

Applied Diamond Conference 1995 to Focus on Improved Processing Technology for Commercial Diamond Applications

The 3rd International Conference on the Applications of Diamond Films and Related Materials will be held August 21–24, 1995 at the National Institute of Standards and Technology (NIST), Gaithersburg, Maryland. The meeting is sponsored by NIST and cosponsored by the Materials Research Society and the American Physical Society. Cooperating societies are: American Carbon Society, American Ceramic Society, ASM International®, IEEE—Electron Devices Society, Japan New Diamond Forum, and SPIE.

With the objective of identifying technical barriers that hinder large-scale commercial diamond applications, as well as research strategies for overcoming these barriers, this biennial conference brings manufacturers and end-users of diamond and related technologies together with scientific researchers in the field. This year, the focus will be on new developments and advances in diamond process-

ing technologies, including major mechanical, thermal, optical, electronic, medical, and chemical applications of diamond, diamondlike carbon, cubic boron nitride, C-N compounds, and related wide-bandgap superhard materials.

Papers are solicited on topics covering both practical applications and basic science, including but not limited to:

- Cutting Tools,
- Sensors,
- Wear-Resistant Surfaces,
- Biomedical Implants,
- Bearings,
- Deposition Process Optimization,
- Protective Coatings,
- Scale-Up,
- Polishing,
- Oriented Growth,
- Heat Management,
- Low-Temperature Growth,
- Electronic Packaging,
- Fabrication Process,
- Active Electronics,

- Process Monitoring,
- Optoelectronics,
- Performance Evaluation,
- Windows, Lenses, Domes,
- Economic Analyses, and
- Acoustics.

Contributing authors must submit five copies of an abstract (up to one page long) by **January 30, 1995**. Manuscripts will be published in the Conference Proceedings, to be distributed at the conference.

Demonstrations of products, processing equipment, and prototype specimens that show progress in the development of applications are encouraged, but sales promotions are not permitted at NIST.

For further information, please contact the conference chairman: Albert Feldman, Chairman ADC '95, National Institute of Standards and Technology, A329 Materials Building, Gaithersburg, MD 20899; fax: (301) 990-8729; e-mail: feldman@micf.nist.gov. □

EDUCATION EXCHANGE

“The Material World”: Making the World of Science Materialize for Kids

Three years ago, the University of Rochester formed its chapter of the Materials Research Society (URCMRS). Since then, our membership has expanded to more than 60 members (graduate students, postdocs, and faculty) spanning eight different departments within the University: Chemical Engineering, Chemistry, the Science and Technology Center, Electrical Engineering, Laboratory for Laser Energetics, Mechanical Engineering, Institute of Optics, and Physics. Our activities include conducting an annual symposium, sponsoring invited speakers, distributing newsletters and abstracts, hosting happy hours, holding general meetings, and conducting grassroots education activities for local students and educators. This year we have made great strides in the area of grassroots education and would like to share some of our experiences.

A Science Day for Scouts

On March 12, URCMRS hosted 50 minority members of the Girl Scouts of

America for a science day entitled “The Material World.” The event—sponsored through a collaboration between URCMRS, the Society of Hispanic Professional Engineers, and the Girl Scouts of Genesee Valley—was designed for children in the sixth through eighth grades. We treated our guests to a series of science demonstrations, a forum on women in science, and a hands-on experiment.

I began the program by welcoming the girl scouts to the university campus, handing out a program of the day's events, and explaining some of the aspects of materials research. I pointed to the major issues in choosing materials for a given task, or to creating new materials, then reviewed these issues in the context of the upcoming demonstrations, to give the young visitors a more critical perspective and increase the depth of their experience.

Four half-hour-long demonstrations, conducted in succession, facilitated the presentation of different elements of

materials research and science. To introduce the properties of polymers, Anita Alanko (graduate student, Chemical Engineering) and Robin Henderson (postdoc, Chemistry) explained the synthesis and properties of nylon and slime. This was the scouts' favorite demonstration, probably because Robin handed out chewing gum and explained that it was also a polymer. The girls got really excited about touching the slime, and all of them wanted to take it home. Although they were unfamiliar with the term “polymer,” they all recognized everyday materials made of polymers, such as styrofoam cups, pantyhose, and spandex.

Eileen Korenic and Marie Inman (graduate students, Optics) then introduced the concepts of optics, materials, and light. They discussed such issues as polarization and color. This demonstration was perhaps too advanced. The scouts enjoyed seeing rainbows on the ceiling, but I think the concept of polarization was too difficult. Next, the scouts observed Paul Rodney and Leon Waxer

(graduate students, Optics) demonstrate levitation in superconducting materials. They learned about electrical conductivity and how it changes in superconductors. They loved the liquid nitrogen demonstrations! Paul and Leon froze a number of different things, the girls' favorite being the carnation that shattered all over the floor. Finally, Karen Moore (graduate student, Optics) and Michal Freedhoff (graduate student, Chemistry) discussed lasers, sound, and waves, concluding their demonstration with a laser show synchronized to music. Many of the girls, I was surprised to learn, had attended laser light shows in the past, but they still enjoyed the music and bouncing laser beams.

After lunch, the girls were given the opportunity to query a panel of local women scientists and graduate students. Following a brief introduction by each speaker, scouts were encouraged to ask the invited scientists why and how they had become interested in science and what it was like to be a scientist. The girls' responses were not as enthusiastic as we had hoped. Although they listened intently, there were very few questions. The committee discussed this afterwards and decided that the girls' age group (between 8–12 years) was not conducive to the panel discussion format. The girls were too young to appreciate such an opportunity, and had not had enough time to formulate or even anticipate what problems they might encounter in college. Junior high school or high school students would probably have better appreciated the panel.

The hands-on experiment consisted of making a silicate garden. After dumping their favorite-color minerals into the silicate solution, the girl scouts capped their garden and took it home, complete with directions for safe and environmentally friendly disposal.

It was very hard work (and great fun) designing, organizing, and implementing the day-long event. It was nice because we could be as creative as we wanted and could choose any program format we desired. The design was not too difficult; we knew we wanted to do materials-related demonstrations. All of us had been exposed to a science show as undergraduates, so we got ideas from that.

The Education Exchange highlights the experiences of scientists and engineers with local schools, along with helpful hints and resources. If you would like to share your own involvement in science education, contact: Finley Shapiro, Department of Electrical and Computer Engineering, Drexel University, Philadelphia, PA 19104, U.S.A. Phone (215) 895-6749; fax (215) 895-1695; e-mail: shapiro@ece.drexel.edu.

Apart from being really tired after "The Material World," we felt great about our efforts and success, and exchanged stories of the day's events.

The Girl Scout program has been our most ambitious undertaking, and we were fortunate to have been publicized in a local and a campus newspaper, as well as on a local television show. All feedback from the scouts themselves was extremely positive; 54 out of 55 said they had had fun and learned something. We hope that we sparked some interest in science in a segment of the population that may not ordinarily be exposed to it.

In starting the grassroots education effort, we found that our biggest challenge was getting the program off the ground. All of us really wanted to educate young people about science, and to encourage them to pursue it if they have an interest. We also wanted to erase some of the preconceived notions about science: that it is too difficult to understand, that scientists are all "nerds," or that it is a field for men only. But how do you do this? Where do you begin? Whom do you call? Once we were able to answer these questions, the rest was easy because we then had the resources and the enthusiasm to carry out the remaining tasks. The key was in finding a contact. One phone call to Diana Garcia-Prichard—a personal friend who is heavily involved in community outreach programs for children—and we were on our way. Diana introduced us to the Girl Scouts and set up the preliminary meeting. It was through her that we were able to get this program off the ground.

Other Grassroots Efforts

URCMRS has also participated in two other grassroots events this year. One took place at a local museum during Engineering Week. Demonstrations at the Rochester Museum and Science Center were organized so that area children and their parents could see many facets of materials science. Before crowds of eager viewers, URCMRS performed several experiments that demonstrated different materials properties. Most recently, URCMRS participated in a Teacher/Mentor program in collaboration with the Rochester Business Alliance and Eastman Kodak's 21st Century Learning Challenge. Seven Rochester city elementary school teachers were hosted for four half-day sessions. Depending on which graduate student they were paired with, the teachers were shown different aspects and experimental techniques of materials science research. Everything from third harmonic generation experiments to gas chromatography was offered.

By creating programs such as these, URCMRS hopes to inspire not only children but also parents and educators, and to achieve its goal of spreading knowledge of science beyond the confines of the university campus. Because of our effort, the chapter was recently awarded \$500 from the Science and Technology Center in the Chemistry Department for future grassroots-related endeavors!

JULIE REHM

Julie Rehm is a fourth-year graduate student in chemistry at the University of Rochester, Rochester, New York, and is the 1993–94 president of the University of Rochester Chapter of Materials Research Society. She works on the spectroscopic characterization of semiconductor nanocrystalline materials, such as porous silicon, silver bromide, and titanium dioxide. For more information about URCMRS, please send her e-mail at: rehm@chem.chem.rochester.edu.

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