



# RESEARCH CONNECTIONS AT NORTHEASTERN

INFORMING, INSPIRING, AND ENGAGING

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From the Office of the Senior Vice Provost for Research

## WASHINGTON UPDATE

### 2012 ELECTION RECAP

On November 6th, President Obama defeated former Massachusetts governor Mitt Romney, winning a second term in office. The Congressional landscape did not change dramatically, despite a few key seats changing hands. Republicans will continue to hold a majority in the House. In the Senate, Democrats picked up several seats, but are still short of a 60-vote super majority.

In one of the most closely watched Senate races in the country, Elizabeth Warren prevailed in her bid for the Massachusetts Senate seat held by Senator Scott Brown, winning by eight percent. In Massachusetts House races, all of the incumbents up for reelection held onto their seats, and Joseph Kennedy III won election to replace retiring Congressman Barney Frank.

Northeastern will continue to engage with the congressional delegations from Massachusetts and other states, including those representing our graduate campuses in North Carolina and Washington State, especially around key research partnerships.

### SEQUESTRATION

Following the election, Congress returned for a lame-duck session. A top priority for the session was to work on a tax and spending compromise that would prevent sequestration. If enacted, these automatic spending cuts would have devastating effects for higher education. It is likely that the most intractable issues will be postponed until the new Congress takes office. A Continuing Resolution (CR) passed in October will continue to fund the government through March 27, 2013. While the CR does little to reduce the uncertainty surrounding the federal funding environment, the president's reelection may begin to shake loose agency solicitations for major Administration initiatives that have stalled.

Northeastern president Joseph Aoun, along with other university presidents, recently wrote to the Massachusetts Congressional delegation outlining the impact sequestration would have on the Commonwealth, including essential student financial aid and research funding programs. The Office of Government Relations will continue to provide the Northeastern community with updates on federal funding activity.

To learn more, contact Tim Leshan, VP for government relations, at [northeastern.edu/governmentrelations](http://northeastern.edu/governmentrelations)



## REGIONAL HIGH-PERFORMANCE COMPUTING CENTER OPENS

Three years in the making, the Massachusetts Green High Performance Computing Center (MGHPCC) officially opened its doors in Holyoke on November 16, 2012, the culmination of a historic partnership to develop a world-class, high-performance, academic-research computing center.

Powered by a combination of “green” and cost-competitive traditionally sourced energy, the center offers a sustainable solution to the exponential growth in computational research needs of its member institutions—Northeastern University, the Massachusetts Institute of Technology, Boston University, the University of Massachusetts, and Harvard University.

The MGHPCC, developed in partnership with the Commonwealth of Massachusetts, the City of Holyoke, EMC and Cisco Systems, also represents a unique collaborative platform for its partners to accelerate the application of high-performance computing (HPC) in addressing complex challenges facing society.

“We are committed to working collaboratively with all college deans and faculty to help them leverage this important shared computational research facility,” explained Rehan Khan, vice president and chief information officer for Information Services. “This will include hiring dedicated personnel to conduct outreach and training, and provide proposal-development support and equipment advice to researchers.”

Northeastern’s researchers will be able to access the facility for their research computing needs via a dedicated high-speed optical fiber network, and choose among various support options. The university will maintain a shared HPC infrastructure in the facility for use by all researchers. Researchers will be able to add standardized equipment to the shared system where it is centrally supported, in return for equivalent priority access. In addition, a dedicated service option will allow equipment purchased by a researcher to be hosted and maintained centrally by the university, for use by the researcher and designated partners. Partner institutions will begin moving equipment into the facility later this winter.

Even before its doors opened, the MGHPCC was creating new opportunities for its members to address pressing research problems, including major cross-collaborative initiatives in cybersecurity and big data. In the past few months, partners have secured a \$2.3 million National Science Foundation Major Research Instrumentation award. In addition, \$1.2 million in seed funds have been allocated for collaborative research by consortium researchers. Awardees have included David Kaeli, Hossein Mosallaei, and Gunar Schirner in Northeastern’s Department of Electrical and Computer Engineering. A second round of awards will be announced in January.

*For more information on the MGHPCC, contact Rehan Khan or Rajiv Shridhar, director of Systems and Production Services, at [northeastern.edu/is/mghpcc](http://northeastern.edu/is/mghpcc)*

## SELECTED FUNDED PROJECTS



**Rebecca Carrier**, associate professor of chemical engineering, received funding from the National Institutes of Health to investigate the effect of lipid ingestion on drug absorption in the human intestines, using mechanistic studies paired with mathematical modeling. The resulting model will enable quantitative prediction to help advance the rational design of delivery vehicles to maximize absorption of nutritive supplements and support oral delivery of compounds that might otherwise require injection.



**Ennio Mingolla**, professor and chair of the Department of Speech-Language Pathology and Audiology, was funded by the Air Force Office of Scientific Research for research to computationally model human capacities for depth

perception through visual motion. Mingolla will investigate the ability to separate a visual object from a background of similar appearance, as in conditions of camouflage.



**Richard Wamai**, assistant professor of African American studies, is studying the efficiency of HIV/AIDS prevention programs in Eastern and Southern Africa as part of a multipronged research initiative that seeks to optimize the prevention response. The research is funded by the Bill and Melinda Gates Foundation through the National Institute of Public Health in Mexico.



**Dr. Steven Scyphers**, a postdoctoral research fellow in associate professor Jonathan Grabowski’s lab at the Marine Science

Center, was awarded a grant from the National Science Foundation to investigate the social and ecological resilience of coastal shoreline ecosystems. The study will develop a novel framework for informed decision making and contribute to our understanding of sustainability along coastlines.



**Ali Abur**, professor and chair of the Department of Electrical and Computer Engineering, secured Department of Energy funding, through Charles River Associates, to investigate innovative use of line switching for efficient electric power transmission. Abur’s findings will contribute to improved monitoring capabilities to facilitate the use of topology control in maintaining a resilient transmission grid with multiple renewable power sources.

## SNAPSHOT:

### Northeastern Spinouts Showcased at Global Entrepreneurship Week, Nov. 12–16, 2012

#### 3-SPARK LLC

A spinout from Professor Dinos Mavroidis' Biomedical Mechatronics Laboratory, 3-SPARK uses a novel embedded-sensor technology in a 3D printing process. The parts produced by the 3-SPARK system are able to measure contact and respond to user interactions. For example, a custom orthotic device with built-in sensors could let the wearer know when it is time to "print" a new orthotic and how to adapt it to the user's changing physical requirements. Public awareness and use of 3D printing in the home, office, and classroom has jumped, leading to an exponential growth in the global purchase of desktop systems under \$5,000. The technology's inventor, mechanical engineering graduate Richard Ranky, PhD'12, hopes to bring 3-SPARK into the 3D printing marketplace targeting the education and consumer markets. 3-SPARK could be used by students to apply physics and engineering principles to build smart components, or demonstrate prototype products from product design firms. Partnerships with Northeastern University's Center for Research Innovation, the College of Engineering, Health Science Entrepreneurs, and IDEA business programs provide the product development and commercialization mentorship for this new venture.

#### ZEPHYR ENERGY CORPORATION

Northeastern University spinout Zephyr Energy Corporation is an alternative energy company that aims to revolutionize wind-energy harvesting with its non-rotating wind-energy generator technology. An engineering capstone project by Tom Olsen, ME'11, supervised by Professor Mo Taslim, the generator's groundbreaking design makes it more versatile as an option for the military, commercial, humanitarian, and scientific sectors. Its low operational wind-speed requirement, compact design, and safe operation will make Zephyr's generator competitive with traditional wind-turbine technology. Zephyr Energy Corporation has partnered with Northeastern University's Center for Research Innovation and the Gordon Engineering Leadership Program to continue its research and development and commercialization efforts, and is working with the student-run venture accelerator, IDEA, to refine its business plan.

## DEADLINE NEARS FOR GRANT PROGRAM SUPPORTING RESEARCH INNOVATION

The deadline to submit applications to the 2014 TIER 1 internal grant program is fast approaching. This competitive program is designed to encourage individual faculty members to form multidisciplinary teams to secure proof of concept, with a goal of successfully competing for future sponsored research opportunities. Funds are also available as seed grants for faculty teams to develop new research directions.

Total support of up to \$50,000 for one year is available, provided by the colleges and the senior vice provost for research. Proposal packets must be uploaded via the online TIER 1 portal by February 1, 2013.

TIER 1 grants are one way that Northeastern supports faculty in pursuing innovative research. During the most recent competition cycle, 27 grants were awarded to teams of researchers across the university. Past TIER 1 awardees have leveraged the awards to expand their labs and secure external research funding, with a return on investment of 1:3, and still climbing.

This year, the Office of the Provost will be particularly interested in funding proposals that address the university's global research themes of health, security, and sustainability, with an added focus on Big Data/ Network Science projects. As many as half of the awards will be for projects that advance research in these strategic areas.

**For more information, contact Karen Drew in the Office of Research Development and visit [northeastern.edu/research/funding](http://northeastern.edu/research/funding)**

## UPCOMING RESEARCH EVENTS

### JANUARY 18–19

[Center for the Arts Symposium](#)  
The Fenway Center, Jordan Hall, Calderwood Hall  
[Beyond Notation: An Earle Brown Symposium](#)  
Northeastern Center for the Arts, with support from the Earle Brown Music Foundation, presents a two-day symposium on American avant-garde composer Earle Brown (1926–2002). An international group of presenters from music, art, and dance will examine the life and musical legacy of Earle Brown.  
[music.neu.edu/earlebrown](http://music.neu.edu/earlebrown)

### JANUARY 30

[Blackman Auditorium](#)  
6–9 p.m.  
[Research Cinema: Focus on Biofilms](#)  
The screening of a documentary featuring Tom Webster, chair of the Department of Chemical Engineering, followed by a panel discussion and poster presentations.

### MAY 7

[440 Curry Student Center](#)  
11:30 a.m.–1 p.m.  
[NSF CAREER Workshop](#)  
This workshop will offer proposal-writing tips and information specific to the NSF CAREER program and will include a panel of recent CAREER award recipients.  
[northeastern.edu/advance/events](http://northeastern.edu/advance/events)

### JUNE 23–26

[Northeastern University](#)  
[12th International Symposium on Electrokinetic Remediation](#)  
Hosted by Northeastern University's College of Engineering, the symposium will focus on breakthroughs in removing soil contaminants through the use of electrical currents.  
[northeastern.edu/erem2013](http://northeastern.edu/erem2013)

## FACULTY NEWS

**Alvero Cuervo-Cazurra**, assistant professor of international business and strategy in the D'Amore-McKim School of Business, joined the executive committee of the International Management Division of the Academy of Management.

Four professors of mathematics, **Christopher King**, **Venkatramani Lakshmbai**, **Mikhail Shubin**, and **Andrei Zelevinsky**, have been named to the inaugural class of Fellows of the American Mathematical Society. The society was founded in 1888 to further the interests of mathematical research and scholarship.



Alvero Cuervo-Cazurra



Phil Brown



Jeff Howe

**Phil Brown**, University Distinguished Professor of Sociology and Health Sciences and director of the Social Science Environmental Health Research Institute, has been honored with the 2012 Leo G. Reeder Award, presented at the

annual meeting of the American Sociological Association's Medical Sociology Section. The award recognizes scholarly contributions to both theory and research in medical sociology and acknowledges teaching, mentoring, and service to the medical sociology community, broadly defined.

**Jeff Howe**, assistant professor in the School of Journalism, spent July in Thailand and Burma, investigating the extraordinary impact of Chinese soft power—foreign loans, infrastructure investments, and bilateral agreements—on Southeast Asia. GlobalPost published a five-part series produced by Howe and photographer Gary Knight.



# Northeastern University

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