



FROM THE UNIVERSITY OF VERMONT

To print: [Click here](#) or Select **File** and then **Print** from your browser's menu

This story was printed from [The View](#) located at <http://www.uvm.edu/theview>

Conference to Feature Student Research

By The View Staff

URL: <http://www.uvm.edu/theview/article.php?id=2680>

It's fitting that UVM's newly created student center should serve as the venue for a wide ranging exhibit of newly created student knowledge.

On April 17 the Dudley H. Davis Center will host the university's first [Student Research Conference](#) from 8:30 a.m. to 5:30 p.m. in the Silver Maple Ballroom.

Sixty-two undergraduates and 81 graduate students from every UVM college and school will present the results of their original research, scholarship and creative activity via 79 poster presentations and 60 oral presentations.

Research projects cover a wide range of topics, from the Lake Champlain ecosystem, robotics, wireless networks, archaeology, mountaineering, and environmental justice to voting behavior, sustainable development, molecular genetics, nutrition, biofuels, organizational change, immigration, irrigation, and land use.

The event is free and open to the public. Students will be on hand to explain their work in lay language.

Many student research events have been held at the university in the past, according to Frances E. Carr, vice president for research and graduate studies, but they were organized at the unit and departmental level or focused exclusively on graduate student work.

As a premier small research university with a land grant mission, research is vital to UVM's identity, Carr said, and it's important that students be exposed to, participate in, and celebrate the creation of new knowledge.

"This is the beginning of what we hope will be an ongoing and growing celebration of student research institution-wide for years to come."

Here, profiles of three students' projects provide a glimpse of the breadth of research on display at the conference.

A not-so nanoproject

The hardest part of Zachary Burchman's highly ambitious project, "Synthesis and Categorization of Nickel Nanowires Obtained by Template-Assisted Electrodeposition," wasn't trying to grow nickel nanowires or use an atomic force microscope to test their mechanical properties. It was a requirement that would seem comparatively easy: coming up with three or four lines to describe it.

Burchman decided to start by defining nanowires. "They are very tiny rods of metal that exhibit extraordinary strength when compared to their bulk material counterparts," he says, adding that they have multiple applications in the fields of medicine, aerospace, memory storage, energy storage, and electronics. "The primary focus of my research is in developing a consistent method to create the wires and then physically testing them to verify the consistency. The next stage in this research is to tweak the growth conditions to tailor the wires for a given application."

This required some serious lab work using mini-filters with pores (kind of like a mold) in which he poured nickel to grow the barely visible nanowires. It also required the use of a scanning electron microscope to probe the mechanical properties of the nanowires by shooting electrons at them and by bending them to see how much resistance they could take. The point of nanotechnology, he says, isn't always to make objects smaller, but rather

to make things like batteries more powerful without increasing the size of the object they're powering.

Burchman's advisor, Frederic Sansoz, assistant professor of mechanical engineering and materials science, calls the use of the atomic force microscope to probe the mechanical properties of the nanowires "a novel approach" since no research study exists on nickel nanowires where both controlled synthesis and nanomechanical testing have been applied together.

Work and play

From celebrities to presidential candidates, everyone has an opinion on the causes of autism. While research remains inconclusive whether it's genetics, vaccinations, or something else entirely that causes the debilitating neurological condition, Patricia Prelock, chair of communication science, has made headway using a play-based therapy to help autistic kids break through the barriers that keep them from communicating and interacting with others.

Prelock's research provided junior Erin Maskell-Ferland a point of entry into the complex field of autism spectrum disorder (ASD) research. For her summer research project as a McNair Scholar, "Maternal Perceptions and Observations of Play in Children with and without Autism Spectrum Disorders," Maskell-Ferland used primary sources from Prelock's research (questionnaires given to mothers or primary caregivers and videotapes of autistic and typically developed kids playing together) and designed her own study.

"I looked at the mother's descriptions or the primary caregiver's descriptions of what they said their child would do in play, and then I compared it to tapes of the kids doing free play with each other," Maskell-Ferland explains. "Most of the parents were very correct with their assumptions of how their children play."

Existing literature about peer play among autistic children didn't ring as true, however. "A lot of literature said that autistic children are solitary players – that they only like to play with themselves. Our findings didn't completely support that. A lot of them actually participate in a lot of peer play with each other and more dramatic play," she says. Ultimately, Maskell-Ferland says this observational research could improve the diagnosis process and help get kids the therapy they need as early as possible.

Life under the lens

The baked landscape just north of Moab, Utah would seem one of the least promising places on earth to probe the soil in pursuit of life. But it's the diversity of the organisms contained in just a spoonful of this red crust that intrigues Brian Darby, a doctoral student in plant and soil science. The plots he has monitored through fieldwork in southeastern Utah and closer examination under the stereo microscope in a Hills Building lab are under study as part of a Department of Energy-funded grant he works on through Deb Nehrer, professor and chair of plant and soil science.

Explaining his work, Darby offers a chart showing the microscopic food web at work in the soil – multiple arrows on the schematic overlap in a dense network that illustrates the doings of the fungivorous nematodes, the zoophagus prostigs, the oribatid mites, and the like. There's a diversity of invertebrates in your backyard's dirt to rival most zoos, notes the grad student, who will finish at UVM this spring and head to a post-doc at Kansas State University.

At the upcoming Student Research Conference, Darby will discuss "Desert soil microfauna in a changing climate." The nitrogen cycling of such arid lands (which account for 35 percent of the global and United States land mass) is of particular interest to the Department of Energy. At his presentation, Darby will consider possible bigger picture scenarios as expected elevated temperatures and drought stresses life in the desert soil. But in 126 Hills Building, he is just as eager to share the small picture where such pursuit of knowledge often begins. "I can't let you leave without showing you a nematode," he says and places a plate under the microscope's lens.

[The View Homepage](#) | [UVM Homepage](#)
[News Briefs](#) | [Events](#) | [Notables](#)
[Print This Issue](#) | [Print Past Issues](#) | [Feedback](#)