

# \$99.67M powers rebound for Cornell research projects

## Aid stands to get synchrotron back on beam

BY LIZ LAWYER | ELAWYER@GANNETT.COM • OCTOBER 30, 2009, 7:00 PM


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ITHACA -- For the past couple of years, National Science Foundation-funded research projects have been losing [funding](#).

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Since the NSF is the foremost provider of research [funds](#) at Cornell University, this had a heavy impact. But with the delivery of federal stimulus money to the NSF and several other federal research institutions, that's changing. Thanks to increased funding from the NSF, National Institutes of Health, and federal Department of Energy, \$99.67 million is coming to Cornell this year.

The Cornell High Energy Synchrotron Source is a prime example of a project that faced hard times, but is now moving forward again.

In addition to layoffs in early 2008, the lab's administrators have been forced to leave positions open as staff members leave and decrease the amount of time the underground radiation facility was running to save [electric power](#) costs. This caused work on dozens of research projects to go forward more slowly, said Ernie Fontes, senior research associate and assistant director of CHESS.

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The loss of support was due to flat funding for the synchrotron's primary supporter, the National Science Foundation, and a slow tapering off of work on the biggest project the synchrotron has been serving for the past several decades, a long-term, high-energy particle physics project that was the initial purpose behind the

synchrotron's construction in the 1960s, Fontes said. Demand for access to the synchrotron and ideas for new uses of the lab were unabated -- but financial support was foundering.

With the reinstatement of funding for the National Science Foundation, the top source of research dollars on Cornell's campus, through the stimulus act last February, the synchrotron has received several NSF grants totaling \$19 million, allowing three projects at the synchrotron to start hiring again. "Beam time," or operating time, also has increased due to NSF funding.

Even with those millions, Fontes said he does not expect to be able to bring staffing levels back up to where they were even two years ago, when the particle physics project began tapering off.

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
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
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
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"What will happen when the ARRA funds taper down has yet to be seen, but the funding levels of the NSF, NIH and others must continue to grow to realize the positive impact that science can have on the U.S. economy," he said.

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### Stimulus At Cornell

Cornell is by far the entity in Tompkins County that has received the most stimulus dollars. Of more than 170 grants or [loans](#) through ARRA, 121 were to Cornell.

Funds from the American Reinvestment and Recovery Act are supporting more than 100 projects at Cornell University, have created or saved 94 research and staff positions, and are subsidizing more than \$2 million in students' tuition costs.

Projects that have received stimulus support range from research on fruit fly genetics to cholesterol to superconductivity to biodiversity in South America.

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Nearly \$3 million in Pell Grant and federal work-study funds have also been made available to Cornell students through ARRA.

ARRA allots \$17 billion dollars for research, research infrastructure and education through federal agencies, including the National Science Foundation, the Department of Energy and the National Institutes of Health.

Total awards to Cornell now amount to more than \$99 million. In its first quarterly report to the

federal government in October, Cornell noted that ARRA funding created 19 new jobs and retained 75.2 jobs, including several part-time positions added together. Weill Cornell Medical College in New York earlier this month reported a total of 100 full-time jobs created and retained with 63 awards amounting to \$21.9 million.

Vice Provost for Research Bob Buhrman said externally funded research at the Ithaca campus came to \$371 million in the fiscal year ending in 2008. With nearly \$100 million additional research dollars coming to the campus, the research budget will see considerable impact.

"We will definitely see an increase and it will extend several years," as the awards are disbursed over two to five years, Buhrman said.

### 'Good Science'

Buhrman said that due to a couple of years of flat federal funding to the National Science Foundation and National Institutes of Health, resulting in a decline in the purchasing power of their budgets, fewer projects could secure funding and the number with full funding was even lower. Before ARRA, only about 20 percent of all projects that submitted grant applications to NSF were accepted, Buhrman said.

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"There's much good science, very important work -- it's just not receiving support," he said.

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Since the flood of stimulus support, many more projects are getting that support. Many of the research projects receiving funding at Cornell are new, while others are ongoing, Buhman said. Stimulus funding saved some projects from ending prematurely.

"Some (projects) were in danger of being terminated because the NSF budget was not going to allow them to continue. There are new projects ... that would not have started, while others may not have continued. And others are now able to continue at a faster pace," because they could hire a new researcher, Buhman said.

One project that was short-staffed before getting an NSF grant backed by ARRA is headed by Matt Miller, professor of mechanical and aerospace engineering.

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Miller and a brigade of grad students are examining the way cracks form in material at the most basic levels. Typically, they study structural materials such as alloys of titanium, aluminum and steel to understand how defects initiate in structures such as aircraft and automobiles during use. In this project, they are analyzing why cracks form in the production of aluminum nitride, used as a semi-conductor in electronics.

Miller hopes his research will result in the capability to produce single crystals of aluminum nitride for semi-conductors without microscopic cracks.

Due to the limits of the funding he originally received, Miller had to reduce the scope of his research. Now his project has received a \$300,000 NSF grant, it's possible to support one of his researchers for a longer period and complete all the experiments he wants to do in the project.

"It's pretty common to ask for a certain amount of money and only get a portion of it," Miller said. With the stimulus funding, Miller's program manager at NSF has been able to "take projects that had been ranked highly and give them full funding."

#### Job Creation

The purpose of ARRA, as stated in the act, is to "(make) supplemental appropriations for job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and state and local fiscal stabilization."

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Scientific research projects are still being chosen primarily on the basis of what would be the best research, Buhrman said, but the agencies are putting more of an emphasis on job creation and research that would create economic growth.

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"They are disbursing the money essentially as they normally do, with an emphasis on job creation and things that would grow the economy, including improving health," he said. "(Jobs created) is generally a component that you have to put in a research proposal. As far as we can understand -- and we're pretty confident it is the case -- the main criteria is which is the best research. But it's important in writing these grants that attention be paid to how the projects would save or create jobs."

When the stimulus bill was still in the works, members of the scientific community pushed for support for research and the training of new scientists, Fontes said.

"We need to train more scientists and engineers," Fontes said. "Science is really a driver of the economy. Companies (in the United States) often have no option but to hire people from other countries because there aren't enough grads in the U.S. Call it a pipeline problem ... We need minds doing the work."

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