



SCCAVS Newsletter



January 2011

Happy New Year from your local AVS Chapter

Special points of interest:

- Mt. Wilson Observatory Trip sold out!
- Solar Power Technology Speaker/Dinner at UCI synopsis
- Astounding Inventions at Irvine Valley College January 31, 2011
- Elections for Chapter Officers held. New positions announced below.

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Solar Cell Power Technology Dinner-Presentation, Tour: An Update from UC Irvine

Richard Stamberg

"Photovoltaic Solar Power Technology: Challenges and Opportunities" was presented by Dr. Lori Greene, Director of Research and Development at UC Irvine on October 6. We sponsored this enlightening field trip event to the University with a well attended presentation, tour and dinner. The meeting began with a tour of the UCI solar cell (crystalline silicon) power facility for generation of 895 KW total DC. Next, we were taken on a tour of a few of the UCI Solar Energy Research Labs including Dr. Matt Law with his nanostructure thin-film solar cells and quantum dot solar cells.

Lori Greene's delightful presentation emphasized that less than 1% of US power is presently generated by Photovoltaic (PV) Solar Energy and that there is much room for expansion, i.e.

there is vast potential in the US Southwest to generate significant terawatts of electrical power and reduce our dependence on foreign oil. Photovoltaic Solar Power has become one of the fastest growing industries as costs begin to rival those of conventional power sources. Lori's presentation was fast moving and included the four PV Cell Technologies:

1. Crystalline Silicon (mono XL, poly and Hetrojunction)
2. Thin Film (CdTe, CIGS[Cu (In,Ga)Se₂], Amorphous Si, Thin Film Si, and Micro-morph Si)
3. Multijunction Concentrators (Lattice-Matched, Metamorphic and Inverted Metamorphic using In-GaAs, P, Ge)
4. Emerging Technologies (Organic, Dye-Sensitized,

Nanocrystalline/ Quantum Dot, etc.)

Also covered were best cell efficiencies, costs of renewable energy, cost reduction trends, global cumulative installed PV capacity worldwide in 2008 (Germany and Spain lead), and UCI state-of-the-art research projects at the Center for Solar Energy.

Note: A few view graphs and additional pictures will be posted online early January at www.sccavs.org which show additional rooftop views of the installation and interior lab photos of the tour.

We all wish to thank Dr. Lori Greene for sharing her information with us.



Rooftop installation on Natural Sciences II



Tour of Professor Matthew Law's lab

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Astounding Inventions to be held at Irvine Valley College January 31,



Corinne Freeman

An invention competition for elementary and middle school students, this popular annual event draws many students from the Irvine Unified and Tustin Unified School Districts. Approximately 4,000 students compete in preliminary rounds within their schools and approximately 400 students participate in Astounding Inventions at IVC. Students compete within their own age groups and present the judges with an impressive display of creative and imaginative innovations. Earlier this year, this Irvine Valley College sponsored event had three kids on The Tonight Show with Jay Leno. In addition, top winning students (1 from TUSD and 1 from IUSD) received press coverage and received patent searches valued at \$10,000. All student receive blue, red, or green ribbons according to the judges scoring of the invention.



To see photos, click on: <http://www.ivc.edu/foundation/Pages/ai2010leno.aspx>. This year the SCCAVS will be a special awards judge for vacuum related inventions! The SCCAVS will be providing a certificate and monetary prize for one winner.

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CHAPTER OF THE
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TECHNOLOGY
SOCIETY**

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We're on the web!
www.sccavs.org

Upcoming Events

**NCCA VS 32nd
Annual Vacuum
Equipment
Exhibition
Wyndham Hotel
1350 North First St
San Jose, CA 95112
February 23, 2011**



www.nccavs.org



Local Chapter Events

Mt. Wilson Observatory Field Trip Proves Popular Event

Larry Oberlander

October 30th was the date of the SCCAVS tour at Mt Wilson. It was preceded by a cold, windy and stormy night. It brought rain to the valley below and snow to the upper reaches of the San Gabriel Mountains. Mount Wilson itself was spared the snow and ice. Twenty-three members and friends of the SCCAVS braved the elements and a fire-necessitated detour to tour the Mount Wilson Observatory. Our guides from the Mount Wilson Observatory Association, Gale Gant and Michael Rudy began with a history lesson including a stop at the mountain-top museum. We learned of Andrew Carnegie and George Ellery Hale, The former with money and the latter with a vision to construct telescopes of unprecedented size and capability. In 1904 Carnegie provided the money and within 4 years, two of the 3 Solar telescopes were finished as well as the 60 inch observatory. We toured it with amazement at how an instrument of such magnitude and Swiss clock precision could be constructed in the mountain wilderness. Seven hundred tons of material and equipment had to be hauled up the dirt Mount Wilson Toll Road.--quite a feat for c. 1907. In the observatory we passed an old set of lockers with names of astronomers who frequented this place. Whose name should we see front and center but Edwin Hubble's, hired by Hale in 1919. Hubble using the 60 inch and 100 inch telescopes would later show the universe was expanding.

Next stop was the 100 inch telescope. It advanced the 60 inch telescope and was larger and more powerful in every respect. The structure of the telescope and its mirror were massive. We were in awe of the knife switches and antique motors and mechanisms used to move this telescope and open the shutter. We were shown the old control console and a chair on an elevated platform to bring operators in proximity to the eye piece. A large disc type structure was actually a camera that operators would use over a period of as much as 2 days to gather light from distance galaxies. Continual compensation needed to be made for the earth's movement. At ground level of this observatory, was a coating room. Here a large diffusion-pumped chamber from the 1930s is used to coat all the mirrors on the mountain with a highly reflective aluminum coating. This process is repeated every 2-3 years. The tour ended with a visit to the Chara Array which allows combining light from six one meter mirror telescopes positioned in a "y" pattern encompassed by a 1086 foot circle. Light from the six are combined to create images as if from a quarter mile diameter single telescope mirror.

All in all, it was a fascinating day. We gathered at the Cosmic cafe to snap a group photo and enjoy a lunch with a view from on high. Then it was time to head back to Planet Earth. For additional photos of this event, see our SCCAVS.org website toward the end of December.

