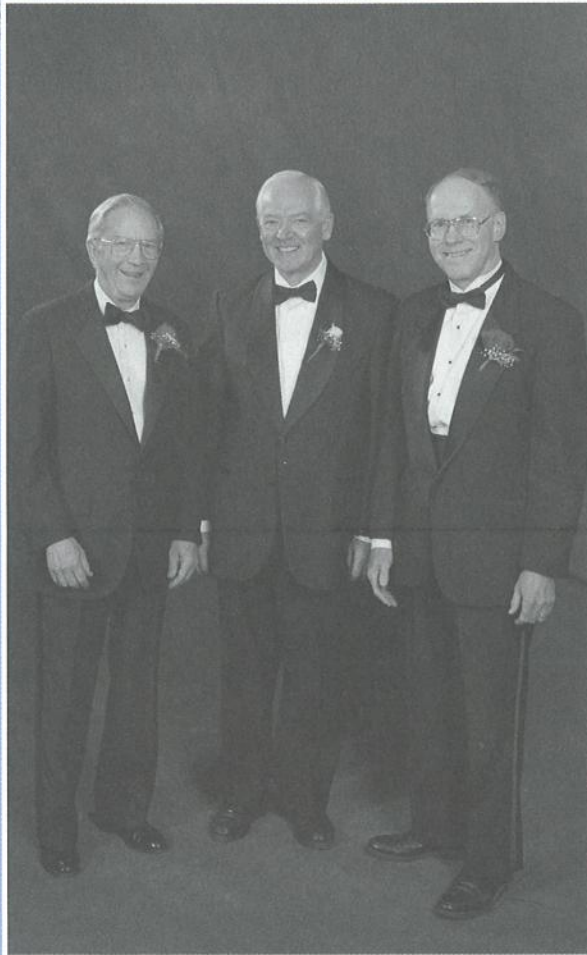# The President's Perspective

TO HONOR the memory of Haraden Pratt, who was Director Emeritus of the IEEE and who had given dedicated and distinguished service to the Institute for 31 years, the IEEE Foundation sponsors the presentation of the *IEEE Haraden Pratt Award*. Established in 1971, this Award is presented annually during the IEEE Honors Ceremony. Pictured here from left to right are Emerson W. Pugh, IEEE Foundation President; Charles W. Turner, 2003 IEEE Haraden Pratt Award recipient, and Michael Adler, IEEE President.

We become who we are because of the influence of our experiences and special individuals who touch our lives. Over the years, IEEE societies, members and their families, friends, colleagues, and corporations have worked with the IEEE Foundation to recognize, honor, and remember some of those special individuals who have helped shape us, our technical communities, and the world in which we live.

This year, for example, two IEEE Societies chose to honor important leaders in their technical communities. The IEEE Communications Society established the *IEEE Guglielmo Marconi Paper Prize Award* to remember the work of Guglielmo Marconi and to honor an original paper in the field of Wireless Communications. Qualcomm Incorporated sponsors the Award. The IEEE Power Engineering Society and GE Power Systems established the *IEEE-PES Charles Concordia Power Systems Engineering Award* to honor Charles Concordia, a long time GE Engineer. The Award recognizes outstanding contributions in the high-voltage electric power systems-engineering field.

The IEEE Foundation is pleased to have played a role in helping us remember the seminal contributions of key individuals in our profession and, by honoring these individuals, providing role models and additional incentives for our future leaders. I invite you to read more about some special Funds and the people they honor in the pages of this newsletter as well as on the IEEE Foundation website at **www.ieee.org/foundation**.

Best Regards,

Emerson Pugh

Emerson Pugh
President, IEEE Foundation

Creativity on Display at Fourth Annual CSIDC

By: **Stacy Saul**, IEEE Computer Society

Complex designs and business plans were on display as ten undergraduate teams competed at the fourth annual IEEE Computer Society International Design Competition (CSIDC) World Finals. The future entrepreneurs had to solve a real-world problem with a marketable solution using the latest software engineering techniques. Then they had to "survive" a two-day series of formal presentations and live demonstrations before a panel of twelve top computer engineers and scientists.

At the 1 July awards ceremony, the top five winning teams were announced. First prize of US$15,000 in prize money was awarded to the National Taiwan University team for *NEWS: Novel Educative Wireless Style*, a system designed to improve interaction in e-learning. The Politehnica University of Bucharest won second place for its *EyesOnly* information security device; and the North Carolina State University won third place with *Diet Download*. These teams received

US$10,000 and US$6,000 in prize money. Financial aid funds were also awarded to the top three universities. In addition, the Instituto Militar de Engenharia and Devry Calgary received US$3,000 and US$2,000 respectively for their projects. Honorable mention awards of US$1,000 each went to the Indian Institute of Technology, Delhi; Indian Institute of Technology, Kanpur; Lahore University of Management Sciences; Seoul National University; and University of Karlsruhe.

Intended to present undergraduate students with the opportunity to develop a computer design project addressing a real-world problem, CSIDC 2003 began with applications from more than 150 teams of undergraduate students at schools in 41 countries. Only the teams with the top ten projects were invited to compete at the Finals. Said CSIDC Chair Dr. Alan Clements, "This competition provides a unique challenge where students can learn not just how to

build a device but how to work together over the duration of an intensive project."

After two days of evaluating each prototype's creativity, usability, and marketability, the judging panel selected the winners. Said Robert Cook from Georgia Southern University, chair of the judging panel, "The innovation and quality of the projects this year was outstanding. Each one solved a real-world problem and all could easily become viable commercial products. The amount of thought, energy, enthusiasm, and hard work put into each project made selecting the winners an extremely challenging task."

CSIDC 2003 was made possible by support from the IEEE Foundation, ABB, and Microsoft Corporation. Additional information, including project reports and presentations, can be found on the CSIDC web site at **http://computer.org/csidc**.

Front row (left to right) - Wolfgang Giloi; Ray Kaleda, Spectrum Resources; Laurel Kaleda, IBM; and Mario Barbacci, Carnegie Mellon University. Back row (left to right) - MAJ Fernando Maymi, United States Military Academy; Michael Lutz, Rochester Institute of Technology; Andrew Bernat, Computing Research Association; Robert Cook, Georgia Southern University; Christoffer Apneseth, ABB; Robert Graham, Toshiba TAIS; Simon Ellis, Intel; and Kathy Land, Northrup Grumann

The winning team from the National Taiwan University showing off their marketing materials. From left to right Hsien-Ting Cheng, Pao-Hsian Huang, May-Chen Kuo and Bo-Chun Lin

Honoring Innovators at the 2003 IEEE Honors Ceremony

Nick Holonyak, Jr. (center) accepts the *2003 IEEE Medal of Honor* from IEEE President Michael Adler (left) and IEEE President-Elect Arthur Winston (right) during the 2003 IEEE Honors Ceremony. Dr. Holonyak received the Medal for a career of pioneering contributions to semiconductors, including the growth of semiconductor alloys and heterojunctions, and to visible light-emitting diodes and injection lasers. The IEEE Foundation sponsors the *IEEE Medal of Honor*.

Charles W. Turner (left) recipient of the *2003 IEEE Haraden Pratt Award* onstage during the 2003 IEEE Honors Ceremony with IEEE President-Elect Arthur Winston (right). Dr. Turner received the Award for his outstanding leadership in extending the transnational activities of the IEEE into eastern and central Europe. Sponsored by the IEEE Foundation, the Award is given in recognition of outstanding service to the Institute.

Teen Wins 2003 IEEE Presidents' Scholarship with Power Engineering Project

By **Lynn Murison**, IEEE Educational Activities

Generating energy by pulsing mercury through a copper coil won 16-year old senior Elizabeth Van Cortlandt Varela from Alexandria, VA, USA the *2003 IEEE Presidents' Scholarship*. Sponsored by the IEEE Foundation, this US$10,000 Scholarship was presented by IEEE President-Elect Arthur Winston on 15 May 2003 at the Special Awards Ceremony during the Intel International Science and Engineering Fair (ISEF) in Cleveland, Ohio, USA.

As is customary, the IEEE Section that hosts the presentation provides the judges for the Scholarship. This year, Ray Heintel, Lead Judge for the Scholarship, was joined by a panel of seven other IEEE members. They spent one very long day sorting and evaluating 1,100 projects from over 35 nations, before selecting Varela's project entitled "A Magneto Hydrodynamic Direct Current Transformer." Heintel described Varela's project as, "…one that has the ability to improve the generation of energy in a little studied area and which could benefit power engineering."

A Magneto Hydrodynamic Direct Current Transformer is a machine that can generate energy when a DC to AC alternator is not wanted and when DC sources (i.e.: battery, fuel cell) are necessary. Magneto Hydrodynamic (MHD) can be very useful where there are high mechanical costs, such as with turbines in electrical generators. Because it uses liquid metal alloys that are highly conductive, MHD could lead to improved conservation of natural resources, reduced thermal pollution, and lower fuel costs.

"What was impressive," IEEE President-Elect Winston said about Varela's project, "was that she practiced engineering and actually built the equipment using a MHD transformer."

Varela's transformer involved the use of an innovative "accumulator" to cut the circuit through the mercury coil and allow the use of coils and electrodes in series. She went through three distinct design phases, eventually using an auto fuel injector pump. Her transformer is made up of two coils, one of copper wire windings, and the other of mercury-filled tubing, both wrapped about the same iron core.

In the true spirit of investigation, two and a half years ago Varela was working on a totally different project when she noticed anomalies appearing in part of her research. "I found that these strange things I was seeing were due to MHD, about which I could find very little. I turned to the Internet for my research," she said. Little by little she found MHD so fascinating that she started to build her transformer in order to learn more about MHD. Although she found two researchers, one in Israel and the other in Latvia, to correspond with, she had no direct mentor for her project.

Beginning in August 2003, Varela will be a freshman majoring in physics at Duke University in Durham, NC, USA. One of the reasons she chose Duke was that freshman can begin conducting their own research immediately, so she can keep working to improve the efficiencies on her MHD direct current transformer. If you would like more information about the IEEE Presidents' Scholarship or the Intel International Science and Engineering Fair, please contact the IEEE Educational Activities department by telephone at +1 732 981 3443 or send an email to **education-services@ieee.org**.


IEEE President-Elect Arthur Winston (left) presents Elizabeth Van Cortlandt Varela (right) with the *2003 IEEE Presidents' Scholarship* for her project "A Magneto Hydrodynamic Direct Current Transformer."

Hailed by his colleagues as the "father of semiconductor light emitter technology in the western world", Dr. Holonyak accepts the *IEEE Medal of Honor* during the 2003 IEEE Honors Ceremony held at the Gaylord Opryland Hotel in Nashville, Tennessee, United States.

IEEE Foundation President Emerson Pugh (left) congratulates Raymond S. Stata (right), the recipient of the *2003 IEEE Founders Medal*, and thanks him for gifting his honorarium to the IEEE Foundation. Mr. Stata's gift is to be used for educational grants in math and science. He was selected to receive the Medal for leadership in the electronics industry through innovative technological development and visionary contributions in entrepreneurship, management and education. The IEEE Foundation sponsors the *IEEE Founders Medal*.
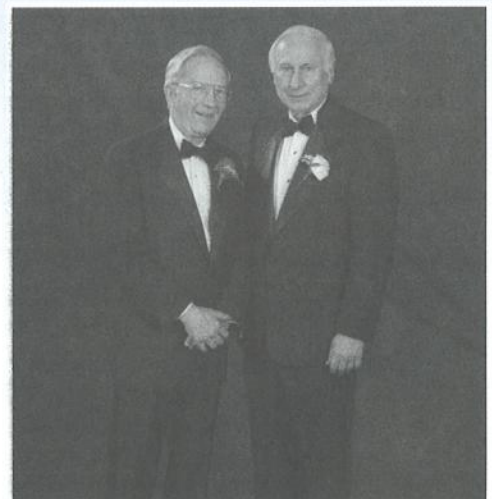
Summit Participants Agree to Collaborate to Improve Technological Literacy

By: **Douglas Gorham**, IEEE Educational Activities

All 150 deans and faculty members representing 65 Colleges of Engineering and Education from around the world who participated in the "Deans Summit II: Fostering Campus Collaborations" agree that improving the science, technology, mathematics, and engineering knowledge of pre-service teachers would ultimately improve technological literacy in all segments of society. Supported by grants from the IEEE Foundation General Fund and the IEEE Life Members Fund and convened by the IEEE Educational Activities Board (EAB), the goal of the "Deans Summit II: Fostering Campus Collaborations," was to identify ways that Colleges of

Engineering and Education can collaborate to improve technological literacy among pre-service teachers and enhance the delivery of instruction among engineering educators. Utilizing a variety of forums, including general sessions and presentations, participants reviewed current engineering-education collaborations in three focus areas: teacher preparation, pre-college community outreach, and pedagogical approaches for engineering education. Breakout sessions were used to develop collaborative action plans for future programs.

More than 30 action plans for future campus collaborations were developed. These included the creation of a new master's program in education with a concentration in engineering, a partnership involving engineering, education and industry focusing on a well qualified applicant pool for education, engineering and the workforce, and an undergraduate degree with a dual major in education and engineering. Other action plans focused on strengthening the understanding of education theory and practice among engineering faculty,

Katie Blanding from NASA asks a question during a presentation.

improving pedagogy in engineering education, and establishing a comprehensive assessment system for engineering education.

Two months after the Summit, members of the planning committee met to explore ways to further encourage and support engineering-education collaborations. The group identified two environmental themes—the importance of technological literacy and the pervasiveness of standards-based curricula—that will impact future work on the following four objectives set by the planning committee.

- Pursuing and promoting a national/international agenda for technological literacy
- Expanding collaborations by sharing best practices of successful partnerships
- Involving industry as partners in collaborative activities
- Creating a sustainable structure for future summits and continued engineering-education collaborations

Members of the "Deans Summit II: Fostering Campus Collaborations" Planning Committee pose for the camera. Seated, left to right, Ted Batchman, Peter Crouch, Walter Gmelch and Barbara Stoler. Standing, left to right, Shlomo Carmi, Ernest Rose, David Burghardt, Douglas Gorham, Lyle Fiesel, James Melsa, and William Sparkman.

Disaster Relief to the Electronics and Telecommunications Department at the University of Kocaeli in Izmit, Turkey

By: **Assoc. Prof. Dr. Sarp Ertürk**, University of Kocaeli and IEEE Member

Before the earthquake of 17 August 1999, the University of Kocaeli in Izmit, Turkey had approximately 20,000 students, 1,150 educational staff and a campus of 650,000 square meters. Kocaeli was considered one of the top 10 universities in Turkey in terms of the number of scientific projects carried out, and was within the top 20 universities in terms of the number of students.

Then came the earthquake, which brought massive destruction. Thanks to the efforts and sacrifices of staff, administration, and supporters, Kocaeli was able to re-open its doors to the students within a short period of time. Approximately US$23.5 million was spent to re-open Kocaeli after the earthquake with

government funding only accounting for about US$4 million. The additional funding was provided by private donations and grants, such as the grant from the IEEE Foundation.

In 2000, the IEEE Foundation awarded the Electronics and Telecommunications Department at the University of Kocaeli a US$28,600 disaster relief grant to reestablish teaching, computing and laboratory facilities. This grant was used to establish a signal and image processing laboratory. Using the grant funds, a full set of measurement instruments was acquired.

In addition, five computers were purchased for the laboratory, along with a video camera and Texas

Instruments 6711DSK and 6701EVM DSP boards for research purposes. This Laboratory will be used as an undergraduate and postgraduate computing and research facilities, enabling computer usage and signal processing applications. Furthermore a projector has been purchased to enable contemporary teaching within the Laboratory.

The IEEE Foundation grant helped the University of Kocaeli recover from a devastating natural disaster and provide invaluable computing, research and teaching facilities for the Electronics and Telecommunications Department. To learn more about the Laboratory visit us on the web at **http://mf.kou.edu.tr/elohab/ipl/**.

Corporations Pay Tribute to the Profession

By: **Karen Galuchie**, IEEE Development Office

Commemorative gifts, sometimes called honor or memorial gifts, are a special way to acknowledge people who are or have been particularly important in our lives or in the life of a corporation. Recently, two corporations have given commemorative gifts to the IEEE Foundation in honor of someone who has played an important role in the life of the corporation or the profession.

Wishing to honor Charles Concordia for his lifetime of work and dedication to General Electric, GE Power Systems approached the IEEE Power Engineering Society to establish an award in his name. It was decided the most fitting tribute to Charles Concordia, known to many as Charlie, would be to establish the *IEEE-PES Charles Concordia Power Systems Award*. This new Award is given "to recognize outstanding contributions in the high-voltage electric power systems-engineering field" and will be presented annually at the PES General Meeting, if a worthy nominee is identified and selected. GE Power Systems agreed to sponsor the *IEEE-PES Charles Concordia Power Systems Award* for ten years beginning with the first presentation in 2003.

Qualcomm Incorporated, with its longstanding tradition of supporting educational and research activities in the field of communications, opted to pay tribute to Guglielmo Marconi, sometimes called "the father of wireless." Qualcomm is sponsoring the *IEEE Guglielmo Marconi Paper Prize Award in Wireless Communications* for ten years starting in 2003. The *IEEE Guglielmo Marconi Paper Prize Award in Wireless Communications* is an annual award for an original paper in the field of Wireless Communications published in the *IEEE Transaction on Wireless Communications* published during the previous calendar year.

If you are interested creating a lasting and meaningful testimonial to someone who has impacted your life or the life of your corporation in significant way, consider making a commemorative gift to the IEEE Foundation. To learn more about this type of giving and the opportunities available, please contact the IEEE Development Office by telephone at +1 732-562-3860 or by email at **supportieee@ieee.org**.


GE Power Systems representatives Edward L. Owen (left) and Hamid Elahi (second from left) and Charles Concordia (third from left) congratulate F. Paul deMello (third from right) and his wife Margaret (second from right) for being the first recipient of the *IEEE-PES Charles Concordia Power Systems Award*. Paul de Mello is being recognized for "major contributions to the development of high-voltage power systems worldwide." Also pictured is Charles P. Concordia, Charlie's nephew (right).
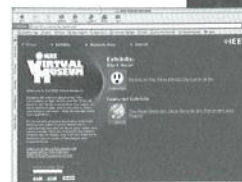
"Fun, Fascinating and In-Depth — Yet Surprising Accessible": The IEEE Virtual Museum.

By: **Kim Breitfelder**, IEEE History Center Staff

Only a year and half old and the IEEE Virtual Museum (VM) has become one of the most successful outreach projects of the IEEE. The VM reaches masses of people who would otherwise have little association with the IEEE.

What makes the VM so appealing is its unique juxtaposition of the technical with the historical and the global with the personal. It is our belief that linking technology with the social sciences and placing technology within contexts that highlight its cultural and social ramifications will engage those who might be otherwise disinterested in or intimidated by technical subjects. Conversely, it will enable those with a technical interest to see the broader benefits and consequences of technology, rather than just thinking about technology for technology's sake.

The value of this mix has been demonstrated by the many honors bestowed on the VM in the last year.

These include:

- *Science* magazine singled out the VM in its Netwatch column in July 2002.
- *PC Magazine* selected the VM as its Site of the Week in May 2003. (The title of this article is a quote from *PC Magazine's* review of the VM).
- Eisenhower National Clearinghouse, a U.S Department of Education funded program, chose the VM as one of its Digital Dozen in August 2003.

These accolades are due in large part to the debut of two exhibits in the last year: *Empowering the Electrical Revolution: Women and Technology and Microwaves: From Your Kitchen to the Edges of the Universe. Women and Technology* explores both the direct and indirect ways women have influenced technology and explores the many roles they have played such as telegraph and telephone operators, factory workers for electrical manufacturers, consumers, and then, finally, as engineers and tech company executives. From *Microwaves*, users learn everything from how a microwave oven works to how microwave technology enables radar, air traffic control, satellites, cell phone communications, and even weather prediction. In addition to being the first complete online technical and historical overview of the technology, *Microwaves* marks the first time an IEEE society has used the VM as a forum for presenting the history of their field. With these two new exhibits, the VM now comprises about 300 unique pages, most with graphics, audio, video, or animation.

This pattern of exhibit growth, however, is becoming increasingly difficult to maintain. To keep our virtual doors open, our focus must shift from generating content to fundraising, creating instructional material, and promotion. Nonetheless, the VM will add another new exhibit in the fourth quarter of 2003, which will focus on technology development and usage during World War II. If funding becomes available, the next few years will see exhibits on technologies such as the PC, aerospace, biomedical engineering, the Internet, or on themes such as, "What is an engineer?" It is our sincerest wish that all of these important topics find their way into the IEEE Virtual Museum so that we can continue serving those who have already contributed to our success.

As always, the IEEE Foundation remains a loyal and enthusiastic partner of the IEEE Virtual Museum. We are grateful for the continued support. If you would like to help ensure our doors stay open and our content continues to grow, please make a contribution by checking off the box for the IEEE Virtual Museum Fund on the enclosed business reply envelope and send it to the IEEE Development Office.
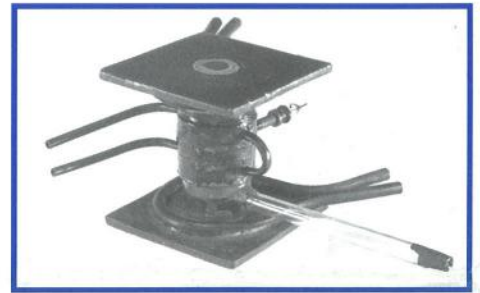
An image of Randall and Boot's 1940 cavity magnetron from *Microwaves from Your Kitchen to the Edges of the Universe*. It was critical to the success of the Allies' World War II radar program and makes the microwave oven possible. Courtesy: Science Museum/Science & Society Picture Library.