Preview: 1997 MRS Spring Meeting

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Meeting Chairs:
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The 1997 Spring Meeting, with 26 technical symposia, reflects the immense breadth of the materials community covering a wide range of topics from polymers to semiconductors to superconductors and from polycrystalline thin films to epitaxial growth mechanisms. The meeting, located at the San Francisco Marriott, runs from March 31 to April 4.

A number of symposia on electronic materials will take place at the meeting. In mainstream Si processing, integration problems (Symposium K) have become ever more critical, overlapping reliability issues (Symposium J) and surface preparation (Symposium P). Low-dielectric-constant materials (Symposium N) offer more challenges, but these materials are strongly needed by industry. Many manufacturers are looking to implement them imminently. It is therefore a critical time for their development.

A new symposium in the silicon area is Symposium O, which, along with the associated tutorial, will address materials problem-solving techniques and the identification of failure- and yield-loss mechanisms for Si ultralarge-scale-integration processing. It will highlight new inspection and diagnostic methods for understanding effects of microcontamination, identifying problems associated with new dielectrics and electrodes, and understanding other issues associated with devices relying on high-purity materials and nanometer-scale features.

Also new is Symposium E, reflecting the need to understand the atomistics of diffusion in Si. The integrated-circuit manufacturer needs to model the details of atomic diffusion in order to predict device performance from process parameters. This need is pushing understanding of Si diffusion processes to the next level.

While materials issues still dominate the new nitrides (Symposium D), processing problems (Symposium C) are the focus for more traditional compound semiconductors. Another class of materials combines versatile mechanical properties of polymers and electrical properties of semiconductors to produce light-emitting diodes and field-effect transistors. These organic materials and issues associated with their use will be considered in Symposium H. For amorphous silicon (Symposium A) and flat-panel displays (Symposium G), the symposium titles remain the same as ones run previously by MRS, but devices are moving into a new era.

The relationship of magnetic properties and device performance to structure at the atomic, nanometer, and submicron length scales will be the focus of Symposium M. In the area of optical materials, Symposium S will look at materials that change their transmission properties when exposed to varying light intensities (optical limiting materials).

Now that many components are computer-designed, the process of rapid prototyping and solid freeform manufacture (Symposium U) can reduce the time to move a concept through development. Prototype parts can be formed directly from the computer model by depositing a sequence of patterned thin layers to make a variety of macroscopic shapes with specified materials characteristics. Materials synthesis also can be influenced by structure-directing agents and self-assembly phenomena to manipulate and control the structure and chemistry of inorganic-organic interfaces. Symposium V will address these issues to tailor porous materials, thin films, and other inorganic-organic composites.

Metastability and critical phenomena as applied to polymer phase behavior will be discussed in Symposium W. Metastable phase behavior can be influenced by size, order, and symmetry of the polymer. Moreover phase transformations can be impeded by kinetic limitations.

In the area of computational materials science (Symposium T), the focus will be on the mesoscale (1–100 microns), with the purpose of connecting knowledge of the atomic scale to the macroscopic scale. Features such as grain boundaries, dislocations, grain growth, and crack propagation will be modeled.

For the sports-minded materials scientist, Symposium Y on Materials for Sports and Recreation includes talks on advanced materials for yachting, windsurfing, skiing, biking, and other recreational activities.

Other symposia cover rapid thermal processing, epitaxial oxides, thermoelectric materials, high-temperature superconductors, and specimen preparation for transmission electron microscopy.

Special Events

Special events are highlighted on the following pages but include a plenary presentation Monday evening by Paul Peercy, President, SEMI/SEMATECH on "Materials Research and the Semiconductor Industry in the Twenty-First Century"; a presentation by the 1997 Outstanding Young Investigator Christopher N. Bowman of the University of Colorado on "Polymerization and Properties of Polymer-Stabilized Ferroelectric Liquid Crystals"; and presentation of graduate student awards.

Presented at noontime, Symposium X, Frontiers of Materials Research: Authoritative Reviews for Nonspecialists, includes a clever array of topics geared toward a broad technical audience. Monday covers life on Mars with one talk on a Martian meteorite and another on robots for Mars. Tuesday starts with "What's New in the Sausage Factory," focusing on how the government works, with a second talk on university and industry research. Wednesday covers novel materials with negative aspect ratios (thermal expansion and Poisson's ratio). The Thursday session addresses "Materials Challenges in the Human Genome Project."

The MRS Membership and Academic Affairs Committees are sponsoring a Junior Faculty Forum on the art of obtaining grants, a student mixer, a networking happy hour for job seekers, a Women in Materials Science and Education event, and a job center. Also, university chapters and students teams are invited to participate in a photo contest of "symmetry scapes," with photos scheduled to be displayed during the meeting.

Meeting registrants also can benefit from major poster sessions Tuesday through Thursday which for the first time will include a competition for the "best" poster presentation each evening, an exhibit including a reception Tuesday evening from 5:00–6:30 p.m., and tutorials (overview lectures by leading experts) integrated into the technical program. See the following pages for a matrix of symposia sessions, highlights of special events, profiles of exhibitors, and other information. If you need a program or would like to register, contact MRS at 412-367-3003 (phone); fax 412-367-4373; e-mail info@mrs.org; or see the MRS website http://www.mrs.org/ for information. MRS