

# SAN DIEGO MEETING HIGHLIGHTS

**T**hey say it never rains in San Diego in May, but it did when the ECS showed up for its first meeting there. The unusual and brief showers didn't dampen anyone's spirits at the Society's 193rd Meeting this past May. Among other highlights, the Meeting featured an impressive gathering of many of the trailblazers of the microelectronics industry (from the Silicon 1998 Symposium), and the first-time offering of a new symposium on Government, Academic, and Industrial Interactions in the New Global Economic Environment. The Meeting drew 1,637 attendees and 1,175 papers presented in 35 symposia. There were over 21 posters in the Society General Student Poster Session, and 35 booths and displays for the Technical Exhibition.

## "The Research University of the 21st Century"

As Provost and Senior Vice-President of the University of California (UC), C. Judson King's thoughts on the future of research universities are not only important as it applies to the nine existing UC campuses, but in the planning of the tenth campus in Merced which will be the first new major university of the new century. In his plenary address, Dr. King shared his perspectives and the challenges and opportunities of research universities as they "change and adapt to the times." He also conceded that the future is difficult to predict, considering the changes since the time he was programming with ORACLE as a student at MIT.

First, Dr. King listed the traditional roles of the research university as discoverers, generators, organizers, custodians, and deliverers of knowledge, and in evolving and nurturing critical thinking and creativity. Then he outlined the major changes that will be occurring: (1) information technology in which global networking and increased bandwidth will overcome distance, time, time zones, and language in research; (2) demographic and education and career path changes in which there will be increased ethnic diversity, increased availability and quality of education with university education being the primary route to upward mobility, and a shift to life-long learning and continuous education; (3) a shrinking globe with "world business and a business world" (often giving a shortened horizon for research); and (4) financing research and judging its worth.

The question of how the research university will evolve with these changes was pondered next by Dr. King. The nature of research will change from individual investigator to collaborative partnerships with international teams. Global problems, such as control of weapons destruction and environmental issues, will be addressed in the "global laboratory" and with increased emphasis on language



**Award Winners** — (from left to right) Robert A. Rapp received the Henry B. Linford Award for Distinguished Teaching; Barry Miller, 1997-98 ECS President, presented the awards; and Walther G. Grot received the Vittorio de Nora Award.

**The Research University of the 21st Century** — C. Judson King, Provost and Senior Vice President, Academic Affairs, of the University of California system, presented the Plenary Lecture, the text of which appears on page 17 of this issue.



Photos by Karras Photography, San Diego, California

studies. Scholarly communication will be via electronic journals and home pages with "living" publications. The best and most lasting will be reserved for peer-reviewed, archival publications. The information base for research will include extensive databases, intricate network linkages and more powerful search engines. The structure of the research enterprise will be such that industry will pursue targeted and proprietary applied R&D, while universities will pursue new discoveries and the interpretation and generalization of knowledge in a public sense. However, there will be limits on research as it will be necessary to explain its value to society. The national laboratories will focus on research pertaining to national interests such as defense, environment, building codes, criminal justice, etc. The size of the research enterprise will change by a paring down of the production of PhDs. Dr. King felt the California master plan for education was worthy of exportation, as a way to implement change for the future in education.

Dr. King concluded by predicting that education in the research university of the future would foster creativity, provide a breadth of education, deliver first professional degrees, have increased diversity and access, respond to the impact of information technology, and provide continuing, life-long education. There will be growths of partnerships of all sorts to facilitate these changes as research universities enter the 21st century.



**Welcome to the San Diego Meeting** — (Right) *The Host Committee for the 193rd Meeting included (left to right): Chris J. Johnson, Jan B. Talbot, Walter A. Tracinski (Chairman), and Weihong (Wendy) Li. A great welcome, but we thought it never rained in San Diego in May!*



**Microelectronics Revolutionaries.** — (Above) *The 1998 Silicon Symposium celebrated the 50th anniversary of the commercialization of the point-contact transistor, and included a special historical session, "Fifty Years and Counting." Presenters from the session included: (front row, left to right) Norman G. Einspruch, Yoshio Nishi, Bruce E. Deal, S. M. Hu, Junichi Nishizawa, R. C. Newman, and George Rozgonyi; (back row, left to right) Ulrich Gösele, Alfred Seeger, Else Kooi, Jack S. Kilby, Howard R. Huff, (Helen Huff, who provided secretarial assistance for the proceedings volume), Takao Abe, Michael Riordan, Hans J. Queisser, Kurt Hubner, Kiyoo Itoh, and Hideki Tsuya. Missing from the picture are Makoto Kikuchi and Gunter Schwuttke.*



**Technical Exhibition** — *Over 40 exhibitors presented displays and information on instruments, systems, materials, and publications. The technical Exhibition was the setting for the Monday Evening Mixer and Student Poster Session.*



*A view of the audience for Dr. King's lecture.*

### Vittorio de Nora Award Address

Following the Honors and Awards Session on Wednesday morning, May 6, Dr. Walther G. Grot presented his award address titled "Perfluorinated Ionomers - Past and Future." Dr. Grot discussed both the introduction and modern day use of NAFION polymer membranes in both the chlor-alkali industry and for fuel cells. He discussed the use of NAFION as an improved separator in the electrolysis of sodium chloride solutions as compared to mercury and diaphragm cells. These membranes offer independent optimization of the structural components, and lower investment and production cost (i.e., electric power consumption) for the chlor-alkali industry. Membrane cells represent 100% of new capacity and 30% of existing total capacity of 35K tons/day. Dr. Grot projected a slide actually made of NAFION, about which he commented was less expensive than the other slides in his presentation.

Dr. Grot then described the process he developed, while employed at DuPont, to convert NAFION to a liquid which occurs by phase inversion in an alcohol. In a serendipitous discovery, Dr. Grot's planned experiment had failed as the NAFION dissolved. At the time there was no use in mind for this process. However, this process is now essential for the modern solid polymer electrolyte membrane (PEM) fuel cell.

It was noted by Dr. Grot that fuel cells offer a wide power output range from  $10^{-2}$  to  $10^5$  kW. The challenges in R&D for PEM fuel cells were discussed, such as improvement in the three-phase contact for gas, protons and electrons, reduction of membrane resistance, and improvement in water management. Membranes are needed that have unique selectivity properties so as to prevent diffusion in direct methanol-air fuel cells. Dr. Grot concluded by stating there were reasonable prospects of solving these problems. ■

### Board Highlights

- ▶ Results of the 1998 election were announced, and the following new officers began their terms on May 9, 1998: Gerard Blom as President, Jan B. Talbot as Third Vice-President, and William D. Brown as Treasurer.
- ▶ The Nominating Committee's slate for nominees for the 1999 election were approved— Vice-President: Karl E. Spear and Subhash C. Singhal.
- ▶ A Publication Agreement was approved to allow the co-sponsorship of *Electrochemical and Solid-State Letters* (premiering July 1998) by the Institute of Electrical and Electronics Engineers/Electron Devices Society.
- ▶ The formation of a new Local Section, Korea, was approved; Su-Moon Park will serve as its first Chairman.
- ▶ Guidelines for the Dissolution or Consolidation of Divisions and Groups were approved.
- ▶ A plan for selling Meeting abstracts online was approved. Abstracts from Meetings will be available for free before the current Meeting, and for about six months after. Individual abstracts from previous meetings may be purchased, at \$5.00 for members and \$6.00 for nonmembers (per abstract).
- ▶ The Finance Committee reported that the Society had another excellent year, ending 1997 with an operating surplus of \$451,417, primarily attributed to greater-than-budgeted income from Meetings, the Journal, and Proceedings Volumes.
- ▶ Orlando, Florida was approved as the site for the Fall 2003 Meeting. Other approvals included Europe (Paris or Vienna) as the site for the Spring 2003 or 2004 Meeting.

*Contributions to Meeting Highlights were from Jan B. Talbot and Mary E. Yess, Interface's Editor and Managing Editor, respectively.*