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FOR IMMEDIATE RELEASE

May 7, 2014

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### *Cal Poly Team's Solar Panels Win Second Place at International Competition*

SAN LUIS OBISPO — An innovative approach to solar panels won a Cal Poly environmental engineering team second place at the International Environmental Design (IEE) Contest held in April at New Mexico State University (NMSU) in Las Cruces, N.M.

The event brought together students from across the U.S. to develop technological solutions to environmental problems.

Cal Poly's team was recognized for its design of floating solar panels for a hypothetical copper mining operation in the southwestern U.S. It also picked up an innovation prize for energy efficiency.

Led by winners from last year's team — Yakov Suvorov, a senior, and Chris Pittner, a junior — this year's team included fourth-year student Ryan Yanda; third-year students Christian Bowen, Samuel Cronin, Nathaniel Homan, Kyle Lee, Jared Matthews and Collen Taggart; sophomore Kathrine Muirhead; and freshman Jillian Brown. Faculty co-advisors were Tracy Thatcher and Sam Vigil, civil and environmental engineering professors.

The students' primary challenge was to design and develop a floating solar cell platform that would save energy and water — two valuable commodities in the mining industry — without disrupting mining operations.

The team responded with an innovative design that emphasized flexibility.

"We mounted thin and flexible amorphous silicon panels to a flexible foam, producing a solar-cell configuration that covered the surface of the pond," said Pittner. "Much like a pool cover, it makes the platform easy to roll up and keep clean."

Added Suvorov: "Amorphous panels also have the advantage of being cheaper than crystalline panels. And even though amorphous panels have lower efficiency — which means a larger solar panel surface must be used to convert sufficient quantities of sunlight to electricity." The larger surface area was a plus in this case: the larger surface coverage affords more protection from evaporation.

"The judges liked the focus the students put on the reduction in evaporation of the mine tailings water by having their solar panels directly over a large surface of the pond," said Thatcher.

In addition to reducing water evaporation, the proposed system provides energy for use in pumping water for mine operations. The team estimated \$48,000 in annual savings from reduction in water evaporation and \$336,000 in energy savings.

The team was awarded a \$1,000 prize for its second-place finish, coupled with an Energy Efficiency Innovation Award of \$500 from NMSU's Institute for Energy & the Environment (IEE),

"It was gratifying to see Cal Poly make such a strong showing again this year," said Suvorov. "For a number of schools, the contest is part of a year-long design course. For us, it's part of a special one-unit, student-led course, with just two quarters to get everything together — from research and design to fabrication and presentation."

Last year, as a result of their participation in the contest, Pittner and Suvorov were invited by the IEE to extend their research through a special student internship. Over the summer, they studied waste management, water energy and distillation systems at NMSU and the Brackish Groundwater National Desalination Research Facility in Alamogordo, N.M.

IEE/WERC (Waste-management Education and Research Consortium) is a consortium for environmental education and technology development within the NMSU Department of Chemical Engineering. The annual IEE/WERC International Environmental Design Contest brings together industry, government and academia in the search for improved environmental solutions for real-world problems.

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