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## **SSU student boosting power of the sun** **Solar collector for telescope project aims to reduce cost of electricity**



Sonoma State University senior Orion Leland displays the solar collector he's working on at the university last week. MARK ARONOFF / The Press Democrat

By [Bob Norberg](#)

THE PRESS DEMOCRAT

A Sonoma State University student has built a prototype solar collector that focuses the sun's energy on photovoltaic cells, increasing the ability to generate electricity thousands of times.

"The idea is to use optics to concentrate sunlight on a small piece of photovoltaic material," said Orion Leland of Rohnert Park. "The big cost of solar power is the photovoltaic material. If you can eliminate the amount of PV you need, you bring the cost down."

The research is an outgrowth of the \$2 million, remote-controlled telescope the university is building at its Galbreath Wildlands Preserve near Boonville. The telescope will be so powerful and its optics so advanced that it will be able to see a volcanic eruption on Io, a moon of Jupiter.

"The plan is to build a 1-meter telescope, which is far beyond anything we have here," said Scott Severson, an assistant professor in SSU's physics and astronomy department. "It'll get us a major astronomical observatory.

Good astronomy, however, needs a dark sky and usually a remote location, in this case a ridgetop in Mendocino County halfway between Cloverdale and Boonville.

"This project has grown out of the need to provide power to Galbreath," said Severson, referring to Leland's solar collector.

Severson said Leland's solar collector is one of several academic disciplines that will be necessary to operate the telescope, which is being constructed over the next three to five years.

The telescope will be remotely controlled from the SSU campus, requiring motor systems, cameras and computer controls and optics that Severson is developing in a new SSU laboratory.

Severson has established an adaptive optics lab at SSU and has an \$85,880 grant to develop a silver- or gold-coated mirror that will flex to take the turbulence out of the earth's atmosphere, giving the telescope an image as clear as one taken by a satellite in space.

Similar telescope systems now use an array of dozens of tiny, motor-actuated mirrors that can cost \$1 million. Severson said the flexible mirror he is developing can cut the cost to \$30,000.

The solar collector prototype is similarly a cost-cutting measure, but for the generation of electricity.

It uses a parabolic mirror that focuses sunlight on the end of a fiber-optic cable, which will then project the beam onto a photovoltaic cell. The collector is mounted on a tripod and tracks the sun.

"The idea is to have light coming out the fiber optics so we can study solar cells," Leland said. "It's exactly like a magnifying glass."

The collector will be mounted on the roof of SSU's Darwin Hall science building. It was developed by Orion at a cost of \$1,000, funded by SolFocus of Mountain View.

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