UNH Faculty Receive $1.3 Million in Prestigious NSF CAREER Grants

Korkolis, Ruml, Wosnik awarded prestigious grant for junior faculty

Thursday, February 23, 2012

-
-
-

YANNIS KORKOLIS, ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING AT THE UNIVERSITY OF NEW HAMPSHIRE, RECEIVED A PRESTIGIOUS FACULTY EARLY CAREER DEVELOPMENT (CAREER) AWARD FROM THE NATIONAL SCIENCE FOUNDATION.

Three University of New Hampshire faculty members will explore energy from the ocean, manufacturing on a tiny scale, and speedier computer planning, thanks to prestigious Faculty Early Career Development (CAREER) Awards from the National Science Foundation. The grants, totaling nearly $1.3 million over five years, went to assistant professors Yannis Korkolis and Martin Wosnik of the mechanical engineering department and Wheeler Ruml of the computer science department.

"UNH is fortunate to have three assistant professors recognized by the National Science Foundation this year for their excellence in scholarship and their plans for advancing their research agenda," says Jan Nisbet, UNH senior vice provost for research. "Given the competitiveness of the CAREER awards, UNH should be proud of its success rate and its faculty." Korkolis, Ruml, and Wosnik are among 20 UNH faculty members to receive this award since 1998.

Korkolis, who works in solid mechanics and studies how materials behave and deform when they are used to manufacture anything from a pencil to an airplane, will investigate "microforming" processes. "We're looking at very small pieces of metal, like a needle or a water-cooling channel for a microchip," Korkolis says. "The scientific

challenge is that the behavior of these materials when you make them very small is different than at the macroscale, which is more familiar and better understood nowadays."

With this grant, Korkolis will create unique experimental equipment to test the behavior of microtubes. In addition, the grant will support two UNH graduate students to work with Korkolis's collaborators in Germany and South Korea and numerous UNH undergraduates from the Durham and Manchester campuses to work in his lab in Durham.

Wosnik's CAREER award will advance the development of renewable energy from the ocean – waves as well as tides and currents – which is considered to be one of the more environmentally sustainable ways to generate electricity. His research addresses one roadblock to this industry: "When you put any piece of machinery like a turbine into a turbulent flow, the device interacts with the flow," he says. "You need to understand how that device is affected by the turbulence, how it modifies the flow and what happens in its wake."

This information, previously unavailable, will help the marine hydrokinetic energy industry place additional devices in optimal position to each other and minimize negative impact on the environment and organisms in the water column. This grant will support graduate students working with Wosnik on this research, which he will undertake using a large indoor tow tank at UNH's Chase Ocean Engineering Laboratory as well as an open-water tidal energy test site in the Great Bay Estuary between Dover and Newington.
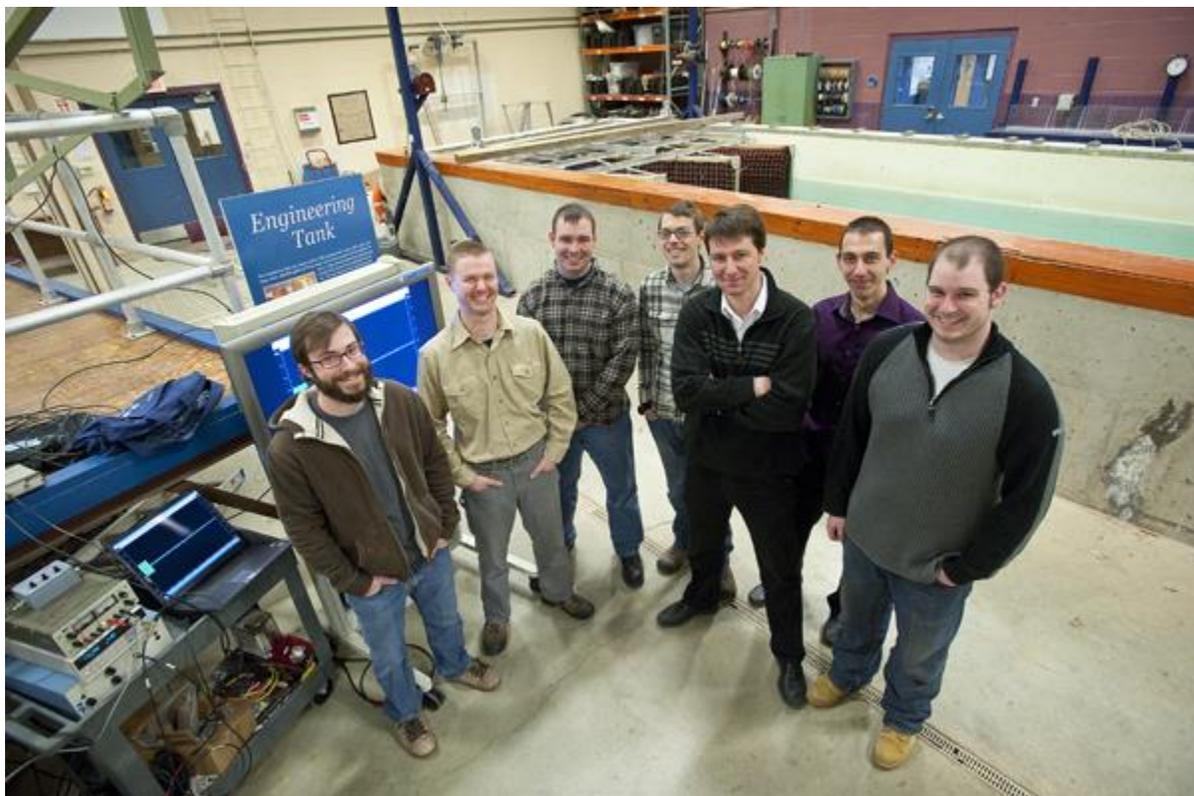
L–R PETE BACHANT (PH.D. CANDIDATE), MATT ROWELL (MASTER'S STUDENT), NATE DUFRESNE (MASTER'S), MARTIN WOSNIK, ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING, VINCENT LYON '13, IVO NEDYALKOV (PH.D.), JEFF BYRNE (MASTER'S)

With his award, Ruml will continue his investigation into helping computers make faster—but suboptimal—plans. "The central premise is that sometimes the best is the enemy of the good," he says. "By the time you figure out what the best thing to do is, sometimes it's too late." Ruml's research involves formalizing this concept with an algorithm that helps computers "manage" their time better, finding a good-enough plan when the perfect one would take too long to execute. Such work might be used to program robots to execute tasks efficiently, says Ruml, or to plan complex tasks such as scheduling military troop deployments in far-off lands. "It's quite a challenging problem," he says.

L–R: MIKE LEIGHTON (MASTER'S STUDENT), ETHAN BURNS (PH.D. CANDIDATE), WHEELER RUML
(ASSISTANT PROFESSOR), JORDAN THAYER (PH.D. CANDIDATE, SCOTT KIESEL (PH.D. CANDIDATE), CHRIS SEXTON (MASTER'S STUDENT)

This funding also will support Ruml and his undergraduate and graduate students in creating and curating an online handbook of planning algorithms that will aim to be an entry point into the scientific literature for both researchers and practitioners. The award will provide summer support for two students each year, as well as a set of computers for benchmarking algorithms.

The Faculty Early Career Development (CAREER) Program is a foundationwide activity that offers the National Science Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research,

excellent education and the integration of education and research within the context of the mission of their organizations.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,300 graduate students.

- WRITTEN BY:

Beth Potier | Communications and Public Affairs | beth.potier@unh.edu | 2-1566

PHOTOGRAPHER:
Perry Smith | Freelance Photographer

SUCCESS