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UNH Labs Receive Two NSF Grants Totaling $1.35M for Research Instruments

DURHAM, N.H. – University of New Hampshire researchers will have two new instruments – a DNA sequencer and a computer cluster capable of modeling space weather – to advance their work, thanks to two National Science Foundation (NSF) Major Research Instrumentation (MRI) grants to the university. The grants, totaling $1.35 million, will facilitate research in UNH’s Hubbard Center for Genome Studies and the Space Science Center in the Institute for the Study of Earth, Oceans, and Space (EOS), as well as other departments and centers.

“This is cutting-edge equipment,” says UNH senior vice provost for research Jan Nisbet. “A genome sequencer and a supercomputer will allow us to conduct nationally and internationally relevant, high-impact research.”

UNH received $815,000 for an Illumina HiSeq 2000 DNA sequencer — the largest MRI grant the university has ever received. The grant comes amid advances in DNA-sequencing technology that have been fueled by interest in personal genomics.

“The unintended consequence of that sea change in technology is that it has had an impact on such a broad spectrum of biology — and especially in areas where UNH excels, such as environmental biology and ecology,” says W. Kelley Thomas, professor of biochemistry and director of UNH’s Hubbard Center for Genome Studies, who spearheaded the grant proposal. “I think the real reason we won the award is the overall strength of the faculty in those areas.”

The DNA sequencer will help researchers answer questions about emerging diseases, consequences of environmental change (including global warming and land development), conservation of threatened species, cleanup of oil spills, and agricultural practices. It will contribute to research and training in 16 UNH laboratories over the next five years, supporting the work of 237 undergraduates, 65 graduate students and 29 postdoctoral fellows. Currently, UNH faculty must use instruments at labs across the country, where internal users usually have priority and turn-around time for UNH faculty typically has been four to nine months.

The other MRI grant to UNH, totaling $535,000, is for a new computer cluster that will benefit investigations in multiple disciplines, including physics, engineering and math. It will help researchers better understand turbulence, fluid flows, magnetic reconnection (the process by which magnetic energy is converted into heat and kinetic energy), and
space weather, says Joachim (Jimmy) Raeder, professor in the physics department and the Space Science Center in EOS, who led the grant proposal.

The machine’s computational abilities will, the researchers hope, lead to advances with practical implications — such as improved prediction of space weather. Solar storms affect many types of navigational and communications technology, including the global-positioning system (GPS) used in industries ranging from aviation to off-shore drilling. According to Raeder, being able to predict space weather could help mitigate its disruptive effects.

The new computer cluster, which will be used by about a dozen faculty members along with 20-30 graduate students, post-doctoral fellows, and other researchers, will replace one installed in 2005. “It’s really old in the computer world, so there’s a big need to replace it,” Raeder says. He adds that the new cluster will be roughly 15 times as powerful as the current one. Although physically slightly smaller than the current cluster, it will fill three 19” wide “racks” that are three-feet deep by eight-feet high. “We will get about 500 times what a typical desktop computer would have — and to solve many problems we need that degree of power,” Raeder says.

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.

**Photographs available to download:**

Caption: W. Kelley Thomas, professor of biochemistry and director of UNH’s Hubbard Center for Genome Studies.
Credit: Mike Ross, UNH Photographic Services

Caption: Joachim (Jimmy) Raeder, professor in the physics department and the Space Science Center in the Institute for the Study of Earth, Oceans, and Space (EOS) at UNH
Credit: Kristi Donahue, EOS

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