



The Materials Information Society

www.ASM-SCV.org

Santa Clara Valley Chapter

December 2003

Volume 47, Number 4

Wednesday, December 10

Electroactive Polymers: Stretching the Limits of Transducer Technology

Roy Kornbluh
SRI International

This Month Only We Will Meet at a Special Location!

Please remember to indicate a meal selection when you sign up!

5:30 pm Social/Networking... 6:15 pm Dinner... 7:30 pm Speaker

Meeting Location:

Mariani's Inn

2500 El Camino Real
Santa Clara
(408)243-1431

Dinner Cost: ASM Members \$20, Students \$10, Guests \$25

Meal Choices: Coulette Steak, Broiled Fillet of Halibut, or Vegetarian Lasagna

RESERVATIONS REQUIRED:

Stacy Ewert at (408) 742-2521 or stacy.s.ewert@lmco.com

Reservation deadline is 1pm on Monday, Dec 8 (\$5 late fee after this time)

Tour of Salazar Glass December 13... See Page 3 for More Info



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Meeting Directions

Mariani's Inn is on El Camino Real, just west of San Tomas Expressway. From highway 101, take the San Tomas Expressway/Montague Expressway exit, proceed south on San Tomas, and turn right on El Camino. From highway 280, take the Saratoga Ave. exit, proceed north on Saratoga Ave., turn left onto San Tomas Expressway, and then left again at El Camino. In either case, Mariani's will be on the left (south) side of El Camino shortly after your turn.

RETURN SERVICE REQUESTED

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Have You Moved Recently?

If so, please remember to correct your address by logging onto the national website, www.asminternational.org, where you can review and update your membership record.

About the Topic

Electroactive Polymers: Stretching the Limits of Transducer Technology

Electroactive polymers (EAPs) offer the potential to overcome limitations of traditional smart material and transducer technologies. A particularly promising class of EAP is dielectric elastomers. Dielectric elastomer transducers are rubbery insulating polymer materials with compliant electrodes that have a large electromechanical response to an applied electric field. The technology has been developed to the point where outstanding performance has already been demonstrated. For example, the strains and elastic energy corresponding to an applied electric field is larger than that observed in any other field-activated materials, including the best piezoelectrics - strains of over 300% have been demonstrated. Dielectric elastomers have also shown potential for use as large-area "skins" and as monolithic substrates on which many individually addressable areas can be patterned. Because of their unique characteristics and expected low cost, dielectric elastomer transducers are under development in a wide range of applications including multifunctional muscle-like actuators for biomimetic robots, microactuators for MEMS, smart structures, conformal loudspeakers, haptic displays, shoe-mounted generators for harvesting the energy of walking and replacements for electromagnetic and pneumatic actuators for industrial applications. The dielectric elastomers have shown unique performance in each of these applications, however, some further development is required before they can be integrated into products and smart materials systems. Among the many issues that may ultimately determine the success or failure of the actuation technology for specific applications are the durability of the actuator, the operating voltage and power requirements, and the size, cost and complexity of the required electronic driving circuitry.

The talk will describe the principle of EAP operation, show the performance of various polymer materials and highlight projects in a variety of applications. A live demonstration will be performed.

About the Speaker

Roy Kornbluh

SRI International

Roy Kornbluh is a Senior Research Engineer at SRI International, where he has worked for most of the past 15 years. During that time he has been involved with several projects relating to the development of electromechanical devices and systems as a member of the Advanced Transducers Program. These projects have included the development of a tonometric blood pressure monitoring instrument and automated mail handling systems. For the past nine years, Roy has focused on the development of electroactive polymer transducers for a variety of commercial and government applications. Roy has authored more than 30 published papers and journal articles. He holds several patents in the area of electroactive polymers and other transducer technologies. Prior to arriving at SRI, Roy received his Masters degree in mechanical engineering from the Massachusetts Institute of Technology and his bachelors in mechanical engineering from Cornell University. Roy served as a water and sanitation consultant in Ecuador as a member of the Peace Corps from 1991 to 1994. Roy serves on the program committee for the SPIE Conference on Electroactive Polymer Actuators and Devices, Actuators 2004 Conference and IASTED Conference on Robotics and Automation.

Tour of Salazar Glass

We are pleased to once again offer a tour of Salazar Glass!

This year's event will take place Saturday, December 13... See Page 3 for sign-up info.

Last Month's Sponsor

We would like to thank **Exponent Failure Analysis Associates** for sponsoring our November Meeting. Exponent is a leading engineering and scientific and consulting firm. We appreciate Exponent's support, which enables us to provide quality technical programming at a reasonable cost. We are still seeking sponsors for future meetings. If you are interested, please contact Dave Himmelblau at (408)743-7893 or dave.himmelblau@lmco.com

Bruce G. Pound, Ph.D.
Managing Scientist

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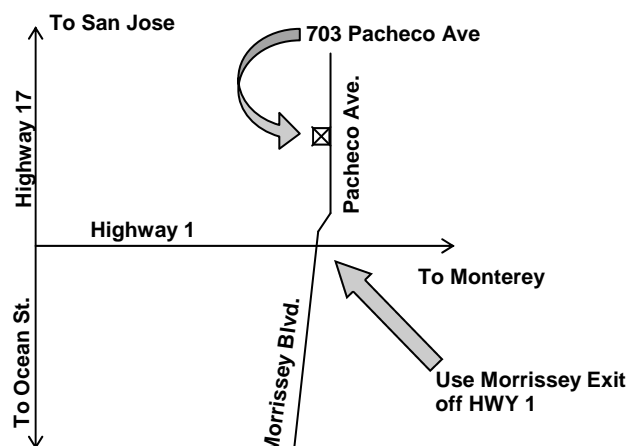
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Menlo Park, CA 94025
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Tour of David P. Salazar Glass

This year we will again offer a tour of David P. Salazar Glass. For those of you who don't know, David P. Salazar Glass is a glass art studio in Santa Cruz. The artist, David Salazar, uses the techniques of torchwork, lampwork and millefiori to create his dazzling art glass. This is an opportunity to see the fascinating process in action, as well as to prepare for some of your holiday gift-giving needs. David is a very entertaining host, and his tours have always been hits in the past, especially with the kids. To get an idea of what his work looks like, visit www.salazarglass.com.

The tour will be on **Saturday, December 13, 2003**. We'll meet at the studio at **10am sharp**, and the tour should run for several hours. We need an accurate headcount by **Thursday, December 11**, so if you plan to attend, please sign up. To do so, call Bob Wallace at (408)867-4576. The location Salazar Glass is: 703 Pacheco Ave., Santa Cruz., see the map at the right.

Map to David P. Salazar Glass



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Job Opening

Honeywell Electronic Materials is looking for a Senior Development Engineer at their Spokane, WA facility. The position involves leading development projects on new products and new processes for sputtering targets used in the semiconductor industry. The individual is responsible for transferring these new products into production. This will require working in a cross-functional team environment. The Senior Development Engineer will also need to keep up to date with technology trends and use this information to recommend new manufacturing techniques and processes that will complement or expand Honeywell's core competencies.

A successful candidate will be a team player with good communication skills who is also enthusiastic, goal oriented, and self-motivated. The position requires an education in Materials Science or Metallurgical Engineering, and hands on experience in PVD. A working knowledge of 6 Sigma tools is preferred.

Interested Candidates should visit myinterconnect.com and honeywell.com to learn more about Honeywell and the Electronic Materials Division. Please submit resumes via e-mail to Dr. Susan Strothers at susan.strothers@honeywell.com.

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SCV Member Receives ASM International Award

Professor Reinhold H. Dauskardt, professor and associate chair, Department of Materials Science and Engineering, Stanford University (and SCV Chapter member!) is the 2003 recipient of the **Materials Science Research Silver Medal**. Established in 1986, this award recognizes a materials scientist whose individual and collaborative work has had a major impact on the science of materials. This award is administered by the ASM Materials Science Critical Technology Sector. Congratulations, Professor Dauskardt!



Materials CampSM Fact Sheet

WHAT IS MATERIALS CAMP?

- Week-long, summer residential camp utilizing hands-on learning principles of applied math, physics, chemistry, and basic physics.
- A very unique team-based, intensive problem solving science experience under the direction of a distinguished world-class faculty “Materials Mentor”.
- Combination of mini-demonstrations, field trips with extensive involvement in unique laboratory facilities to actively explore materials science & engineering principles.

WHEN AND WHERE ARE MATERIALS CAMPS LOCATED?

- Residential Student Camps :
 - Materials Camp-Canada (McMaster University) - July 4-11, 2004
 - The Eisenman Materials Camp (Materials Park, OH) - August 9-15, 2004
- Nonresidential/Day Camps:
 - Materials Camp-Chicago - July 12-17, 2004
 - Materials Camp-Seattle - Dates TBA
 - Materials Camp-Quad Cities - Dates TBA
 - Materials Camp-Lehigh Valley - Dates TBA
- Mini-Camps (One Day only):
 - Materials Camp-Los Angeles - Date TBA
 - Materials Camp-Columbus (during the ASM Materials Solutions Conference)

WHO SHOULD ATTEND?

- Students entering their Junior or Senior year in high school.
- Highly motivated inquisitive learners with math and science aptitude.

WHAT DOES IT COST TO ATTEND?

- Absolutely nothing. Students receive free travel, housing, meals, tuition, entertainment and knowledge.

HOW DO STUDENTS APPLY?

- Applications are available online (see below), and are due by **January 31**.
- Required information includes school transcript, a maximum of two letters of recommendation, and a personal essay (200 words or more).

HOW ARE STUDENTS SELECTED?

- This is a competitive application process. Students must have basic knowledge of algebra, chemistry, and physics and describe why they want to learn more about engineering and materials science as a possible college major and career.
- Experienced practicing engineers review each application to select the “best and brightest”, highly motivated students who have not yet made a firm decision about a college major or career.
- Students must have a strong interest in applied science.
- Prior participation in science fairs is helpful, but not required.

WHAT WILL STUDENTS ACTUALLY DO AT MATERIALS CAMP?

- **Have fun.** Our number one goal is to make applied science an exciting, fun experience.
- Solve a technical problem. Using the “failure analysis” exploration model, students work in small groups and investigate the failure of a man-made material to perform its intended function.
- Learn to use state-of-the-art research equipment in an engineering laboratory under the guidance of experts.

WHERE CAN I GET ADDITIONAL INFORMATION?

- Visit our website at: www.asminternational.org/foundation The website has more information and downloadable applications.
- Call the ASM International Foundation toll-free: 1-800-336-5152.

Deadline Coming Soon!

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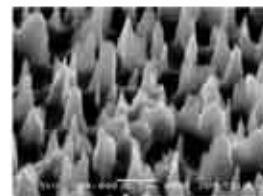
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Upcoming Events

There are still a few local engineering events this month despite the holiday season...


Dec 8: ASME, "ASME Networking Forum: Building a 'Whole' Career". Visit www.asme.org/sections/scvs/

Dec 10: AIChE, "Tour of Alza Corporation". Visit www.aiche-norcal.org/Meetings/dec03_south.htm

Dec 10: IEEE-CPMT, "Outlook for the Semiconductor Equipment/Materials Market.". Visit cpmt.org/scv/meetings/cpmt0312.html

Dec 16: IEEE-LEOS, "How the Laser Came To Be". Visit www.silicavalley.com

Jan 22: ASC, "Unraveling the Past through Chemistry". Visit www.scvacs.org



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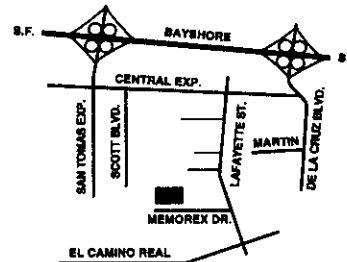
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Chapter Information & Upcoming Activities

Officers

Chair:

Jacques Matteau (650)591-7787

Vice Chair:

Ramas Raman (408)567-0941

Treasurer:

Richard Chung (408)924-3927

Secretary:

Stacy Ewert (408) 742-2521

Executive Committee

Mark Alexander (831)338-4790

Paul Fojas (510)538-7309

Ed Francis (408)653-1700

Dave Himmelblau (408)743-7893

Alfred Kwong (408)248-1916

Fred Landry (650)508-8700

Mingwei Li (650)966-5735

Lou Wirtz (408)756-0621

Shari Yokota (650)594-4065

Special Positions

SVEC Rep:

Ed Kaminski (408)241-4842

Newsletter Editor:

Scott Dickerson (408)986-3655

Thanks to our ASMI-SCV Sustaining Member:

CSU - Fresno Henry Madden Fresno

Would your company like to support the chapter by being a sustaining member? To find out more, contact Fred Landry at fred@altairusa.com.

Executive Committee Meetings: ASM-SCV Executive Committee meetings are held in September, October, January, March and May. Any member can attend! Call Jacques Matteau at (650)591-7787 for meeting times and locations, and to reserve a seat at the table.

SM

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Upcoming Meetings: **Jan:** Manufacturing of Computer Chips...
Feb: Bioceramics... **Mar:** Flat Panel Displays... **Apr:** Materials
Selection Software...*Stay tuned for more info!*

Never Too Late to Participate in Your Chapter

Many of you may not know, but the Santa Clara Valley chapter of ASM has 7 committees working throughout the year to provide services to the local membership, welcome new members, and generally further the causes of ASM International on a local level. Committee chairs for the 2003-2004 season have been appointed by the Executive Committee, but we could still use some additional new faces and fresh ideas for the committees themselves! Please consider joining one of the teams and help to shape the SCV ASM the way you want it. Participation in chapter leadership is valuable to you in terms of networking with other prominent ASM members, contributing to the chapter's direction, and developing your leadership skills that will be helpful in furthering your career. This year the Committees are as follows.

Technical Program: Traditionally, this committee is chaired by the Chapter Vice Chair. The primary duty is to find and schedule speakers for the monthly dinner meetings. There is also an Arrangements Subcommittee, whose duties include collecting meeting fees, taking reservations, selecting meeting menus, arranging for presentation equipment, bringing door prizes, and finding a meeting facility from year to year. *Contact: Ramas Raman, ramas@surmet.com*

Sponsorship: This committee identifies meeting sponsors and advertisers for the chapter bulletin and website. This committee makes an important financial contribution to the chapter and provides an opportunity for member's companies to publicize their goods and services. *Contact: Dave Himmelblau, dave.himmelblau@lmco.com*

Membership: This committee encourages membership in the ASM-SVC, including Sustaining Membership (special category for corporate members). The committee welcomes new members and encourages nonmembers to attend monthly meetings and become new members. *Contact: Fred Landry, fred@altairusa.com*

Education: This committee arranges and organizes chapter education such as classes and symposia. Members interface with local universities, high schools, and the "Discover E" program. They also endorse local participation in ASM International's Materials Camp events, and assist with annual Science Fair judging. Additionally, this committee leads the ASM-SCV Chapter Scholarship selection and award activities. *Contact: Mingwei Li, mli@splasers.com*

Yearbook: This committee is charged with producing and distributing a yearbook (membership directory) for the chapter. *Contact: Shari Yokota, shari.yokota@cpii.com*

Publicity: This committee publicizes the chapter's activities. It publishes and distributes the monthly newsletter, maintains the chapter website, submits articles to ASM International, and provides e-mail communication and other information of interest to the membership. *Contact: Scott Dickerson, scott_dickerson@amat.com*

Long Range Planning: This committee functions to develop chapter direction to meet the future needs of the members. The committee uses information obtained from member surveys and feedback from the other committees to plan the future goals of the chapter. *Contact: Jacques Matteau, Jacques@altairusa.com*