

# 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. 17,3) 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).

### GENERAL

#### ➤ Science and Security in an Age of Terrorism

*Presidents of the National Academies issued a joint statement, "Science and Security in an Age of Terrorism," recognizing that the scientific, engineering, and health research community "has a clear responsibility to protect the United States by harnessing the best science and technology to help counter terrorism and other national security threats." The statement:*

- Urges "appropriate balance between scientific openness and restrictions on public information."
  - > Restrictions are clearly needed to safeguard strategic secrets.
  - > Openness is needed to accelerate progress of technical knowledge and enhance the nation's understanding of potential threats.
  - > Clear distinctions between classified and unclassified research are required.
- Urges dialogue focused on two action points:
  - > The scientific, engineering, and health research community should work closely with the federal government to determine which research may be related to possible new security threats and to develop principles for researchers.
  - > Urges federal government to affirm and maintain general principle of National Security Directive 189: "No restrictions may be placed upon the conduct or reporting of federally funded fundamental research that has not received national security classification, except as provided in applicable U.S. statutes."
- Concludes with an appeal for:
  - > "... careful, informed action on the part of both governments and the scientific, engineering, and health community."
  - > "A continued meaningful dialogue ... that produces a true collaboration for the many decisions that need to be made."

[[www4.nationalacademies.org/news.nsf/0a254cd9b53e0bc585256777004e74cd3/64fa661785eed14785256c56005d0ad6?OpenDocument](http://www4.nationalacademies.org/news.nsf/0a254cd9b53e0bc585256777004e74cd3/64fa661785eed14785256c56005d0ad6?OpenDocument)]

#### ➤ Discouraging Terrorism: Some Implications of 9/11

*A report issued by the National Research Council summarizes findings of the Panel on Understanding Terrorists in Order to Deter*

*Terrorism. The panel attempted to identify "ingredients of terrorists' mentality and situation that are positively meaningful to them and that might be deterred by threat or inducement" and examined the question of deterrence. The report recommends:*

- Increased efforts to utilize third parties.
- Adoption of policies "directed toward distancing and alienating relevant audiences."
- Intelligence efforts directed at points of most vulnerability.
- Better preventive strategies to improve conditions that render societies vulnerable to the effects of terrorist organizations.
- A general approach that is "adaptive, opportunistic, and multi-sided."

[[books.nap.edu/books/0309085306/html/](http://books.nap.edu/books/0309085306/html/)]

### EDUCATION & COGNITION

#### ➤ Revamping Undergraduate Science, Technology, Engineering, and Mathematics Teaching Evaluation

*A National Research Council report urges colleges and universities to use evidence of student learning to measure teaching effectiveness in science, technology, engineering, and mathematics education. The report:*

- States that "rigorous peer review systems" are in place to evaluate university research and observes, "evaluation of teaching in these fields of study has been haphazard and less exacting."
- Notes that "fair strategies" for faculty teaching evaluation exist and should receive wider use.
- Recommends that teaching and program effectiveness be judged by extent of student learning.
- Urges universities to make undergraduate education in these fields a top priority.
  - > Teaching methods should be based on scientific evidence about how students learn best.
  - > Centers should be established to provide faculty with professional development opportunities.
  - > Faculty evaluations should include separate ratings on teaching, research, and service.
- Concludes that external agencies and boards that oversee certification should revise policies to stress student learning as a primary criterion for program accreditation.

[[www.nap.edu/catalog/10024.html?onpi\\_topnews](http://www.nap.edu/catalog/10024.html?onpi_topnews)]

## HEALTH

### ➤ An Unhealthy State of Affairs: The Consequences of Uninsurance

*The Institute of Medicine's Committee on Consequences of Uninsurance specifies most notable, and most troubling findings. "Left unchecked, these forces will have profound consequences for the health of all Americans, insured and uninsured alike."*

- Employment rate directly linked to rate of health insurance – or uninsurance.
- Uninsured often forgo early treatment of symptoms, resulting in illnesses that are more advanced at time of treatment.
  - > This effect is most notable with conditions where early detection and treatment are critical, such as hypertension & cancer.
  - > Other chronic health conditions of concern include: diabetes, heart disease, kidney failure, HIV infection, and mental illness.
  - > The uninsured suffering from these conditions have "consistently worse medical outcomes" than the insured.
- Problem of uninsurance likely to get worse.
  - > Rising health care costs and insurance premiums, and weak national economy cited as reasons for concern.
  - > Safety net for coverage of children through public insurance programs is in jeopardy as many of the states facing increased costs and reduced tax revenues are considering paring these programs.

[[www4.nationalacademies.org/onpi/oped.nsf/aaca9385e5452a588525667500734307/f822733c82ce884b85256c5d00538248?OpenDocument](http://www4.nationalacademies.org/onpi/oped.nsf/aaca9385e5452a588525667500734307/f822733c82ce884b85256c5d00538248?OpenDocument)]

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## ENVIRONMENT

### ➤ Predicting Abrupt Climate Change

*A National Research Council report concludes that scientists don't have enough information to predict abrupt climate change, but know from analysis of Earth's history that periods of gradual climate change are likely to include episodes of abrupt change. The report:*

- Recommends that given current global warming trend, likelihood of sudden climate shifts be studied more closely.
- Indicates that chance for abrupt climate change increases when the climate is forced to change – as is occurring now with greenhouse gases that are warming the planet.
- States researchers need to improve computer models that simulate abrupt climate change to better understand mechanisms that cause such a change to occur.
- Concludes ultimate goal is to accurately forecast abrupt climate change events.

[[books.nap.edu/catalog/10136.html?infocus\\_2.1](http://books.nap.edu/catalog/10136.html?infocus_2.1)]

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