



SCCAVS Newsletter

December 2009

Happy Holidays!

Special points of interest:

- SEW held at AVS National in San Jose, CA
- Astounding Inventions!!!
- "Ask The Experts"
- Join us for our first 2010 meeting January 13th at 6pm. Location TBD. For more info & RSVP: sccavs@sccavs.org
- MARS Lander speaker meeting filled to capacity!

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Linda Ellsworth

Corinne Freeman

Ethel Poiré

Richard Stamberg

Dick Madison, Past-Chair

Greg Mills

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AVS Hosts Science Educator's Workshop in San Jose

Corinne Freeman

The AVS Science and Technology Society has conducted a two-day in-service workshop on low-pressure experiments and modeling for middle and high school science teachers since 1990. Teachers are sponsored by regional Chapters of the Society with all expenses paid by the sponsoring Chapter.

The workshop is divided into two parts: (1) lectures on the underlying science and the mathematical calculations and (2) hands-on experience in which a group of teachers perform experiments and develop models under the guidance of an instructor team. Upon completion of the workshop, teachers receive at no cost:

- A certificate of completion
- 1.4 Nationally certified CEU's
- A vacuum system for their school identical to ones used in the workshop

Astounding Inventions!!!

Every year, the Irvine Valley College Foundation hosts Astounding Inventions, a premier elementary and middle school invention competition that is now in its 23rd successful year. The participants come from the Irvine and Tustin Unified School Districts and the event features original student invention displays. Over 4,000 students will compete in preliminary rounds within their own schools for the



The Southern California Chapter of the AVS chose teacher Charlie Seo (2nd from left) to attend this year's Science Educator's Workshop in San Jose, CA, pictured here with committee members from L-R: Linda Ellsworth, Corinne Freeman, and Ethel Poiré

This year's winner sponsored by the Southern California Chapter was Mr. Charles Seo of Camino Nuevo High School in Los Angeles. Camino Nuevo is a charter school focused on project-based learning, and Mr. Seo is the only chemistry teacher.

After attending the workshop, Charles said he was surprised at the size of the conference, that he had a blast, and is excited to apply what he learned. The next workshop will be held in Albuquerque, NM in the Fall of 2010.

privilege to compete at Astounding Inventions and possibly a chance to appear on The Tonight Show with Jay Leno. The IVCF is looking for volunteer judges for the next event to be held on Saturday, January 31, 2009. This is an opportunity to listen to a fast pitch and then interview some really clever kids. If you are interested please respond to Dr. Richard Nelson, rnelson@richardnelson.com.

SCCAVS Launches Job Site on Web

The Southern California Chapter of the AVS would like to remind our members that we have a jobs page on our website, and that we will post resumes or employer job announcements free of charge.

For info contact:
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Southern California Representatives for:

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- Brooks Automation Inc.** - www.brooks.com
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Advertising Opportunity

Sponsorship starts at just \$75 per quarter, and a discount rate of \$250 for the entire year (4 issues) is available.

Please contact Corinne Freeman with questions.
Our next issue will go out in March 2010.

Corinne@sccavs.org

SCCAVS Exhibits at the CSTA Conference

Corinne Freeman

The Southern California Chapter of the AVS shared table space with the Northern California Chapter at this year's California Science Teacher's Association Conference in Palm Springs. The 4-Day conference took place in October at the Wyndham Palm Springs Hotel. At the AVS booth we displayed several low-priced, low-tech vacuum experiments for the classroom teacher, grades K-12, such as the Magdeburg Hemispheres and demonstration of Boyle's Law using a simple Foodsaver "chamber", hand held pump, and balloons. One favorite demonstration was using a simple plastic food bag, battery operated vacuum pump from Reynolds, and a porous sponge or even a marshmallow to show that air indeed has "weight" when you change going from a high to low pressure environment. The NCCAVS gave away several \$20 vacuum "kits" to local teachers at a CSTA afternoon event. More information on these and other classroom experiments can be on the web at www.nccavs.org and www.thebelljar.net.



Exhibiting at CSTA Conference



**SOUTHERN
CALIFORNIA
CHAPTER OF THE
AVS**

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

Upcoming Events:

**NCCAVS 31st Annual
Vacuum Equipment
Exhibition**

Wyndham San Jose
Hotel

1350 North First Street

San Jose, CA 95112

February 10, 2010



The Science and Technology Society

Planet MARS Dinner Meeting September 29 with Michael Hecht (JPL) was Filled to Capacity (32 attendees)

Richard Stamberg

Life on Mars would truly be different from that on Earth. Dr. Michael Hecht of Jet Propulsion Labs in Pasadena treated us to a rare and entertaining glimpse into the environs of Mars at our Dinner Meeting September 29th with a beautiful display of color. Starting with a simulated launch and journey, we landed near the North Pole off Mars via animation on May 25, 2008 - almost like being there. The main goal of the Phoenix Mars Mission was to identify and verify that there was water-ice on the planet - necessary to sustain LIFE ON MARS. The chemistry of Martian Soil was unveiled as we probed the surface first with cameras, then with a scoop to expose what lies under the soil which was ICE - in fact vast sheets of it. Originally termed "white stuff" until it was carefully analyzed with probes and in a beaker. Wet chemistry was performed to determine the pH (about 8 after the ice was melted). Salts were examined in the water (high in non-toxic perchlorates and magnesium). Soil analysis included an optical microscope to determine the size and shape of Martian dirt particles, and even utilized an atomic force microscope which worked well. At night, moisture condensed from the Martian atmosphere to form crystals on the arms of the Phoenix Lander. Frost was very evident on camera close-ups.

The Phoenix Lander "rose from the ashes" of parts resurrected from earlier JPL projects built on a shoestring budget to become fully successful. LIDAR Laser Radar was used to see a few large snowstorms.

The soil was determined to be non-toxic. The air pressure on Mars is only 1% that of Earth with very little nitrogen. The atmosphere is 95% carbon dioxide (35x that of Earth) with some oxygen and argon. There are volcanoes on Mars but not at the North Pole. The mission lasted 151 Martian days (about 4 Earth months) until night enveloped the Lander.

When the sun finally went down, the mission ended because of lack of power from the solar cells. We wish to thank Dr. Michael Hecht and JPL for this exciting journey to MARS.

Community Q&A: "Ask The Experts"

Ethel Poiré
Welcome to our new Q&A forum where questions can be sent in by you, the reader, and answered by industry experts from our membership! All questions and answers are to be sent to:

ask@sccavs@sccavs.org

Deadline is March 1st, 2009

Last Month's Question:

"I am new to designing for vacuum. Our customer has asked us to build our product for use in space and requested we use low outgassing materials. Can you suggest a reference for finding low outgassing materials and the relative difference between materials?" -SB

Member Response:

Check NASA Reference Publication 1124 or <http://outgassing.nasa.gov>

Question of the Month:

The typical potting compounds used for producing metallurgical cross sections tend to work well for scanning electron microscopy, but not for Auger electron spectroscopy (and other surface analysis techniques) because of the lower vacuum level (UHV vs. HV) and increased sensitivity to charging. Are there compounds available that have sufficiently low electrical conductivity and vapor pressure, and yet retain good properties for sectioning and polishing cross sections?