



Cancun

Meeting Highlights

October 29 through November 3, 2006

Cancun, Mexico was the site of the first Joint International Meeting of three technical societies: ECS, the **Sociedad Mexicana de Electroquímica** (SMEQ), and the **Sociedad Iberoamericana de Electroquímica** (SIBAE). SIBAE Past Presidents Yunny Meas and Ernesto Gonzalez and past ECS President Jan Talbot all played an important role in the planning of this meeting. This meeting was successful on many levels: it provided an excellent array of technical sessions, enabled those working in the field to meet new counterparts from around the world, and had a number of social events to make the meeting a memorable one. There were 2,185 presentations in 50 symposia, including poster sessions that drew 84 entries from students and 438 posters for other symposia. Members of the ECS IE&EE Division

traveled offsite to run a special outreach program for 65 high school and 100 undergraduate freshmen students in the area of hydrogen polymer electrolyte membrane (PEM) fuel cells. (See story on page 15.) Although many symposia were still going strong on Friday, the more social aspect of the meeting closed out with a "Cena Baile" (dinner dance) on Thursday evening. Upon entering the event, guests were treated to an array of Mexican food in a room decorated with vibrantly-colored piñatas and table decorations. The real fun of the evening got started shortly after when a live band provided non-stop entertainment for everyone to dance the night away. This first joint meeting of ECS, SMEQ, and SIBAE certainly set the standard for future collaborations. Following are highlights from just two of the major talks given at the meeting.

Plenary Session: **"Science and Technology Policy in Mexico for the 21st Century"**

The plenary talk was given by **José Luis Fernández Zayas** on "Science and Technology Policy in Mexico for the 21st Century." Dr. Fernández Zayas is a senior researcher at the Institute of Engineering of the National Autonomous University of Mexico (UNAM). The speaker started out with historical perspectives on Mexico's science and technology (S&T) policy through the years. Until the 19th century, the country had adopted an isolationist stance and resisted external influences. This softened somewhat in the 20th century and the economy did not open up till NAFTA was signed some 20 years ago. The challenges with having an S&T giant (*i.e.*, U.S.A.) just north of the border have been considerable in Mexico's attempts to



Cancun, Mexico was site of the first joint international meeting of ECS, the Sociedad Mexicana de Electroquímica (SMEQ), and the Sociedad Iberoamericana de Electroquímica (SIBAE). Marking this historic occasion were **MANUEL LOPEZ TEJERO** (far left), President of SIBAE; **MARK ALLENDORE**, ECS President (second from right); and **LUIS GODÍNEZ MORA-TOVAR** (far right), SMEQ President. Joining them was **JOSÉ LUIS FERNÁNDEZ ZAYAS** (second from left), of the Universidad Nacional Autónoma de México (UNAM), who delivered the Plenary Lecture.

make up lost ground in technological competitiveness with the rest of the advanced world. In particular, the brain drain of trained scientists, engineers, and professionals from Mexico to the U.S. has been a crucial problem.

Dr. Fernández Zayas showed data on how poorly Mexico fared relative to other countries, in terms of the number of scientists and engineers, as a function of R&D expenditures in units of %GNP. Countries like the U.S. and Finland were at the top of this chart. The speaker then charted out strategies for improving the technological competitiveness of Mexico. He referred to a linear model that relies on the progression from science to technology to innovation, leading ultimately to competitiveness in the market arena. Value is added to knowledge at each stage in this progression (*i.e.*, creating a “knowledge economy”). A major problem with Mexico is that the vast majority of the jobs are “low-tech” and do not create wealth. The challenge then for Mexico for the 21st century is to increase the financial return per unit of labor input; and this can only be done by raising the level of education and the technological awareness among a much greater swath of the population.

Dr. Fernández Zayas then turned to a discussion of the strategic technical areas targeted by the new government policy makers. These include materials, biotech (genomics), software and wireless, and advanced manufacture. Sustainable development, with particular attention to societal needs, would be one cornerstone of this new S&T policy. He identified the three axes of this policy as promoting S&T in the new to medium term balanced with cultural and economic initiatives, creation of new and better quality (high-tech) jobs that create substantial wealth (the Silicon Valley model), and the development of new and successful social/education schemes to bring up the poor and disadvantaged sections of the Mexican society.

Many of the points addressed in this interesting lecture could have been easily transposed to any developing nation but the speaker was particularly effective in reminding the audience that Mexico was looking to her neighbor for collaboration and co-operation rather than pity, in her quest to achieve technological competitiveness in a global economy.

The Sunday Evening “XYZ” Talk: “Polymer Electrolyte Fuel Cells for the Rest of Us”

The “XYZ for the Rest of Us” lecture series is fast becoming a popular fixture in the ECS meeting landscape. This was again reflected in the excellent turnout on Sunday (notwithstanding the numerous



The 2006 Edward G. Acheson Medal, one of ECS's highest honors, was awarded to **VITTORIO DE NORA**, who could not be in Cancun to accept the award. **RENE VON KAENEL** (right), President of MOLTECH, received the medal on behalf of Dr. de Nora from ECS President **MARK ALLENDORF** (left).

distractions available at the resort) for “Polymer Electrolyte Fuel Cells for the Rest of Us” given by **Jim Fenton**. Dr. Fenton, Director of the Florida Solar Energy Center and professor of mechanical, materials, and aerospace engineering at the University of Central Florida (Orlando), was introduced by Prof. Johna Leddy (University of Iowa), a founding member of the ECS Education Committee that sponsors this lecture series at each meeting.

The speaker began his fast-paced and entertaining talk with an overview of the energy crisis and the disproportionate and gluttonous use of fossil fuel resources by the U.S. The steps taken by the current government to address this looming

crisis, including the Hydrogen Fuel and Freedom Car initiatives, were then mentioned within the context of where fuel cell technology fitted in. The barriers to a hydrogen economy rested with finding cost-effective and efficient solutions to hydrogen storage and production. Lowering of fuel cell system costs was another crucial aspect of the challenges facing the renewable energy R&D community. Fuel diversity in the short term (meaning a mix of fossil fuels, nuclear, and renewable energy options) would have to give way to a dominance of carbon-free energy in the long term such that CO₂

(continued on page 11)



HOCK MIN NG (right) is the second recipient of the ECS Charles W. Tobias Young Investigator Award, which is given to a young scientist or engineer who has produced outstanding scientific or engineering work in fundamental or applied electrochemistry or solid-state science and technology. He received the award from ECS President **MARK ALLENDORF** (left).



ECS President **MARK ALLENDORF** (front row, center) inducted the 2006 Class of ECS Fellows. Pictured in the front row, from left to right, are: **ANIL VIRKAR**, **ALBERT G. BACA**, (Allendorf), **MARK ORAZEM**, and **GERALD FRANKEL**. In the back row, from left to right, are: **NOBUYOSHI KOSHIDA**, **HARUMI YOKOKAWA**, **BARRY MACDOUGALL**, **HISHAM MASSOUD**, **DURGA MISRA**, and **SUPRIYO BANDYOPADHYAY**. Unable to attend the ceremony were new Fellows **THOMAS FAHIDY**, **CHENNUPATI JAGADISH**, **JEAN LESSARD**, and **ANDRZEJ WIECKOWSKI**.

Meeting Highlights

(continued from page 9)

(and other greenhouse gas) levels could be capped at safe limits. Particularly noteworthy was a graph of how the steeply rising trend of

gasoline consumption with time could be slowed and even inverted with an increasing penetration of hybrid vehicles and fuel-cell powered transportation.

The talk then turned to a focus on the various types of fuel cells with

particular emphasis of the polymer electrolyte membrane (PEM) variety, which is now being considered for transportation applications (Editor's note: See, for example, Vol. 14, No. 3, fall 2005 issue of this magazine).

The technical challenges associated with durability, cost, and high temperature operation of PEMFCs were then discussed along with electrochemical methods for testing components and complete systems. Particularly of interest in this part of the lecture, especially to the non-specialists in the audience, were examples of niche applications and "success stories" of FC deployment such as the N.Y. Central Park Precinct police station (which escaped the power black-out that swept the East Coast a couple of years back) and the much lighter FC power packs to be carried by future soldiers on the battlefield relative to the heavy (72 lb.) battery loads with which they are currently burdened. ■



The **TECHNICAL EXHIBIT** in Cancun featured over 30 companies, with presentations of instruments, technology, and publications. The blank poster boards in the background were ready for the 84 student posters on Monday night and the 438 posters from other sessions.