

# The Institute

www.theinstitute.ieee.org

DECEMBER 2003 VOL. 27, NO. 4



## When Disaster Strikes, IEEE Members Take Action



Like these searchers near Melrose, Texas, USA, IEEE Member Charles H. Chapman walked carefully through rough terrain to recover debris from the Columbia space shuttle.

### BY CAROL GOODALE

WILDERNESS SURVIVAL SKILLS were not part of IEEE Member Charles H. Chapman's job requirements as a NASA computer engineer, but that changed last February when he found himself combing the rugged east Texas terrain for debris from the NASA shuttle *Columbia*.

When disasters strike, IEEE members have been called on to help in many ways. Chapman was asked to use his knowledge of the shuttle. And after the blackout in the northeastern United States last summer, Jack Casazza was pressed into service to explain to the public what had happened, while Richard Wakefield advised the U.S. Congress.

### Slogging through swamps

Toiling in intensely cold weather was just one of the challenges Chapman faced as he and a team of searchers slogged knee-deep in swamps and through dense woods where thorns grew as big as toothpicks. Chapman had been working in a new position as a

computer engineer on the shuttle launch-computer processing system at the Kennedy Space Center in Florida for only a month when the *Columbia* shuttle disintegrated 16 minutes before it was scheduled to land at the space center on 1 February.

The crisis "was a very difficult time for everybody," says Chapman, a NASA employee since 2000. "I wanted to do something to help." He joined other volunteers from the space center who were flown to Barksdale Air Force Base in Bossier City, La., USA, to search for shuttle debris.

More than 1 million hectares were searched, according to Chapman. Teams on foot covered about 284 000 hectares while the rest were searched from the air and on the water. Debris from the shuttle was found only in eastern Texas and western Louisiana.

Although Chapman had not worked directly with the *Columbia* hardware, he says, "I knew more about the shuttle hardware than the others on my team."

That familiarity made Chapman the expert on his team of searchers for determining which of [Continued on page 14]

## Seeing The Invisible

IEEE leads the way in medical imaging

### BY ERICA VONDERHEID

MEDICAL IMAGING is not a new field—X-rays, which were used in the first medical imagers, were discovered by Wilhelm Conrad Röntgen in 1895. But in the last 10 years, medical imaging has made nearly as many strides technologically as were made in the previous 100. Through its technical societies, special issues of publications, and conferences and symposia, the IEEE has helped to bring these technological advances forward.

Biomedical imaging allows physicians to see what had to that point been unseeable in living organisms: bones, organs, tissues, and even a beating heart. It lets physicians detect brain tumors early, closely follow a patient's treatment, or watch a fetus grow. Technologies used for these [Continued on page 13]



An electronic slice through a human brain, such as the one shown in this magnetic resonance imaging scan, can help physicians diagnose disease early and track the course of treatment.

# Life Assurance

..... Sleep Easy with These Exclusive Insurance Programs .....

## A Full Range of Insurance Programs...

- Auto/Homeowners Insurance
- Canadian Retiree Insurance
- Cancer Expense Insurance
- Catastrophe Major Medical Insurance
- Catastrophic Disability Insurance
- Comprehensive Health Care Insurance
- Dental Plan
- Disability Income Insurance
- High-Limit Accident Insurance
- International Accident & Medical Insurance
- Level Term to Age 65 Life Insurance
- Long Term Care Insurance
- Medical Savings Account Program
- Member Assistance Plan
- Permanent Whole Life Insurance
- Prescription Plan
- Professional Liability Insurance
- Small Employer Group Insurance
- Term Life Insurance

## ...Plus Three New Programs for IEEE Members

### 10-Year Level Term

- Designed specifically for IEEE members under age 65, this Plan offers ten years of financial security with a benefit amount and premiums that are guaranteed to remain level.
- The Plan features options up to \$2,000,000. Attractive rates and money-saving discounts are available if you're a qualified non-smoker and/or you elect higher options of coverage. Other valuable benefits include a continued interest account and an accelerated death benefit provision.

Plan available in the U.S. (except territories), Puerto Rico and Canada (except Quebec).

### Identity Theft Insurance

- The Identity Guard® plan provides US\$20,000 of insurance coverage for certain expenses incurred to recover a stolen identity. It covers fees for such things as submitting legal filings, re-applying for loans, and gaining reimbursement for lost wages resulting from the time spent re-establishing one's identity. The insurance is underwritten by American International Group, the leading U.S.-based informational insurance and financial services organization.

Program available in U.S. only.

### Life Line Screening

- Life Line Screening is a series of non-invasive, painless ultrasound screenings that can identify vascular disease and osteoporosis. IEEE Members and their families will be able to register for a choice of one or a combination of the four screening tests available at sites near their residence.

Program available in U.S. only.

For more information, call +1 800 GET IEEE (438 4333) or visit [www.ieee.org/fap](http://www.ieee.org/fap)

The IEEE Financial Advantage Program®  
Tools to Secure Your Tomorrow



# contents

## NEWS

### 4 Anderson Selected As 2004 President-Elect

Google Searches Link To IEEE Xplore

## DEPARTMENTS

### 5 Marketplace of Ideas

### 6 Letters

### 8 Member Profile

### 10 Awards

### 11 Best Practices

### 16 Education

### 17 Careers

### 20 In Memoriam

### 21 Member Recognitions

### 22 Products & Services

### 23 Financial Advantage

**Editorial offices:** IEEE Operations Center, 445 Hoes Lane, Piscataway, N.J., USA 08855-1331  
**Telephone:** +1 732 562 6825  
**Fax:** +1 732 235 1626 **E-mail:** institute@ieee.org  
**Web:** <http://www.ieee.org/theinstitute>

**Editor:** Kathy Kowalenko

**Assistant Editor:** Erica Vonderheid

**Editorial Consultant:** Alfred Rosenblatt

**Copy Editor:** Sally Cahur

**Editorial Intern:** Lauren Culliton

**Editorial Board:** Robert T. H. Alden, Scott M. Blair, Jan Brown, Anthony Durniak (IEEE Staff Executive of Publications), Murray Eden, Gus Gaynor, Roger Grice, Susan Hassler (IEEE Spectrum Editor), Dorota Kieronska, Michael Lightner (IEEE Vice President-Publication Services and Products), Tania Lorena Quiel, and Roland Saam

**Senior Art Director:** Mark Montgomery

**Editorial Production Director:** Robert Smrek

**Graphic Designer:** Bonnie Nani

**Web Production Coordinator:** Robin Edwards

**Web Production Assistant:** Jacqueline L. Parker

## IEEE MEDIA

**Publisher:** Jame A. Vick

**Associate Publisher, Sales & Advertising Director:** Marion Delaney

**Business Manager:** Robert T. Ross

**Marketing & Promotion Manager:** Blanche McGurr

**Advertising Sales:** +1 212 419 7760

**Advertising Production Supervisor:** Felicia Spagnoli

**Advertising Productions:** +1 732 562 6334

**Art & photo credits:** Page 1: Michael Pilla/Corbis (top); Chris Hondros/AP(center); General Electric Co. (bottom); Page 3: Harry Goldstein (top); Mick Wiggins (illustration); Page 4: Michael Pilla/Corbis; Page 7: Jordan Hollender; Page 8&9: Harry Goldstein; Page 10: Jeff Sciortino(Holonyak); Marcelo Coehlo (Kroemer); Jim Allen (Kogelnik); Page 13: Mario Tama; Page 14: Rick Browner (top); Kim Shiflett (bottom); Page 15: AP/Wide World Photo; Page 20: Marconi Foundation (Gallager/Metcalfe); IEEE (Bayless & Shepherd); Page 21: IEEE

## 1 When Disaster Strikes Members Take Action

BY CAROL GOODALE

Charles H. Chapman searched the East Texas, USA, terrain looking for space shuttle debris while Jack Casazza and Richard Wakefield advised the public and U.S. Congress about the causes and repercussions of the northeast blackout.

## 1 Seeing the Invisible

BY ERICA VONDERHEID

In the last 10 years, there have been many important technological breakthroughs in medical imaging. The IEEE has played a crucial role in these advances through its technical societies, conferences, and publications.

## PRESIDENT'S COLUMN

## 7 Reflections on A Busy Year

BY MICHAEL S. ADLER

The year is drawing to an end and so is his year as IEEE President. Michael Adler looks back on his accomplishments in the areas of strategic planning, industry relations, and governance.



Page 8



Page 11

## 18 IEEE Publications Popular in Patents

BY KATHY KOWALENKO

What does Intel's patent for a spread-spectrum wireless communication system have in common with a Mitsubishi patent for a videophone with privacy protection? The technology that these and other top patenting companies cited in their U.S. patent applications first appeared in IEEE publications.

## THE INSTITUTE ONLINE

Find information on these topics and more at [www.theinstitute.ieee.org](http://www.theinstitute.ieee.org) on 5 December.

## Competitions Lead to Jobs

Some young engineers entering technical contests sponsored by IEEE Student Branches wind up with more than a plaque.

## Region Builds Careers Site

IEEE members in the southeastern United States develop an online resource for job-hunting engineers.

## PLUS

**Dues Trail** Wonder how your dues are spent? Learn where your money goes.

**News** The members have voted. Read full coverage of 2003 IEEE election results.

## Featured Conference

IEEE International Solid-State Circuit Conference, 14 to 19 February, San Francisco, Calif., USA.

THE INSTITUTE (ISSN 1050-1797) is published quarterly by The Institute of Electrical and Electronics Engineers, Inc., 3 Park Ave., 17th Floor, New York, N.Y., 10016-5997; tel. +1 212 419 7900. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canadian GST#125634188. Annual subscription rate: US\$26.00. The editorial policies for IEEE's major publications are determined by the IEEE Board of Directors. Unless otherwise specified, the IEEE neither endorses nor sanctions any positions or actions espoused in THE INSTITUTE. Major IEEE boards review items within their purview prior to publication. When published in THE INSTITUTE, individual viewpoints of elected IEEE officers are labeled as such. They are reviewed by the individuals to whom they are attributed, unless they are a matter of record. The editorial staff is responsible for selection of subject matter and its placement within the issue. Copyright © 2003 by The Institute of Electrical and Electronics Engineers, Inc. THE INSTITUTE is a registered trademark owned by The Institute of Electrical and Electronics Engineers, Inc. POSTMASTER: Send address changes to THE INSTITUTE, IEEE Operations Center, Coding Department, Box 1331, Piscataway, N.J. 08855-1331.

# NEWS

From Around the IEEE & the World

## Anderson Selected as Next President-Elect

W. CLEON ANDERSON has been selected as the 2004 IEEE President-Elect. (Election results were unofficial when this issue went to press. The tally of votes was to have become official on 16 November after the IEEE Board of Directors accepts the report of the Tellers Committee.)

The vote was very close. Of members who voted, the preliminary count shows that 18 144 chose Anderson. His opponent, Michael R. Lightner, received 18 019 votes.

Anderson, who will begin his term as IEEE President on 1 January 2005, is a



chief project engineer at L-3 Communication Systems-West in Salt Lake City, Utah, USA. He will succeed 2004 IEEE President Arthur Winston, who takes over on 1 January 2004.

A Senior Member, Anderson joined the IEEE in 1970. He is Regional Activities Vice President and a member of the IEEE Board of Directors. He is also a member of the IEEE Computer Society and the IEEE Engineering Management Society.

Of the 246 731 ballots mailed, 37 233 valid ballots were returned for a voter turnout of 15.09 percent, down from 15.66 percent in 2002.

## Alphonse is 2004 IEEE-USA President-Elect

GERARD A. ALPHONSE has been selected the 2004 IEEE-USA President-Elect.

He will begin serving as IEEE-USA President on 1 January 2005 and will succeed 2004 IEEE-USA President John W. Steadman, who takes over on 1 January 2004.

Alphonse, an IEEE Fellow, is retired from Sarnoff Corp., Princeton, N. J., USA, and LaSalle University, Philadelphia, Pa., USA. He is Region 1 Director and a member of the IEEE Board of Directors.

## Google Searches Link to IEEE Xplore

PEOPLE USING GOOGLE to search for IEEE articles are now automatically linked to IEEE Xplore, the electronic platform for distributing the institute's published information. The tie-in enables users to view a document's abstracts, containing the document's summary and bibliographic information, free of charge. Xplore guests can also browse the table of contents of IEEE publications, but to get the full text of an article, they must purchase the document. The IEEE is the first technical society to have its documents indexed for public use. ●

Alphonse also served on the IEEE-USA Board of Directors from 1998 to 1999, and again from 2002 to 2003. He was IEEE-USA Vice President of Operations from 1998 to 1999.

For more election news, visit *The Institute Online* at [www.theinstitute.ieee.org](http://www.theinstitute.ieee.org) ●

# Easy. Efficient. Powerful. Essential.

Now  
access titles  
back to 1988  
and select  
content to  
1950

The **IEEE Member Digital Library** brings you access to IEEE journals, magazines and conference papers back to 1988, select titles to 1950. Full-text access with one convenient subscription.

Select IEEE Member Digital Library when you renew your membership. It's all you need.

**Subscribe: [www.ieee.org/renewal](http://www.ieee.org/renewal)**



**The IEEE Member Digital Library**  
Seek. Discover. Innovate.

## This Month's Question

# When the Power Fails

Since last August, more than 100 million people have lost electricity. First, eastern and midwestern portions of the United States and Canada experienced a blackout. Next, London's grid shut down during a rush hour, then Sweden and Denmark lost power, and in late September, most of Italy was plunged into darkness. Some power outages lasted less than an hour, others more than several days.

What can engineers do to prevent large-scale blackouts from happening again? Reader responses to the question above will appear in the March issue of *The Institute*.

To respond to the question, write to us by e-mail or regular mail. It is unlikely that space will permit publication of all responses, but we will try to draw a representative sample. Your comments are subject to editing for brevity. Suggestions for questions are welcome.

E-mail: [institute@ieee.org](mailto:institute@ieee.org)

Regular mail: *The Institute*, IEEE Operations Center, 445 Hoes Lane, Piscataway, N.J., USA 08855-1331; Fax: +1 732 235 1626

## Responses to September's Question

Should employers be allowed to make their employees take brain imaging tests to find out if they are predisposed to diseases like Alzheimer's, Parkinson's, or to psychological illnesses such as bipolar disorder?

### No Testing for Engineers

I might have a genetic predisposition to Alzheimer's, but I might not live long enough for the disease to manifest itself. I might have a predisposition to alcoholism, but my lifestyle and morality may be such that I never take a drink.

Doctors and airline pilots are subjected to rigorous medical exams because they are in direct control of the public's safety. But engineers?

People must be responsible for themselves, and if you are in a position to harm the public, then you must understand that your job, your family, and your property are all at risk if you disregard a serious health problem. After people display risky behavior, their right to privacy might be secondary to the public good, requiring them to take such tests, but not before.

*Robert Sacks  
Toccoa, Ga., USA*

### Any Testing Is Unethical

The U.S. system of law is based upon the supposition that one is innocent until proven guilty. People are punished for what they do, and not for what they think or intend.

The imaging tests cannot prove that the specific disease will develop; thus, results of such tests are hypothetical possibilities, conjectures, and assumptions. To base someone's employment on an

event that may never happen is unfair discrimination.

Even for professionals who affect the safety of the general public, such as doctors and airline pilots, the risks do not justify these kinds of tests. Until symptoms emerge, a person with a predisposition poses no threat beyond that of normal humanity. Instead, periodic performance reviews should determine an individual's mental competence.

*Dave Saunders  
Kaysville, Utah, USA*

### False Expectations

I believe it is false to assume that results from such brain imaging tests would provide useful information as a basis for employment decisions. It is one thing to test mechanical or electrical components for predisposition to failure, but it is quite another to do the same with a complex, adaptable system like a human being. Just because there's a new tool that provides a different view does not mean that the results should outweigh other analyses or common sense.

I believe engineers should be allowed to do their jobs for as long as possible. Let their performance and results determine their value, not just a single medical test.

*Dan Franzblau  
Ottawa, Ont., Canada*

### Lifestyle Choices More Relevant

It would certainly not be ethical to discriminate against someone based on statistical probabilities, especially when genetics, not lifestyle choices, are involved. Women with a family history of breast cancer may be more likely to develop the disease, and men over the age of 55 may be predisposed to prostate cancer.

However, these people may also make more healthy lifestyle choices to decrease their overall risk than would a cigarette-smoking co-worker with emphysema, a boss who drinks and drives, or a young, swinging, single salesperson who contracts HIV. Too bad employers won't find brain-imaging technologies to screen for bad judgment, wastefulness, and deceit.

*Lee Anne Ryan  
Cary, N.C., USA*

### Testing Is Damaging to Employees

This question touches two different social issues. One issue is the balance between individual liberty and security, such as my level of confidence that my cab driver will not have a seizure while driving. The other issue is the conflict between the social benefit and the profitability of insurance companies.

The measure of whether a person can be trusted with critical tasks should be an objective test of ability. This approach allows those who are afflicted with predispositions to disease or slow-acting degenerative ailments like aging to perform critical tasks as long as they are competent. An exception would be conditions that could cause sudden and unpredictable impairment.

Insurance exists to protect individuals from being financially destroyed by catastrophic medical costs. People's willingness to pay for insurance and insurance companies' willingness to insure individuals are based on the unpredictability of who will suffer catastrophes. The social contract is, "I will be protected if I pay."

Putting this societal function in the hands of for-profit companies introduces a conflict of interest. If the future could be predicted, then denying aid to those in need would maximize companies' profits. If information about predisposition to disease is made available to insurance companies, nothing today prevents them from denying coverage. Until we can separate profiteering from protection, employees could be damaged, and hence it would be unethical to force them to take tests that could be used against them.

*Mike Schultes  
Austin, Texas, USA*

### Some Testing Is Necessary

It would be criminally negligent to deny the use of any pertinent tool available to pre-screen potential public service or safety employees to determine their suitability. Stop thinking as an outside arbiter for a moment and place yourself in the shoes of any public-safety job seeker.

Professionals who wish to be entrusted with the lives of dozens or hundreds of people would welcome the use of every possible tool to assure themselves that they are unlikely to fail. All professionals recognize and welcome an ongoing, never-ending world of training, retraining, testing, competing, certifying, re-educating, and re-proving throughout their career.

*J.C. West  
Norwalk, Conn., USA*

### Make It Voluntary

Tests for predisposition to disease should be voluntary, and the results should be kept confidential between the patient and the clinic that performs the tests. Even if a test is accurate, the disease could be cured before it manifests symptoms. If people are not hired for particular jobs because of their predisposition to these diseases, it could lead to severe psychological problems.

*Fatma Demirbilek  
Waukesha, Wis., USA*

### Personal Experience

As the parent of a son who suffers from light-to-moderate bipolar and anxiety disorders, I was brought face to face with this issue. Thanks to a team of psychiatrists with experience in brain imaging technologies, I was able to get an objective and accurate diagnosis for my son. I am very grateful for such imaging and look forward to the day when improvements will make this tool less expensive and more available.

The brain is exceedingly complex, and imaging can give a distorted diagnosis if the results are not read by an experienced professional. There are still many variables that are not revealed through images without thorough interviews to accompany the reading.

With such complexities and privacy issues, it would be unethical for an employer to draw conclusions about predispositions toward mental illness based on brain imaging alone. Such conclusions would be blind to various treatments and health practices that can manage symptoms. In critical positions, one's experience, training, and reputation are more accurate indicators of future performance.

*Dennis J. Hansen  
South Jordan, Utah, USA*

# LETTERS

## Member Grades & E-mail Signatures

As an IEEE volunteer, I've included my IEEE affiliations in e-mails for several years, mostly so that other people in the IEEE will know which committees I am on.

What concerns me is the way in which the board recommends the member grade be included on business cards and letterhead, as well as in e-mails [September, p. 4]. For many years, if I saw references to one of the suggested abbreviations—FIEEE, LMIEEE, HMIEEE,

LFIEEE, or AIEEE—I would be hard pressed to recognize this as a reference to the IEEE. Other organizations use some of these same acronyms.

The board says this measure is to encourage the growth of membership and strengthen the identity of the IEEE. Certainly having "IEEE" on a business card or in an e-mail signature strengthens the IEEE's brand identity and could lead to encouraging others to join. But I don't believe that many people outside the IEEE would associate the suggested acronyms with the organization.

The board should re-evaluate how it proposes to include member grades in e-mail signatures. For now, I think I'll leave my e-mail signature just as it is.

Scott M. Blair  
Austin, Texas, USA

The IEEE is encouraging members to put their IEEE affiliation and membership grade on their business cards and personal letterheads and in the signature

block on their e-mail.

This is a useless waste of time and bandwidth—six or seven indecipherable bytes added to every message sent by IEEE members. And remember that many messages are sent to several people who then quote the message when replying to the sender or group. Should members give equal billing to all the other societies they might belong to?

The proposal would burden the Web with extra megabytes for every member who follows the practice.

Norman Goldsmith  
East Brunswick, N.J., USA

## IEEE and Industry Partnership a Plus

We at Tata Consultancy Services (TCS), in India, echo IEEE President Michael Adler's sentiments regarding industry's participation with the IEEE [*The Institute*, September, p. 6]. Our company has been encouraging its professionals to join the IEEE and has been paying their membership dues.

TCS's former deputy chair, F.C. Kohli, an IEEE Life Fellow himself, was also Region 10 director and instrumental in forming the India Section and later the India Council. His lead, as well as the support of the present chief executive officer, S. Ramadorai, an IEEE Senior Member, has spurred several TCS professionals to become active IEEE volunteers.

To date, our company boasts two Fellows, 18 Senior Members, and more than 3000 IEEE members. We have the most members and associate members of any organization in India. What's more, last year our employees comprised one-tenth of the higher-grade members in Region 10.

Far from blowing my own horn [for TCS], I am trying to demonstrate that Adler's ideals are eminently achievable if senior management considers the payment of IEEE membership dues as an investment in the future and not as an unnecessary expenditure.

Anthony Lobo  
Mumbai, India

## Dues Increase Challenged

The September issue of *The Institute* [p. 4] reports: "The basic dues for 2004 will be US\$113, an increase of \$3, which is about the rate of U.S. inflation."

This is a 2.7 percent increase, whereas the U.S. Consumer Price Index was at 183.7 in June 2003, a 2.1 percent increase from the 179.9 reported in June 2002. But this may overstate the rate of inflation. The Gross Domestic Product deflator—thought by many to be a more accurate

indicator because it doesn't measure the cost of a fixed "market basket" of goods and services but rather changes "automatically" to match what consumers are buying—increased by 1.6 percent between January 2002 and January 2003.

A \$2 increase would have been 1.8 percent, much closer to the rate of inflation.

My salary has been frozen for two years, and the year before that I received only a 1 percent raise. I think many IEEE members are in the same situation. The last three years have not been kind to the electronics and computer industries. At first glance, the dues increase looks like an unjustified grab by IEEE for more money from members who are struggling financially.

Edward F. Gehringer  
Raleigh, N.C., USA

Michael Binder, IEEE director of membership, responds:

From 1996 to 2001, the IEEE added many new services and significantly improved and expanded its information technology infrastructure. During these years, the IEEE avoided any dues increases by relying on investment returns on its reserve funds to supplement its day-to-day operating budget. Unfortunately, the downturn in world investment markets, coupled with the fact that dues did not keep pace with inflation for six years, led to the need for relatively major increases in dues in both 2002 and 2003.

To stabilize future dues increases, the IEEE Board of Directors passed a bylaw (I-108.5) in 2002 that indexed future dues increases against inflation via the U.S. Consumer Price Index (CPI). The dues rate for 2004 depends on this index. From April 2002 to April 2003, it had increased by 2.2 percent, which was rounded up to the nearest dollar.

We recognize that the dues increases of the last three years have been difficult for some members. We sincerely hope that indexing dues to inflation, as well as implementing some very major operating cost reductions over the past two years, will help avoid any sizable dues increases in the future. In addition, the IEEE no longer relies on investment returns—with their ups and downs—to finance ongoing operations.

According to our research, the vast majority of IEEE members continue to express satisfaction with their membership. We believe that despite the dues increases, our members continue to receive substantial value, with more services, exclusive benefits, and opportunities for professional development than ever before.

## Tell Us What You Think

We welcome letters from readers expressing opinions on matters of interest to IEEE members and to the technical community at large. Please include your city, state or province, and country.

**Mail:** The Institute, IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ, USA 08855-1331 **Fax:** +1 732 235 1626  
**E-mail:** [institute@ieee.org](mailto:institute@ieee.org)



## IEEE Membership Opening the World of Technology

Essential Information  
Networking Opportunities  
Career Development  
Exclusive Benefits

■ ■ Don't risk losing the many benefits of IEEE membership. Renew your IEEE membership online today at:  
[www.ieee.org/renewal](http://www.ieee.org/renewal)

■ ■ Find out more about IEEE membership benefits at:  
[www.ieee.org/memberbenefits](http://www.ieee.org/memberbenefits)



# Reflections on a Busy Year

BY MIKE ADLER

**T**he year is drawing to an end and my term as IEEE President with it. It's hard to appreciate how quickly the year has gone by and to imagine that, earlier this year, I used this column to share my thoughts with you on the IEEE's strategic goals.

At the 2003 IEEE Honors Ceremony in June, I discussed the speed of change and noted how the rate of technological advancement has accelerated to a dizzying pace. Change continues to race through virtually all disciplines within our range of technical interests and all applications we technology professionals dream up. When you consider that as many transistors now have been shipped as there are grains of sand in the world, the speed of technological change boggles the mind.

This is the environment we work in today, and the IEEE's environment is changing just as fast. Although we remain a healthy organization, our challenge is this: we must get in front of change instead of reacting to it.

The late U.S. publisher Malcolm Forbes once joked, "There's never enough time unless you're serving it." But these 12 months have been highly productive for the IEEE, and I want all members—especially our hard-working volunteers—to recognize how much our organization achieved in a short span of time.

During 2003, your Board of Directors began thinking more strategically than ever before and developed a new strategic plan that will drive us to the forefront of these exciting changes. Despite their other IEEE responsibilities and work and family commitments, board members met three extra times to discuss critical issues facing the organization, with the objective of creating a new set of strategies. I am writing this column in October, but by the time you read it in December, I expect the board to have approved the IEEE Strategies for 2004 Plan. It has three main themes: expanding electronic services and products, improving the IEEE's relevance to industry, and increasing volunteerism.

## New and better services

We also made notable progress in providing new or improved electronic services, including an e-mail newsletter from *The Institute* when new articles appear in the monthly online publication; e-mail alerts when new articles and related information are posted in IEEE Xplore; the launch of the IEEE Member Digital Library, and the networking opportunities offered in more than two dozen online collaboration sites.

Another crucial area is improving our organization's relevance to industry. Although other recent IEEE boards wrestled with this topic, I felt an obligation to encourage more industry-related initiatives, because I am the only president in many years to come directly from industry. In October, we conducted the first IEEE Industry Forum—a select gathering of seven senior industry executives who can-



● **The IEEE's working environment is changing as fast as technology. Although we remain a healthy organization, our challenge is this: we must get in front of change instead of reacting to it.**

didly gave their ideas and insights to a small team of IEEE leaders—at General Electric Co.'s corporate headquarters in Fairfield, Conn., USA. In November, we met with industry leaders in Singapore and Tokyo. We plan to continue these dialogs in 2004 with meetings with industry executives in Europe.

Last June, the Board of Directors included governance as an additional strategic theme. At an October retreat, the board agreed on several areas that require attention before IEEE governance is agile enough to meet the rapid pace of change. For example, board members discussed delegating more operational details to IEEE entities, thereby letting the board spend more time on strategic issues. As I write this, a plan based on discussions from the retreat will be presented at the November Board meeting.

During the year, my wife, Virginia, and I met with many IEEE members from Australia, Central America, Hawaii, Iceland, Japan, New Zealand, Russia, and Singapore. I thank the volunteers who were so gracious. We benefited mutually from our discussions, and the result will be a united, more global IEEE.

This has been one of the busiest and most productive years in recent IEEE history. Your 2003 board accomplished a great deal, but more work lies ahead if we are to continue to think strategically and creatively and to make sure our organization keeps pace with the ever-accelerating rate of change. I am grateful for the important contributions from more volunteers and staff than space permits me to acknowledge. I am confident that Arthur Winston, who is a proven problem solver and an able leader, will move the IEEE forward in 2004 as your next President.

## IEEE Quick Guide

**MEMBERSHIP** For inquiries about your membership, contact a Member Services representative assigned to your region via e-mail or telephone.

<b>If you live here:</b>	<b>use this e-mail address</b>
Northeastern USA	member.services.1@ieee.org
Eastern USA	member.services.2@ieee.org
Southeastern USA	member.services.3@ieee.org
Northern Midwest USA	member.services.4@ieee.org
Southwestern USA	member.services.5@ieee.org
Western USA	member.services.6@ieee.org
Canada	member.services.7@ieee.org
Europe, Middle East, Africa	member.services.8@ieee.org
Latin America	member.services.9@ieee.org
Asia/Pacific, Australia	member.services.10@ieee.org

To reach your representative toll-free by telephone in the U.S. and Canada, call +1 800 678 IEEE (4333); elsewhere, +1 732 981 0060.

Members may change their address, obtain information about Section activities, learn about student resources, and more at the IEEE's Member Services Web site at [www.ieee.org/membership](http://www.ieee.org/membership)

**Contact Points:**  
**IEEE Operations Center**  
 445 Hoes Lane  
 Piscataway, NJ 08855-1331 USA  
 Tel: +1 732 981 0060  
 URL: [www.ieee.org](http://www.ieee.org)

**IEEE Corporate Office**  
 3 Park Avenue  
 New York, NY 10016-5997 USA  
 Tel: +1 212 419 7900

**IEEE-USA**  
 1828 L Street, N.W., Suite 1202  
 Washington, D.C. 20036-5104 USA  
 Tel: +1 202 785 0017  
 E-mail: [ieeeusa@ieee.org](mailto:ieeeusa@ieee.org)  
 URL: [www.ieeeusa.org](http://www.ieeeusa.org)

**Conference Information**  
 Tel: +1 732 562 3878  
 URL: [www.ieee.org/conferencesearch](http://www.ieee.org/conferencesearch)

**IEEE Financial Advantage Program**  
 Tel: +1 800 438 4333  
 E-mail: [fap-benefits@ieee.org](mailto:fap-benefits@ieee.org)  
 URL: [www.ieee.org/services/financial/fap](http://www.ieee.org/services/financial/fap)

**Ombudsman**  
 Tel: +1 800 678 4333  
 E-mail: [ombudsman@ieee.org](mailto:ombudsman@ieee.org)

**Technical Societies Information**  
 Tel: +1 732 562 3900  
 E-mail: [society-info@ieee.org](mailto:society-info@ieee.org)  
 URL: [www.ieee.org/organizations/tabsociety.html](http://www.ieee.org/organizations/tabsociety.html)

**To Order Products**  
 Tel: +1 800 678 4333  
 Fax: +1 732 981 9667  
 E-mail: [customer-service@ieee.org](mailto:customer-service@ieee.org)  
 URL: <http://shop.ieee.org/store>

**Travel Services**  
 Tel: +1 800 TRY IEEE (Outside U.S., call +1 732 562 5387)  
 Fax: +1 732 562 8815  
 E-mail: [ieee-travel@ieee.org](mailto:ieee-travel@ieee.org)

# An Engineer's Life in Nigeria

Muyiwa Taiwo helped found the IEEE Nigeria Section, but he had to leave his homeland

BY HARRY GOLDSTEIN

**T**he sun beat down through a dusty haze as Muyiwa Taiwo drove us along the causeway from Victoria Island, one of the four islands of Lagos, the commercial capital of Nigeria, to Ikeja, the mainland portion of the city. This megalopolis of 13 million people is where Taiwo, an IEEE member since 1981 and a founding member—not once, but twice—of the Nigeria Section, lives for a few months out of the year.

Since his birth in 1960, the same year Nigeria gained independence from Great Britain, Taiwo's life has been in lock step with the history of a country so troubled that, like thousands of educated Nigerians, Taiwo was forced to leave. He splits his time between Nigeria, where he does information technology (IT) training at the British Council's Lagos office, and the Information Technology Institute in Auckland, New Zealand, where he's a computer instructor and responsible for the curriculum of the school's graduate diploma program in IT.

We were on our way to a hotel to rendezvous with Taiwo's personal assistant, Ego Njoku. She was my guide for a week in June when I was in Nigeria researching an article for *IEEE Spectrum* on the recently completed US\$670 million undersea fiber-optic cable that links Nigeria and eight other African countries to the rest of the world. As we swung onto an off-ramp in Ikeja and through a roundabout, a cop with an automatic rifle slung over his shoulder ordered us to stop. He told Taiwo that he looked like he was having a nice Sunday and wouldn't it be nice if Taiwo could make it nice for him, too. Taiwo handed over 100 naira (about 80 U.S. cents), and we sped away.

Corruption at every level of society has stopped Nigeria dead in its tracks and pushed Taiwo, along with many other educated Nigerians, to leave. Corruption eats at the soul of this nation, its resources squandered for a quick buck to fill the pockets of the rich and well connected, leaving most of the population to live in desperate poverty on less than US\$1 per day.

Taiwo left Nigeria, he tells me, because he gave up hope that anything would change. Ordinary Nigerians are too worried about putting bread on the table today to worry about, much less affect, tomorrow. "There can be no thoughts of the long term when you are trying to survive today," he says.

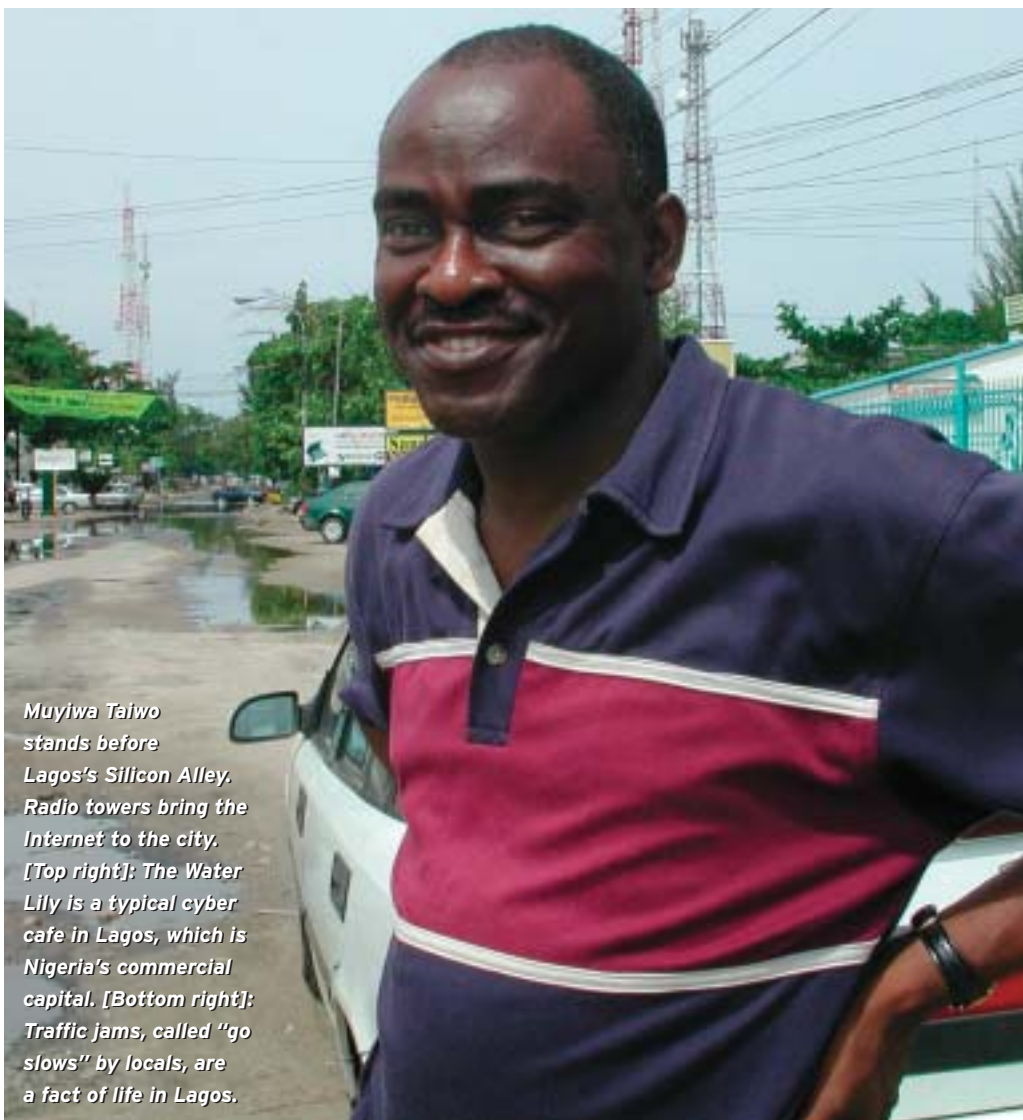


When we arrived at the hotel, we quickly checked our e-mail at the Internet café on the premises, then strolled over to the pool and cabana. Nigerian music pumped through huge speakers as people frolicked in the pool. Taiwo ordered us a local malt beverage and a Guinness, which he mixed into a sludgy brew. We took a seat and shared a helping of suya, thin strips of mystery meat-on-a-stick grilled over a charcoal fire.

As we ate, Taiwo narrated the intricacies of the social scene for me; he counts people-watching as a favorite pastime. He admits he doesn't do much else besides work and talk on the phone. It's the talking that makes him, in his own estimation, a typical Nigerian.

I asked Taiwo what got him into engineering in the first place.

When he was a child, his father built an extension to their house and had it wired for electricity. "A man came to inspect what we needed for the electrical extension. He was so competent—he knew how many circuit breakers we would need, how many sockets—that



Muyiwa Taiwo stands before Lagos's Silicon Alley. Radio towers bring the Internet to the city. [Top right]: The Water Lily is a typical cyber cafe in Lagos, which is Nigeria's commercial capital. [Bottom right]: Traffic jams, called "go slows" by locals, are a fact of life in Lagos.



I thought: I want to be very competent like this man. That's when I made up my mind to become an electrical engineer."

Taiwo's father encouraged him by giving him an electrical experiment kit and exposing him to computers early on.

"My father wanted me to go to school and come back to work for his computer consultancy business," Taiwo explains. "Although I wasn't interested in his company, I did a bit of programming for him and learned COBOL. Then I went to engineering school."

Nigeria's development is retarded by a pathetic educational system—from grade school all the way through university. The government spends little on education at any level, so Nigerian universities rely on grants from the U.S.-based MacArthur and Rockefeller Foundations, among others, to fund infrastructure improvements, books, and basic equipment like computers. Even for the most diligent student, it can take 10 years to earn an undergraduate degree because frequent faculty strikes can close universities for months at a time.

Taiwo was lucky. He matriculated at the University of Lagos, known as Unilag, in 1979, before teacher strikes became the bane of Nigerian students. He received a solid fundamental engineering education at Unilag, where, as part of his degree requirements, he had to put together his own microprocessor-based project. Nowadays, because university engineering labs are so ill equipped, he says students are hard-pressed to learn to put together a simple power circuit in a year.

Taiwo became an IEEE Student Member in 1981. What attracted him to the organization, in addition to joining an international network of engineers, was the quality of IEEE publications. "My university was getting a lot of IEEE journals, such as *Transactions on Communications*, *Transactions on Consumer Electronics*, and *Spectrum*," he explains. "Seeing all that technical literature made me decide to join the IEEE."

His membership gave him the confidence and knowledge to build an RF TV controller while still in school. "Back then, there were no microcontroller chips and you had to build around a microprocessor core, build your input-output and digital-to-analog con-

verters. So I built the radio/TV controller, and it worked. Building it was possible because I was getting IEEE journals, and I applied what I learned."

After graduating from the university in 1982, Taiwo went to work as an oil field engineer in Algeria for the French company Schlumberger. As a member of the IEEE Computer Society, Taiwo stayed up to date on computer hardware and software issues. When he left Schlumberger in 1986, he had enough technical background to shift his career from oil services to computer programming.

After a short stint as a programmer for London's Department of Building Design Services, Taiwo returned to Nigeria in 1987 and started his own computer sales and service business. He soon landed a client who at the time was a bit down on his luck but who would eventually rise up to rule Nigeria and twice be elected president.

#### A well-connected client

In 1987, Olesegun Obasanjo contracted with Taiwo to write software for his farming business. Obasanjo—who had ruled Nigeria as a military strongman in the late 1970s only to fall out of favor with the regime of General Ibrahim Babangida that reigned from 1985 to 1993—was elected president in 1999. He was inaugurated for a second term this past May.

But when Taiwo met him, Obasanjo was just an ordinary gentleman farmer. "He wanted to use his crops to make animal feed. Different plants have different amounts of phosphate and magnesium, and the feed needed a certain percentage of each," Taiwo explains. "So I built a computer model that combined the various ingredients to get the optimum ratios for the feed."

Around the same time, Taiwo helped one of his old professors from Unilag, Albert Alos, launch the Nigeria Section. The section lasted only until 1991, when it folded, along with the entire Nigerian economy. Members simply couldn't afford to pay their dues.

In 1992, Taiwo married. The next year, Vice President General Sani Abacha seized control of Nigeria in a bloodless coup, and a dark period of unfettered corruption and violence ensued, making it hard for Taiwo to make a living. The decline in the fortunes of his business, which had started the previous year, accelerated. So he switched career gears again and became a freelance IT consultant.

"The military guys under Abacha were robbing Nigeria blind," Taiwo says. "At that time, you and I could not hold this conversation because anyone around us could be a spy. But for a consultant, the major problem was that people had very little money. If I could offer a cost-effective solution, then I won. And I could do that because I didn't have a huge overhead of staff."

Taiwo survived by setting up PCs for newly minted lawyers, real estate agents, accountants, and other professionals, and by writing software for customers like Lagos State University and the National Electric Power Authority, the state energy monopoly.

As the economy slowly improved, interest in the IEEE flourished again. In early 2000, former Nigerian IEEE members started e-mailing each other, trying to revive the Section. In May 2000, Isaac Adekanye, the current Section chair, put together a steering committee to revitalize the Section, which Taiwo, in effect, helped found for a second time.

"I didn't have the time to be the chair, but I was ready to play a supporting role," Taiwo says. "So I was elected vice chairman, and that's what I've been ever since."

#### A move to New Zealand

Despite the success he and his colleagues were having with the rejuvenated Nigeria Section and burgeoning student branches, Taiwo was fed up with the bad economy and the endemic corruption, and decided to emigrate to New Zealand. He obtained a work permit after a long wait and moved to Auckland in the spring of 2002.

Within two weeks of his arrival, he had a job teaching programming and network maintenance at Auckland's Information Technology Institute. The school's schedule allows Taiwo to rotate his time between the two countries. He spends three months in Auckland, where he just bought a small house, followed by four to six weeks in Lagos, where his parents still live.

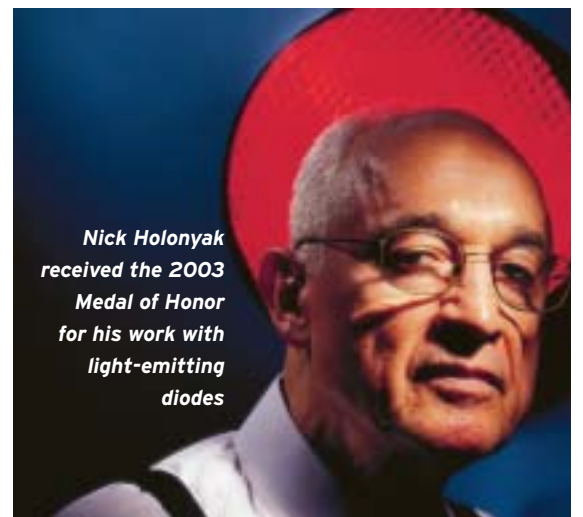
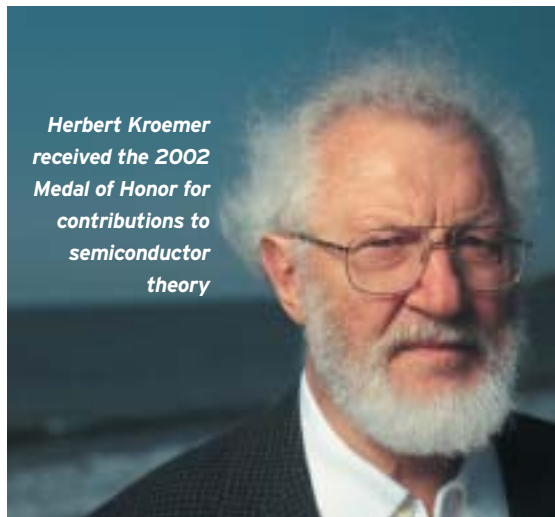
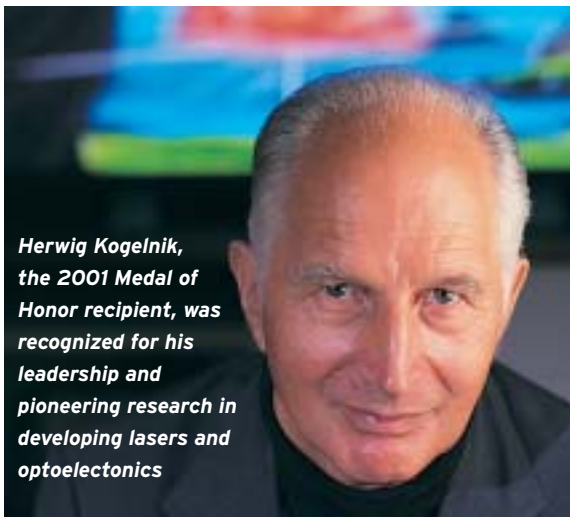
As dusk fell, Ego arrived and we made plans for the week. Afterward, we piled into Taiwo's car to drop Ego at a bus stop. Along the way, we hit one of the ubiquitous traffic jams known in Lagos as a "go slow." As we crawled by the accident that had caused the go slow, I glimpsed a young man lying in the road, two men gripping his arms, pulling his broken corpse out of traffic. Maybe he fell out of a van or off a scooter or just stepped too far out into the road.

"You didn't see that, did you?" Taiwo asks, concerned perhaps that I would be horrified or frightened. Oddly, I felt neither—just numbed by an overwhelming sense of hopelessness about this place that even Nigerians like Taiwo, who both loves and loathes Lagos, seem to share. ●



# Nominations Sought for IEEE Awards

IEEE Sections, Societies, and individual members are invited by the IEEE Awards Board to submit nominations for medals, recognitions, and prize papers to be presented in 2005. The deadline for the board to receive nominations is 1 July 2004.



## IEEE Medal of Honor

For an exceptional contribution or an extraordinary career in the IEEE's fields of interest.  
Sponsor: IEEE Foundation

## IEEE Edison Medal

For a career of meritorious achievement in electrical science, electrical engineering, or the electrical arts.  
Sponsor: IEEE Technical Activities Board

## IEEE James H. Mulligan Jr. Education Medal

For a career of outstanding contributions to education in the fields of interest to the IEEE.  
Sponsors: The MathWorks Inc., National Instruments Foundation, Pearson Prentice Hall, Xilinx Inc.

## IEEE Founders Medal

For outstanding contributions in the leadership, planning, and administration of affairs of great value to the electrical and electronics engineering profession.  
Sponsor: IEEE Foundation

## IEEE Richard W. Hamming Medal

For exceptional contributions to information sciences, systems, and technology.  
Sponsor: AT&T Labs

## IEEE Jack S. Kilby Signal Processing Medal

For outstanding achievements in signal processing.  
Sponsor: Texas Instruments Inc.

## IEEE Jun-ichi Nishizawa Medal

For outstanding contributions to material and device science and technology, including practical applications.  
Sponsors: The Federation of Electric Power Companies, Japan, and Semiconductor Research Foundation

## IEEE Robert N. Noyce Medal

For exceptional contributions to the microelectronics industry.  
Sponsor: Intel Foundation

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

For outstanding accomplishments in advancing the fields of radar technologies.  
Sponsor: Raytheon Co.

## IEEE Simon Ramo Medal

For exceptional achievement in systems engineering and systems science.  
Sponsor: Northrop Grumman Corp.

## IEEE John von Neumann Medal

For outstanding achievements in computer-related science and technology.  
Sponsor: IBM Corp.

## IEEE Honorary Membership

For meritorious service to humanity in the IEEE's designated fields of interest.  
Sponsor: IEEE

## IEEE CORPORATE RECOGNITIONS

### IEEE Corporate Innovation Recognition

For outstanding and exemplary contributions by an industrial entity, governmental or academic organization, or corporate body that have resulted in major advancements in electrotechnology.  
Sponsor: IEEE

### IEEE Ernst Weber Engineering Leadership Recognition

For exceptional managerial leadership in the fields of interest to the IEEE.  
Sponsor: IEEE

## IEEE SERVICE AWARDS

### IEEE Richard M. Emberson Award

For distinguished service to the development, viability, advancement, and pursuit of the technical objectives of the IEEE.  
Sponsor: IEEE Technical Activities Board

### IEEE Haraden Pratt Award

For outstanding service to the IEEE.  
Sponsor: IEEE Foundation

## IEEE PRIZE PAPER AWARD

### IEEE Donald G. Fink Award

For an outstanding survey, review, or tutorial paper in any of the IEEE transactions, journals, magazines, or proceedings.  
Sponsor: IEEE Life Members Committee

**DEADLINE FOR NOMINATIONS:**  
**1 JULY 2004**

For nominating information, visit the Awards Web site at [www.ieee.org/about/awards](http://www.ieee.org/about/awards) or contact: IEEE Awards Activities, 445 Hoes Lane, Piscataway, NJ, USA 08855-1331; Telephone, +1 732 562 3844; fax, +1 732 981 9019; e-mail: [awards@ieee.org](mailto:awards@ieee.org).

# Nurturing Online Collaboration

BY ERICA VONDERHEID

**T**oday, there are more than 70 IEEE online collaboration sites (OCS) with approximately 5000 members overall. These include sites for technologies such as bioinformatics, power, electrical safety, and non-technical areas such as engineering management, Women in Engineering, and Section and Region based sites.

Several years ago, the IEEE began looking at online collaboration sites for members interested in emerging technologies that had no home in an IEEE society or council. Engineers in the nanotechnology field were the first to form such a site in 2001 (and that group became a council a year later).

An online collaboration site is a Web site where members can brainstorm, communicate, and network regardless of geographical borders or time zones. These sites are more commonly known as virtual communities.

In 2004, the IEEE is looking to create online collaboration sites around more interests to address members' needs.

## Opening the tool box

"We're offering a suite of services that members can apply to whatever they're interested in doing," says Matt Loeb, staff director of Corporate Strategy and Communications, the department that oversees these sites.

These services include discussion boards, shared files, calendars, lists, images like pictures from meetings or graphic files, and polls—informal surveys to gauge opinions from site members. All the services have been set up to encourage communication and information sharing. For example, the Santa Clara Valley (Calif., USA) Women in Engineering (WIE) group uses the virtual community to post meeting agendas and hold live chat sessions in addition to holding meetings by teleconference.

"Our chat sessions aren't about kids or golf scores, but are related to growth and to get the word out about WIE," says Jack Sherman, a WIE volunteer in Chicago, Ill., USA.

Many online collaboration site members use the instant messaging feature of the site to see who is online, to get a quick answer to a question, or to chat.

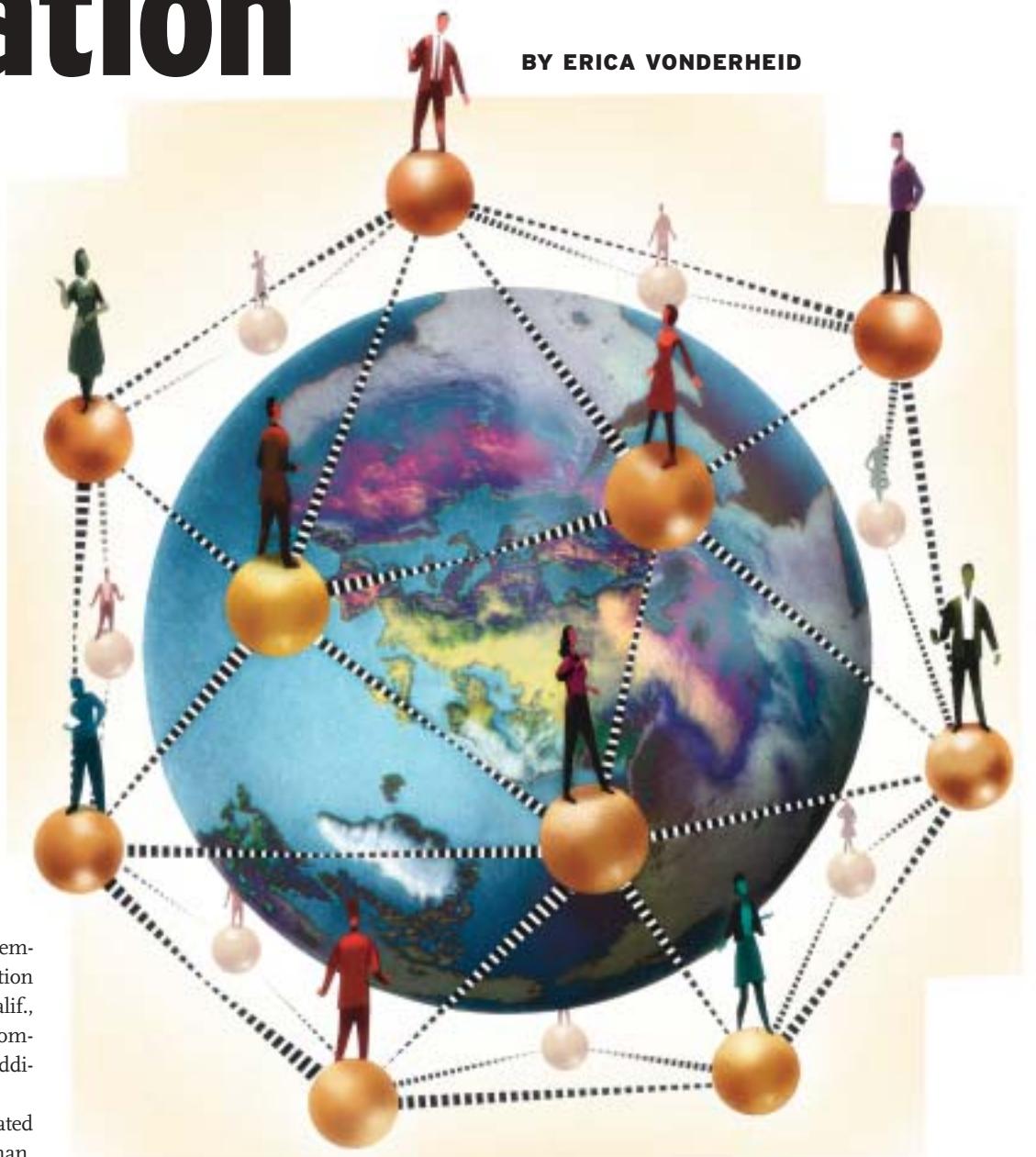
A group interested in starting an OCS needs to understand what is to be accomplished with the community and decide what tools would work best to reach those goals. Another consideration is whether the site should be an open or closed group. That is, should its membership be limited so that new members can only join by being invited by a current site member or should anyone interested in the community be allowed to sign on.

Sometimes the review process may lead to the realization that an online interaction won't work for the particular project in mind.

"An online collaboration site is not the answer to everybody's problems," says Marilyn Catis, manager of new products at IEEE Educational Activities, in Piscataway, N.J., USA, the office within the institute charged with helping to set up a site. "It's just another tool that may help you accomplish some of the things you're doing related to a project."

## Finding success

"There is an assumption that if you just set up an online collaboration site, people will come and start their own discussions," says Tara Gallus, another manager of new products at IEEE Educational Activities. "That isn't the case. There is a lot



of time and work involved in building and maintaining these sites."

Communities built around subjects that members are passionate about, such as employment, career strategies, or an emerging technology, tend to be the most popular. Loeb points out that successful online collaboration sites are those with a focused task. "When people know exactly what they need to accomplish in a specific time frame, it works extraordinarily well." For example, student members in Mexico will use their OCS to plan a meeting of all student branches in their region.

A successful community also needs a dedicated leader or leaders who will keep things moving and maintain the members' interest. The leader must know the community's audience well enough to start discussions, sometimes daily, that elicit responses. And the leaders must always respond quickly to members' questions and encourage members to participate. Otherwise the community will wither and die.

"We want [participants] to make comments," Sherman says. "Don't just log on and read; say something."

To start a community or to provide feedback on how online collaboration sites are operated, write to [communities@ieee.org](mailto:communities@ieee.org) or visit [www.ieeecommunities.org](http://www.ieeecommunities.org). ●

# Buying a House is a Lot of Work

Let IEEE Help

## 1 Real Estate Service

IEEE members and their families can receive up to \$2000 cash back (based on the sale price) with the excellent home selling and home purchasing assistance provided by Weichert Relocation Company!

## 2 Mortgage Program

Now available to IEEE Members: Great mortgage rates from Wachovia Mortgage Corporation. Discounted rates, easy processing, professional guidance and fast approval.

## 3 Moving Services

Don't worry about the hassles or the expense of moving. Let the professionals at North American Van Lines provide the quality and worry-free service that you and your family deserve.

## 4 Auto/Homeowners Insurance

Affordable, convenient automobile and homeowners insurance for IEEE Members. If you insure both your car and home under this program, you may save up to 10% on premiums!



**Don't put it off another day! Call +1 800 GET IEEE (438 4333) or visit [www.ieee.org/fap](http://www.ieee.org/fap)**

**The IEEE Financial Advantage Program®**  
**Tools to Secure Your Tomorrow**



Programs available in U.S. only. May not be available in all states. Please check with carrier.

## MEDICAL IMAGING *from page 1*

procedures include magnetic resonance imaging, positron emission tomography, computer axial tomography, and ultrasound.

“Doctors’ use of medical imaging has evolved from [their] simply looking at a picture—which is the classical, radiological or X-ray use of imaging—to the current state, where they can take measurements, and simulate and model organs and functions,” says IEEE Senior Member Christian Roux, a professor of biomedical imaging at the Ecole Nationale Supérieure des Télécommunications de Bretagne, in Brest, France.

Physicians can thank engineers, and in part the IEEE, for the sophisticated diagnostic tools in use today. The institute’s involvement in medical imaging is distributed over several societies, notes Senior Member Zhi-Pei Liang, an electrical and computer engineering professor at the University of Illinois at Urbana-Champaign. Societies such as Engineering in Medicine and Biology, Nuclear and Plasma Sciences, Signal Processing, and Ultrasonics, Ferroelectrics, and Frequency Control each have their own publications and sponsor conferences on technologies related to medical imaging.

But now, Liang says, a more coordinated effort exists among the societies, which have established interdisciplinary journals and conferences.

“Any part of medical imaging must be multidisciplinary,” says Senior Member Jayaram K. Udupa, professor of radiological sciences at the University of Pennsylvania in Philadelphia, USA. Engineers have to know about all the related processes in imaging to create a useful device.

This knowledge ranges from the basic physics of the imaging technology, to the biology of the system to be imaged, to how to process the information that has been sensed.

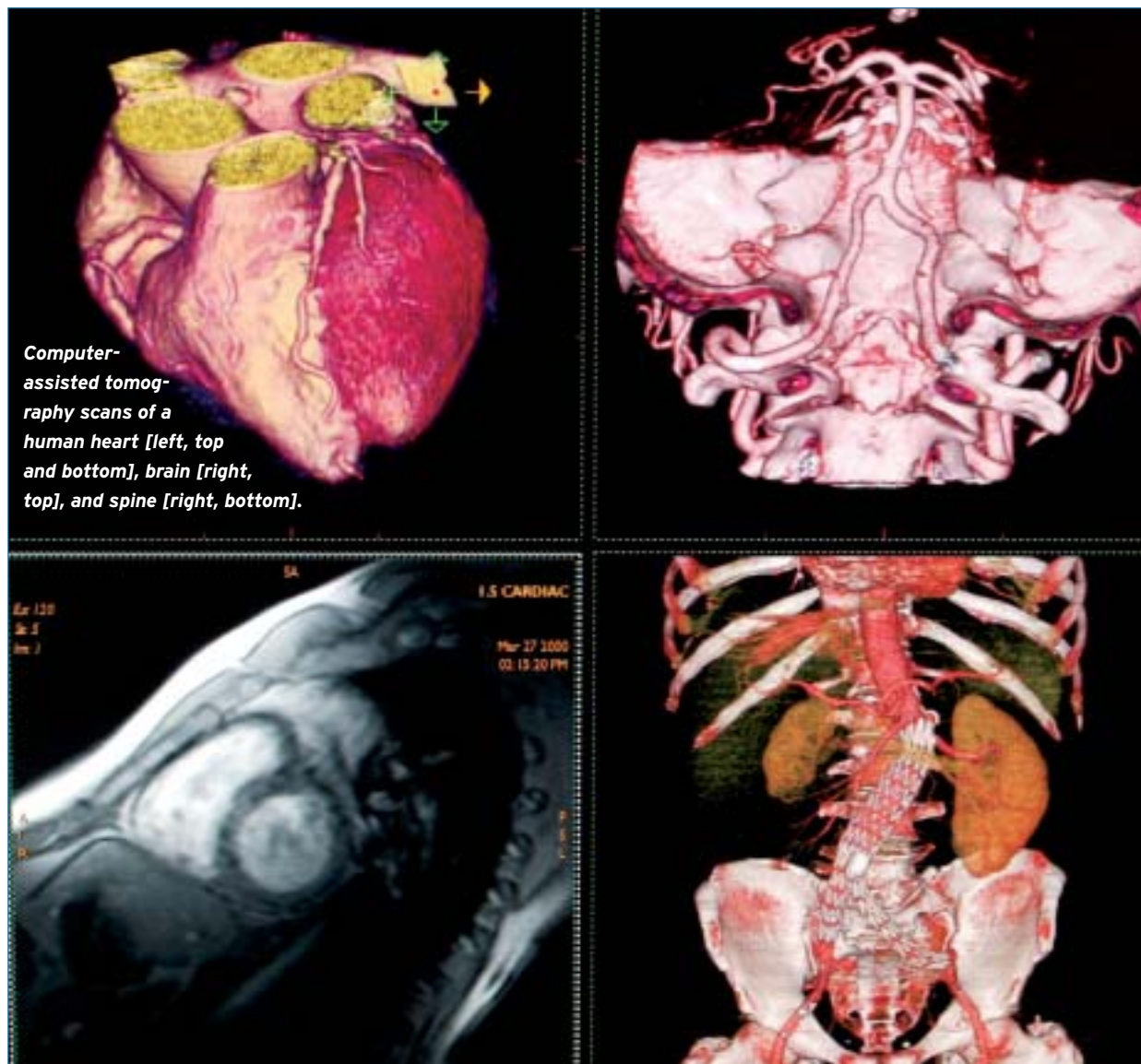
As Senior Member Richard Leahy, professor of signal and image processing at the University of Southern California, Los Angeles, USA, puts it: “A revolution in biomedical imaging is still continuing. Luckily the IEEE is aware of this and is supporting research through its publications and conferences.”

### Dedicated journal

Recognizing the important work taking place in the field, the *Proceedings of the IEEE* dedicated its entire October 2003 issue to medical imaging. The magazine was more than two years in the making after the *Proceedings* editorial board contacted Roux and Udupa with the idea for such an issue. As co-editors, Roux and Udupa focused the papers they solicited on three areas: hardware, image processing, and image construction and display.

One of the oldest of the IEEE’s medical imaging publications is the *IEEE Transactions on Medical Imaging*, which has been published for almost two decades. In 2002, references to its articles in other publications made it the most often-cited journal in imaging science and photographic technology, according to the Institute for Scientific Information’s annual *Journal Citation Reports*.

The composition of the steering committee of *Transactions on Medical Imaging*—Roux is the chair—illustrates the field’s multidisciplinary nature. The committee has representatives from four IEEE Societies—Engineering in Medicine and Biology; Nuclear and Plasma Sciences; Signal Processing; and Ultrasonics, Ferroelectrics, and Frequency Control.



Computer-assisted tomography scans of a human heart [left, top and bottom], brain [right, top], and spine [right, bottom].

Wiley-IEEE Press has also published a dozen books on medical imaging, including the seminal *Principles of Magnetic Resonance Imaging: A Signal Processing Perspective*, by Zhi-Pei Liang and Paul Lauterbur. Earlier this year Lauterbur received the Nobel Prize in Medicine for his work in magnetic resonance imaging.

### A first for biomedical imaging

Traditionally, when the IEEE publishes a transaction or journal on a specific technology, there is a corresponding conference. But it was only last year that Liang and his colleagues established the International Symposium on Biomedical Imaging, which was held in Washington, D.C., USA. The 2004 event will be held 15 to 18 April in Arlington, Va., USA.

Next year’s symposium will start out, for example, with short courses on statistical modeling so that attendees may better understand the topics that will be discussed. The tutorials will be followed by a dozen technical sessions on subjects ranging from electron microscopy to brain imaging. There could be as many as 300 contributed papers, according to Leahy.

The conference is cosponsored by the IEEE Engineering in Medicine and Biology and the Signal Processing societies in cooperation with the National Institute of Biomedical Imaging and Bioengineering (NIBIB) in Bethesda, Md., USA. Established two years ago by the U.S. Congress as a branch of the U.S. National Institutes of Health, NIBIB is responsible for developing new medical imaging technologies. According to Roderic Pettigrew, director of NIBIB, it is the only institute in the National Institutes of Health dedicated to developing emerging technologies for medicine and health care.

“It is important for people from different disciplines to come to a single high-quality, technical meeting such as the biomedical imaging symposium,” Liang says. “In particular, there will be a cross-fertilization among the different application areas in terms of the computational tools that we’re using.”

Imaging will also play an important role at one of the most well-attended conferences in biomedical engineering, the 2004 IEEE Engineering in Medicine and Biology Conference, to be held on 1 to 4 September 2004 in San Francisco, Calif., USA. Serving as program chair for the meeting, Liang plans to offer tutorial workshops on medical imaging at this meeting as well. ●

### For More Information

Societies, conferences, and publications mentioned in this article have their own home pages.

IEEE Engineering in Medicine and Biology Society  
[www.embs.org](http://www.embs.org)

IEEE Signal Processing Society  
[www.ieee.org/organizations/society/sp](http://www.ieee.org/organizations/society/sp)

IEEE Nuclear and Plasma Sciences Society  
<http://ewh.ieee.org/soc/nps>

IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, [www.ieee-uffc.org](http://www.ieee-uffc.org)

IEEE Engineering in Medicine and Biology Conference  
[www.ucsfresno.edu/embs2004](http://www.ucsfresno.edu/embs2004)

IEEE International Symposium on Biomedical Imaging  
[www.biomedicalimaging.org](http://www.biomedicalimaging.org)

*Proceedings of the IEEE*  
[www.ieee.org/organizations/pubs/proceedings](http://www.ieee.org/organizations/pubs/proceedings)

*IEEE Transactions on Medical Imaging*  
[www.ieee-tmi.org](http://www.ieee-tmi.org)

## DISASTER *from page 1*

the bits and pieces they found could be debris from *Columbia* that should be collected. For Chapman, however, the expertise that inspired him was the searching abilities of the other 40 team members, firefighters from Nevada, USA.

"The tracking skills of the firefighters truly were impressive," Chapman says. "Many were Native Americans. Team members would fan out, about 3 meters apart. The firefighters had an uncanny ability to spot things that didn't belong in an area. They would notice a broken branch, and work out its path to a small piece of metal or other debris." When they found something, the searchers stopped as the call went out: "NASA!" This was Chapman's cue to run to the searcher's side to identify the object.

The difficulty of identification varied, Chapman says. "Some pieces obviously were from the shuttle. A few were in a gray area. I'd ask the team's opinion about what they thought it might be. When in doubt, we would send it on for analysis."

Chapman's team eventually recovered about 100 pieces of the shuttle. The biggest was a quick-disconnect mechanism, comparable to the gas intake of a car, according to Chapman. It weighed about 35–40 kg. "It took us two hours to dig this small piece of debris out of the crater it made," he says.

One item the team recovered brought

home the event's human tragedy. "We found one crew effect, a spoon engraved with the shuttle's name," Chapman recalls. Search teams ultimately recovered about 30 percent of the shuttle by weight, which helped NASA learn more about the disaster.

Although Chapman's special expertise was his familiarity with the shuttle, he says the key to being successful in this assignment was being able to recognize the limits of his own knowledge.

"I needed to learn as much and as fast as I could about shuttle hardware, particularly any pieces that could have either hazardous chemicals or explosive devices," he explains. It helped to be clear about the limits of his knowledge, too.

"I also realized that I was smart enough to know what I didn't know," he says.

### Making sense of blackouts

In the days after the Northeast–Midwest blackout shut down electrical power to 50 million U.S. and Canadian customers on 14 August, many media people familiar with the IEEE Power Engineering Society called the group looking for experts to interview. IEEE Fellow Jack Casazza, an author and public speaker, found himself in the spotlight as television and radio producers and newspaper editors sought explanations for an audience hungry for information.

When the lights went out in five U.S.



*With machetes for cutting through heavy brush, searchers looking for space shuttle debris walk across a field near Hemphill, Texas, USA [above]. Parts of the shuttle are spread out in a hangar at the Kennedy Space Center, Cape Canaveral, Fla., USA [below].*





**On 14 August, large swaths of the northeastern and midwestern United States and eastern Canada were in the dark after power lines in Ohio, USA, went down.**

states and two Canadian provinces, Casazza was at home in Springfield, Va., USA, an area unaffected by the blackout. Calls started pouring in to him from newscasters and editors familiar with his power industry background. Casazza, a member of the board of directors of the Georgia System Operations Corp., an electricity cooperative, and president of the American Education Institute, has won many awards for his contributions to the development of electric power systems. He had also predicted that a major northeastern United States blackout would occur in August 2004 in his book, *Sham? Shame! Inside the Electric Power Industry*, published by the American Education Institute in 2001.

The media were eagerly searching for commentators, Casazza says. He was interviewed by more than 20 newspapers, and his television appearances in the days immediately after the blackout included the "Today Show" on NBC and programs on CNBC and MSNBC. He was also a member of a panel discussion on "Democracy Now!," a production of Pacifica News distributed to more than 160 radio stations in the United States.

"When I appear on television or radio, my objective is to meet my professional code of ethics, which is to inform the public of the truth," he explains.

Casazza says public statements made by others about the blackout that he deemed "inaccurate, and sometimes ridiculously false" distressed him. In a phrase that echoes a comment by NASA's Chapman, Casazza added, "One of the things is to know what you don't know, and if you don't know, don't say anything."

He is now working on a series of articles about the power grid for newspapers

and magazines around the world, including some with wide European circulation. In addition, his newest book, *Understanding Electric Power Systems, An Overview of the Technology and the Marketplace*, has just been published by Wiley-IEEE Press.

With the ongoing investigation of the blackout, Casazza sees an opportunity for the IEEE to assume a leadership role. Planning for the future, he says, "should be directed by engineers who understand the technology."

He is also working with an ad hoc group of about 10 IEEE Fellows to determine how engineers can more effectively speak up about the power industry. "We're not trying to be destructive," he says. "We are saying that we need a thorough review provided to the public of what is being done and why." The group welcomes participation by other members.

Also quoted in several newspapers, including *The New York Times*, was IEEE Life Fellow Mel Olken, editor of *IEEE Power & Energy* magazine. The magazine published several articles about the blackout.

#### **Educating policymakers**

Another request for help went out to IEEE Senior Member Richard Wakefield, chair of the IEEE-USA Energy Policy Committee, who was just leaving for vacation when he received a call from the House Energy and Commerce Committee of the U.S. Congress.

In preparation for a hearing into the causes of the Northeast-Midwest Blackout, the House committee chair, U.S. Representative Billy Tauzin (R-Louisiana), needed background information. Wakefield rearranged his schedule and called on other members of his Energy Policy Committee,

who also carved out time from their schedules to respond to the request. Tutoring members of the U.S. Congress and its staff about various technologies has been an activity of many IEEE-USA policy committees. For the hearing on the blackout, the House committee submitted questions to IEEE-USA for comment.

IEEE members who prepared a written report include Fernando Alvarado, professor emeritus of engineering at the University of Wisconsin, Madison; Harold Adams, director of electric market policy at Dominion Virginia Power, an electric utility in Virginia and North Carolina; and Thomas Gentile, head of transmission planning for the National Grid, a utility that operates transmission facilities in New York, Massachusetts, and other New England states.

"A number of people quickly jumped to conclusions about causes and needed remedies," says Wakefield, vice president of management consulting at KEMA Inc., in Fairfax, Va., USA. "But to effectively reduce the possibility of blackouts in the future, we need to understand how the system went down."

In writing the report, "We used non-technical language to give the House committee and its staff members a better

understanding of how a cascading blackout occurs and the important issues in maintaining power system security," Wakefield continues.

Even though he's an expert in the field, Wakefield finds there are aspects of the technology behind electric transmission that "still amaze me." ●

#### **For More Information**

To view the IEEE-USA Energy Policy Committee's report, "Response to Questions Posed by the House Energy and Commerce Committee Concerning the Northeast Blackout of August 2003," visit [www.ieeeusa.org/forum/POLICY/2003/082903.html](http://www.ieeeusa.org/forum/POLICY/2003/082903.html).

For more electrical reliability information from IEEE-USA, see [www.ieeeusa.org/forum/issues/electricreliability/index.html](http://www.ieeeusa.org/forum/issues/electricreliability/index.html).

For details about the ad hoc group Casazza is working with, contact [ameredinst@aol.com](mailto:ameredinst@aol.com).

To read articles about the blackout published in *IEEE Power & Energy* magazine, visit [www.ieee.org/portal/index.jsp?pageID=pes\\_level1&path=pes/subpages/publications-folder&file=magazine.xml&xsl=generic.xsl](http://www.ieee.org/portal/index.jsp?pageID=pes_level1&path=pes/subpages/publications-folder&file=magazine.xml&xsl=generic.xsl)

## **Introducing the latest from the IEEE Financial Advantage Program**

# e-FAP

Want the latest on IEEE financial and insurance services? Sign up for e-FAP, a quarterly email newsletter proving IEEE members with the latest updates, program notifications and highlights.

Optimize your benefits. Sign up today at [www.ieee.org/fap](http://www.ieee.org/fap)

### **The IEEE Financial Advantage Program® Tools to Secure Your Tomorrow**



# Cutting-Edge Courses Headed for **Xplore**

BY CAROL GOODALE

**I**EEE Educational Activities is working to bring cutting-edge engineering developments presented at IEEE conferences to a wider audience by modifying and distributing them as online courses. Educational Activities Vice President James Tien describes the effort as “unlocking the value of IEEE workshops and tutorials.”

This initiative addresses a pressing need that industry leaders have voiced repeatedly in interviews with IEEE volunteers: they want online delivery of the newest technical information. “Results of surveys we’ve conducted show that companies are

seeking timely and leading-edge educational materials that can be easily accessed by their employees,” Tien says.

The plan is to market and distribute these educational “modules” to industry and other institutional customers like universities and government agencies through IEEE Xplore, the IEEE’s electronic platform for distributing published information. Eventually, these courses could be offered to individual IEEE members, Sections, Chapters, and Student Branches.

This phased approach also was used to introduce online access to technical publications, first through the IEEE/IEE Electronic Library, which is aimed at institutional customers, and then by giving members access through the IEEE Member Digital Library.

Four IEEE societies—Computer, Electron Devices, Engineering Management, and Lasers & Electro-Optics—are providing content for prototype courses. What

## Proposed E-Learning Courses

SOCIETY	TOPIC	SOCIETY CONTACT
Engineering Management	Managing innovation	Wade Shaw/Dave Kemp
Electron Devices	Oxynitride, nitride gate dielectrics	Bill Van Der Vort
Lasers & Electro-Optics	Optical connection speed	Paul Shumate
Computer	Security or wireless	Dick Price

they develop, and how they go about it, will provide a valuable yardstick for evaluating the processes needed for producing the courses, Tien says. [For topics under consideration, see the table.]

One of the first courses will address innovation in industry, according to Wade Shaw, editor-in-chief of *IEEE Engineering Management Review*. “The Managing Innovation module, developed from workshops presented by the Engineering Management Society, will present cutting-edge methods for learning to be innovative, and moving from concept to commercial product faster. The prototype module will examine the foundations of innovation, the characteristics of an innovator, and the impact organizational culture can have on new ideas.” The initial courses will be one hour long, but later courses may be longer or shorter.

The project is now in a “proof-of-concept” phase. In the coming months, a business plan will be developed and feedback will be sought from potential customers, IEEE societies and regions, and experts providing content.

“This feedback will be crucial to successfully developing a model that provides ‘win-win’ opportunities for all,” Tien notes.

If the first phase of the initiative is a success, efforts to launch an online educational module business will be expanded significantly, he says. ●

# Great

## IEEE Credit Cards Around the World

The MBNA Credit Card for IEEE members  
in Canada, Puerto Rico and the UK

- Low annual percentage rates
- No annual fees
- High credit limits
- Every purchase helps support ongoing IEEE initiatives!
- Many other great benefits!

Sign up today:  
[www.ieee.org/fap](http://www.ieee.org/fap)

The IEEE Financial Advantage Program®  
Tools to Secure Your Tomorrow





# Salaries for EEs on the Rise, Unemployment Too

BY CHRIS MCMANES

DESPITE RECORD U.S. UNEMPLOYMENT for high-tech workers, the median annual salary for working U.S. members increased to more than US\$100 000 last year, according to the results of the latest IEEE-USA Salary and Fringe Benefit Survey.

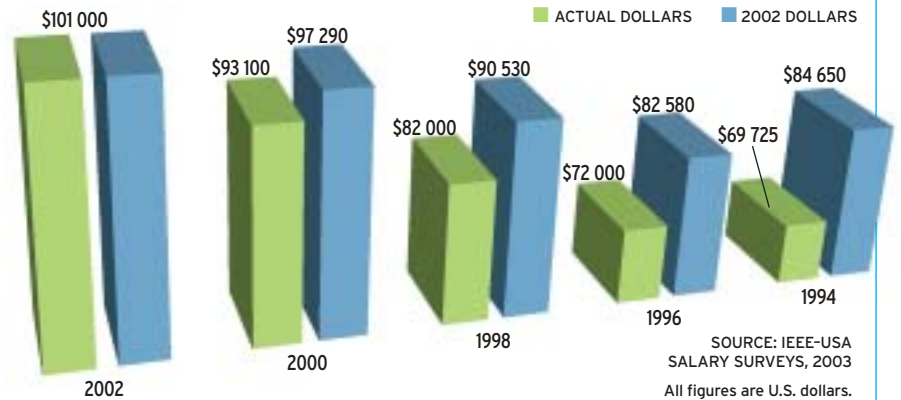
Median income from so-called primary income sources—that is, base pay plus any self-employment income, commissions, or bonuses—for U.S. members working full time in a technical field increased to \$101 000 in 2002 from \$93 100 in 2000, the last time the salary survey was conducted. That is an increase of 3.8 percent over the purchasing power of the median income in 2000, accounting for inflation.

“Despite sharp declines in demand for electrical, electronics, and computer engineers, the IEEE’s U.S. members have held onto the salary gains achieved in recent years,” says survey analyst Richard Ellis. “Members were able to keep ahead of cost-of-living increases and achieve gains in their real incomes.”

Conducted in March and April, the IEEE-USA survey shows that income for members with similar specialties, job functions, employer types, geographic locations, education, and years of experience differs by more than \$50 000 between those at the lowest and highest deciles.

Results of the survey also mirror recent unemployment trends. The number of members who reported they were involuntarily let go jumped from less than 1 percent in 2001 to 4 percent in 2003. This is the highest level of unemployment ever recorded by the IEEE Salary Survey, more than double the levels reached during recessions in the mid-1970s and early 1990s.

For all electrical and electronics engineers in the United States, the U.S. Department of Labor reported that unemployment rates reached an all-time high of 7 percent in the first quarter of this year, and stood at 6.7 percent in the third quarter. The jobless rate for computer hardware engineers increased to 6.9 percent during the same time period, and the third-quarter rate for network and computer systems administrators reached 7.6 percent.



Median Income of IEEE Members

The 2003 survey is the IEEE’s most accurate portrait of U.S. member compensation, according to IEEE-USA. Data were gathered from more than 11 130 responses—the largest number IEEE-USA ever received to its salary survey.

IEEE-USA is offering U.S. members who take its 2003 Salary and Fringe Benefit Survey free access to its new Salary Service. One of the features of the service is a salary calculator built on data from the 2003 survey. Users will be able to generate personal compensation estimates based on such factors as their experience, job responsibility, and technical specialty.

Beginning in 2004, the service also will allow members to compile a salary history for themselves as they update their responses to the survey.

Take the survey at [www.ieeeusa.org/careers/salary](http://www.ieeeusa.org/careers/salary).

## Are You Using the Official IEEE Credit Card?

The IEEE Credit Card from **BANKONE** for U.S. Members



These are the **only** official IEEE Credit Cards

- Low annual percentage rate
- No annual fee
- Auto rental collision insurance
- Travel insurance coverage
- And many other great benefits!

Every purchase made with the IEEE Credit Card helps support ongoing IEEE initiatives!

**Sign up today!**

+1 800 GET IEEE (438 4333)  
or +1 732 981 0060 or  
[www.ieee.org/fap](http://www.ieee.org/fap)

The IEEE Financial Advantage Program®  
Tools to Secure Your Tomorrow



# IEEE Publications Popular in U.S. Patents

BY KATHY KOWALENKO

WHAT DOES INTEL'S PATENT for a spread-spectrum wireless communication system have in common with a Mitsubishi patent for a videophone with privacy protection? The science and technology that these and other top patenting companies cited in their U.S. patent applications first appeared in IEEE publications.

U.S. information technology-related patents that reference IEEE papers have increased 267 percent in the last 10 years, according to a report that analyzed the effect of IEEE publications on patented technology.

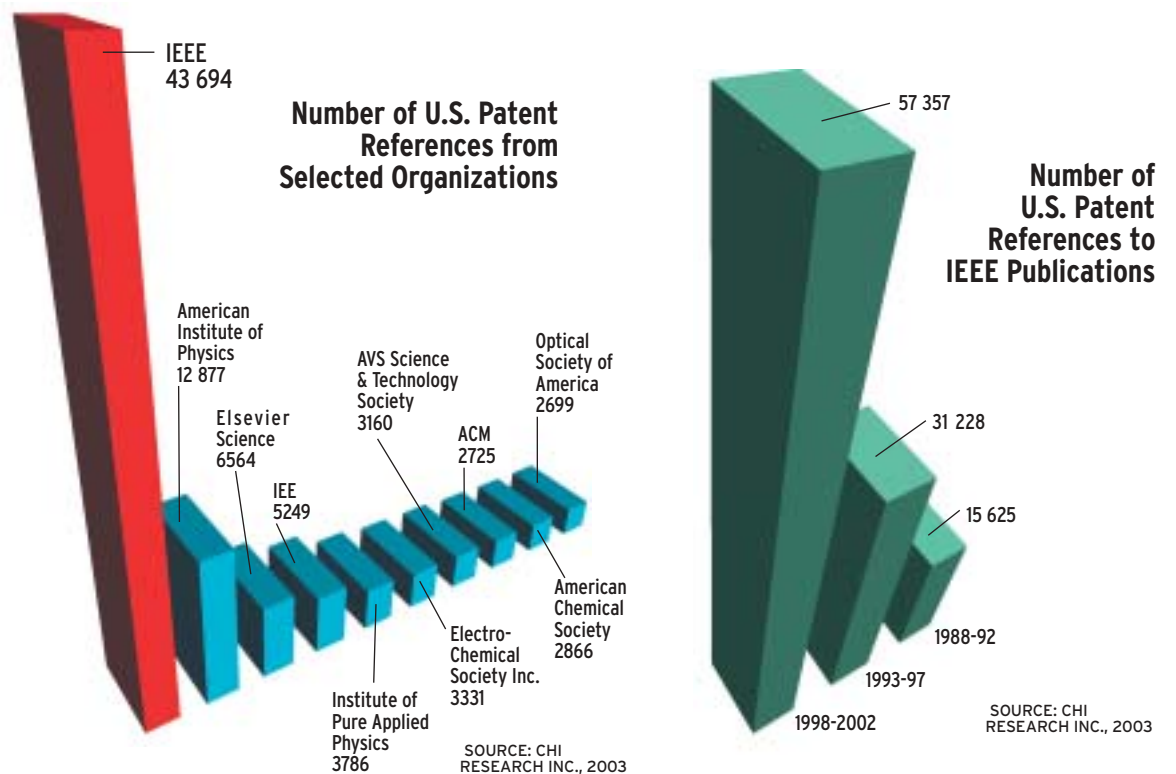
The study—commissioned by the IEEE and conducted by CHI Research Inc., in Haddon Heights, N.J., USA, a leading intellectual property consulting firm—found that in the five years from 1988 through 1992, a total of 15 625 patents referenced IEEE journals. But in the five years from 1998 through 2002, that number had jumped to 57 357.

Meanwhile, in the 10 years between 1992 and 2002, the number of U.S. patents issued increased by only 76 percent, indicating, according to CHI Vice President Anthony Breitzman, that “patents are building on papers published in IEEE journals to a much larger extent than they did a decade ago.”

Why do inventors rely on IEEE literature? As one who holds 130 patents, Donald R. Scifres, the 2003 IEEE Robert N. Noyce Medal recipient and IEEE Fellow, knows the answer.

“Many of the articles in IEEE journals describe a new idea for the first time, and that is what you need to cite [in a patent application], the first reference to the idea in public literature,” Scifres says. “The CHI findings indicate that IEEE journals are getting the newest, most revolutionary ideas in increasing numbers, and that the journals are improving in quality.”

To be issued a patent by the U.S. Patent and Trade-



mark Office (USPTO), an invention must be useful, non-obvious, and novel. To prove the novelty of their inventions, inventors search for and then cite in their applications all prior art. Prior art means those inventions that already exist and that the inventor is aware of. The search is to ensure that patent claims are unique and were not made earlier by others.

Prior art can be found in publications or in previous patents. USPTO patent examiners themselves rely on information in publications to get more data about what is new about an invention. And, of course, they look at

issued patents to find whether claims made in new patent applications were covered earlier.

“Patents not only build on earlier innovation, but they may build on earlier science, and a lot of them build on research described in IEEE journals,” Breitzman says.

## Tops in references

The study analyzed references from 18 leading high-tech patenting organizations whose patents referenced articles from any journal at least 100 times. The companies were selected from among the top 25 patenting organizations in 2002 and included IBM, Intel, Lucent, and Mitsubishi, as well as the Massachusetts Institute of Technology (MIT) and the University of California.

Specifically, 52 percent of Intel's scientific references are to IEEE literature, as are 40 percent of Mitsubishi's, 35 percent of Lucent's, and 25 percent of MIT's. The report shows that over the past 10 years, references to articles in 62 IEEE publications totaled 43 644, while references to publications of the American Institute of Physics were 12 877 and to those of Elsevier Science, 6564.

The most often cited IEEE publication was *IEEE Journal of Solid-State Circuits*, followed by *IEEE Transactions on Electron Devices*, *Proceedings of the IEEE*, *IEEE Transactions on Communications*, and *IEEE Transactions on Magnetics*.

Could the Internet—which makes it so easy to find information—be contributing to the high reference rate for IEEE over other publishers? Not necessarily, Breitzman says.

“There is something to the argument that it is easier than [it was] 10 years ago for inventors preparing a patent to find IEEE articles germane to their inventions, but that goes for articles in other publications as well. The fact is that people are referring more to IEEE journals,” Breitzman explains.

## Book Takes on The Ins and Outs Of U.S. Patent Law

Are you thinking of obtaining a patent on something you've invented? But what if you've already published your idea in a research paper? Is it too late to file a patent application? What if your invention isn't a device at all but a software program? Can that be patented?

And just exactly what is this prior art you've heard about? How do you go about searching for it?

Tailored to engineers and scientists, a book to be published next May provides answers to these and other patent questions. *Intellectual Property Law for Engineers and Scientists* (Wiley-IEEE Press, New York City) by IEEE Member Howard Rockman, a patent attorney with Barnes and Thornburg in Chicago, Ill., USA, explains much of what you need to know about U.S. patent, copyright, trade-secret,

trademark, and unfair competition laws. He also details how to protect intellectual property rights in other countries.

“When patent attorneys talk to engineers, we realize they have no idea about how the patent laws work unless they are repeat inventors,” Rockman says. “For most people, we have to explain the entire intellectual property process to them. I've written this book as if I were addressing engineers and scientists, not other attorneys.” According to Rockman, the book will prepare prospective inventors to answer the questions posed by any patent attorney or patent agent they might engage to help them succeed through the patent process.

Rockman, an adjunct professor at the University of Illinois at Chicago's College of Engineering and the John Marshall Law School, teaches Internet-based, intellectual property rights courses for students seeking master's degrees in engineering.

List price of the book will be US\$79.95; for IEEE members, it's \$67.96. The ISBN number is 0-471-44998-9.

—K.K.



# Tomorrow Starts with What's New Today

Subscribe to

## What's New@IEEE

Choose from **10 free** email newsletters covering the latest technology, IEEE news, career advice and more every month.

**Pick the ones that  
are right for you!**

- Circuits
- Communications
- Computing
- Career Alert
- Eye on Washington
- Libraries
- Power
- Signal Processing
- Students
- Wireless

"What's New is an excellent service from IEEE. Time and again I pick up some wonderful 'pearls' to share with friends and IEEE members... Your ability to focus on the key issues in the monthly crop of publications is commendable."

Anthony Lobo, IEEE Bombay Section

Sign up today!

[www.ieee.org/whats-new](http://www.ieee.org/whats-new)

# IN MEMORIAM

## William Shepherd, 1966 President

BY LAUREN CULLITON

IT WAS A GOOD THING that no major issues surfaced during his time as the first President of the IEEE, William Shepherd recalled. This allowed him the time to concentrate on developing the organization formed by the merger of the American Institute of Electrical Engineers and the Institute of Radio Engineers.

"We were seeing the benefits of being one unified electrical sciences organization, not two," he noted in a very recent interview with *The Institute* ["Catching Up with Past Presidents," September, p. 12], during which he reflected on his term in office.

He worked for 10 years at Bell Telephone Co. Laboratories in New York City, USA. In 1943, he and colleague John Pierce invented the Pierce-Shepherd tube, which greatly enhanced radar capabilities during World War II.

But Shepherd spent most of his 42-year-long professional career at his alma mater, the University of Minnesota—Twin Cities in Minneapolis—St. Paul, USA. In 1947, he became a professor of engineering at the university and held various positions there, including associate dean of the university's Institute of Technology from 1954 to 1956, head of the electrical engineering department from 1956 to 1963, and vice president of academic affairs in 1963. He also served as the director of the university's Space Science Center, a position he held until his retirement in 1979.

Shepherd continued to be active in his retirement years. He served as chair of the National Association of State Universities and Land Grant Colleges. He also was involved in fund-raising activities for his university, in particular for the Weis-



man Art Museum. In addition, he worked as a consultant to many international commissions and private industries, and was a member of several of the governor's commissions for Minnesota industry. ●

**WILLIAM SHEPHERD, 92**

**DIED:** 5 September 2003

**MEMBER GRADE:** Fellow

**EDUCATION:** Bachelor's of engineering and doctorate in physics from the University of Minnesota at Minneapolis—St. Paul, USA.

**FIELD OF INTEREST:**

Electrical engineering

**CAREER MILESTONES:** Bell Telephone Co. Labs, New York City, USA; University of Minnesota: professor of engineering, associate dean of the Institute of Technology, head of the electrical engineering department, vice president of academic affairs, and director of the university's Space Science Center.

**VOLUNTEER ACTIVITIES:** Board of Directors, 1960–1966; Vice President, 1965; President, 1966.

**AWARDS:** Certificate of Appreciation from the U.S. Navy, 1948; Medal of Honor from the National Academy of Engineering, 1969; Outstanding Achievement Award from the University of Minnesota, 1979.

## Ivan Getting, 1978 President



BY ERIC HERZ

IEEE Executive Director Emeritus

I HAD HEARD OF IVAN GETTING long before I met him. He was well known to the aerospace industry as president of Aerospace Corp., a not-for-profit consultant to the U.S. Air Force based in El Segundo, Calif., USA. But I knew little else about him.

I first met Ivan at a reception in 1975 when the IEEE Aerospace and Electronic

Systems Society awarded him its Pioneer Award for achievements in radar and naval fire-control systems. Ivan seemed at ease and down to earth, not what I expected from a technical genius and leader.

When Arthur Stern, 1975 IEEE President and chair of the Nominations and Appointments (N&A) Committee in 1976, mentioned Ivan along with two other industry leaders as possible candidates for IEEE President-Elect, I quickly added my endorsement. I felt, as Arthur did, that the IEEE needed a leader from industry even if that person did not have a great deal of IEEE volunteer experience. Our work was cut out for us. The N&A Committee and the IEEE Board of Directors were not anxious to depart from the practice of promoting the best insiders, but they did.

Ivan's working style became apparent as soon as he joined the Board of Directors as President-Elect. He did not ask trivial questions. Board business moved briskly, but when a point had to be made, Ivan made it without flourish. He stated his opinions clearly and supported them with logic and facts. Ivan was both perceptive and believable.

Not only did Ivan win the election, but the following year I was elected to serve with him as Vice President of Technical Activities. The outstanding way Ivan put to use the leadership skills he had gained in industry proved just how wise Arthur Stern and the N&A committee were in

**IVAN GETTING, 91**

**DIED:** 11 October 2003

**MEMBER GRADE:** Life Fellow

**EDUCATION:** B.A. in physics at Massachusetts Institute of Technology (MIT), Cambridge, Mass., USA; doctorate in astrophysics from Oxford University, Wellington Square, Oxford, England, and a Rhodes Scholar.

**FIELD:** Physics and electrical engineering

**CAREER MILESTONES:** Joined Harvard as a fellow, 1935; director of the Division of Fire Control and Army Radar at the MIT Radiation Laboratory from 1940–1945 where his group developed the first automatic microwave tracking fire-control radar; MIT professor of electrical engineering from 1945–1950; vice president of research and engineering at

Raytheon Co., Waltham, Mass., 1950–1960; associate director of Project Nobska, a special three-month study sponsored by the U.S. Navy concerning submarine warfare weapons; founding president of the Aerospace Corp., El Segundo, Calif., USA, from 1960 until retirement in 1977, where he led development of the Global Positioning System.

**VOLUNTEER ACTIVITIES:**

President, 1978

**AWARDS:** Navy's Superior Public Service Award, 1999; Inducted into Air Force Space and Missiles Pioneers Hall of Fame; inducted into the San Diego Aerospace Museum's International Aerospace Hall of Fame, 2002; Charles Stark Draper Prize from the National Academy of Engineering, 2003.

recommending his nomination, and the IEEE members in electing him. He was fair and decisive. You knew where he stood and why.

Ivan saved personal stories for dinner conversations. He spoke of his experiences freely, with a great sense of humor and with details that made me wonder how anyone could remember so much—that is, until I read his autobiography, *All in a Lifetime*. Ivan said he did not keep a diary; he just remembered it all.

To me, Ivan Getting was a hero of his

time and a role model for engineers. The son of Slovak immigrants, Ivan was an outstanding student—Thomas Edison was so impressed with Ivan that in 1929 he paid his undergraduate tuition to the Massachusetts Institute of Technology (MIT) in Cambridge, USA. Ivan also was a Rhodes Scholar, an inventive physicist-engineer at MIT Radiation Laboratories, an industry leader at Raytheon Corp. and the Aerospace Corp., an advisor to government, an IEEE Life Fellow, and a friend to many. ●

## Carleton A. Bayless, 1990 President

BY WALLY READ

1996 IEEE President

GEORGE HERBERT, a 15th-century clergyman, once said, “The best mirror is a friend’s eye.” I hope so, because I want to adequately express my appreciation for the contributions made to our profession and to society by someone who has just departed from our midst.

I met Carl in the mid-1980s and received his wise counsel and guidance in my role as IEEE treasurer during his presidency. I found throughout that period that his vision for our organization closely paralleled my own, which made it easy to align my thinking with the objectives he clearly outlined for all of us.

Carl was upfront with all members about his vision for the IEEE as we prepared to close out one century of activity and enter a new one. He believed in the saying “Failing to plan is planning to fail.” In this regard, he guided the 1990 Board of Directors to create a new strategic operational plan. Although he was the consummate long-term planner, he also understood the importance of having members on his side in advance of implementing changes. Through his affable manner, Carl was able to initiate actions required of the Board to comply with our new strategic direction.

Carl’s second initiative was to raise awareness inside and outside the IEEE that our organization is indeed international. To emphasize this point, he organized the first-ever board meeting outside of North America—in Brussels, Belgium. While some may have regarded this meeting as merely a symbolic gesture, it was a strong message that we are a global institution.

I recall the emotional parting speech Carl made when leaving office. He apologized for not having achieved all the objectives he had set for himself at the start of



his term. All of us in that room had experienced that same feeling through the years, and we understood his sentiments. But make no mistake about it: Carl recognized the need to adapt to change that was already on the horizon. He pointed the way to positive moves to benefit members, and he implemented some immediate actions in that direction.

As an organization, the IEEE does not depend on one single person to lead it. It is guided by a series of excellent leaders who build on their predecessor’s efforts and anticipate the need for change well in advance. Carl was one of those fearless leaders who respected that hierarchy and added his own contributions.

We owe Carleton Bayless a debt of gratitude for his foresight and actions. We also should be grateful to Bell Telephone for the excellent training Carl received during his working years. Most of all, we are indebted to his wife, Ann, and to family members for lending him to the IEEE and supporting him in his unselfish efforts to meet our demands. That is a tremendous debt for us, but one that we can repay by following the guidance he has given us.

Thanks, Carl—friend, mentor, and leader. You were first-class, and you are missed by all of us who knew you. ●

**CARLETON A. BAYLESS, 80**

**DIED:** 25 March 2003

**MEMBER GRADE:** Life Fellow

**EDUCATION:** B.S. in engineering physics from the University of California, Berkeley; studied communications systems engineering at the University of California, Los Angeles, and the University of Michigan, Ann Arbor; and engineering economics at Stanford University, California, all in the USA.

**FIELD OF INTEREST:**  
Electrical engineering

**CAREER MILESTONES:** Employed by Bell Systems from 1940 until his

retirement in 1981 with positions at Southern California Telephone, AT&T, Western Electric, and Pacific Telephone and Telegraph.

**VOLUNTEER ACTIVITIES:** Region 6 Director, 1975–76; Board of Directors, 1975–77, 1986–87, and 1989–91; Executive Vice President, 1977; Vice President–Professional Activities, 1986–87; President, 1990; IEEE Foundation Board, 1990–93; IEEE-USA Career Activities Chair, 1984–85, and IEEE-USA Chair, 1986–87.

**AWARD:** Engineer of the Year Award from the Engineering Council of Sacramento Valley, Calif., 1974.

## MEMBER RECOGNITIONS

### Communications Pioneers Share Marconi Fellowship

BY ERICA VONDERHEID

**ROBERT GALLAGER**, an IEEE Fellow, information theorist, and educator, and **ROBERT METCALFE**, the inventor of the Ethernet, shared this year’s Marconi International Fellowship, an annual award given by the Marconi Foundation.

The fellowship recognizes those whose aspirations, careers, and accomplishments in communications technology emulate those of Guglielmo Marconi, the inventor in 1896 of wireless communication. Gallager and Metcalfe shared a US\$100 000 honorarium, which was presented in New York City on 3 October.

Gallager says he does not consider himself an inventor like Marconi, who thought enough of his invention to quickly create a company to market it. Rather, Gallager sees himself as a scientist conducting fundamental research that others may develop further.

“Scientists like me who do basic research build up technical knowledge so that at some point inventors can invent products based on [that] technology,” Gallager says.

In his 1960 doctoral dissertation at the Massachusetts Institute of Technology (MIT) in Cambridge, USA, Gallager created a new type of coding algorithm for transmitting data through networks. At the time, however, that code required massive computing power to work properly, making it too expensive to be used widely. But in the mid-1990s, Gallager’s early work resurfaced when cheaper, faster microprocessors were developed, and his coding theory suddenly became practical and popular because of its relative simplicity.

“Gallager was ahead of his time, and thanks to faster microprocessors, his mathematical approaches to communications information theory are now practical,” Metcalfe says. “He’s an example of someone laying the groundwork and then having the industry [build on top of that work] over the decades.”

Gallager, a professor emeritus at MIT, has also written a textbook, *Information Theory and Reliable Communications*, which is regarded as the most authoritative book on the subject.

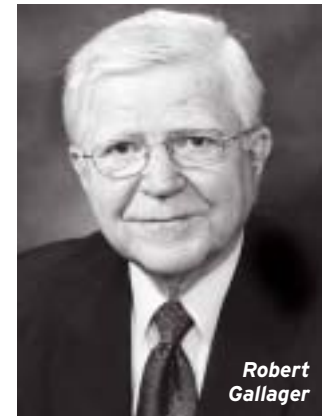
Metcalfe also graduated from MIT, in 1969, and is now a trustee there. He is known for developing the Ethernet standard for high-speed data transfer among office computers, allowing several employees to share a single peripheral, like a printer, or to share an Internet connection. His work paved the way for more complex, high-speed networks, such as the Internet.

“Think of the Ethernet as part of the plumbing of the Internet,” Metcalfe says.

He points out that Marconi invented radio to send information through what was then called the ether. Noting a similarity here with what he was doing, Metcalfe named his invention the Ethernet. He also sees a similarity between himself and Marconi, in that both combined the roles of inventor and entrepreneur.

Metcalfe and Gallager have another award in common: the IEEE Medal of Honor. Gallager received the medal in 1990 and Metcalfe in 1996.

For more information, visit [www.marconifoundation.org](http://www.marconifoundation.org). ●



To submit awards, honors, or recognitions for possible inclusion in The Institute, tell us in 300 words or less about what was accomplished and the significance of the recognition. Include member’s name and IEEE grade, city, state or province, and country. Send this to [institute@ieee.org](mailto:institute@ieee.org), by fax, +1 732 235 1626, or by mail to The Institute, 445 Hoes Lane, Piscataway, NJ, USA 08854.

# The IEEE Makes Finding a Job Less of a Job

BY HELEN HORWITZ

Whether you're a recent graduate seeking a first job or a seasoned technical professional looking for a new position, you face some hard challenges in finding the right job in today's tight labor market. Of course, if you are an IEEE member, a wealth of employment and career resources is available to you—but you still need to take on the task with an organized approach and a careful plan.

"Having a plan is absolutely essential if you're going to find a job that's more than just the next paycheck," says IEEE Senior Member Jean Eason, IEEE-USA's past Employment Assistance Committee chair and author of *The Engineer's Guide to Lifelong Employability*.

"People looking for jobs or seeking to advance their careers need to carefully assess their skills, think about where they really want to be, and devise a plan," Eason says. "As recently as a decade ago, engineers tended to define themselves by their jobs. Now, it's essential for every engineer to have a broader perspective of his or her capabilities and [to realize] how those strengths fit in with today's employment market."

An experienced engineer seeking a new job should be open to the possibility of working in a different industry, according to Eason. She notes one U.S. member who lost his long-time job in telecommunications but found a promising new position in a rapidly developing biomedical field.

## Know what's going on

Eason says the first step in developing a career plan—whether an engineer is actively looking for a job or already settled in a position—is to stay current on trends in technology, business, and the engineering workplace. The IEEE can help members do just that with timely, useful information.

*IEEE Spectrum* magazine is one place to start. Its Careers page in its Resource section in the print edition and its Careers Web page feature articles on career strategies, workplace issues, and continuing education, as well as links to other IEEE information. IEEE-USA's Career Navigator is an online compilation of links to employment sites, services for consultants and entrepreneurs, and career-related materials.

Another source is the weekly *IEEE Career Alert*, an e-newsletter that pub-

lishes articles culled from various news sources and compiled by *Spectrum* editors. Past issues have included stories on leadership, the best business schools, and a leading management expert's advice on what rookie engineering managers need to know.

Also helpful is IEEE-USA's monthly webzine, *Today's Engineer*, which contains articles and tips on business practices, project management issues, and the latest U.S. government policies affecting engineers.

## Hunting down the ideal job

Be sure to check out the IEEE Job Site, which lets you post your résumé, create a job profile, and search a growing database of employment opportunities within a geographic area. If you're concerned that your current employer might see your résumé online, you can limit the amount of information you include about yourself.

Several IEEE Regions and Sections have developed their own job sites. For example, members can query the online database of Region 3's Employment Assistance site to get the contact information of potential employers. Visitors to the site can also research specific industries or companies.

## Meet and greet

Experts agree that networking is the most important resource for jobseekers. "Networking not only can help you find a job but also can help you stay one step ahead of the curve," Eason says. "But networking doesn't mean calling everyone you know and asking for a job. Engineers need to have a strategic outlook on where and how to network."

With over 380 000 members around the world, the IEEE is probably a member's best professional networking resource. Members can make contacts by participating in IEEE Section and Chapter meetings or attending one of the more than 300 IEEE conferences and thousands of technical meetings held worldwide each year.

In response to member requests, more Sections are hosting employment workshops and seminars. For example, a workshop by the Twin Cities Section (Minnesota, USA) in Region 4 featured a panel of local corporate executives who discussed job strategies in the current tight job market. In Region 10, more than 100 attended the Taipei (Taiwan) Section's members-only technical and career development conference. Besides technical talks by IEEE Fel-



lows, the event included a job fair with many Taiwanese employers.

In Kerala, India, almost 100 students attended a recent workshop on interview skills sponsored by two IEEE affinity groups there—Women in Engineering and Graduates of the Last Decade. This session was so successful that another is planned before year's end.

One more way to network is to join the new Employment and Career Strategies Community hosted by IEEE-USA. In addition to discussion groups and chat rooms, the online collaboration site contains information about writing résumés, networking, enhancing interview skills, and setting fees if you decide to become a consultant.

## Keep your skills current

Growing numbers of IEEE Societies and Sections offer their members free or reduced-cost programs to add to their technical and professional knowledge.

Through its Distance Learning Campus, the IEEE Computer Society provides more than 100 free Web-based training courses.

The IEEE Communications Society (ComSoc) has partnered with Stevens Institute of Technology in Hoboken, N.J., USA, to offer online tutorials to its members and others. ComSoc members are also eligible for discounts on other Stevens Institute Web-based courses and seminars.

Many other Societies also offer tutorials on cutting-edge technology at their conferences.

Increasingly, Sections are providing low-cost continuing education opportunities. For example, the IEEE Houston (Texas) Section offers "Education on

Demand," two-day seminars on various topics involving industrial power applications for which continuing education credits are available. Although these are open to anyone, IEEE members can pay as little as US\$60 to attend. ●

Here are the URLs for the job and career assistance sites mentioned in this article:

**IEEE Career Alert** [www.spectrum.ieee.org/careers/signup.html](http://www.spectrum.ieee.org/careers/signup.html)

**IEEE Career Navigator** [www.ieeeusa.org/careers/default.asp](http://www.ieeeusa.org/careers/default.asp)

**IEEE Computer Society Distance Learning Campus** [www.computer.org/distancelearning](http://www.computer.org/distancelearning)

**IEEE Communications Society/Stevens Institute of Technology Online Tutorials** [www.comsoc.org/livepubs/tutorials/stevens.html](http://www.comsoc.org/livepubs/tutorials/stevens.html)

**IEEE Employment & Career Strategies Community** [www.ieeecommunities.org/ecs](http://www.ieeecommunities.org/ecs)

**IEEE Houston Section/Continuing Education on Demand** [www.ieeehouston.org/CEDSeminars/SeminarIndex.htm](http://www.ieeehouston.org/CEDSeminars/SeminarIndex.htm)

**IEEE Job Site** <http://careers.ieee.org>

**IEEE Region 3 Employment Assistance** [www.ewh.ieee.org/reg3/ea](http://www.ewh.ieee.org/reg3/ea)

**IEEE Spectrum Careers** [www.spectrum.ieee.org/careers/careers.jsp](http://www.spectrum.ieee.org/careers/careers.jsp)

# How Much Life Insurance Is Right?

As your life's circumstances change, so do your life insurance needs. Initially, if you have a family depending on you, you may need more life insurance. Starting your own business also can increase your need for insurance. But later, you may need less coverage once your children are grown or because your spouse's future is secured by savings and retirement income.

In general, two key factors affect your need for life insurance most directly: the people who depend on you for financial support, and the assets or resources available to your family if you die unexpectedly.

## A choice of five plans

The IEEE Financial Advantage Program and the administrator of the IEEE Group Insurance Program offer a package of five life insurance plans to meet life's changing needs. They're known as the 10-year level term life, traditional group term life, level term life to age 65, permanent whole life, and universal life plans. Each plan has group rates competitive with other insurers' plans, a wide choice of benefit options, the IEEE's endorsement, and the stability of New York Life Insurance Co., the underwriter.

Each plan also is portable, meaning it will follow you as you change jobs—as long as you meet the plan's eligibility requirements and pay the premiums. In today's workplace, where fewer people spend their entire career with the same company, it makes little sense to rely on your employer for life insurance coverage. And depending on which plan you

Features of IEEE Life Insurance Plan					
	10-YEAR LEVEL TERM LIFE	TRADITIONAL GROUP TERM LIFE	LEVEL TERM LIFE TO AGE 65	UNIVERSAL LIFE	PERMANENT WHOLE LIFE
Eligibility	Under age 65	Under age 70	Ages 50-59	Under age 70	Ages 45-75
Spouse coverage available	Yes	Yes	Yes	Yes (Under group term life plan)	Yes
Non-smoker discount	Yes	Yes	Yes	Yes	No
Volume discount for high coverage	Yes	Yes	Yes	Yes	No
Premium discounts and/or credits	No	Yes	No	Yes	No
Maximum benefit	\$2 000 000	\$1 000 000	\$1 000 000	\$1 000 000	\$50 000
Cash value build-up/savings feature	No	No	No	Yes	Yes
Premium contributions	Level for 10 years	Increases every year after age 60	Level to age 65	Flexible premiums	Level to age 100
Level benefits options	Yes (Level for 10 years)	To age 65 (Begins to decrease thereafter)	Yes (Level to age 65)	Depends on plan option selected	Yes (Level to age 100)
Termination age	100	75	65	100	100

Source: AM Best, Fitch Ratings, Standard & Poor's, Moody Investor Services. The IEEE Term Life, 10-Year Level Term Life, Level Term Life to Age 65, Universal Life, and Permanent Whole Life insurance plans are all underwritten by New York Life Insurance Co., 51 Madison Ave., New York, NY 10010.

choose, you can be covered through your retirement years.

## Life stages

All of us pass through at least one of these stages: single, married, parents, empty nesters, and retirees. Today, the dividing lines between these stages are not as clear-cut as they used to be. More people now start families later in life, become responsible for aging parents, have adult children who move back home, or become single again in mid-life or during retirement.

Here are some suggestions on which insurance plan to consider, based on your

stage of life. The accompanying chart presents the plans' features and benefits side-by-side for comparison.

- **Single.** Don't assume that just because you're unmarried, you don't need a life insurance policy. You probably have student or car loans that you want to make sure are paid off. The longer you wait to get life insurance coverage, the greater the risk a health condition could prevent you from qualifying for a policy.

Consider group term life if you're in your 20s or 30s, the 10-year level term life plan, which is new, if you're in your 40s or 50s, or the level term to age 65 plan if you are closer to retirement age.

- **Married.** It's time to get serious about life insurance now that someone else depends on your income. This holds true even for a two-income household.

Consider group term life in your younger years, or the 10-year level term life plan if you're 45 years of age or older.

- **Growing Family.** During this stage, more people depend on your income for food, housing, and education.

Consider the group term life. It provides the most life insurance coverage at the lowest cost during the years you're most likely to need it.

- **Empty Nester.** Once your children have moved out and they no longer depend on your income, you might consider cutting back on life insurance, provided you have enough savings and retirement income. But estate-planning

considerations, responsibility for aging parents, or the purchase of a new vacation home might warrant increasing life insurance coverage instead.

Consider the 10-year level term life plan. It can provide small or large amounts of coverage at a premium that's guaranteed to stay the same for 10 years. If you want a plan that builds cash value, consider the universal life plan's flexible premium payment options or the permanent whole life plan's fixed premium feature.

- **Retirement.** Once you are on a fixed income, you'll likely not need as much life insurance, but you'll want your coverage to cost the same year after year.

Consider the 10-year level term life, level term to age 65, or permanent whole life—all have premiums guaranteed to stay the same for an extended period of time.

It's important to remember that when you buy a new policy—even with the same insurance company—you should never cancel your existing coverage until you receive written notification that you've been approved for new coverage and that the new policy is in force.

More detailed descriptions of most of these programs, including applications, are available at [www.ieeeinsurance.com](http://www.ieeeinsurance.com). For additional information or to obtain a customized universal life proposal, call +1 888 239 7585.

For all other life insurance plans, call +1 800 493 4333.

## IEEE Health Care Plan Expands to 12 More States

The IEEE Comprehensive HealthCare Plan for U.S. residents recently expanded to every state except Hawaii and New York. The plan can provide health care coverage for you, your spouse, and your children. To qualify, you must be under the age of 65 and have been an IEEE member for two consecutive years. The plan includes:

- Coverage for hospital charges, surgical procedures, nursing care, and maternity services.
- In-network and out-of-network providers.
- Prescription coverage.
- Portability, which means you can take the medical coverage with you if you change jobs.
- Insurance deductibles of US\$500, \$1000, \$2000, or \$5000 to help lower the premium.

Connecticut General Life Insurance Co., a CIGNA company, underwrites the plan. For more details, visit [www.ieeeinsurance.com](http://www.ieeeinsurance.com) or call +1 800 493 4333.

# The **Cure** for Holiday Shopping Blues

Books, Music, Movies, Computers, and a Whole Lot More



- **Choose an Amazon.com site near you**
- Read product descriptions written in your language
- Pay in your local currency
- Save money with regional shipping

Take advantage of Amazon.com's everyday low prices and support IEEE at the same time.

A portion of the proceeds from every purchase you make goes to support the ongoing mission of IEEE.

#### **HELP SUPPORT IEEE**

Add Shop Amazon.com at IEEE to your Web site. Every sale helps support IEEE. Contact: [shopamazonbanners@ieee.org](mailto:shopamazonbanners@ieee.org)

IN ASSOCIATION WITH  


[www.ieee.org/shopamazon](http://www.ieee.org/shopamazon) 

