

The University of California
Advanced Solar Technologies Institute
(UC Solar)

Research—Innovation—Education

UCMERCED

Cal



UCDAVIS
UNIVERSITY OF CALIFORNIA

UCSanDiego
Local Impact, National Influence, Global Reach

UC Solar Mission Statement

UC Solar creates technologies that make solar energy systems more efficient, more affordable, and the best choice for the people of California and the world. In addition, UC solar educates and develops tomorrow's solar energy leaders and entrepreneurs.

UC Solar Overview

- UC Solar is a multi-campus, multidisciplinary solar research institute made up of faculty and researchers from UC Merced, UC Berkeley, UC Santa Barbara, UC Davis and UC San Diego
- Established in 2010 by the UC Office of Research
- The institute's faculty members include mechanical engineers, materials scientists, environmental engineers, physicists, biochemists and computer scientists
- UC Solar is led by UC Merced Professor Roland Winston
- Research projects are funded by government, corporate and foundation grants and private philanthropy

UC Solar Overview

- Initial UC Solar research areas include:
 - **UC Merced:** advancing the state-of-the-art in solar concentration (PV and thermal) and solar forecasting
 - **UC Berkeley:** employing nanotechnology in high efficiency solar cells and devices
 - **UCSB:** harnessing the UV portion of the solar spectrum
 - **UC Davis:** creating new solar cells and developing sunlight-to-electricity processes
 - **UCSD:** designing planar solar concentrators and enhanced forecasting technologies



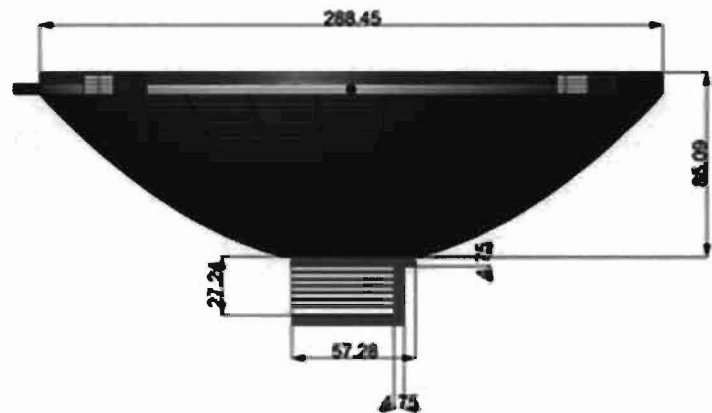
UC Solar Overview

- UC Solar faculty are leaders in their fields with track records of research and development success
- The emphasis is on “applied” research—projects that can be brought to market quickly and efficiently
- UC Solar is a vital component of a solar R&D continuum that is essential to California’s economic future
 - ***Education (UC Solar)***
 - ***Research (UC Solar)***
 - ***Innovation (UC Solar)***
 - Product development
 - Commercialization
 - Widespread adoption



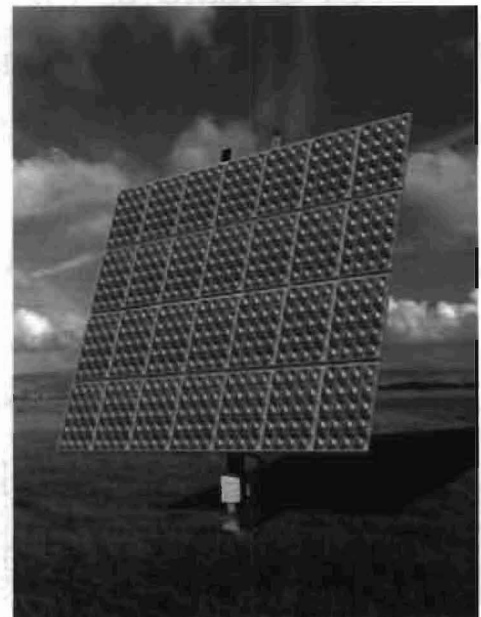
Concentrating PV

- Began working with Silicon Valley entrepreneurs in 2004
- Received a \$75,000 EISG grant to design a lower-cost alternative to flat panel PV systems using solar concentration
- System uses high-efficiency (40%+) multi-junction solar cells with 500 times concentration
- System design and testing were done at UC Merced



Concentrating PV

- Today, his work is being commercialized by SolFocus
- SolFocus is an industry leader headquartered in Mountain View, CA
 - Over \$160M in VC funding
 - 120 employees worldwide
 - 10MW deployed or under construction in the US
(California, Arizona, Colorado, Hawaii), Mexico, Spain, Portugal, Italy, Greece, South Africa, Saudi Arabia, Malaysia, Australia, and Korea



Solar Thermal

- With support from PIER, UC Merced has developed the External Compound Parabolic Concentrator (XCPC)
- XCPC features include:
 - Non-tracking design
 - 50% thermal efficiency at 200°C
 - Installation flexibility
 - Performs well in hazy conditions
- Displaces natural gas and electricity consumption and reduces emissions
- Targets commercial applications such as cooling, boiler preheating, dehydration, sterilization, desalination and steam extraction



Solar Thermal

- UC Solar is in the process completing a Solar Thermal Air Conditioning Demonstration Project
- 25Mw thermal collectors power a 6.5 ton double-effect absorption chiller
- Produces 500W thermal energy psm at a target cost of \$150 - \$200 psm
- The XCPC system is in the early stages of commercialization by two California companies



Contact Us

- For more information regarding UC Solar, please visit the UC Solar website at: www.UCSolar.org
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