, those who were trained in that galvanizing period are now reaching retirement age. NSF's proposed FY 2006 budget decreases in science and mathematics education, which continue the decline that started in 2004, is unlikely to inspire confidence in NSF's commitment to science education. Without funds or an adequate supply of mentors, where will the next generation of leaders come from?

Jo Ellen Roseman

Jo Ellen Roseman
Director

Many of today's science education leaders got their start working with the post-Sputnik era curriculum and teacher development projects.

FYI

Online Update

- Check out science education resources in your community! Twenty-six cities across the country—from Akron, OH, to Portland, OR, to the Triad Region, NC—have posted free local versions of an English/Spanish *Family Guide to Science* on the Partnership for Science Literacy Web site at **www.ScienceEverywhere.org**.

George DeBoer Elected AAAS Fellow

The AAAS Council has elected George DeBoer, Project 2061 deputy director, as a Fellow of AAAS. Fellows are AAAS members who have made distinguished contributions to the advancement of science in their field. Dr. DeBoer was recognized for his work in science education at the Fellows Forum in February during the 2005 AAAS Annual Meeting in Washington, DC. DeBoer was also recently invited by the China Association for Science and Technology to serve as an international advisor to China's National Scientific Literacy Action Plan, an effort to build science literacy among all Chinese citizens.

Partnership for Science Literacy Recognized

AAAS's Partnership for Science Literacy was honored with a 2004 Certificate of Excellence from the Washington, DC, chapter of the Public Relations Society of America. The Partnership, a national outreach campaign, promotes science literacy for all students—with a special focus on underserved Latino and African-American communities—by helping parents find out more about science and about science education issues in their schools. The Partnership's work is carried out by AAAS's Project 2061 and Education and Human Resources Directorate in conjunction with TryScience.org and science centers, museums, and other organizations in partner communities across the nation, with assistance from The Element Agency. For more information, visit **www.ScienceEverywhere.org**.

Biology Textbook Evaluation Now Online

Detailed reports from Project 2061's evaluation of nine high school biology textbooks are now available online. *High School Biology Textbooks: A Benchmarks-Based Evaluation*—one of four evaluations of science and mathematics textbooks conducted by Project 2061—looked at how completely each textbook's content aligns with key ideas important to science literacy and how well each textbook's instructional strategies support students' learning of those ideas. Reports on each evaluated textbook for the Matter and Energy Transformations topic, along with in-depth information about the evaluation and Project 2061's analysis procedure, are available at **www.project2061.org/biology**.

Introducing…

Project 2061 is pleased to welcome two new research associates who are contributing to the development of goals-based assessment resources. **Arhonda Gogos** comes to Project 2061 from Columbia University, where she was a research scientist in the department of biochemistry and molecular biophysics. Gogos holds a Ph.D. in biophysics from the Johns Hopkins University School of Medicine and a B.S. in physics from the University of Athens. **Alice Lurain** recently completed a Ph.D. in organic chemistry from the University of Pennsylvania and holds a B.A. in chemistry from Wesleyan University. Lurain has served as a teaching assistant and tutor for undergraduate organic chemistry courses and taught high school chemistry and middle school physical science.

You're Invited: *Atlas* Workshops in 2005

Project 2061's "Using *Atlas of Science Literacy*" workshop gives participants firsthand experience in using *Atlas* strand maps and other Project 2061 tools to build an effective curriculum. The following workshops are now enrolling participants:

- June 9–11 in St. Louis, MO, at Maryville University
- October 17–19 in Washington, DC, at AAAS headquarters

Workshop participants may apply for a limited number of scholarships provided by the AAAS Fund for Excellence to cover the registration costs. For more information, including registration forms, see **www.project2061.org/workshops**.

2061 *today*

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