



Science and Technology
of Materials, Interfaces, and Processing

Southern California Chapter

April 2013

Special points of interest:

- Bi-Annual Mt. Wilson Observatory field trip announced for August 10, 2013-60-Inch Telescope nighttime viewing!!!
- OCSEF 2013 Winners
- Elmer Carvey Scholarship
- SEW Held in Long Beach for 2013-Calling all teachers!!!

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Mt. Wilson Observatory Trip planned for August 10, 2013

Corinne D'Ambrosio

Join us for this rare opportunity for nighttime viewing through the historic 60-Inch telescope located at Mt. Wilson Observatory. In the first half of the 20th Century, eminent astronomers such as Harlow Shapley and Edwin Hubble used the incomparable facilities of Mount Wilson Observatory to forever alter humankind's view of our place in a vast and expanding Universe. Prior to World War I, this telescope revealed that the sun is *not* located at the center of the milky way. Today, Mount Wilson's original solar and night-time telescopes, the world's largest for two generations of as-

-tronomers, have been joined by new facilities achieving unprecedented high-resolution views of the stars.

For the first time, the SCCAVS is sponsoring a nighttime event complete with Observatory private tour starting at 6:00pm, followed by dinner on the observation deck of the 60-Inch Telescope, and hours of **private nighttime viewing through the telescope!** Join your local Chapter on Saturday, August 10, 2013 for this one-of-a-kind experience!

The views of planets, star clusters, nebulae, and galaxies through the 60 inch telescope are unforgettable.

Ticket prices are \$60 (no children under the age of 12 permitted), and include tour, dinner, and private viewing session **until 1:00AM.**

Parking is an additional fee of \$5 per car and passes must be purchased in advance. The approximately 2 -hour tour involves about a mile of walking and climbing some stairs. Please contact annacorinne@sccavs.org for more information. *There are only 25 spaces available and this event will sell out.*

Early Interest List: Deposit will be due in June for 1/2 total ticket price or \$30.

All Others: Registration via email or call (714) 536-2800



From Left to Right: 60-Inch Telescope and 100-Inch Telescope.
Photo credit: Dave Jurasevich

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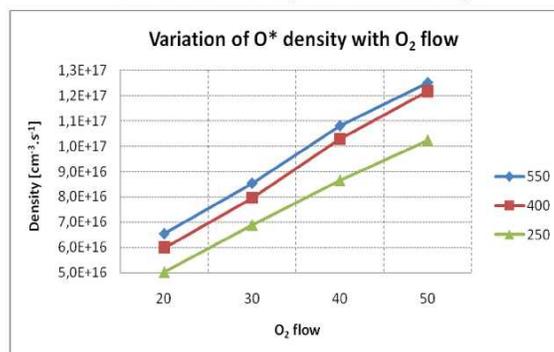
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**SOUTHERN CALIFORNIA
CHAPTER OF THE AVS :
THE SCIENCE &
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MATERIALS,
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PROCESSING**

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

Upcoming Events

SVC TechCon 2013
April 20-25, 2013
Rhode Island
Convention Center
Providence, RI

40th ICMCTF
April 29-May 3
Town & Country Hotel
San Diego, CA



AVS 60th International
Symposium &
Exhibition
Oct 27-Nov 1, 2013
Long Beach
Convention Center



Local Chapter Activities

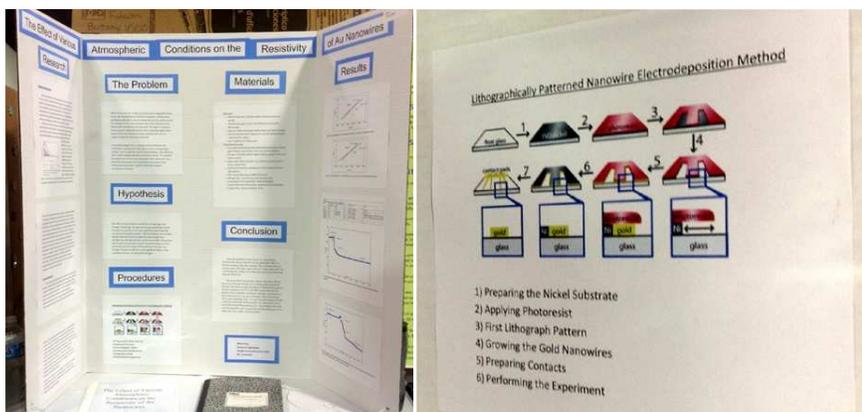
2013 OCSEF Held At OC Fairgrounds, Costa Mesa

Corinne D'Ambrosio & Dan Coursen

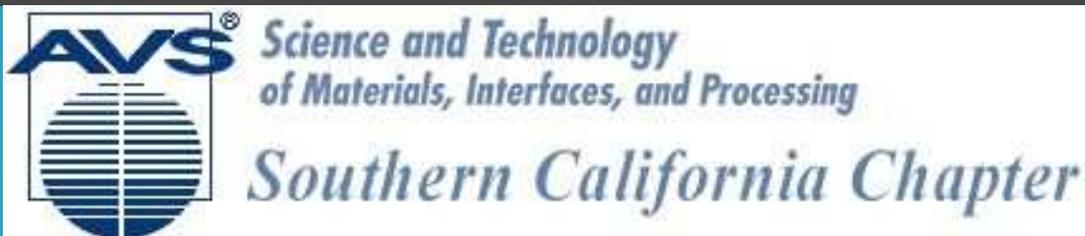
The 57th Annual Orange County Science & Engineering Fair was held on Tuesday, March 19th at the Orange County Fairgrounds in Costa Mesa. The science fair draws hundreds of middle and high school students from around the County. Many of the best exhibits are selected to enter the California State Science Fair. Dan Coursen of Coursen Coating Labs and Corinne D'Ambrosio of Mbar served as Special Awards Judges for the SCCAVS at this year's competition.

**1st Place Award (\$100): Albert Tung, University High School
"The Effect of Various Atmospheric Conditions on the Resistivity of Au Nanowires"**

This Senior in Ms. Levensailor's classroom at University High School is interested in solving the problem of resistance waste in electrical wiring, particularly in the "narcosm", referring to a wire that transverses even the distance of a chip at room temperature generating significant thermal energy in comparison to its size. With the demand for smaller processors and integrated circuits, Mr. Tung reports that industries are beginning to find that resistance of their wires (specifically nanowires) are increasing dramatically. He explains that the higher resistance means greater power loss and an ever increasing need to find ways to alter the internal structure of conductors such as copper and gold to decrease resistivity. His hypothesis was that out of two atmospheric conditions, nitrogen gas and nitrogen dioxide gas, that nitrogen dioxide gas would likely be the atmospheric condition that most significantly decreases the resistivity of the gold nanowire. Using the lithographically patterned nanowire electrodeposition method, this young man grew his own Au nanowires in preparation for his experiment. He used a Ni substrate, a metal evaporator with mechanical vacuum pump, applied photoresist and first lithograph pattern, grew the Au nanowires, and then prepared contacts to perform experiment. Based on tests conducted using a SEM, it showed that the wire became splotchy, with islands of gold where the wire was once continuous. Albert believes this was due to over-annealing of the wire, drawing the conclusion that nitrogen dioxide could have a significant potential effect on the recrystallization of gold nanowire. Although his results were not repeatable since nitrogen dioxide reacts with water vapor in the air to form nitric acid, disrupting the validity of the data, his research using vacuum deposition techniques, equipment, and analysis tools made this project stand out. We hope Mr. Tung continues his interest in the field of vacuum science and nanotechnology.



(Continued on next page)



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CHAPTER ANNOUNCEMENTS

AVS Science Educators' Workshop
October 28-29, 2013
Long Beach, California

The AVS Science and Technology Society is seeking applications for 8-10 high school and middle school science teachers to receive, FREE OF CHARGE, complete vacuum apparatus and training along with 1.5 CEUs or 150 hours from the University of Dayton.

Application Deadline: August 30, 2013

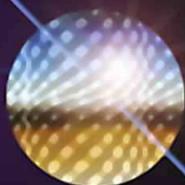
For more information:

<http://www.avs.org>

To apply:

<http://www.avs.org/education-science-educators-workshop.aspx>

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Elmer Carvey Scholarship Announcement

Jeff Lince

The Elmer Carvey Memorial Scholarship is awarded to undergraduate students attending public, four-year colleges in California. The stipend is \$1,500 for one year and is applied toward tuition during the 2013-2014 school year. Applications from students in physics, chemistry, materials science and engineering, whose desired career goals are in areas of interest to the society are encouraged (see <http://sccavs.org/about.htm>). (Biological sciences are generally not covered by this Scholarship unless the student's study area is interdisciplinary and involves areas of interest to the SCCAVS.) High school seniors and current college students may apply. Apply online at www.sccavs.org

Application Deadline: June 1, 2013

FEATURED WEBPAGE

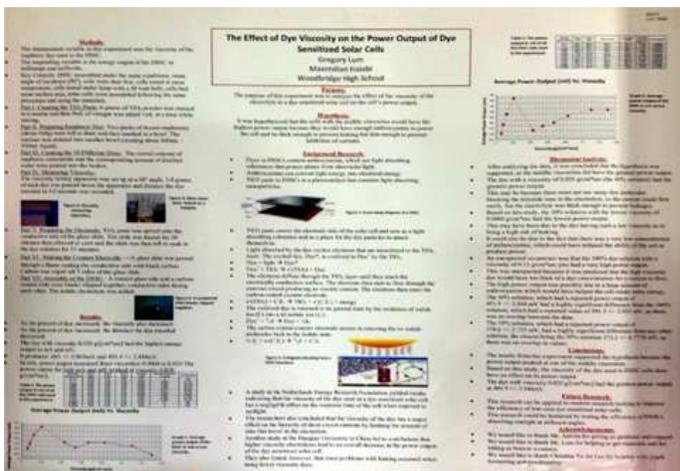
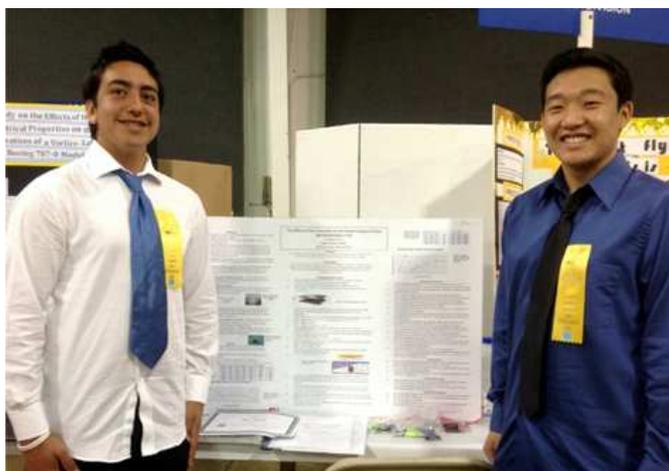
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technological community.

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2nd Place Award (\$50): Gregory Lum & Maximilian Halabi, Woodbridge High School
“The Effect of Dye Viscosity on the Power Output of Dye Sensitized Solar Cells”

Mr. Halabi and Mr. Lum are Juniors at Woodbridge High School in Irvine with an interest in solar power. At last year’s OCSEF Gregory Lum explored Silicon solar cells, which led him to his interest in dye sensitized solar cells as a competing technology. He and Maximilian Halabi were interested in DSSC because although they produce less energy than Si cells, they are much less expensive to produce. They hypothesized that dyes with the middle viscosities (60%, 50%, & 40% concentrations) would create the most efficient dye sensitized solar cell. They made the DSSC by mashing raspberries and mixing with different amounts of distilled water to create different dyes, and then TiO₂ paste was spread on the conductive side of a glass slide which was sintered on a hot plate and soaked in the dye solution. Another glass slide was passed through a flame conductive side down, creating a carbon coating, then finally the two slides were clipped together and the electrolyte was added. Using a multi-meter, data was recorded supporting the hypothesis. It was found that the DSSC dyed in 40% viscosity raspberry solution had the overall greatest average energy output of all the DSSC, with an average of 401.9 millivolts. We would like to encourage Mr. Lum and Mr. Halabi to further explore their interests in solar power technology, perhaps leading them to research in the field of vacuum science in the future.

For more information about the OCSEF visit: www.ocsef.org



April 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22 	23	24	25	26	27
28	29	 30	 1	 2	 3	 4