

## Mihail Roco Receives FMS National Materials Advancement Award

**MIHAIL C. ROCO**, the primary coordinator of the U.S. nanotechnology science, engineering, and technology effort, received the National Materials Advancement Award from the Federation of Materials Societies (FMS) at a reception at the National Press Club in Washington, DC, on December 5, 2007. FMS ([www.materialsocieties.org](http://www.materialsocieties.org)) is an umbrella organization whose member societies and affiliates represent the professional societies, universities, and National Research Council organizations that are involved with materials science, engineering, and technology. ECS is a member society.

The National Materials Advancement Award is presented to recognize individuals who have demonstrated outstanding capabilities and contributions in: advancing the multi-disciplinary field of materials science and engineering; the effective and economic use of materials in the marketplace and the application of materials developments to national problems and defense; and the development and implementation of national policy which furthers

the impact of materials sciences and engineering on our society.

Dr. Roco chairs the National Science and Technology Council's subcommittee on Nanoscale Science, Engineering, and Technology (NSET) and is Senior Advisor for Nanotechnology at the National Science Foundation. He is widely recognized as the individual most responsible for support and investment in nanotechnology by government, industry, and academia worldwide. Envisioning a "next industrial revolution" powered by advances in the control of matter at the nanoscale, he built a coalition of agencies that became the nucleus of the National Nanotechnology Initiative (NNI) launched in 2000. Since then, federal investment in nanotechnology has almost tripled, to nearly \$1.5 billion in fiscal year 2007. The NNI has served as a catalyst for additional investments in R&D, education, infrastructure, and commercialization by foreign governments, universities, states, venture capitalists, start-ups, and leading multinationals in many industrial sectors. It also recognizes the

need to support education at all levels, including K-12 students and teachers. Dr. Roco's leadership has emphasized pre-competitive issues such as intellectual property, environmental/safety/health concerns, and standards/metrology.

Prior to joining NSF, Dr. Roco was a professor of mechanical engineering at the University of Kentucky and held visiting professorships at the California Institute of Technology, Johns Hopkins University, Tohoku University, and Delft University of Technology. He helped create a new forum—the International Conference on Cooperation and Collaboration—whose third meeting was April 2007 in Brussels. He has served as editor for the *Journal of Fluids Engineering* and *Journal of Measurement Science and Technology*, and is Editor-in-Chief of the *Journal of Nanoparticle Research*.

Previous recipients of the National Materials Advancement Award include ECS members Robert Baboian, retired Fellow of Texas Instruments (1998), and Jerry M. Woodall, Purdue University (2002). ■



## Subhash Singhal Wins Fuel Cell Seminar Award

Fuel cell pioneer **SUBHASH SINGHAL** received the 2007 Fuel Cell Seminar and Exposition Award during the Plenary Session of the Fuel Cell Seminar in San Antonio, Texas in October. Dr. Singhal was given this award for his outstanding leadership and innovation in the promotion and overall advancement of fuel cell technology. In his acceptance speech, Dr.

Singhal reflected on the evolution of solid oxide fuel cells for clean and efficient power generation and his role in this evolution.

Dr. Singhal has been a member of ECS since 1976 and was named an ECS Fellow in 1996. He received the ECS HTM Division's Outstanding Achievement Award in 1994. He served on the ECS Board of Directors during 1992-94, and continues as the chair of the highly successful biennial International Symposium on Solid Oxide Fuel Cells, which he initiated in 1989. Dr. Singhal served as chair of an ad hoc Long Range Planning Committee (2002-2005) and is currently chair of the ECS Publication Committee.

A Battelle Fellow, Dr. Singhal is the Director of Fuel Cells at the Pacific Northwest National Laboratory (PNNL) in Richland, Washington, where he provides senior technical, managerial, and commercialization leadership to the Lab's extensive fuel cell program.

He is a highly regarded, acknowledged world leader in solid oxide fuel cells (SOFCs). He joined PNNL in April 2000 after having worked at Siemens Power Generation (formerly Westinghouse Electric Corporation) for over 29 years. Dr. Singhal is also an adjunct professor in the Department of Materials Science and Engineering at the University of Utah; and serves on the Visiting Advisory Board of the Department of Materials Science and Engineering at the University of Florida.

At Siemens/Westinghouse, he conducted and/or managed major research, development, and demonstration programs in the field of fuel cells. From 1984 to 2000, he was manager of Fuel Cell Technology there, and was responsible for the development of high temperature solid oxide fuel cells for stationary power generation. In this role, he led an internationally recognized group in the SOFC technology and brought this technology from a few-watt laboratory curiosity to fully-integrated 200 kW size power generation systems. He has authored over 75 scientific publications, edited 14 books, received 13 patents, and given over 250 plenary, keynote and other invited presentations worldwide. His book on *High Temperature Solid Oxide Fuel Cells: Fundamentals, Design and Applications* has received worldwide acclaim and has also been translated in the Chinese language.

Dr. Singhal received a BS degree in physics, chemistry, and mathematics from Agra University; a BE degree in metallurgy from the Indian Institute of Science; a PhD degree in materials science and engineering from the University of Pennsylvania; and an MBA from

(continued on next page)

**Singhal***(continued from previous page)*

the University of Pittsburgh. Dr. Singhal is a member of the U.S. National Academy of Engineering, a Fellow of four professional societies (ECS, American Ceramic Society, ASM International, and American Association for the Advancement of Science); and a senior member of the Mineral, Metals & Materials Society. He served as President of the International Society for Solid State Ionics during 2003-2005.

Dr. Singhal has received several awards for his contributions to solid oxide fuel cell technology, including the American Ceramic Society's Edward Orton Jr. Memorial Award in 2001; an Invited Professorship Award from the Japan Ministry of Science, Education, and Culture in 2002; and the Christian Friedrich Schoenbein Gold Medal from the European Fuel Cell Forum in 2006. He serves on the Editorial Board of the *Journal of Power Sources* and is an Associate Editor of ASME's *Journal of Fuel Cell Science and Technology*. He has also served on many national and international advisory panels

including those of the National Research Council, National Science Foundation, Materials Properties Council, U.S. Department of Energy, NATO Advanced Study Institutes and NATO Science for Peace Programs, United Nations Development Program (UNDP), United Nations Industrial Development Organization (UNIDO), International Energy Agency (IEA), and the European Commission.

Dr. Singhal has been responsible for promoting solid oxide fuel cell technology for clean and efficient power generation through his pioneering and continuing a biennial International Symposium on Solid Oxide Fuel Cells and through his large number of lectures worldwide. He has advised many international organizations and countries on this technology, and has participated in numerous radio, TV, and print media interviews to explain and promote the technology. He has also been active in facilitating collaboration among industry, academia, and national laboratories. ■

**In Memoriam****Roger Gordon Bates  
(1912-2007)**

**ROGER GORDON BATES**, an emeritus professor of chemistry at the University of Florida, died August 20. Prof. Bates was best known for his work leading to the operational definition of "pH" and the NBS pH scale. He received his BS from the University of Massachusetts in 1934; and received MA and PhD degrees at Duke University (1937). He was then awarded a Sterling Fellowship at Yale University, where he spent two years involved in postdoctoral chemical research. In 1939, he moved to Washington, DC, and took a position as a physical chemist at the National Bureau of Standards, where he remained for 30 years. At the NBS, he served as chief of the Electrochemical Analysis Section and assistant chief of the Analytical Chemistry Division.

Dr. Bates was the author of more than 200 journal articles and three books, including *Electrometric pH Determinations* in 1954 and *Determination of pH: Theory and Practice* in 1964 and 1973.

Dr. Bates was awarded the Hillebrand Prize of ACS's Washington, DC, Section in 1955; the Gold Medal for Exceptional Service of the Commerce Department in 1957; the ACS Award in Analytical Chemistry in 1969; and the Anachem Award of the Federation of Analytical Chemistry & Spectroscopy Societies in 1983. In 1995, he was recognized by the Analytical Division of the Royal Society of Chemistry "for distinguished contributions to solution chemistry." He was a fellow of the American Institute of Chemists and the American Association for the Advancement of Science.

From 1951 to 1983, Bates was active in both the Analytical Chemistry and Physical Chemistry Divisions of the

International Union of Pure & Applied Chemistry, serving as chair of both the Commission on Electrochemical Data and the Commission on Electroanalytical Chemistry. Bates also served on the editorial advisory boards of several publications, including *Chemical & Engineering News and Analytical Chemistry*.

Upon his retirement from NBS in 1969, he accepted a position on the chemistry faculty at the University of Florida, where he taught until 1979. Prof. Bates continued to be involved in graduate education at the University of Florida long past his retirement from active research. He taught jointly, with Herb Laitinen, a graduate analytical chemistry course and established a Bates and Laitinen Award in Analytical Chemistry at the University of Florida that each year recognizes outstanding analytical chemistry graduate students at the University of Florida. ■

**Erratum**

The fall 2007 issue of *Interface* was published as Vol. 17, No. 3; it should have been Vol. 16, No. 3. We apologize for any inconvenience.