

Bulletin of the

CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING



Volume 19,4 / Winter 2004

Activities of the Academy

Following is a list of the most recent major reports of the Academy. Reports are available for a nominal fee from the Academy office or web site; executive summaries of the most recent reports are available online at www.ctcase.org.

"Long Island Sound Symposium: A Study of Benthic Habitats" (2004)

"A Study of Railcar Lavatories and Waste Management Systems" (2004)

"Study Update: Bus Propulsion Technologies Applicable in Connecticut" (2003)

"A Study of Fuel Cell Systems" (2002)

"A Study of Bus Propulsion Technologies Applicable in Connecticut" (2001)

"Study of Radiation Exposure from the Connecticut Yankee Nuclear Power Plant" (2000)

"Efficacy of the Connecticut Motor Vehicle Emissions Testing Program" (2000)

"Indoor Air Quality in Connecticut Schools" (2000)

"Efficacy of MTBE Use in Connecticut" (1999)

"Radon in Connecticut: Quantitative Perspectives about Effects on Public Health" (1998)

"Building Agricultural Biotechnology in Connecticut" (1997)

"Status of Connecticut Critical Technologies" (1997)

"Evaluation of Critical Technology Centers" (1996)

The Connecticut Medal of Technology



Photonics Pioneer DeMaria Awarded State's Highest Technology Honor

Anthony J. DeMaria, considered a pioneer in the fields of photonic and laser research and development, was presented with the state's highest technology honor — the Connecticut Medal of Technology — during ceremonies at the Alliance for Connecticut Technology's Innovation Day and Award Dinner on November 10, 2004. In a video address to the more than 700 guests gathered for the award dinner at the Mohegan Sun Convention Center in Uncasville, Governor M. Jodi Rell announced the award, which was then presented to Dr. DeMaria by Harry H. Penner, Jr., chairman of the Board of Governors for Higher Education of the Connecticut Department of Higher Education, which sponsors the medal.

Dr. DeMaria was chosen for the prestigious award in recognition of his seminal work in the fields of lasers and photonics, notably picosecond laser pulse physics, and his extraordinary contributions in the areas of technology, education and business to the state's technological and economic competitiveness.

(See Medal, page 2)

News from the National Academies

The following is excerpted from press releases of the National Academies and from *Infocus Magazine*, a news resource of the National Academies, which can be found online at www.infocusmagazine.org.

◆ Childhood Obesity Requires Comprehensive National Effort

Calling for a program as "comprehensive and ambitious as national anti-smoking efforts," a new report from the Institute of Medicine of the National Academies recommends a multi-pronged approach by schools, families, communities, industry, and government to reverse the rapid rise in obesity among American children and youth.

"We must act now and we must do this as a nation," said Jeffrey Koplan, vice president for academic health affairs at Emory University in Atlanta, and former director of the Centers for Disease Control and Prevention. Koplan chaired the committee of 19 experts that developed the report in response to a request from Congress for an obesity prevention plan based on sound science and the most promising approaches.

The report calls for schools to implement nutritional standards for all foods and beverages served on school grounds, including those from vending machines. It also recommends that schools expand opportunities for all students to engage in at least 30 minutes of moderate to vigorous physical activity each day.

In addition, the report urges the food, beverage, and entertainment industries to voluntarily develop and implement guidelines for advertising and marketing directed at children and youth, and suggests that Congress give the Federal Trade Commission authority to monitor compliance with the guidelines and establish external review boards to ban ads that fail to comply. Restaurants should continue to expand their offerings of nutritious foods

(See National Academies, page 7)

Our Thanks to Academy Sponsors

The Academy wishes to express its sincere thanks to all of its sponsors, whose support makes the important work of the Academy, including this publication, possible.

Special recognition and thanks for continuing support of the Academy's programs to the Connecticut Department of Economic and Community Development.

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The *BULLETIN* of the Connecticut Academy of Science and Engineering is published by the Connecticut Academy of Science and Engineering, Inc., 179 Allyn Street, Suite 512, Hartford, CT 06103-1422. Telephone and fax: (860) 527-2161. E-mail: acad@ctcase.org. Web site: www.ctcase.org. To subscribe to the Bulletin, contact us by phone, email or subscribe online at our web site.

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Medal (continued from page one)



Harry H. Penner, Jr., left, Chairman of the Board of Governors for Higher Education, presents Tony DeMaria, right, with the Connecticut Medal of Technology during ceremonies on November 10, 2004

Dr. DeMaria began his career at United Technologies Research Center (UTRC), where he developed and implemented a visionary program in photonics — the field of technology dealing with the generation, control, manipulation and application of light. His research in the field of pico-second laser pulse physics has had enormous impact on the fields of molecular and atomic dynamics, nonlinear optics, and plasma physics, and he is considered to have fundamentally influenced the study of laser science and optics.

During more than three decades at UTRC, Dr. DeMaria guided the Center to international leadership in three important technology fields: high beam quality carbon dioxide lasers, fiber Bragg gratings, and optical modulators. All have important telecommunications, medical, military, and industrial applications. Development of these technologies resulted in the creation of four UTRC spin-off companies (Uniphase Technology Photonics; CiDRA, Industrial Laser, Inc., and DeMaria ElectroOptics Systems), which between them have employed up to 1300 people.

In 1995, it was Dr. DeMaria who founded DeMaria ElectroOptics Systems (DEOS), serving as CEO and chairman of the Bloomfield-based company, which designs and produces leading-edge carbon dioxide and far infrared lasers. In 2001, DEOS was bought by Coherent, Inc. and became Coherent-DEOS, LLC. Dr. DeMaria currently holds the position of chief scientist at Coherent-DEOS, where he heads the company's CO₂ business unit.

The author of two books and scores of journal articles, Dr. DeMaria also holds 35 patents. He has taught at the University of Hartford, the Hartford Graduate Center and the University of Connecticut for more than 20 years, and is a member of the prestigious National Academy of Engineering and the National Academy of Sciences. A founding member of the Connecticut Academy of Science and Engineering, he served as president of that body from 1994 to 2000. He has also served as president of the Optical Society of America, and SPIE, the international society for optical engineering.

(See Medal, page 8)

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Business & Industry

ONE-STOP SHOP. **SBC Communications**, Connecticut's largest telephone company, is now offering local customers the opportunity to check all their messages in one location. Accessible by phone or by internet, the unified cross-platform messaging system makes it easier to respond to all email, voicemail and faxes. Those who wish to tie-in cell phone messages must subscribe to **Cingular Wireless**, an SBC affiliate.

FIVE MORE YEARS. A five-year grant from the National Institute of General Medical Science will renew funding for **Wesleyan's Molecular Biophysics Training Program**. The \$600,000 grant will help the university cover expenses for three graduate students each year, and will fund outside speakers as well as laboratory research and travel to conferences. Since the training program began at Wesleyan in the 1980s, it has brought in more than \$2.5 million dollars to the university's science programs.

PROFITS SOAR FOR NATURAL FOODS. **United Natural Foods of Killingly** reported a 93% increase in profits this quarter over the same period last year. The company carries and distributes over 35,000 products to more than 18,000 customers nationwide. These products are found in conventional supermarket chains, natural product superstores and independent retail operators. They include organic foods, nutritional supplements and personal care items.

MAGIC CARPET. An eagle's nest observation deck beneath a 140-foot-high roof will extend over I-91 "like a magic carpet ride," said **Cesar Pelli**, the architect unanimously selected to design the \$100 million **Connecticut Center for Science and Exploration at Adriaen's Landing** in Hartford. The whimsical deck, designed to invite the environment in, will help attract the 400,000 annual visitors expected at the Hartford site. **Theodore Sergi**, president of the center, said Pelli's firm was chosen for the quality team he put together and for the passion that Pelli himself demonstrated. The project (to be completed in 2007) carries deep personal meaning for Pelli, a long-time Connecticut resident and **Yale's** former dean of architecture. Pelli is best known for his design of the 88-floor Petronas Twin Towers in Kuala Lumpur, Malaysia.

NEW BIOTECH FIRM. A new company called **HistoRX** that offers state-of-the-art digital technology developed at **Yale University** will locate its operations in **New Haven**. **Robert Curtis**, president and CEO of HistoRX, said that the company's AQUA™ technology will provide an extraordinary tool for improving tissue analysis — both for patient care and pharmaceutical research and development — by helping researchers localize and quantify proteins while maintaining the spatial relationships of those proteins. This process vastly increases the quality and quantity of information for tissue analysis, and has the potential to significantly reduce clinical trial failure and move drug candidates through development faster.



Communication

NEW CPTV STUDIO. "Before, we were in the horse and buggy era. Here, everything is digital and high-definition," said **Jerry Franklin**, president and CEO of **Connecticut Public Broadcasting** about their recent move to Hartford's Asylum Hill. Previously located on the **Trinity College** campus, the parent of **Connecticut Public Television** has installed state-of-the-art technology at its new \$22 million headquarters at 1049 Asylum Avenue. It has also

doubled studio capacity to two television and four radio studios. The decision to move came in response to the federal government's mandate to convert to digital technology by 2006. The Asylum location keeps CPTV in Hartford and provides good elevation for transmitting signals.

BLOG POLITICS. The rapid rise of online political media, including press accreditation to bloggers (self-publishing commentators of weblogs) at both presidential conventions, has come as a surprise to many. But not to **Matt Margolis**, a recent graduate of the **University of Hartford**, who started Blogs for Bush, an online resource that supported President Bush's re-election. Margolis, who is not a journalist by training, turned to blogging because he felt that traditional media were out of reach. He's been able to build an audience, he said, "because he's an ordinary guy who can relate to other ordinary people." Fellow blog publisher Chris Barsanti of New York credits blogs with bringing some desperately needed energy back to political coverage, but warns of their potential to further divide an already partisan country.

COMING HOME. Independent filmmaker **Daniel Poliner** is coming home to **Durham** and bringing with him his latest film, "Right Foot, Left Foot or the Daring Young Man in the Cubicle" to share with the many residents who helped him produce it. The short film, to be shown at the **New Haven Film Fest** this year, was shot around Durham and **Middlefield** in 2002. Poliner, raised in Durham and educated at **Wesleyan** and New York University, said it's a humorous, slightly bittersweet tale of a "man in a cubicle as he contemplates his life, love, regrets and dreams." A number of area sites will be recognizable in the film, as will several area residents, including **David Walton** of Cromwell, **Jill Mackey** of Middlefield and **Harry Kinne** of Durham.

TOWN ALERT. Pending license approval by the Federal Communications Commission, residents in **Manchester** may soon have their own radio station that can broadcast emergency information to everybody in town, day or night. A \$25,800 grant from the state Department of Public Health department will cover costs for the 1630 AM station, which is modeled after one in West Hartford. **Steven Caron**, emergency response coordinator for the state health department, said the station will be eligible for the grant because it addresses a "multi-tier of public health issues" such as information about vaccinations in case of bioterrorism or evacuation information for severe weather or accidents. The radio station will mostly be used for everyday events like meetings, school cancellations and pool openings.



Education & Cognition

GET TOUGH. "Students who take more rigorous courses in high school are better prepared to be successful in school... and enter more highly-paid, satisfying careers," said **Lauren Kaufman**, vice president of education and job training for the **Connecticut Business & Industry Association (CBIA)**. With that in mind CBIA has launched a public service campaign (in English and Spanish) urging students to take tough courses like algebra, geometry,

Items that appear in the In Brief section are compiled from previously published sources including newspaper accounts and press releases. For more information about any In Brief item, please call the Academy at (860) 527-2161, write the editors at 179 Allyn St., Suite 512, Hartford, CT 06103-1422, or email us at acad@ctcase.org

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biology, physics, chemistry and languages. According to the Department of Education, 7 out of 10 students graduate from high school without the courses they need for college. Of college-bound students, 49% have to take remedial courses once they get there.

CAP-TCHING UP. “The news is generally excellent,” said state education commissioner **Betty Sternberg** about the **Connecticut Academic Performance Test (CAPT)** scores released this fall. Not only are more 10th graders taking the test, but they are getting better scores, the new results show. More than 40,000 10th graders took the test last spring. Under a new state law, they are the first group who can use those test scores as one way to meet statewide graduation requirements. Test standards are rigorous. Only about half the state’s sophomores met the goals in each of the four main subjects — math, writing, science and reading— although students in some of the state’s poorest urban systems made notable gains.

EIGHT IS ENOUGH. In **Tolland**, eight determined parents founded the **Tolland Education Foundation** and dedicated it to supplementing the curriculum of the town’s four schools. Said foundation treasurer **Bob Stewart**, “What we want is teachers, parents, whoever... to come to us and say, ‘Gee that sounds like a good program. Can you fund it?’” **Liz Stokes**, president of the **Connecticut Consortium of Education Foundations** (of which there are 55 in the state), said these foundations “... allow teachers to take a risk, try something new and different.” They are particularly valuable because of increasing budget cuts in local school systems.

150 YEARS AND COUNTING. It’s not the place to find bestsellers or summer escape reading, but the 150-year old **Connecticut State Library** does offer a wealth of information one can’t find anywhere else. Directly across from the state capitol in Hartford, the library holds 1.1 million books and millions of documents, such as Connecticut’s Fundamental Orders, the 1662 Royal charter from King Charles II and the state’s two constitutions. Many of the documents were handwritten. These eventually gave way to typewritten and printed documents, and now there are documents that exist only digitally. This new format presents a challenge to archivists, who must preserve the online documents indefinitely and make sure future generations can access them.



Energy

HERE COMES THE SUN. Under a new three-year program, **Connecticut** homeowners can receive a financial incentive to help defray the cost of installing solar energy systems in their homes. The state’s Clean Energy Fund will cover half of the installation cost, with a maximum of \$25,000 per installation. The new solar systems use photovoltaic panels that harness energy from the sun to generate electricity. In some homes, they can supply all the electricity needed. Officials hope that the incentive will spur solar energy usage and reduce local reliance on oil, natural gas and nuclear fuels.

RIVER DRAW. A proposed \$200 million electrical generator plant in **Middletown** has received a permit to draw 7.39 million gallons per day from the **Connecticut River**. The water will help cool the power plant’s giant turbines as well as provide back-up public water supply. Despite some opposition by environmentalists, the **Department of Environmental Protection (DEP)** approved the permit, noting that the water draw “would not significantly affect long-range water management... or impair the use of water resources.” **Philip Armetta** of **Armetta & Associates, LLC**,

developer for the new plant slated for the **Maromas** section of town, hopes to have it up and running by 2008. As part of an agreement with conservationists, Armetta will pay for a 10-year water capacity study of the Connecticut River.

KEEPING WARM. Advocates for the poor and elderly say they will be working harder than ever this year to help their clients get through the cold weather season. They are urging people to apply early for assistance, conserve energy every day and make sure utility payments are made to avoid service shutdown. These measures are especially critical this year because of expected high fuel prices and a shortfall in the state’s fuel bank funds. Two cold winters in a row have seriously depleted the resources of **Operation Fuel** (also called **Warm Thy Neighbor**). This not-for-profit state agency helps fund local fuel banks that assist poor households with heating costs.

REBATES FOR RELICS. With just one phone call, consumers can rid themselves of old, inefficient, electricity-gobbling appliances and even get paid for them — as long as they work. **Connecticut** utilities have hired Minneapolis-based Appliance Recycling Centers of America to help take these old relics off the power grid and “de-manufacture” them of coolants, chords and trim. The parts are then recycled or sold for scrap. In just three months, the company has collected 10,000 refrigerators, freezers, air conditioners and dehumidifiers. The collections became so popular, the company developed a huge backlog and had to expand the program. “It’s beyond everyone’s expectation,” said **Craig Clark**, program administrator for conservation programs at **Connecticut Light & Power**. The collections are part of a new \$2 million electricity conservation program approved by state utility regulators.



Environment

MYTH OR MONSTER. Although it’s never been seen alive in its natural habitat, the giant squid is reputed to be a magnificent animal. This year, “In Search of Giant Squid” starts its national tour at **Yale’s Peabody Museum of Natural History**. Yale is a fitting place, since it houses early pieces of squid specimens and copious squid revelations from Professor **Addison Verrill**, curator of the Peabody until 1907. Even so, little is known about the squid called *Architeuthis*. Scientists believe it lives in the deep ocean, floating in canyons a few thousand feet below the surface. They don’t know for sure how it lives or how big it gets, although carcasses have washed up measuring 60 feet — the length of a school bus. One of the world’s foremost experts in the species, **Clyde Roper**, has led two expeditions to hunt for it and is planning a third. Said Roper about the giant species, “It’s elusive... it’s beyond our ken, and that’s why we keep plugging away at it.” Emphasis on the giant squid calls attention to a replica constructed in Newfoundland by **Henry H. Townsend**, which now hangs in the entrance lobby of the museum.

FOREVER WILD. “Personally I think he waited until the land was settled,” said **Pat Fairbank**, about her husband **Phil** who died of a long illness soon after he sold 51 acres of woodlands to the **Old Saybrook Land Trust**. Fairbank wanted his land — home to owls, partridges, deer, turkeys, hawks and more — to remain undeveloped as it had for four generations of family ownership. The Land Trust bought the property, which links the town-owned **Great Cedars Conservation Area** and **Clark Community Park**, for \$400,000. Almost half the money will come from the state **Department of Environmental Protection**, which chose to fund

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the purchase under its open space and watershed land acquisition program. The Land Trust intends to raise the rest itself. Aside from being perfect for extending the town's trail system, the land is historic, once the site of a well-known Christmas tree farm.

CULTURAL GATEWAY. With all the attention going to West Hartford's **Blue Back Square** and Hartford's **Adriaen's Landing**, few people know about a new gateway project that is setting out to transform **Hartford's Park Street** into New England's premiere Latino Boulevard. But that could soon change. The installation of sidewalks has begun along the north side of Park Street and the **Hartford City Council** will soon be purchasing eight lots on the corner of Park and Main. Next will be the selection of a developer to create a matching pair of mixed-use (retail, office and residential) complexes for Park Street's southwest and northwest corners. The developer's challenge will be to make the project a real authentic gateway that speaks to the cultural identity of the street and entices people to explore a newly revitalized Park Street.

RECREATION SPACE. In a **Haddam** public meeting, over 100 taxpayers overwhelmingly supported a proposed town and Nature Conservancy partnership that would result in the acquisition of almost 300 acres of **Haddam Neck** woodland. Said **Shelley L. Green** of the Nature Conservancy, the "pristine woodland would be open for passive recreation such as bird and wildlife watching, skiing, fishing and hiking." Others at the meeting lobbied for hunting to be a permitted activity. In a later meeting, taxpayers will vote to see if they actually want to pay for the \$2 million purchase of open space. So far, the state **Department of Environmental Protection** has agreed to contribute \$450,000 and the conservation commission another \$30,000 from the municipal open space fund.

CLEAN A MARINA. Milford Landing Marina on Milford Harbor is the fifth recreational boating facility in Connecticut to be certified as a "Connecticut Clean Marina" by the Connecticut Department of Environmental Protection (DEP). Once a municipal sewage treatment plant, it's now a marina for transient boaters, with slips for a few commercial fishermen. One exceptional feature is a boat sewage pumpout station for customers as well as for the general public. In addition, marina staff recycle bottles, keep trash cans covered and tied down and even provide for proper pet waste. In case of an emergency, staff have immediate access to a spill response kit.



Food & Agriculture

CHANGING OF THE GUARD. The Board of Control of the **Connecticut Agricultural Experiment Station** elected Academy member **Louis Magnarelli** director, succeeding Academy member **John F. Anderson**. Anderson has led The Station since 1987 and will continue research in medical entomology, notably West Nile Virus, as a Distinguished Scientist. Anderson made the first isolation of the virus in North America.

PICK OF THE CROP. Once again, the number one and two choices of Connecticut apple buyers are the McIntosh and Red Delicious, respectively. But **Rick Hutton**, farm manager at **Rogers Orchards** in **Southington**, thinks that's because apple lovers are often reluctant to try out new varieties such as the newcomer Honeycrisp apple — a hard, crunchy apple that isn't much to look at but is good for eating. "It's been a great year for all kinds of apples... a 5-year high in production," said **Richard Macsuga** of the **Connecticut Department of Agriculture**.

FROZEN ASSETS. With milk prices plummeting, former Connecticut **Commissioner of Agriculture Shirley Ferris** and her sons knew if they were to save their 80-acre dairy farm in **Newtown**, they had to diversify. Although the farm had been in the family since 1864, dairy farming alone was no longer supporting the three Ferris families. So they decided to build on their existing retail operation of selling pumpkins and cornstalks in the fall, by adding homemade ice cream in the summer. After four years of planning, **Ferris Acres Creamery** opened last summer and was an instant success. Ferris makes 20 flavors of hard ice cream each week and enjoys dreaming up new combinations, such as peanut butter, caramel and chocolate chips. Currently, there are five farms producing ice cream products in the state, according to **Jane Slupecki** of the **Department of Agriculture**.

CHILE-CHALLENGED. Unlike the Southwestern United States, where just-picked chiles flavor barbecue, corn bread, salsas, sausages and even butter, in chile-challenged Connecticut, one practically needs a detective to find a fresh jalapeno pepper. "This is the land of ... pork roast and New England boiled dinner," said **George Purtill**, who with his Texas-raised wife **Sharon**, grows organic chile peppers at their **Old Maids Farm** in **South Glastonbury**. From mild to hot, the Purtils grow Cubanelle, Anaheim, Poblano, Jalapeno, Long Red Cayenne and Habanero varieties. So far, **Yale University** is leading the way; it's the single biggest purchaser of George and Sharon's chiles.



Health

PREVENTION: THE NEW FRONTIER IN RESEARCH. What can you do about cancer? The most promising scientific answer, according to **Carolyn Runowicz**, director of **University of Connecticut's Neag Comprehensive Cancer Center**, is prevention. In fact, said Runowicz, "prevention is also the new frontier of cancer research." The federal Food and Drug Administration has already approved drugs for cancer prevention and several large-scale studies looking at new drugs and approaches for prevention are underway. In her new book, *The Answer to Cancer*, Runowicz and co-author Sheldon Cherry explain each kind of cancer, the causes and risk factors, available screenings and emerging chemopreventions, vitamins and other therapies for keeping cancer at bay or derailing it before it becomes invasive.

INSTANT MESSAGING. According to an article recently published in *Nature*, **Yale** researchers have demonstrated the crucial role of a particular membrane lipid (fatty-like substance called PtdIns (4,5)P2) in how information is passed along from neuron to neuron in the brain. Lowering the level of this substance negatively affects the efficiency of chemical message transmission, explained **Pietro De Camilli**, **Eugene Higgins Professor of Cell Biology** and author of the study. The study reveals new insights into how messages travel through the junctions between neurons (called synapses) and has important implications for medicine. For example, Down Syndrome patients have an extra copy of a gene that produces a chemical enzyme that lowers the lipid in question. Said De Camilli, "The field is still in its infancy but rapid advancements... in the analysis of lipids promise the possibility of identifying new targets... for disease interventions."

HEALTHY VENDING MACHINES. At **Southington High School**, a new vending machine stocked with yogurt drinks, juice smoothies, cheddar cheese crackers, nuts and other healthful snacks has replaced an old one that sold only ice cream. The big switch happened as part of the school's participation in a "healthy

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vending pilot program” run by **Connecticut Team Nutrition**. The Team is a joint venture of the state’s **Departments of Education and Public Health**, the **University of Connecticut (UConn)** and the **Yale Center for Eating and Weight Disorders**. “If you bring healthy food to kids, they will come,” said project manager **Colleen Thompson**, who is with UConn’s department of nutritional science. So far, she’s right. Machine sales were up within days of installation. Prior to the machine replacement, students filled out a survey designed to track what they ate at home and at school. A follow-up study at the end of school will determine the cost and benefit of the healthy vending machines.

LIFE SAVER. When **Maxine Kates**, 59, of **Avon** welcomed **Timothy Blomquist**, 32, into her home recently, she was finally meeting the hero who had unknowingly saved her life. At age 19, when he was serving with the 82nd Airborne Division, Blomquist volunteered to donate stem cells for a bone marrow transplant so someday someone who had leukemia might live. Years later, Kates turned out to be that person. About 30,000 Americans are diagnosed with leukemia each year. At any given time, said **CarolAnn Baldwin**, education specialist at the Farmington-based **New England Marrow Donor Program**, approximately 3,000 of them are searching for matches. The donor program is trying to increase the ethnic diversity of donors since usually patients find matches among their own ethnic group. But not always. Kates is Jewish, Blomquist is not, but even so, they matched both in blood type and in spirit. During a Yom Kippur dinner with Kates’ family, Blomquist gave Kates a gift from his wife, a Muslim from Pakistan.



High Technology

LOCATION, LOCATION, LOCATION. In **Connecticut**, if you use your cell phone to call 911, your location can now be tracked within seconds of your call — even if you don’t know where you are. That’s because Connecticut is one of the first states to get life-saving locator technology in all 107 centers that take emergency 911 calls. The \$4.4 million upgrade provides each center with a high-end computer and an LCD monitor to display locator maps. The system works one of two ways: some phones actually have a global positioning capability that allows them to be tracked, while others are located by measuring the length of their signals as they reach multiple cell towers. Although accuracy isn’t perfect yet, said **George Pohorilak**, director of the Office of Statewide Emergency Telecommunications, “in many cases, ...it’s right on the money.”

SCIENCE OF ART. Many years ago, Academy member **Henry DePhillips**, chemistry professor at **Trinity**, played tennis with **Stephen Kornhauser**, conservator of art for **Hartford’s Wadsworth Atheneum**. After the game, Kornhauser asked him if he would analyze some microscopic paint chips from a museum collection. And so it was that DePhillips abandoned 25 years of analyzing the proteins of sea life for the analysis of paint chips from the world’s great art. He is part of a growing field of scientists involved in art conservation and authentication. By analyzing chips with specialized, amplifying microscopes, DePhillips pinpoints the origin of paint and the time period when materials were available. Said **Patricia Garland**, senior conservator at **Yale University Art Gallery**, “What’s special about Henry is he’s a chemist who... has a great interest in how science facilitates art.”

AEROSPACE 21. If all goes as planned, the former **Rentschler** airfield in **East Hartford** will become the site of a new \$21 million military and commercial technology complex. To be called the **National Center for Aerospace Leadership**, the complex will fulfill

the long-time dream of **US Rep. John B. Larson**, who has spent years trying to secure its funding. The federal money, part of a 2005 defense appropriation, is earmarked for construction of 225,000 square feet of space, the majority of which will be a leadership center and the rest an innovation center or “incubator” for small businesses. Selection of the **Rentschler** location, which is near the **University of Connecticut** football stadium and adjacent to **Pratt & Whitney**, is contingent on the resolution of transportation and environmental issues.

HAVE BONES WILL TRAVEL. A group of computer science students from **Southern Connecticut State University (SCSU)** are helping the National Aeronautics and Space Administration (NASA) discover how to minimize the harmful effects of weightlessness on human bones during space travel. As part of the 11-university New York City Research Initiative, they hope to identify why astronauts experience widely different rates of bone loss in space so they can identify those who may need in-space countermeasures. For its part, the SCSU team is scrutinizing micro CT scan images of mice bones to figure out how to quantify bone loss more accurately, pixel by pixel. Based on their knowledge of image processing, they are using a computer to objectively convert grayscale images to binary (black and white) images. This process will help them capture clearer, crisper bone scan images so bone loss can be measured in individual mice.



Transportation

MULTI-USE GREENWAY. **Connecticut** is the third of 14 states through which a cycling team is traveling to reach the Florida Keys from its point of origin, the southernmost corner of Maine. The seven cyclists, all over the age of 50, have embarked on a journey to promote the development of the East Coast Greenway: an “urban Appalachian trail” of roadways, abandoned rail corridors, parks and cleared paths accessible to pedestrian and non-motorized traffic. Supported by the East Coast Greenway Alliance of Wakefield, RI, the cyclists each raised \$10,000 from donors to participate in the inaugural excursion. Connecticut has about 70 miles of greenway completed out of the 180 planned.

TRANSPORTATION NEEDS. The **Transportation Strategy Board** would like to survey **Connecticut** residents to see what they think are the most pressing transportation problems in the state and how they can best be solved. That input would be forwarded to **Governor Jodi Rell** and the legislature to help them make decisions for the upcoming year. “Those selected for the survey would have to attend an informational session about the issues before being polled,” said **Robert Hammersley**, manager of the Board. If approved by the commissioner of the state’s **Department of Transportation**, **Stephen Korta**, the survey will take place in 2005.

GO HYBRID. In **Connecticut**, buyers of new hybrid cars, which run on a combination of gas and electricity and average more than 40 miles a gallon, are now exempt from paying sales tax on the purchase. Connecticut is the first state in the country to use legislation to encourage the sale of hybrid cars. **Rep. Ken Bernhard** from **Westport** said this seemed to be the best way to establish a state policy and clearly tell people to clean up the air and get better gas mileage. The exemption, which would save buyers 6% of the purchase price, would cost the state a few hundred thousand dollars in revenue. “If this is a successful program, said Bernhard, “the loss of revenue will be higher and we’ll have to find an alternate income source. But that’s a problem I’d like to have.”

— *Compiled and edited by Barbara Standke*

From the National Academies (from page 1)

and beverages, and should provide calorie content and other nutrition information.

Parents are urged to provide healthy foods in the home and encourage physical activity by, among other things, limiting their children's recreational TV, videogame, and computer time to less than two hours a day. Community organizations and state and local governments should implement programs that promote nutrition and regular physical activity, according to the report, which also recommends that federal programs such as the Food Stamp Program and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) support pilot programs to increase participants' access to nutritious foods.

Health insurers and health plans should make childhood obesity prevention a priority health issue and should include screening and obesity prevention services in routine clinical practice, the report says.

[<http://books.nap.edu/catalog/11015.html>]

◆ Evaluating the Safety of Dietary Supplements

A new report from the Institute of Medicine and the National Research Council of the National Academies outlines a science-based process for assessing dietary supplement ingredients, even when data about a substance's safety in humans is scarce. This approach works within the regulatory parameters set by the Dietary Supplement Health and Education Act (DSHEA), which does not require manufacturers to provide safety data on their products. However, supplement makers, the public, and others need to increase their reporting of health problems related to supplement use in order to further improve the Federal Drug Administration's (FDA) ability to protect consumers, the report advises.

DSHEA established in 1994 that dietary supplements are to be regulated like foods instead of drugs, meaning that they are considered safe unless proved otherwise and are not required to be clinically tested before they reach the market. It is therefore up to FDA to determine whether a particular substance on the market is harmful based upon information available in the public domain. The report categorizes different kinds of data that FDA can use to assess safety and offers guidelines for determining the significance of the evidence available on a particular substance.

The report recommends that manufacturers and distributors be required by DSHEA to report adverse events to FDA in a timely fashion to facilitate safety evaluations. Labels on supplements should include a toll-free number for consumers and health professionals to call in health problems or concerns related to the product, the committee said. In addition, although manufacturers need not seek approval to market a supplement, DSHEA does require them to notify FDA of their intent to introduce a new compound. During this pre-marketing review period, supplement makers and distributors should be required to provide the agency with all available safety data, both favorable and unfavorable, on their new products. This change would not mean that supplement makers would be required to conduct pre-market testing.

Congress should provide FDA with sufficient funding to collect and analyze data and carry out the consumer protection and education responsibilities mandated by DSHEA.

[<http://books.nap.edu/catalog/10882.html>]

◆ Power Sources Needed for Soldier of the Future

A new report from the National Academies' National Research Council recommends that the US Army investigate alternative power sources, such as fuel cells and small engines, to create longer-lasting, lighter, cheaper, and more reliable sources of

energy for the equipment soldiers will use in the future. The report also urges the Army to increase efforts to develop and acquire technologies that are more energy-efficient.

The Army will equip its future warriors through a program called "Land Warrior," which, in addition to weaponry, includes high-tech electronics that significantly increase soldiers' awareness of the combat environment; these electronics will need new power sources to operate efficiently. The development, testing, and evaluation of these new energy sources will be carried out under a program known as "Future Force Warrior."

The committee evaluated and prioritized options for supplying energy to various low- and high-power applications on the battlefield. In addition to disposable and rechargeable batteries, the committee considered fuel cells, small engines, and hybrid energy systems such as those combining a battery with a fuel cell, or a small engine with a battery. Among all possible energy sources, hybrid systems provide the most versatile solutions for meeting the diverse needs of the Future Force Warrior, the committee concluded.

[<http://books.nap.edu/catalog/11065.html>]

◆ Public Access to Pathogen Genome Data Advised

A new report from the National Academies' National Research Council recommends that current policies allowing scientists and the public unrestricted access to genome data on microbial pathogens not be changed, and concludes that security against bioterrorism is better served by policies that facilitate the free flow of such information. Restrictions tight enough to impede access by individuals or nations trying to develop bioweapons would probably also hinder valuable scientific research, including efforts to develop vaccines and other countermeasures to bioterrorism, the reports says. It adds, however, that an advisory board should be created to regularly review future developments in genome research in order to assess the security implications of such developments.

The complete genome sequences of more than 100 microbial pathogens, including those for smallpox, anthrax, and Ebola hemorrhagic fever, are already publicly available in Internet-accessible databases around the world, and hundreds more pathogens will be sequenced in the next few years, the report notes. The US government requires that all genome data produced by federally funded research be made public, with rare exceptions. The Research Council was asked by several federal agencies to report on how biological scientists view policies governing access, and the potential for misuse of the data.

Given the interconnections between different areas of life-science research, there is no clear way to predict which scientists need access to which genome data, the report notes. Deciding what data should be restricted also would be problematic, since even the gene sequences of nonpathogenic organisms could potentially aid a bioterrorist. The committee considered the option of requiring users to register, but concluded that such a system would not stop a determined malefactor, and would raise troubling questions about who could use registration data, and for what purposes.

In addition to impeding research, implementing effective curbs on access would be impractical, the report notes, adding that without a uniform international agreement, users who are denied access because of US policy could simply turn elsewhere. Instead of restricting access, policy-makers and researchers should focus on exploiting genome information fully to improve defenses against infectious diseases of all types, said the committee.

[<http://www.nap.edu/catalog/11087.html>]

What is the Connecticut Medal of Technology?

The Connecticut Medal of Technology is awarded by the State of Connecticut through the Board of Governors for Higher Education in recognition of "extraordinary achievements" by an individual in fields of technology that are demonstrated to have "made a difference in Connecticut's industrial competitiveness."

The award is modeled after the National Medal of Technology, the nation's highest technology honor, which is awarded annually by the president of the United States to recognize "lasting contributions to America's competitiveness, standard of living, and quality of life through technological innovation, and to recognize those who have made substantial contributions to strengthening the Nation's technological workforce."

Previous recipients of the Connecticut Medal of Technology include H. Joseph Gerber, founder of Gerber Scientific, Inc., who received the first medal in 1995, and Charles H. Kaman, founder and CEO of Kaman Corporation. Beginning with this year's award, the medal will be awarded bi-annually, with the Connecticut Medal of Science awarded in alternate years.

Criteria for the Connecticut Medal of Technology include:

"Extraordinary achievements in the development and widespread implementation of technology in one or more of the following areas:

- process and/or product innovation,
- technology transfer,

- advanced manufacturing, and
- technology management.

These achievements must also be shown to have "made a difference in Connecticut's industrial competitiveness."

"Unique, ingenious or novel achievements in the widespread implementation of new or existing technologies as measured by documentation in the following areas:

- impact on commerce and society,
- benefits to mankind,
- degree of risk-taking and methods of risk management,
- degree of vision, resolve, and persistence as reflected in the number of barriers overcome.

"Widespread implementation of technology" is judged by:

- breadth of market penetration as measured by the number of industrial sectors involved and/or the depth of influence in one or more sectors,
- impact on Connecticut exports,
- contribution to Connecticut's competitiveness as measured by the degree of product use in Connecticut or other markets,
- extent of Connecticut prestige involved, such as implementation of a technology with worldwide recognition,
- actual or potential return on investment as measured by the amount and duration of the return, and
- patents, copyrights and trademarks resulting, as measured by the number, timing and significance to the contribution.

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