

# NEWS in Science and Technology



from the

## CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

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The following is an Executive Summary of the Academy's quarterly Bulletin (Vol. 24,1) that includes topics and issues in science and technology deemed by the Academy to be both timely and relevant to Connecticut's interests. Each item is briefly summarized from press releases and reports of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Hyperlinks are included to the original online source, where more detailed information is available.

NOTE: Online versions of this newsletter and the Bulletin are available on the Academy website at [www.ctcase.org](http://www.ctcase.org).

### FEATURE ARTICLE

#### ➤ New Science Center to Educate and Inspire

"The Connecticut Science Center's mission is to inspire interactive learning that explores our changing world through science. One of the key strategies to draw people into science is to enable individuals, families and groups to discover how science belongs in all of our lives," states Matt Fleury, incoming president & CEO of the Connecticut Science Center.

As Hank Gruner, vice president of programs at the Science Center, points out, approximately 50% of all policy decisions involve science, including, but not limited to issues in the areas of genetics, food, land use, and pharmaceuticals.

#### The Space (Architect, Cesar Pelli & Associates)

- soaring "Magic Carpet" Roof, 40,000 square feet of exhibits
- 150 exhibits in ten galleries and traveling exhibition hall
- four educational labs
- community room
- 3D digital theater
- plaza and rooftop garden
- gift shop and a café which will serve many locally grown and organic foods

#### Main Exhibits

- Forces in Motion (Northeast Utilities Foundation Gallery)
- Planet Earth
- Exploring Space (United Technologies Gallery)
- The Picture of Health (Aetna Gallery)
- Smart Energy
- Sight and Sound Experience (Chase Gallery)
- Sports Lab
- Invention Dimension
- A River of Life
- KidSpace (Pitney Bowes Literacy and Education Fund Gallery)
- AT&T Learning Connection

#### Science Center Audiences

- students from pre-K to twelfth grade
- families that visit and want to participate in an educational experience
- community youth groups, including the Boys and Girls Club of Hartford, the YMCA and after school programs; and educators

#### Science Education - Current Landscape

- Major emphasis on science education in American schools based, in part, on recent findings that show American students lagging behind in science and math performance compared to peers in other industrialized nations.
- In October 2007, the National Science Board (NSB) created an action plan, urging local and national reforms, and making science education a priority. The No Child Left Behind act requires states to test students in science starting with the 2007-08 school year. Science tests are required at least once in grades 3-5, grades 6-9, and grades 10-12.
- Connecticut has enhanced its curriculum and assessments to include science testing as part of the Connecticut Mastery Tests (CMTs) at the fifth and eighth grade level.

#### The Center's strategies for success:

- develop a culture of inquiry and exploration
- make science interesting, relevant and place-based
- serve as life-long learning resource
- celebrate diversity, youth achievement, and positive attitudes in science
- foster a sense of ownership with Connecticut scientific and business communities
- support exemplary science education for Connecticut schools

#### Programming

**Helping Educators** — Nearly six hundred teachers in the past four years have already benefited from an inquiry-based education program designed to enhance classroom teaching methods. It includes

- week-long summer workshops for improving teaching techniques in specific content areas;
- follow-up programs include two-day workshops where participants share their experience and its application to their professional practices and student learning; and
- Science Frameworks Resources database on the Science Center's website, part of the AT&T Learning Connection, to assist in developing lesson plans, and discovering enrichment opportunities.

**Outreach programs** to schools and community groups will begin as early as fall 2009, following a longitudinal model to enhance science proficiency and increase standardized test scores through a multi-step process.

1. Teachers participate in workshops at the Science Center in preparation for their classroom visit.
2. Science Center staff visiting schools to make presentations to individual classrooms or assembly-style programs

- Students attend field trip enriched by prep work and with scientists answering questions on the gallery floor and relating lessons back to the world and the community.
- Online follow-up resources will be available with PDFs, pod and video casts and career links.

**Science Café program** — The Science Center plans to offer a series of monthly programs on topical issues to encourage open dialogue among participants. On Monday nights, visitors can hear lectures on topics such as stem cell research and stay for a discussion session.

[Read more at [www.ctcase.org/bulletin/24\\_1/24\\_1.pdf](http://www.ctcase.org/bulletin/24_1/24_1.pdf)]

## NEWS FROM THE NATIONAL ACADEMIES

### ➤ A Key to Treating Lyme Disease

A research team led by the La Jolla Institute for Allergy & Immunology and Albany Medical College illuminated the important role of natural killer (NK) T cells in Lyme disease. “Our findings are that the NK T cells are critical to preventing the chronic inflammatory infection that causes Lyme arthritis and they participate in clearing the bacteria which cause it,” said Mitchell Kronenberg, the La Jolla Institute’s president & scientific director and co-senior author on the study, which used a mouse model of Lyme disease. Timothy J. Sellati, associate professor at Albany Medical College and co-senior author on the study, says this knowledge can be explored therapeutically in potentially developing immunological agents to trigger more NK T cells for fighting the disease.

[<http://www.pnas.org/content/105/50/19863.abstract?sid=397ce9e8-d744-4840-bd87-6043b58fcb24>]

### ➤ Overhaul of US Forensic Science System Urged

A congressionally mandated report from the National Research Council finds serious deficiencies in the nation’s forensic science system. The report finds rigorous and mandatory certification programs and strong standards and protocols for analyzing and reporting on evidence are lacking. Many forensic science labs are underfunded, understaffed, and have no effective oversight. The report calls for strong leadership to adopt and promote an aggressive, long-term agenda to strengthen forensic science. It strongly urges Congress to establish an independent National Institute of Forensic Science to lead research efforts; establish and enforce standards for forensic science professionals and laboratories, and oversee education standards. Public forensic science laboratories should be made independent from or autonomous within police departments and prosecutors’ offices, the report says. Noting disparities among operations in federal, state, and local law enforcement agencies, the report recommends mandatory certification for forensic science professionals and accreditation for laboratories.

[[http://www.nap.edu/catalog.php?record\\_id=12589](http://www.nap.edu/catalog.php?record_id=12589)]

### ➤ Preventing Mental, Emotional, and Behavioral Problems in Young People Should be US Priority

A new report from the National Research Council and Institute of Medicine says that disorders like depression, anxiety, and substance abuse, take a tremendous toll on young people and their families, costing the nation an estimated \$247 billion annually. The report urges the White House to create an entity for coordinating agency initiatives in this area, set public goals for prevention, and provide research and funding to achieve them. The departments of Education, Justice, and Health and Human Services should align their resources and programs with this strategy, as well as fund state, county, and community efforts to implement and improve evidence-based programs. The committee urged continued research of what interventions work for whom and when, and how best to implement them. The National Institutes of Health should develop a comprehensive 10-year plan to research ways to promote mental health and prevent mental, emotional, and behavioral disorders in young people. In addition, agencies and foun-

dations should establish equality in research funding between treatment and prevention, the report says.

[[http://www.nap.edu/catalog.php?record\\_id=12480](http://www.nap.edu/catalog.php?record_id=12480)]

### ➤ Role of Hydrogen Research for US Energy Future

Scientists from Pennsylvania State University and Virginia Commonwealth University discovered a new way to produce hydrogen from water using minimal energy. Although demonstrated only on a small scale, the finding illustrates the importance of innovative research as America’s energy future evolves. A 2004 report from the National Research Council and National Academy of Engineering entitled “The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs,” highlighted the potential of hydrogen as an alternative fuel. A 2008 NRC report points out that the greatest challenge for production of hydrogen from water splitting is cost. Discovery of an efficient, cost-effective technique to split water could enhance the likelihood of a successful transition to hydrogen fuel. The National Academies’ America’s Energy Future project, a long-term initiative designed to stimulate discussion about US energy options, will release a series of reports in 2009 detailing the potential costs and benefits of energy efficiency technology, renewable energy, and alternative fuels.

[<http://national-academies.org/headlines/20090211.html>]

### ➤ HIPAA Privacy Rule Fails to Adequately Protect Patient Privacy and Hampers Health Research

A new report from the Institute of Medicine finds that the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule does not adequately protect the privacy of people’s personal health information and hinders important health research discoveries. The report notes that the current HIPAA rule is difficult to reconcile with other federal regulations governing research patients’ personally identifiable information. The report recommends that Congress authorize the development of an entirely new approach that applies privacy, data security, and accountability standards uniformly regardless of who funds or conducts the research. If policymakers continue with the current rule, the committee recommends a series of changes to improve it as well as better guidance from the US Department of Health and Human Services on how to comply with it. The report urges all institutions conducting health research to strengthen data protection.

[[http://www.nap.edu/catalog.php?record\\_id=12458](http://www.nap.edu/catalog.php?record_id=12458)]

### ➤ Views on ‘Dual Use’ Research, Bioterrorism Studied

The National Research Council and the American Association for the Advancement of Science (AAAS) conducted a survey to assess scientists’ awareness of and attitudes toward “dual-use” research—studies undertaken for beneficial purposes that could have harmful applications like bioterrorism. The survey explored actions scientists might support to reduce risk of misuse of research and steps that scientists may already be taking. While respondents see a potential risk of a bioterror attack in the next five years (a risk they believe is greater outside the United States) they do not believe that dual-use knowledge, tools, or techniques are likely to facilitate such an attack. However, some respondents have been so concerned about dual-use issues that they have already taken action to avert misuse of research, even in the absence of guidelines or government restrictions. Most favor professional societies prescribing a code of conduct to help prevent misuse of research.

[[http://www.nap.edu/catalog.php?record\\_id=12460](http://www.nap.edu/catalog.php?record_id=12460)]

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