

## Serving/Members

The IEEE is committed to doing business electronically and to serving our growing, global membership to the best of our ability. Last year, the organization provided important new or improved benefits designed to increase the value of every membership.

### IEEE.org: Users Enjoy 75 Percent Faster Performance

Members and other visitors to the IEEE Web site began enjoying significantly faster performance in mid-2001 after a new content-delivery system was introduced. Response time — the period required for graphics and text to download to the user's PC — was cut from four seconds to about one, a 75 percent improvement. Response time for the IEEE Global Travel Services Web site improved even more dramatically, from eight seconds to one.

The new content-delivery system enables speedier, more efficient use of the IEEE.org site — especially important for such high-traffic areas as the IEEE home page, IEEE Global Travel Services, certain IEEE Standards offerings, and the IEEE Search feature. The system, from Akamai Technologies, uses external caching servers in various worldwide locations to store IEEE Web content. As a result, most members and other visitors now retrieve their requested information from servers located significantly closer to them. Previously, all visitors were served through the IEEE Data Center in New Jersey, USA.

### Popular New Site Matches Job Seekers and Employers

In its first six months of operation in 2001, the new IEEE Job Site not only attracted 9,000 members in search of new jobs, but also nearly 1,300 companies with technical employment openings. Despite the weakened world economy, the number of employers registering jobs grew more than five-fold by year's end.

Launched in mid-year, the site permits job seekers to search a large database of employment opportunities, and employers to post new openings. All job seekers can use the search function, but only IEEE members can create and register an ideal-job profile — and update it at anytime. Jobs matching a member's profile can be viewed online or received by email. Members who register their profiles also can choose how much of their identity and professional information to supply. Employers can post jobs, search resumes and prescreen candidates — all of whom are prequalified by their IEEE membership. The IEEE Job Site utilizes Hire.com's e-Recruiter™ software.

### 68-Million Email Messages — All Scanned for Viruses

A record 68-million email messages passed through the IEEE system during 2001 — nearly 42 percent more than the previous year. Over 72,000 members had signed up for the IEEE email alias and virus-scanning service by year's end.

The virus-scanning feature is an important reason why more members are continuing to register for the email alias service, which is available at no cost to all IEEE members. During 2001, IEEE scanners detected and prevented the transmission of 158,000 viruses — almost 20,000 of them during the last three months of the year. The IEEE does not guarantee that every virus will be detected and stopped, but the scanning system is operated for maximum effectiveness, with software updates performed daily.

### Online Membership Processing Sets Another Record

Since 1997, when the IEEE first began offering Web-based applications to prospective members, busy professionals have enjoyed ever-improving levels of ease and convenience to manage their memberships. In 2001, the online system handled almost 34 percent of the record 77,462 new applications for IEEE membership.

In time for the 2002 renewal period, which began in September 2001, several new system enhancements enabled a record 144,445 IEEE members to renew faster and more efficiently than ever. This figure represents almost 51 percent of all members eligible to renew online.

Enhancements to online renewal processing resulted in minimal downtime for both members and staff. In addition, scanning technology was implemented to better serve more than 139,000 members who submit their renewals by postal mail or facsimile.



To enhance portability, personal communications equipment requires ever-smaller and lighter components. This surface-mounted device, tiny enough to be a wasp's snack, is one of the technological secrets of state-of-the-art mobile phones. Courtesy of Siemens.

## Serving/Society

Throughout the long history of the IEEE, a core value has been to serve society. In 2001, a variety of programs demonstrated the organization's commitment to offer balanced, reliable information on key technological topics, and to encourage educational excellence — from pre-college through adult education.

### Enabling Members to Raise Technological Literacy

Growing numbers of IEEE members are taking part in a new program to enhance the technological literacy of pre-college educators. Launched in early 2001 in Florida, USA, the Teacher In-Service Training Program had attracted 14 IEEE Sections in the U.S., South Africa and Canada by year's end. IEEE members work with local school districts to develop and present programs on technological topics aligned with state or national standards to local pre-college educators as part of their professional development.

Teachers who participate gain new knowledge for their science, technology, engineering and math curricula, as well as a greater understanding of technological topics and career requirements and opportunities they can convey to students. In addition, the teachers and engineers interacting in this program have an opportunity to learn more about each other's professions and develop future collaborative efforts.

### IEEE Standards Association Continues Industry Focus

Strong industry relationships continued to be a major priority during 2001 for the IEEE Standards Association (IEEE-SA). Industry Connections is a new program to provide a fast track to publishing peer-reviewed specifications, guides and position papers. It is designed to permit interested corporations to refine their thinking on rapidly changing technologies and to build further acceptance for a technology by moving it on to other IEEE processes.

IEEE-SA corporate memberships grew to 50 by year's end, with new members including Ceramic Fuel Cells Limited, Dell Computer Corporation, Intel Corporation and Microsoft Corporation.

A new initiative to develop standards for voting equipment was launched by IEEE-SA. When completed, the standards will provide specifications for electronic, mechanical and human factors that can be used by manufacturers of voting equipment.

IEEE members are improving the technological literacy of pre-college educators in a new program that also helps engineers and teachers learn more about each other's professions and explore future collaborative efforts.



Representative Rob Portman (left) was one of six members of the U.S. Congress who received the IEEE-USA Award for Distinguished Public Service for his efforts in passing major pension reforms. Ned Sauthoff, 2001 IEEE-USA president, presented Rep. Portman with a plaque.



### IEEE-USA Supports Landmark Pension Reforms

Last year, continued teamwork between IEEE-USA and other organizations helped win passage of comprehensive legislation known as The Economic Growth and Tax Relief Reconciliation Act of 2001. Its purpose is to improve the quality of life for future retired Americans — including IEEE members who are U.S. citizens.

The new law is designed to strengthen America's private pension system and to help individuals increase their savings for retirement. Features include higher contribution limits for Individual Retirement Accounts and workplace retirement plans, reduced vesting requirements, and better portability of earned benefits when people change jobs. It also offers broader availability of pension coverage by making it easier for small businesses to establish retirement savings plans.

### U.S. Government Fellowships Provide Engineers' Perspectives

Three U.S. members served as IEEE-USA Congressional Fellows during 2001 in Washington, D.C. The program offers the nation's legislators a professional engineer's insights on relevant public-policy issues.

Russell F. LeFevre served as Congressional Fellow to Senator John D. Rockefeller IV. Besides assisting with proposed legislation to give tax credits to companies providing Internet broadband access in rural areas, LeFevre also helped on energy and environmental issues.

S. Jason Remer provided energy and nuclear power expertise to Representative Joseph Barton, who heads the House Energy and Air Quality Subcommittee of the House Energy and Commerce Committee.



Peter Winokur (right) served as an IEEE-USA Congressional Fellow on the staff of Senator Harry Reid (left). At year's end, Winokur agreed to continue on Sen. Reid's staff through 2002.



2000 IEEE President Bruce Eisenstein presented Mariangela Lisanti with the US\$10,000 IEEE Presidents' Scholarship at the 2001 Intel International Science and Engineering Fair.

Peter S. Winokur served on the staff of Senator Harry Reid, who is Senate Majority Whip, one of the most influential positions in the U.S. Senate. At year's end, Winokur accepted an offer to continue on Sen. Reid's staff through 2002. During 2001, Winokur provided assistance on issues including renewable energy resources and domestic commercial space-launch facilities.

### “Golden” Project Wins IEEE Presidents' Scholarship

Using gold as the conductor for measuring conductance quantization in metallic nanowires helped Mariangela Lisanti of Westport, Connecticut, USA, win the US\$10,000 IEEE Presidents' Scholarship. Lisanti, who was 17 at the time, entered her project, “Conductance Quantization in Au Nanocontacts,” at the 2001 Intel International Science and Engineering Fair in San Jose, California, USA. She is now studying at Harvard University, Cambridge, Massachusetts, USA.

The IEEE Presidents' Scholarship is sponsored by the IEEE Foundation.

### IEEE Computer Society Offers Software Certification

Software engineers seeking to demonstrate the level of knowledge and competence they have achieved in the software engineering field have a new certification tool available to them. The Certified Software Development Professional program, which was developed by the IEEE Computer Society (CS), is expected to appeal especially to younger engineers because they can demonstrate their knowledge of the subject matter. The certification identifies and establishes norms of common practice in software engineering — formerly lacking in this relatively new field. The CS intends this designation to be a benchmark, not a guarantee of competency.

## Membership/Development

### Year-end Membership Reaches All-time High

In 2001, IEEE year-end membership reached a new, record high of 377,342. This was 3.1 percent over the 2000 total of 366,135, as well as the fifth consecutive year of membership growth for the IEEE.

Membership in non-U.S. regions continued to follow recent growth trends, with a 7.3 percent increase last year. At year's end, non-U.S. members constituted 141,751 or 37.6 percent of the total organization. This compares with 22.5 percent of the total membership just 12 years earlier. If this trend continues, the number of IEEE members outside the U.S. will equal 50 percent of the total membership by 2010. The highest growth rates were in Europe/Middle East/Africa (Region 8) with a 9.7 percent increase, and in Latin America (Region 9) with 9.4 percent.

The demand for quality IEEE products and services, as well as the organization's progress with enhancing its online offerings, are two key reasons for the continued expansion of non-U.S. membership.

The number of female IEEE members also increased last year, paralleling the recent growth in non-U.S. and student categories. Women are still underrepresented in the organization, but now reflect 8 percent of the total IEEE membership. Among student members, women represented 17.4 percent of that category at year's end — but it is still too early to confirm whether this encouraging sign is the start of an actual trend.

### Student Membership Sets New High

At the end of 2001, IEEE student membership stood at a record 65,669. Last year was the sixth consecutive year of growth for this category, which rose 12.6 percent. The increases were greatest in non-U.S. Regions, continuing one of the major trends in IEEE membership. Moreover, the percentage of students joining an IEEE Society grew to 45.6 percent.

In October 1997, when student membership was just 40,315, the IEEE set a five-year goal of 55,000 student members by 2002. This target was attained in early 2000.



The command center of the new IEEE Data Center supports users with continuous, uninterrupted service. Several key functions are located in the command center. These include the IEEE Help Desk and visual displays that help system administrators keep close watch on both critical network performance and the server status for various IEEE electronic services.

## Operations

### New IEEE Data Center Provides 24/7 Services

The state-of-the-art IEEE Data Center is providing new levels of reliable computing and communications services that should serve members, employees and other users until well into the 21st century.

The 10,000-square-foot facility, which became operational in July 2001, features a command center that supports users with uninterrupted services 24 hours a day, seven days a week. Among these services are the personal email alias with virus scanning, IEEE Web accounts for members, conference registration, and access to online volunteer rosters. The center also serves several of the most highly trafficked pages on the IEEE Web site, such as IEEE Global Travel Services and the IEEE Online Catalog & Store. All services incorporate technology to help ensure high availability of the data.

The IEEE Data Center is located adjacent to the IEEE Operations Center in Piscataway, New Jersey, USA. The command center at its core accommodates several key functions, including the IEEE Help Desk and work areas for data center operators. Visual displays help system administrators keep close watch on critical network performance information and server status for various IEEE electronic services. For example, during the annual online membership renewal period, employees can monitor Web response time from various worldwide locations.

Before the Data Center opened, the IEEE — like many organizations — had outgrown its computer and communications systems facilities. In addition, various organizational units maintained computer equipment in different parts of the Operations Center. To ensure reliable performance and operating efficiency, all networking and computer services are now consolidated in a 4,000-square-foot secure room. It is equipped with fire protection and climate controls, and also houses network equipment, a tape library and an uninterruptible power supply.

### Continued Growth for IEEE Systems, Usage

Members and other users are enthusiastically using new or enhanced IEEE online products and services. As a result, IEEE systems and usage continued to grow throughout 2001. For example, the number of servers the IEEE maintains has more than tripled, from 45 in 1998 to some 140 in 2001. At the same time, the number of members with IEEE email aliases grew some 250 percent, from 29,000 to 72,000. Web accounts, which enable members and customers to quickly access IEEE products and services, rocketed from 38,000 in 1998 to 291,000 in 2001.

These performance metrics demonstrate that the IEEE vision — “to do business electronically” — is being realized as never before.

## Awards/and/Honors

### Herwig Kogelnik Receives IEEE's Highest Honor

2001 IEEE President Joel B. Snyder (left in photo) presented the IEEE Medal of Honor at the annual Honors Ceremony to Herwig Kogelnik of Bell Labs/Lucent Technologies (right). Also an IEEE Life Fellow, Kogelnik was recognized for his fundamental contributions to the science and technology of lasers and optoelectronics, and for his leadership in research and development of photonics and lightwave communication systems. Hugo Maria Fernandez Versteegen, 2001 IEEE Secretary, is in the center.



#### IEEE Medal of Honor

Herwig Kogelnik  
Bell Labs/Lucent Technologies  
*Sponsor: IEEE Foundation*

#### IEEE Edison Medal

Robert H. Dennard  
IBM  
*Sponsor: Hitachi Ltd., Mitsubishi Electric Corporation, Toshiba Corporation of Japan*

#### IEEE James H. Mulligan, Jr. Education Medal

Brian D.O. Anderson  
Australian National University  
*Sponsor: AT&T Labs*

#### IEEE Medal for Engineering Excellence

L. Bruce McClung  
Union Carbide Corporation  
*Sponsor: Siemens*

#### IEEE Founders Medal

Robert A. Frosch  
Harvard University  
*Sponsor: IEEE Foundation*

#### IEEE Richard W. Hamming Medal

Alexander G. Fraser  
AT&T Labs  
*Sponsor: AT&T Labs*

#### IEEE Heinrich Hertz Medal

Adrianus T. de Hoop  
Delft University of Technology  
*Sponsors: IEEE Antennas & Propagation Society, IEEE Microwave Theory and Techniques Society*

#### IEEE Jack S. Kilby Signal Processing Medal

Thomas S. Huang  
University of Illinois,  
Urbana-Champaign

Arun N. Netravali  
Bell Labs/Lucent Technologies  
*Sponsor: Texas Instruments Incorporated*

#### IEEE Robert N. Noyce Medal

Hajime Sasaki  
NEC Corporation  
*Sponsor: Intel Foundation*

#### IEEE Dennis J. Picard Medal for Radar Technologies and Applications

Fritz Steudel  
Raytheon Company (retired)  
*Sponsor: Raytheon Company*

#### IEEE Simon Ramo Medal

Kurt E. Petersen  
CEPHEID  
*Sponsor: TRW Foundation*

#### IEEE John von Neumann Medal

Butler W. Lampson  
Microsoft Corporation  
*Sponsor: IBM*

#### IEEE Honorary Membership

Charles M. Geschke  
Adobe Systems (retired)  
*Sponsor: IEEE*

#### IEEE Richard M. Emberson Award

Charles J. Robinson  
Louisiana Tech University  
*Sponsor: IEEE Technical Activities Board*

#### IEEE Haraden Pratt Award

Arthur P. Stern  
Magnavox Advanced Products  
& Systems Company (retired)  
*Sponsor: IEEE Foundation*

#### IEEE Ernst Weber Engineering Leadership Recognition

Michael J. Birck  
Tellabs

Christopher M. Earnshaw  
British Telecommunications Plc.  
*Sponsor: IEEE*



## IEEE Members Receive Global Honors

During 2001, eight IEEE members received important honors for technological achievements from other major world organizations.



National Science Foundation

The U.S. National Science Foundation's (NSF) Alan T. Waterman Award, the highest honor for young engineers and scientists, was given to **Vahid Tarokh**. Dr. Rita Colwell, NSF director, presented the award. It includes a US\$500,000 grant for three years of scientific research or advanced study in any science or engineering field. Tarokh is the primary inventor of "space time coding," a technique that significantly improves the speed and reliability of wireless data transmission.



National Academy of Engineering

From left, George Fisher, president of the U.S. National Academy of Engineering (NAE), presented the US\$500,000 Charles Stark Draper Prize to IEEE Fellows **Vinton Cerf** and **Robert Kahn** and IEEE Life Fellow **Leonard Kleinrock** along with Lawrence Roberts for their individual efforts in developing the Internet. In addition, IEEE Life Fellows **Earl Bakken** and **Wilson Greatbatch** received the NAE's Fritz J. and Dolores H. Russ Prize, also US\$500,000, for their invention of the first human heart pacemaker.



The Franklin Institute

IEEE Life Fellow **Paul Baran** (center) received The Franklin Institute's Bower Award for Achievement in Science, which includes a US\$250,000 prize. Dennis M. Wint (left) Franklin Institute president and chief executive officer, presented the award. IEEE Life Senior Member Roy Privett, who sponsored the nomination, looks on. Baran was honored for his part in development packet switching, a key Internet technology.



The Inamori Foundation

From left, IEEE Life Fellow **Izuo Hayashi** was one of three corecipients of the Kyoto Prize for Advanced Technology. The others were Zhores I. Alferov and Morton B. Panish, being congratulated by Ryuzo Sejimo, chairman of the Inamori Foundation. The award includes 50 million yen (about US\$410,000) and is Japan's highest private honor for lifetime achievement.



## 2001/Board of Directors

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Hugo Maria Fernandez Versteegen, *Secretary*; Raymond D. Findlay, *President-Elect*; Joel B. Snyder, *President*; Bruce A. Eisenstein, *Past President*; Dale C. Caston, *Treasurer*; Daniel J. Senese, *Executive Director*

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