

Bulletin *of the*

CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING



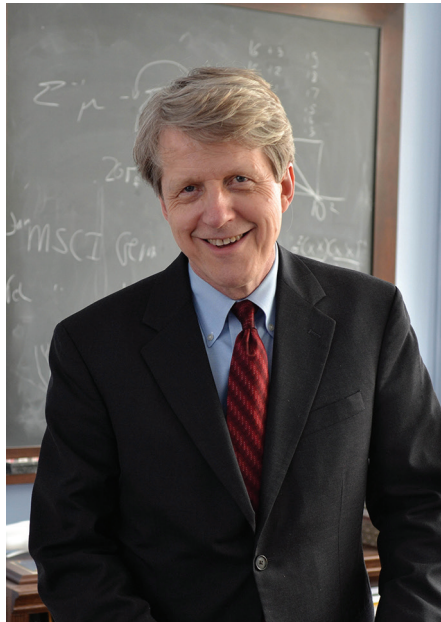
Volume 29,1 / Spring 2014

Yale's Robert Shiller Awarded Nobel Prize for Research in Asset Price Analysis

Laureate to present keynote address at 2014 CASE Annual Meeting in June

There is no way to predict whether the price of stocks and bonds will increase or decrease over the short term, such as days or weeks. However, based on the findings of Nobel Laureates Eugene Fama, Lars Peter Hansen, and Robert Shiller, it is possible to foretell a wider course of asset prices over a longer time horizon, such as three to five years. Although we do not yet understand how asset prices are derived, the research of the Laureates has revealed a number of significant regularities that are helping to develop more complete descriptions.

CASE member Robert J. Shiller is Sterling Professor of Economics, Department of Economics and Cowles Foundation for Research in Economics, Yale University, and Professor of Finance and Fellow at the International Center for Finance, Yale School of Management. He received his bachelor's degree from the University of Michigan and his doctorate in economics from the Massachusetts Institute of Technology. He has written on financial markets, financial innovation, behavioral economics, macroeconomics, real estate, statistical methods, and on public attitudes, opinions, and moral judgments regarding markets. Professor Shiller was awarded the 2013 Nobel Prize in Economic Sciences, together with Eugene Fama and Lars Peter Hansen of the University of Chicago, "for their empirical analysis of asset prices." A new member of CASE, Shiller will share his research and his Nobel experience at the 2014 CASE Annual Meeting on June 5, 2014.



*Nobel Prize-winning economist Robert J. Shiller.
[Photo: Michael Marsland / Yale University]*

The Importance of Asset Price Behavior

Not only professional analysts and investors care about the behavior of asset prices, but most people also consider these trends when making key financial decisions. The choice about how to save money, whether in the form of cash, savings accounts, stocks or bonds, or a house, depends on what one thinks are the risks and returns associated with these various options.

Asset prices are also quite important for the economy as a whole because they provide information for key economic decisions regarding consumption and investments in physical capital, such as buildings and machinery. While asset prices seem to reflect fundamental values well, history provides examples to the contrary, in events labeled as bubbles and crashes. Mispricing of assets can add to major financial crises for countries and globally.

Asset Price Predictability in the Long Run

Researchers are fascinated with the predictability of asset prices and how they relate to the function of markets. In a market with perfect information indicating increasing value in

(See Shiller, page 2)

From the National Academies

The following is excerpted from press releases and other news reports from the National Academies (www.national-academies.org).

◆ Integrating STEM in K-12

Education in the four STEM subjects (science, technology, engineering, and mathematics) is considered vital not only to innovation, but also as a foundation for successful employment, according to US business and government leaders. K-12 STEM education has tended to focus on the individual subjects, most often science and mathematics, while the "T" and "E" subjects have received relatively little attention. However, recent reform efforts, such as the Next Generation Science Standards (NGSS), are stressing the connections between STEM areas—in the case of NGSS, between science and engineering. A new report from the National Academy of Engineering and the National Research Council, *STEM Integration in K-12 Education*, examines current efforts to connect the STEM disciplines in K-12 education. Assessing current approaches to integrated STEM education, the authors propose a set of priority research questions to further understanding of integrated STEM education. The report also proposes a framework for a common perspective and vocabulary.

<http://www.nae.edu/108002.aspx>

(See NAS, page 7)

IN MEMORIAM

David M. Wetstone

1926 ~ 2014

Dr. Wetstone was one of the founders of the Academy and served as its first secretary and chief operating officer from its founding in 1976 until 2001.

the future, the price of the asset would increase in the short term to reflect that certain future value. However, at that moment the asset would be overvalued, resulting in a downward correction and back and forth in the price in what is called a "random walk." In real markets, there is an abundance of information that is not always complete or not always interpreted in the same way by everyone, so random fluctuations of an asset price increase and are less connected to real value. However, prices may follow somewhat predictable patterns over a longer timeframe due to risk. Risky assets are not as attractive to investors, so on average a risky asset will need to have a higher return. The issues of predictability and normal returns that compensate for risk are interwoven. The three Laureates have shown how to separate these issues and analyze them.

Researchers now agree that asset prices over the past few days or weeks cannot be used to predict tomorrow's price, based on Fama's research from the 1960s. How prices react to information was another research area that Fama and others studied. In their research, they investigated stock price movements after news about stock splits, and found that the market seemed to integrate information very quickly, which was a surprising result. This means that, for example, after the initial reaction to a news event, a stock price is extremely hard to predict.

In the 1980s, Hansen presented a statistical method, the Generalized Method of Moments (GMM), that was useful for dealing with the fluc-

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The purpose of the Academy is to "provide guidance to the people and the government of the State of Connecticut ... in the application of science and engineering to the economic and social welfare."

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The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013

On November 27, 1895, Alfred Nobel signed his last will and testament, giving the largest share of his fortune to a series of prizes in Physics, Chemistry, Physiology or Medicine, Literature and Peace - the Nobel Prizes.

In 1968, Sveriges Riksbank (Sweden's central bank) established The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.

tuations of asset-price data. Hansen then used GMM to test whether historical stock-price data were consistent with the standard form of the well-known model at the time, the Consumption Capital Asset Pricing Model (CCAPM). He found that because the model could not explain the data since asset prices fluctuate too much, even when allowing for time-varying discount rates that follow from the CCAPM, it must be rejected. Based on this research, others have focused on how investors in bad times may be more sensitive to risk, and insights have been found about human behavior more generally.

Even though stock prices are near to impossible to forecast over the short term, research by Shiller in the 1980s found that they can be easier to predict over longer time horizons. His studies of stock-price volatility and longer-term predictability provided key insights. Shiller demonstrated that stock prices move more than can be explained simply by dividend streams. Basic theory says that a stock's value should equal the expected value of future dividends, so the price volatility that he observed appeared excessive. An implication of the excessive swings in stock prices is that a high ratio of price relative to dividends in one year will tend to be followed by a fall in prices relative to dividends over subsequent years, and vice versa. This means that returns follow a more predictable pattern in the longer run. Shiller and his collaborators demonstrated this predictable pattern in stock and bond markets, and other researchers have confirmed this finding in other markets.

Additional Implications and Research

Stock markets are very hard to predict in the short run, and stock-picking is very difficult both in the short and the long run. Understanding how the mispricing of assets occurs, and the reason why financial markets do not reflect information efficiently, is one area of future study.

During his prize lecture Shiller explained, while looking at a graph of real S&P dividends since 1871, that "stock prices shouldn't really vary that much, there is no historical reason just in dividends, so maybe it's something else." Shiller went on to explain that, "In understanding speculative bubbles, we have to be eclectic."

The research findings that Shiller and the other two Laureates shared not only has implications for the field of economics, but also affects trends in psychology, sociology, and finance, just to name a few. In a December 11, 2013 interview with PBS NewsHour, Shiller noted that "the aggregate stock market reflects psychology more than fundamentals." — *Alissa DeJonge, Vice President of Research, Connecticut Economic Resource Center, Inc.*

IN BRIEF

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Biomedical Research

BIOSCIENCE INNOVATION ADVISORY PANEL NAMED. On December 23, **Connecticut Innovations** announced the 13 members of the **Bioscience Innovation Advisory Committee**, which will provide direction for the \$200 million **Connecticut Bioscience Innovation Fund** (CBIF). The new board members include **Peter Farina**, executive in residence, **Canaan Partners**; **Steven Hanks**, vice president of medical affairs for **Hartford HealthCare-Central Region**; **Joseph Kaliko**, chief executive officer of **Gaming Innovations International**; CASE member **Marc Lalande**, Health Net Professor and chair of the department of genetics and developmental biology and executive director of Genomics and Personalized Medicine Programs, **UConn**; **William LaRochelle**, head of health-care and key opinion leader management, **Roche 454 Sequencing Solutions International**; **Charles Lee**, scientific director, **The Jackson Laboratory for Genomic Medicine**; **Jewel Mullen**, commissioner of the **Connecticut Department of Public Health** (ex-officio); **Claire Leonardi**, chief executive officer of Connecticut Innovations (chair); **Alan Mendelson**, general partner, **Axiom Venture Partners**; **Edmund Pezalla**, national medical director for pharmaceutical policy, **Aetna**; CASE member **Carolyn Slayman**, Sterling Professor of Genetics, professor of cellular and molecular physiology and deputy dean, **Yale School of Medicine**; **Catherine Smith**, commissioner, **Department of Economic and Community Development** (ex-officio); and **Eleanor Tandler**, founder and chief executive officer, **Novatract Surgical**.

UConn INSTITUTE AWARDED AIR GRANT. The **Institute for Regenerative Engineering** at **UConn** has received a grant for \$1.6 million, including matching funds from industry, through the National Science Foundation's Accelerating Innovation Research (AIR) Program. CASE member **Cato T. Laurencin** is the institute's director as well as the director of the **Raymond and Beverly Sackler Center**, and chief executive officer of the **Connecticut Institute for Clinical and Translational Science**. "Every million dollars in grants translates to 11 jobs created or supported in Connecticut. And a million dollars in new grant funding can translate into a new invention, which can translate into a new patent, and perhaps even a new company," said Laurencin.

SOUTH WINDSOR BIOMED FIRM GETS ADDITIONAL FUNDING. Governor **Dannel Malloy** recently announced that the state will lend **Oxford Performance Materials**, a South Windsor-based biomedical manufacturer, \$3.2 million to add or retain 65 jobs over the next two years. The state **Department of Economic and Community Development** will extend a partially forgivable, 10-year loan to aid a \$9.5 million expansion project. The company manufactures medical implant devices and is planning on expanding into the field of 3-D printing. If the company meets its job retention and creation requirements, the state will forgive \$1 million of the \$3.2 million loan.



Business & Industry

CT ELECTRONICS FIRM BUYS SRC CABLES. Middlebury-based **Winchester Electronics Corp.** recently announced plans to purchase SRC Cables, a California company that makes specialized cables for many high-tech products used in the test and measurement, data communications, military, aerospace and medical technology markets. **Dan Hirschnitz**, former owner of SRC who is staying on

as general manager, noted that this arrangement will allow SRC to grow because it will be able to use Winchester's network, which has manufacturing facilities in China, Malaysia and Mexico. Winchester designs and manufactures connectors and cables for similar markets.

AIRGAS TO EXPAND CT OPERATIONS WITH SECOND PLANT.

In December, Pennsylvania gas supplier Airgas announced plans to expand its Connecticut operations with a second air separation plant in **Bozrah** to separate oxygen, nitrogen and argon from the atmosphere for hospitals, laboratories and high-tech firms. The additional plant, expected to begin production in the fall of 2015, will increase gas production by 600 tons per day. **Tom Thoman**, president of the company's gases division, said the new plant will operate alongside the existing one in Bozrah.

ELECTRIC BOAT SEES GROWTH AHEAD.

Electric Boat's president, **Jeffrey Geiger**, announced in January that because of the strategic roles played by submarines, the company expects to grow significantly despite a decline in US defense spending. The company currently employs about 12,000 people and expects these jobs to hold steady before significantly increasing near the end of the decade as work begins on a new class of ballistic-missile submarines. Construction of the new submarines is expected to begin in 2021, with the first beginning patrols in 2030.

KOLLTAN ANNOUNCES NEW CANCER DRUG THERAPY.

Kolltan Pharmaceuticals Inc., a privately held New Haven firm, recently announced development of a drug therapy intended to block chemical signals in cancer cells that help form tumors. Kolltan raised \$75 million from life science investors and signed a licensing agreement with MedImmune, the R&D portion of AstraZeneca. Kolltan is developing monoclonal antibody drugs, or mAbs. The mAb antibodies target receptor tyrosine kinases (RTKs) that exist on the surface of a cell and send growth signals to cancer cells, causing those cells to multiply. "Our goal is to build an industry-leading company that can generate and develop novel [drugs] for use in oncology and other severe diseases," said **Gerald McMahon**, a former MedImmune executive who took over as Kolltan's CEO in 2012.

P&W ENGINE SALES SOAR AT SINGAPORE AIR SHOW.

At the recent Singapore Air Show, East Hartford-based **Pratt & Whitney** reported more engine sales than any other engine manufacturer, with commitments from India's Air Costa and Singapore's BOC Aviation for 130 of the company's new PurePower Geared TurboFan engine. Combined with orders for its older V2500 engine, Pratt & Whitney sold a total of 184 engines at the air show, a biennial event for aerospace companies in the Middle East and Asia. According to the International Air Transport Association, this region will be the largest market for air traffic in 2016. Pratt now has more than 5,000 orders and commitments for orders for the PurePower engine, which it says uses 16% less fuel and is 75% quieter than aircraft engines today. The engine will fly on medium-range jets manufactured by Airbus, Bombardier, Embraer, Irkut and Mitsubishi.



Communication

AT&T TO SELL CT OPERATIONS TO FRONTIER. In December, **AT&T** announced it had reached an agreement to sell its Connecticut wireline, broadband and video operations to Stamford-based **Frontier Communications** for \$2 billion in cash, ending a 15-year venture by AT&T. Frontier will not cut jobs among the Connecticut employees it

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) 571-7143, or contact us at acad@ctcase.org.

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inherits, including 2,400 members of the Communications Workers of America, assured **Dan McCarthy**, the company's president and chief operating officer, although he noted that some jobs will change. Under the agreement, Frontier will take over AT&T operations that include 2,700 employees, 900,000 wireline telephone connections, 415,000 Internet connections and 180,000 U-verse video subscribers. Frontier will use the U-verse brand name for video services, but not for its bundled voice, video and Internet. The sale is subject to approval by a number of regulatory agencies, including the **Public Utilities Regulatory Authority**, which is part of the Energy Branch of the **Connecticut Department of Energy and Environmental Protection**, the Federal Communications Commission, and the US Department of Justice.

CI INVESTS \$1.5M IN AVON FIRM. **Connecticut Innovations** (CI) recently announced a \$1.5 million investment through its **Eli Whitney Equity Fund** in **iDevices LLC**, a company located in Avon that develops devices connecting wirelessly to smart phones, tablets and computers by leveraging Bluetooth® and Wi-Fi technology. In 2011, CI invested \$150,000 in the company to help support the launch of the iGrill. Since the iGrill, iDevices has also marketed and sold the iShower, iGrillmini and the Kitchen Thermometer, all utilizing Bluetooth® technology. The investment is intended to help iDevices grow strategically, including advising established consumer brands on enhancing products with app-enabling and Bluetooth® technology.



Education & Cognition

CT TEACHERS HONORED WITH PRESIDENTIAL AWARD. Two Connecticut educators—**Mary Servino** of Bridgeport and **Maren Sussman** of Ellington—were among the 2012 recipients of the prestigious Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST), announced by President Barack Obama on December 20. Servino is a science teacher at the **Discovery Magnet School** in Bridgeport, and Sussman is a mathematics specialist for the **New Canaan Public Schools**. The award is given annually to outstanding K-12 science and mathematics teachers from across the country. The winners are selected by a panel of distinguished scientists, mathematicians, and educators following an initial selection process done at the state level. Winners of this presidential honor receive a \$10,000 award from the National Science Foundation (NSF) to be used at their discretion. PAEMST is administered by the NSF on behalf of the White House Office of Science and Technology Policy.

OXYTOCIN MAY AID IN AUTISM TREATMENT. In a study published in the December 2 *Proceedings of the National Academy of Sciences*, a single dose of the hormone oxytocin, delivered via nasal spray, enhances brain activity during processing of social information in children with autism spectrum disorders. In a double-blind, placebo-controlled study, 17 children and adolescents with autism spectrum disorders between 8 and 16.5 were randomly given either oxytocin spray or a placebo nasal spray during a task involving social judgments. Those receiving the oxytocin responded more during social tasks compared with those receiving the placebo. "Oxytocin temporarily normalized brain regions responsible for the social deficits seen in children with autism," said first author **Ilanit Gordon**, a **Yale Child Study Center** adjunct assistant professor.

CT SCHOOLS TO GET TECHNOLOGY GRANTS. The **State Bond Commission** on January 9 unanimously approved \$22.6 million in borrowing to help local school districts purchase new computing

devices, inter-school bandwidth, or inter-district bandwidth. The commission's action follows Governor **Dannel Malloy's** announcement in November that the state intended to fund all requests for technology assistance that were received by the **Connecticut Department of Education** in response to a request for proposals issued in July 2013. Total requests far exceeded the original \$10 million allocated for the program, according to state education officials. The new technology is intended to help students meet the new Common Core State Standards, including assessments that will replace much of the state's traditional paper-and-pencil-administered Connecticut Mastery Test (CMT) and Connecticut Academic Performance Test (CAPT). The new tests, called the Smarter Balanced Assessment System (SBAC), will be administered on computers or other computing devices. In 2014-15, every public school district will administer the SBAC and the state will sunset the administration of the math and English language arts components of the CMT and CAPT tests. Districts will, however, continue to administer the science components.

DANBURY ROBOTICS TEAM A WINNER. **Danbury High School** (DHS) announced their Vex Robotics Team 5150 was awarded seven trophies at the **Connecticut State VEX Robotics Championship** competition held January 25 in Manchester. The 16-member team, running three competition robots, won Tournament Finalist. Team 5150E won Tournament Champion and Team 5150D took Robot Skills winner, Programming Skills finalist, judges' award and excellence award—the top prize at any VEX competition. The DHS Honors Robotics class engages students in science, technology, engineering and math. Students also can join the competitive robotics club, Team 5150. During the past four years, the team competed across Connecticut and New England, qualifying for the VEX World Championships three years in a row.



Energy

NATURAL GAS SERVICE EXPANSION APPROVED. The **Public Utilities Regulatory Authority** (PURA), part of the Energy Branch of the **Department of Energy and Environmental Protection**, in November approved a proposal by **Connecticut Natural Gas**, **Southern Connecticut Gas** and **Yankee Gas** to expand natural gas service to about 280,000 new customers across the state over the next decade. Ordinary homeowners will not be charged upfront connection costs and would pay an extra 10% premium on monthly bills for 10 years, with average-size businesses paying an extra 50% premium on monthly bills over a decade. Yankee Gas estimates capital spending for the expansion would be \$35 million next year and more than \$96 million in 2015 and 2016. Southern Connecticut Gas expects capital spending to be \$61 million in the three years, while Connecticut Natural Gas anticipates spending of about \$47 million in the same period.

CT RANKS #5 IN NATION IN ENERGY EFFICIENCY. In a report issued in November by the American Council for an Energy-Efficient Economy, Connecticut ranked fifth nationally for energy efficiency, largely because of Public Act 13-298, legislation that nearly doubled energy efficiency program opportunities for residents and businesses to reduce their monthly energy bills. This is the first time Connecticut has been in the top five states since 2009. Last year, Connecticut tied with two states for sixth place. "Energy efficiency is the cleanest, cheapest, most reliable energy resource available," said Steven Nadel, executive director of the council, in a statement. "Over the past year, Connecticut has made major strides in creating a sustainable framework that will help its citizens reap all of the benefits of energy efficiency."

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PLAINFIELD BIOMASS PLANT BACK ONLINE. Leidos Holdings of Virginia, the new owner of **Plainfield Renewable Energy**, a 37.5-megawatt biomass power plant, brought the facility back online on January 14, feeding power to the electricity grid. Leidos, which assumed ownership of the plant back in October following an agreement reached with New Jersey-based Enova Energy Group, the original owner of the plant that failed to finish the \$225 million project, has a 15-year contract with **Connecticut Light & Power** and is currently delivering energy to regional grid administrator **ISO New England**. The facility, one of the only Class 1 renewable biomass plants in the state, contributes to Connecticut's renewable energy goals by providing in-state Class 1 energy, powering the equivalent of 37,000 homes.

STUDY FINDS WIND TURBINES DON'T IMPACT HOME SALES. Researchers at **UConn** and the Lawrence Berkeley National Laboratory in California reported that after analyzing more than 122,000 Massachusetts home sales from 1998 to 2012 within five miles of current or future locations of 41 wind turbines, they found no evidence supporting the belief that wind turbines have negative effects on nearby property values or home sales. The study, funded by the US Department of Energy and the Commonwealth of Massachusetts, analyzed densely populated areas; prior studies measured the impact on rural communities with typically lower property values. Connecticut has had a ban on wind turbine construction since 2011 because of concerns by property owners in the northwest corner of the state. "One of the factors that gives us confidence in our results is that we were able to assemble such a large data set of home sales," said lead author **Carol Atkinson-Palombo**, a UConn professor of geography. "If turbines really were blighting these areas, you wouldn't be able to give property away. The fact that you have all these transactions means people want to buy."



Environment

COMMUNITY FOREST 'CONNECTICUT GROWN.' In November, Connecticut's **Departments of Energy and Environmental Protection** and **Agriculture** (DoAg) designated Southington's 223-acre **Crescent Lake Recreation Area** as the state's first community forest to receive the Connecticut Grown recognition for sustainable forest management. With help from **UConn's** Extension Forestry Program, a sustainable forest management plan was developed and accepted by the **Town of Southington**, including: sustainable forestry practices, protection of water quality during forestry operations, compliance with Connecticut's Forest Practices Act, adherence to the standards of DoAg's Connecticut Grown Program, and response to destructive forest pests and invasive plants.

SCOVILL LANDFILL SITE TO BE REMEDIATED. The US Environmental Protection Agency (EPA) announced plans in November to further remediate the **Scovill Industrial Landfill Superfund** site in Waterbury. In 1998 contamination above acceptable health levels was discovered when a 6.8-acre parcel on the site was under development. From 2002 to 2011, EPA and the **Connecticut Department of Energy & Environmental Protection** worked to clean up the site, and ameliorate any immediate risks. EPA now plans to proceed with further remediation which will include removing some soil in the top four feet, restricting land use, putting a cap on the contaminated soil not removed, and monitoring the site for future problems.

RIVERS ALLIANCE NAMES 2013 ENVIRONMENTAL CHAMPION. **Kent** resident and **Housatonic Valley Association** (HVA) executive director **Lynn Werner** was honored in December by the **Rivers**

Alliance as Connecticut's Environmental Champion of 2013 for her leadership in protecting the **Housatonic River** watershed, the regional Highlands, the wetlands and water courses in her hometown of Kent and throughout Connecticut. Werner has headed HVA, a stewardship organization for the tri-state watershed of the river, since 1995. The presentation was made by **Eileen Fielding**, president of **Rivers Alliance of Connecticut** and executive director of the **Farmington River Watershed Association**.



Food & Agriculture

HARTFORD REGIONAL MARKET TO EXPAND. The **Connecticut Department of Agriculture** announced plans last fall to expand the **Hartford Regional Market**, allowing Connecticut farmers to sell produce year-round. The market expansion—identified as an important component in the long-range growth of Connecticut's farms and agriculture industry in a strategic plan released by the Governor's **Council for Agricultural Development** in April 2013—will be funded by state grants and a \$375,644 federal block grant. The project will replace aging facilities with buildings to improve food distribution for farmers and customers; a kitchen and food processing center will be added as well, providing Connecticut's fruit and vegetable farmers with a licensed, sanitary facility in which to prepare products from their harvest for sale and consumption.

STATE FIRST WITH GMO LABELING REQUIREMENT. Late last year, Connecticut became the first state in the nation to require companies to state if their products contain genetically modified organisms, or GMOs. The legislation requires that four other Northeastern states with a combined population of no fewer than 20 million adopt similar legislation before the Connecticut bill can become law. In January, Maine became the second state to require labels on food that contains genetically modified ingredients; however, the Maine law will not go into effect until five nearby states, including New Hampshire, pass similar labeling laws.

NEW FOOD WASTE RECYCLING LAW. On January 1, a new law designed to bring more composting facilities to the state went into effect requiring certain businesses, including commercial food wholesalers or distributors, industrial food manufacturers or processors, supermarkets, resorts, and conference centers to start recycling food waste. **K.C. Alexander** of the **Department of Energy and Environmental Protection**, said "you're going to have to separate your food scrap from the rest of your trash, and get that recycled at one of the facilities, if you are within 20 miles of a facility that can take it."



Health

EXPERT WARNS OF NEW MOSQUITO-BORNE ILLNESS. Case member **Durland Fish**, professor of epidemiology and of forestry and environmental studies at **Yale**, is warning that the mosquito-borne illness chikungunya, recently found in St. Martin, might spread, causing problems in the United States. Chikungunya causes fever, headache, fatigue, nausea, vomiting, rashes, and muscle or joint pain in the ankles and wrists. Symptoms can linger for a few days to a few weeks, with exhaustion lingering for an extended period. It is rarely fatal, but there is no vaccine. It is spread by the same mosquito species that carries dengue. "Unlike West Nile virus, which circulates in birds that infect mosquitoes, humans are the only reservoir host for both chikungunya and dengue," said Fish in a January interview, adding, "I think the potential for it to spread through the Americas and even the United States is very real."

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YALE RESEARCHERS RECEIVE EARLY CAREER AWARDS. Yale's **Andrew Goodman** and **Young-Shin Kim** have been named as recipients of the 2014 Presidential Early Career Award, one of highest national honors given to early-stage researchers and engineers. The awards, established by President Clinton in 1996, are coordinated by the Office of Science and Technology Policy within the Executive Office of the President. Selection is based upon innovative research and commitment to community service as demonstrated through scientific leadership, public education, or community outreach. Goodman, assistant professor of microbial pathogenesis and a member of the **Microbial Diversity Institute at Yale**, will continue his work on the body's resident bacteria impact on health and the metabolism of drugs. Kim, associate professor at the **Yale Child Study Center** and a child and adolescent psychiatrist, will use her award to identify roles of gene-environmental interactions in the etiology of childhood autism spectrum disorders, and causes and consequences of bullying experiences in children.

YALE, JOHNSON & JOHNSON REACH CLINICAL TRIAL DATA AGREEMENT. In a new agreement, Johnson & Johnson (J&J) has agreed to share clinical trial data with the **Yale Open Data Access Project (YODA)**, providing researchers throughout the world with access to information about drug development and disease. Those wishing access to data will submit an application to YODA, who will independently review the request based on principles developed with J&J. Submitted proposals will be posted publicly and registered at clinicaltrials.gov. YODA was founded two and a half years ago to facilitate open access to pharmaceutical clinical trial data. "This is a landmark decision," said CASE member **Harlan Krumholz**, a professor of cardiology at the **Yale School of Medicine** who directs YODA. "They're saying that all of their data is ultimately available to scientists around the world."



High Technology

UTC WINS R&D AWARD FOR PURESTORAGE TECHNOLOGY. **United Technologies Research Center** recently announced an R&D 100 Award from R&D Magazine for its PureStorage energy storage technology. The PureStorage system provides energy-efficient and readily deployable energy storage at 5-10 times the power density of conventional-flow battery cells. The PureStorage system will benefit those areas that experience frequent power outages. The system can be used daily to convert irregular renewable energy sources such as solar and wind into reliable 24/7 sources of power.

ENGINEERING INSTITUTE LAUNCHED WITH UTC GIFT. Last fall, the **UConn School of Engineering** partnered with **United Technologies Corporation (UTC)** to launch the **UTC Institute for Advanced Systems Engineering** at UConn. UTC will contribute a cash gift of \$7.5 million over five years to the university, with a goal of an additional \$2.5 million—for a total \$10 million investment—to fund research services related to advanced systems engineering projects for UTC. The project is aligned with **Next Generation Connecticut**, a plan to expand educational opportunities, research, and innovation in science, technology, engineering, and math (STEM) over the next decade. "We are excited to work with UConn to develop the next generation of engineers who understand how to approach complex systems," said CASE member **J. Michael McQuade**, UTC senior vice president, science and technology.

CTC HONORS GOVERNOR. At its annual meeting in December, the **Connecticut Technology Council (CTC)** honored Governor **Dannel Malloy** with its 2013 Innovation Policy Leadership award for his support of CTC's legislative efforts as well as for his eco-

nomics development efforts, including allocation of funds to support growing the state's tech sector. A variety of programs now provide funding to various nonprofit agencies who are contracted to provide services to both start-ups and more mature companies. At the same event, the Innovation Excellence Award was presented to **Alexion Pharmaceuticals** for its work in developing therapies for patients with severe and rare life-threatening diseases. Also honored was **Patricia Fisher** as 2013 Volunteer of the Year. Fisher, a CTC board member, owns **JANUS Associates**, an IT security consultancy.



Transportation

FROM ROTARY TO ROUNDABOUT. The **Connecticut Department of Transportation (ConnDOT)** was recognized in November by the Roadway Safety Foundation (RSF) and the Federal Highway Administration (FHWA) for the **Killingworth** rotary project at Routes 80 and 81, which has resulted in a 50% reduction in crashes and an 86% reduction in injuries at that site. The site was selected based on crash history, volumes, constructability, and the potential for improvement. "We are proud to honor the Connecticut Department of Transportation for its successful implementation of a rotary to a roundabout conversion, which is reducing crashes and preventing injuries," said Gregory M. Cohen, executive director of RSF. ConnDOT Commissioner **James Redecker** noted, "This award speaks volumes about the dedication of the department's men and women who are constantly working behind the scenes to make our infrastructure safer."

SIKORSKY YOUNG INNOVATOR NAMED. **Sikorsky Aircraft** announced that Vance Hudson, 15, from Collierville, TN, is the 2013 Igor Sikorsky Youth Innovator Award winner and recipient of a \$1,000 scholarship check for imagining an electrically driven helicopter; the S-2050 helicopter with a detachable main section he envisions would allow operators to configure the aircraft rapidly for multiple missions, or deliver modular loads with life-saving resources. Vance's S-2050 aircraft fit the theme of this year's Sikorsky Helicopter 2050 Challenge, a national competition in which youths ages 9-16 envision a helicopter capable of addressing global issues likely to be encountered in the year 2050. "We liked Vance's concept because it takes the idea of a helicopter delivering cargo to a higher level of functionality, namely detaching a part of the aircraft and leaving it behind as a resource for those on the ground," said Sikorsky systems engineer **Larry Levine**.

STATE'S DRIVERS USING PUBLIC TRANSPORT MORE. A report issued in December by the **Connecticut Public Interest Research Group (ConnPIRG)** found that Connecticut drivers are driving less and using public transportation more, particularly in urban areas. The Stamford-Bridgeport area saw a 5.5% decrease between 2006 and 2011, with New Haven and Hartford also declining by 2.6 and 1.9%, respectively. According to the report, this decline is due to lifestyle choice rather than economics. New Haven is ranked 10th nationwide in terms of increase in bicycle commuters.

OFFICIALS SEEK EXTENSION OF FEDERAL TAX BENEFIT FOR COMMUTERS. On January 6, Senator **Richard Blumenthal** and New Haven Mayor **Toni Harp** asked Congress to extend a federal tax benefit for commuters who use public transportation, noting that the expiration will cost public transit users up to \$1,000 a year. When the benefit ended Dec. 31, the amount commuters can set aside to pay for their public transit costs before taxes decreased from \$245 a month to \$130.

—Compiled and edited by Wendy Swift

◆ **Two New IOM Reports Examine Psychological Disorders, Physical Effects of Blast in US Military**

High rates of psychological disorders among military personnel serving in Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom in Iraq as well as among their families have been well documented. For service members' families, the degree of hardship and negative consequences rises with the amount of the service members' exposure to traumatic or life-altering experiences. Adults and children in the families of service members who experience wartime deployments have been found to be at increased risk for symptoms of psychological disorders and to be more likely to use mental health services.

Preventing Psychological Disorders in Service Members and Their Families evaluates risk and protective factors and suggests that prevention strategies are needed at multiple levels in order to address the influence that these factors have on psychological health. This report from the Institute of Medicine (IOM) reviews and critiques reintegration programs and prevention strategies for post-traumatic stress disorder (PTSD), depression, recovery support, and prevention of substance abuse, suicide, and interpersonal violence. It urges the US Department of Defense (DOD) to develop, track, and evaluate programs based on scientific evidence to ensure their effectiveness. The report is a follow-up to the 2013 IOM report, *Returning Home from Iraq and Afghanistan: Assessment of Readjustment Needs of Veterans, Service Members, and Their Families*, which examines the quality and evidence base of programs in DOD designed to prevent negative psychological health outcomes among service members and their families and to identify appropriate performance measures for such programs.

A second IOM report found that US soldiers exposed to blasts while deployed in Iraq and Afghanistan have an increased risk of developing adverse health outcomes over the long term, such as PTSD and, in certain cases of traumatic brain injury (TBI), growth hormone deficiency, and persistent post-concussive symptoms including headaches. The wars in Afghanistan and Iraq differ from previous wars because of the enemy's use of improvised explosive devices (IEDs). The use of these devices has led to an injury landscape different from that in prior US wars. The signature injury of the Afghanistan and Iraq wars is blast injury. The committee that wrote the report, *Gulf War and Health, Volume 9*, focused on health consequences experienced at least six months after a blast. The report also includes recommendations for research most likely to provide the Veterans Administration with knowledge that can be used to inform decisions on how to prevent blast injuries, how to diagnose them effectively, and how to manage, treat, and rehabilitate victims of battlefield traumas in the immediate aftermath of a blast and in the long term.

http://www.nap.edu/catalog.php?record_id=18597

http://www.nap.edu/catalog.php?record_id=18253

◆ **New York's Nanotechnology Model**

New York's Nanotechnology Model, a report from the National Research Council, is the summary of a 2013 symposium that drew state officials and staff, business leaders, and leading national figures knowledgeable in early-stage finance, technology, engineering, education, and state and federal policies to review challenges, plans, and opportunities for innovation-led growth in New York. The symposium participants assessed New York's academic, industrial, and human resources, identified key policy issues, and discussed how the state might leverage regional development organizations, state initiatives, and national programs focused on manufacturing and innovation to support its economic development goals. This report reviews the development of the Albany nanotech cluster and its usefulness as a model for innovation-based growth, and discusses

the New York innovation ecosystem more broadly. It highlights the accomplishments and growth of the innovation ecosystem in New York, and identifies needs, challenges, and opportunities

<http://www.nae.edu/102096.aspx>

◆ **Investing in Transportation in Economic Downturns**

A new report from the National Research Council provides guidance for federal and state officials on the best ways to use stimulus funds for transportation in the future and methods for evaluating such investments. The report examines lessons learned and impacts from the states' management of the transportation component of the American Recovery and Reinvestment Act (ARRA) of 2009, which provided \$48.1 billion for U.S. Department of Transportation (USDOT) programs. Federal stimulus spending during a recession can be effective in the short term, as it leads to an increase in gross domestic product and employment within one to two years after the spending. The report focused on the role and management of transportation spending within a stimulus program, and found it appropriate to include transportation spending as one component of a diversified spending package, especially if the economic downturn is expected to be prolonged.

http://www.nap.edu/catalog.php?record_id=18628

The following Connecticut scientists were elected to the National Academies in 2013:

NATIONAL ACADEMY OF SCIENCES

Ronald R. Breaker, PhD

Henry Ford II Professor of Molecular, Cellular, and Developmental Biology, Yale University
Investigator, Howard Hughes Medical Institute

David R. Mayhew, PhD

Sterling Professor of Political Science and Professor,
Institute of Social and Policy Studies
Yale University

Xing-Wang Deng, PhD

Daniel C. Eaton Professor of Plant Biology, Department of
Molecular, Cellular, and Developmental Biology
Director of Peking-Yale Joint Center for
Plant Molecular Genetics & Agrobiotechnology
Yale University

NATIONAL ACADEMY OF ENGINEERING

Paul R. Adams

Chief Operating Officer, Pratt & Whitney

Ursula M. Burns, MS

Chairman of the Board and Chief Executive Officer
Xerox Corp.

INSTITUTE OF MEDICINE

Ruslan Medzhitov, PhD

David W. Wallace Professor of Immunobiology
Yale University School of Medicine
Investigator, Howard Hughes Medical Institute

Peter Salovey, PhD

President and Chris Argyris Professor of Psychology
Yale University

Visit our web site at www.ctcase.org

West Hartford's New Children's Museum Offers Host of Programs

A four-foot long monitor lizard smells the air with a flick of its tongue. A teen of the future talks to her brother from a lab on Mars. Hydrogen laced with a chemical indicator explodes in a colored fireball. A second grader stretches out a ball of polymer slime.

These are just some of the educational experiences provided by The New Children's Museum. Located in West Hartford, and famous for its outdoor life-sized sperm whale model, the museum offers a host of education programs to schools, libraries, scouts, homeschool groups, families and teachers.

Field trips to the museum mean a chance to experience shows in southern New England's largest planetarium, special classroom programs, and exciting exhibits. From the collection of over 100 live animal species to hands-on exhibits, the museum is a place that makes science and nature fun.

For those who cannot travel to West Hartford, the museum's outreach program brings science to students across Connecticut, Massachusetts, New York and Rhode Island. With spectacular demonstrations, hands-on experiments, visits from our live animals and a portable planetarium, outreach visits will help make science a favorite subject.

On field trips or via outreach, education programs at the museum are all aligned with the Connecticut Science Curriculum Standards. They engage students in STEM activities, and cover a wide range of science topics, from rocks and minerals to electricity and magnets, from invertebrates and chemical reactions to the laws of motion.

To learn more about The New Children's Museum, visit www.TheChildrensMuseumCT.org.



The museum's life-size sperm whale welcomes visitors. [Photo: The New Children's Museum]