

# The Institute

<http://www.ieee.org/theinstitute>
**JUNE 2005 VOL. 29, NO. 2**


*Student Member Abbie Tippie streams her music from the KCSU studio at Colorado State.*

## STUDENTS ROCK ON WEB RADIO

**BY KATHY KOWALENKO**

THE BROADCASTS OF KCSU at Colorado State University and WREK at the Georgia Institute of Technology are no longer heard just by students and the local townspeople. Like many college radio broadcasts today, their shows are distributed over the Internet and can be picked up by anyone with an MP3 player, or RealAudio, iTunes, or other Internet streaming software. And at such student-run college stations you can find IEEE student members sitting in the DJ chairs and working in the engineering rooms.

By day, Abbie Tippie, for example, is a junior electrical engineering student at CSU, in Fort Collins. But every Sunday night, Tippie takes over the airwaves at KCSU, at <http://www.kcsufm.com>, to spin Christian rock CDs.

[Continued on page 8]

# New Portal Personalizes Member Information

## Access is an easy click or two away

**BY KATHY KOWALENKO**

**L**ITTLE THINGS CAN add up to a lot. If, as an IEEE member, you've ever tried to find the names of the journals you subscribe to, wanted to buy life insurance, or needed to submit a change of address, you've probably been frustrated by the number of IEEE sites you had to visit before you found what you wanted. Not anymore. A new site—dubbed the Member Portal—now brings together in one location links to information about all the features and benefits of membership.

The membership link on the IEEE home page takes you to this new portal, which is also open to the public. The portal has links to information on some of the basics that members, and prospective members, might like to know, such as membership grades and qualifications and fees for joining the IEEE.

“The portal is very good for showing anyone the sides of the IEEE that they may not have been aware of,” says Moshe Kam, the 2005 chair of the Membership Development Committee, the IEEE group in charge of membership issues. “For example, we have a lot of benefits that members and visitors may want to know about but that have been completely hidden by being distributed in many different places.”

**PERSONAL AND PRIVATE** But the Member Portal also contains links to members-only



pages, beginning at myIEEE which, Kam predicts, will be one of the most popular links on the portal. This is the personalized area where members can find details about their membership, such as their grade and their section and society affiliations. And that's not all. MyIEEE has links to the pages where you can join a new society, update personal information, renew your membership, and accomplish all those tasks that, in the past, could have been so frustrating to accomplish online.

The link to myIEEE is in the upper left corner of the Member Portal. To enter the

secure site, you'll have to sign on with your IEEE Web Account ID and password. Once logged on to the myIEEE site, you'll see your membership record, which lists your name and your postal and e-mail addresses, plus your member grade, your local section, and societies you've joined. MyIEEE even recommends publications, products, and other IEEE societies that are tailored to your technical interests.

MyIEEE will be especially helpful to members who live outside the United States, according to Francisco Martínez, director of IEEE Region 9.

[Continued on page 7]

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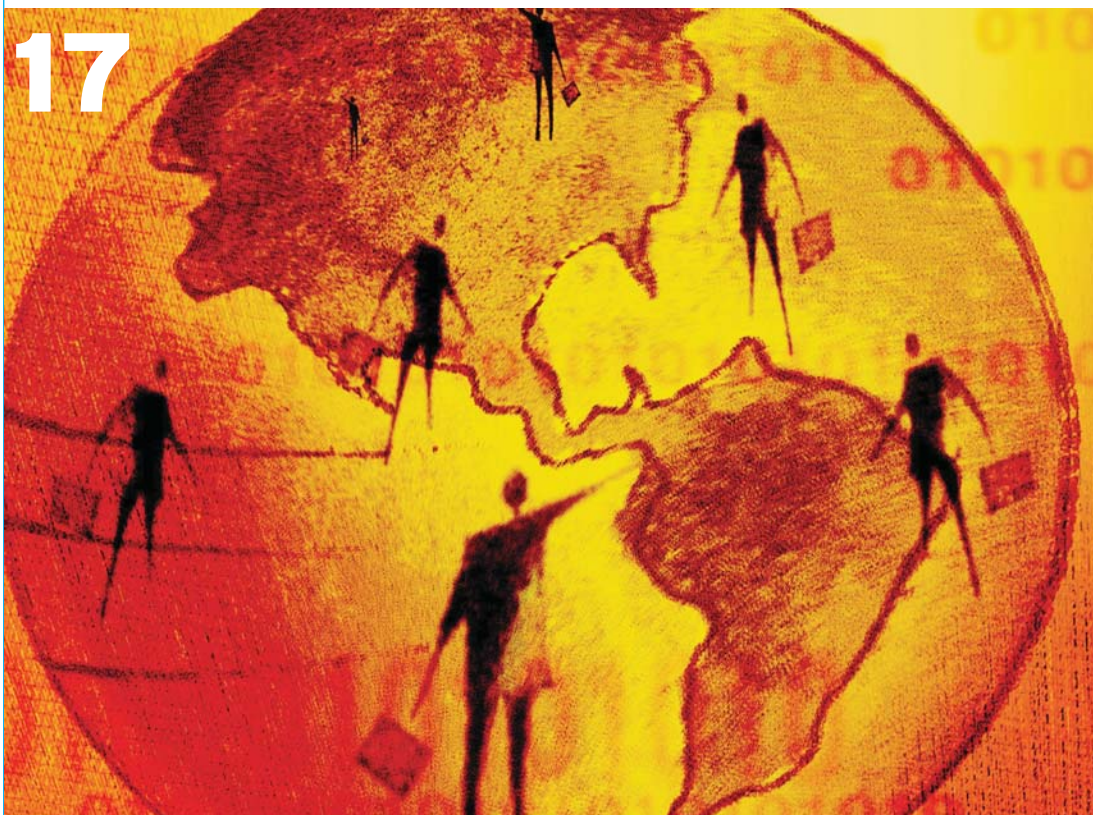
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BY ERICA VONDERHEID

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BY ERICA VONDERHEID

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## 1 New Portal Personalizes Member Information

BY KATHY KOWALENKO

Members now have a Web site, called myIEEE, for all their membership needs—from checking their member grade to changing their address to joining a society.

## 1 Students Rock On Web Radio

BY KATHY KOWALENKO

Many IEEE student members at college radio stations are bursting out of their campus confines by playing a role in streaming radio programs over the Internet.

## PRESIDENT'S COLUMN

## 6 The Advantages of Membership

BY CLEON ANDERSON

The benefits of IEEE membership—from meeting colleagues through networking to getting the latest technical information—are determined by your level of involvement.

## THE INSTITUTE ONLINE

<http://www.ieee.org/theinstitute>

Look for these articles on 6 June

**HISTORY** Built in 1903, the Vucje hydroelectric plant in Serbia is a new IEEE Milestone.

**BUDDING ENGINEERS** How student members organized a top-drawer technical conference for other students.

**FEATURED CONFERENCE** Learn about the latest in broadband over power lines at the 2005 IEEE International Symposium on Electromagnetic Compatibility being held 8 to 12 August in Chicago.

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# NEWS

FROM AROUND THE IEEE & THE WORLD



## 2005 Gordon Prize Recipients

WILLIAM C. OAKES [left] and IEEE Fellows Leah H. Jamieson [center] and Edward J. Coyle shared the 2005 Bernard M. Gordon Prize, which recognizes innovation in engineering technology education, from the U.S. National Academy of Engineering. The three were recognized for Engineering

Projects in Community Service, their undergraduate engineering design program at Purdue University, in West Lafayette, Ind. The program matches teams of engineering students with local community service programs to define, design, build, test, and support projects for the community. ●



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## Investing in Tomorrow's Engineers

THE IEEE BOARD OF DIRECTORS has approved US \$98 000 to fund the Center for Pre-College Engineering Education, an outreach organization designed to encourage students to study engineering in college. It is hoped that the center, to be directed by IEEE Educational Activities, will be of use to educators, engineering associations, and industry.

The center's activities include the development of a Web site for school counselors, students, teachers, and parents with links to a searchable database of information about engineering careers. The center also plans to work to expand the IEEE Teacher In-Service Program to all regions of the institute. The program offers lessons to pre-college teachers on technical subjects including

motors, switches, and simple machines. Section volunteers present the lessons, which could be tweaked by volunteers from other regions to fit their needs.

Educational Activities also is developing a TryEngineering.org Web site for the center, modeled after IBM's TryScience site. TryEngineering will be a science and technology site with interactive exhibits, multimedia adventures, and live TV camera field trips to engineering companies over the Web. One of the new center's first efforts will involve meetings among representatives from the IEEE, teacher associations, and industry who have been involved in raising awareness of engineering among pre-college students. The goal: to discover what they would like the center to accomplish. ●

## Lightner, Society Reps Attend Earth Summit in Brussels

IEEE PRESIDENT-ELECT Michael Lightner, along with Rene Garello from the IEEE Oceanic Engineering Society and Albin Gasiewski, president of the IEEE Geoscience and Remote Sensing Society, attended the Earth Observation Summit in February in Brussels, Belgium, where the new Global Earth Observations System of Systems was adopted. GEOSS is designed to link millions of national, regional, and international sources into a single network able to track environmental changes on the earth, in oceans, ecosystems, and the atmosphere.

The IEEE has supported the development of GEOSS for the past year through its Committee on Earth Observation.

"The IEEE will be proactive in its support for GEOSS and the societal benefits that come from an integrated observation and information system," says Jay Pearlman, the committee chair.

Representatives from more than 30 international organizations, the European Commission, and nearly 60 nations



Michael Lightner [left] and Jay Pearlman

attended the summit, which was held on 16 February.

According to Lightner, the IEEE was invited to participate because of its worldwide membership and global influence.

"The IEEE brings expertise through its members and societies in a wide range of relevant technologies, in internationally recognized standards development, and in a broad base of educational activities," he says. ●



## Anderson Visits India

IEEE President Cleon Anderson [left] traveled to India in January and met with [from left] Indian President A.P.J. Abdul Kalam; IEEE India Council Chair R. Muralidharan; and past IEEE Region 10 Director Harbans L. Bajaj. Anderson was in India at the invitation of the IEEE India Council to meet with IEEE section leaders, student members, and faculty members of eight universities, plus the leaders of several information technology companies.

—Compiled by Lindsay Elkins

## MARKETPLACE OF IDEAS

### RESPONSES TO MARCH'S QUESTION

# Do You Read Blogs?

## Blogging for Fun

Blogs are valuable only if you find one maintained by someone in your field who has opinions you respect and the time to digest and post information. Such people theoretically can serve as valuable news filters to help highlight important information. Journalists, however, are generally the only people with time to perform such a function. I'd prefer to read their products, which are of higher quality.

I dip into blogs occasionally; their value is significantly lower than that of traditional news columns. I am reading blogs and even blogging a bit myself just for fun, but I am not using them as a news source. I don't have the time to serve as anybody else's news source either.

**BILL LOVEGROVE**  
Greenville, S.C.

## Sidekick to News

Blogs are useful information sources that complement traditional news outlets. The key is to monitor a set of blogs for new information. Your set of blogs determines what kind of information you find. It's also important to evaluate the credibility of

the blog sources, as part of managing your monitored blog set.

For professionals in the technical field, it's useful to keep tabs on what your peers are talking about, such as new articles, techniques, and discoveries. Blog authors may present points of view that are new to you.

Blogs are not simply unidirectional either. Comments and cross-references generated by the TrackBack system allow for self-organizing discussion networks on topics of interest.

**DAVE CHEVALIER**  
Crystal Lake, Ill.

## Closer to Truth

Blogs reveal things about the reporters such as their motivations, histories, and points of view. Knowing these filters helps the reader evaluate what the bloggers are reporting. By reading several blogs on a subject, one can come closer to the truth.

**RANDY BRANNEN**  
Savannah, Ga.

## The Next Generation of News

I read blogs daily. Blogging has become a powerful social network and gets informa-

tion out faster than any other news network. Most bloggers blog without any restrictions to the news they discuss.

The tsunami disaster is a recent example of how effective blogs can be for delivering news. The news reached the world from bloggers living in those areas posting it on Web sites before any reports from newspapers or news agencies. This proves the power of the blog network and its prospect of becoming a new mode of social networking that won't have boundaries, rules, or regulations to limit the flow of information.

**SUDHAKAR SADASIVUNI**  
Hyderabad, India

## Open Forum

Blogs perfectly demonstrate the way the Internet has shifted the means of human communication. They allow people's voices to be heard and are great places to exchange information. I find that hearing multiple opinions is crucial for objective thinking.

Blogging can also be a way for me to keep in touch with people who care to read the things that I am passionate about and vice versa. When we start posts, we can write whatever comes to our minds, and as a result we are our own editors. Perhaps it is this freedom that fascinates a lot of people.

**HONG-LOK LI**  
Vancouver, B.C.

## Should We Tighten Up on Ethics?

**AFTER THE RECENT SLEW OF CORPORATE SCANDALS, some companies are adopting a zero-tolerance policy for ethical violations: the first infraction merits a pink slip, even for actions that would have elicited only a reprimand just a few years ago. Is zero tolerance too strict, or is it about time companies got serious about ethics?**

RESPOND TO THIS QUESTION by e-mail or regular mail. Space may not permit publication of all responses, but we'll try to draw a representative sample. Suggestions for questions are welcome. Your responses will appear in the September issue of *The Institute* and are subject to editing for brevity.

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## LETTERS

### On the Higher Member Grade

After reading "Stepping Up to Senior Member" [March, p. 19], I am unsure about the usefulness of the higher member grade. I do not perceive that the grade has any real value. The requirements sound like they consist of suitable employment for 10 years and connecting with the "old boys' network."

Perhaps a more objective set of requirements might give senior member status some meaning, but I find the plain old member grade to be adequate. I suggest we have a single membership grade and skip the organizational fluff.

**STEVE WALTHER**  
Andover, Mass.

I have been a member of the IEEE for 41 years and have been self-employed since 1977, providing design services to industrial clients all over the world. I don't know any IEEE senior members and have virtually no contact with academia, so I can't get references. As a result, I can't obtain senior membership status.

I don't see how being a senior member will help me, but I believe it could help the

IEEE's credibility if there is a way for self-employed members like me to upgrade our membership status.

**WALT MORREY**  
Wilmington, N.C.

Fellow, the highest IEEE membership grade, should recognize professional maturity, not exceptional performance, as there are sufficient IEEE awards for this. Current IEEE Fellow grade qualification criteria are completely out of sync with qualifications for Fellow grade in most other professions.

The 0.1 percent of membership per year limit for new IEEE Fellows should be abolished, and the senior member grade phased out.

**RICHARD M. KURZROK**  
Queens Village, N.Y.

### Freeing Information

The article "Information Free-for-All?" regarding open access [March, p. 1] seems to indicate that our choice is one of two models: either subscription fees pay for publications, which restricts access only to subscribers; or authors pay to publish



their articles, in which case free and open access is possible. I think there is another viable option: advertising.

In this world of open access online, how do other online resources pay for their services without charging customers? They charge for advertising space. The IEEE has a vested interest in keeping the current model of paid subscriptions in

place because that is how IEEE publications generate income.

The IEEE should encourage discussion among members to figure out how we can share information in our technical publications freely—information that, after all, is published with the intent of helping mankind—and still remain a viable institution. So be it if we have to come up with new business models.

**ROBERT M. PEDIGO**  
Virginia Beach, Va.

In the open-access article the IEEE seems to be giving me 20 reasons why something doesn't work, instead of spending energy on finding an answer to the problem.

The article does not explore the six-month window during which the publisher would have exclusive rights to the information, and it does not look into the author-pays model either. In the end, there will be organizations that will make the free-for-all model work, with modern means. The question is whether or not the IEEE will be one of them.

**ROBERT J. SCHAFF**  
Weston, Conn.

# The Advantages of Membership

A boy asked a wise man, “Is the bird I’m holding behind my back alive or dead?” If the wise man said “alive,” the boy would crush the bird and show it dead, but if the man said “dead,” the boy would laugh and let the bird fly away. However, the wise man would have none of such foolishness, telling the boy, “As you will, my son, as you will.”

WHENEVER I AM ASKED, “What is the advantage of IEEE membership?” I think the wisest answer is likewise “As you will.” During my 35 years with the IEEE, I have learned that the benefits of belonging vary among members. What I like to call “the member advantage” is really determined by your own values, needs, and involvement, because the IEEE is not a single-issue or a single-value organization. Our members are interested in a wide variety of technical issues and professional concerns that add value to each individual’s membership.

Easy access to the IEEE’s technical information is a major reason for belonging, but surveys we conduct tell us there are others. These include the ability to stay up to date and compete in one’s field, to build a strong network of colleagues, and to find career opportunities.

I’d like every member to understand that his or her advantage also includes professional involvement and growth with exceptional opportunities for career satisfaction. Involvement can take many forms, and along the way you will build a

worldwide community of colleagues with similar interests.

If you want to stay current in your field, attend one of the 300 major IEEE conferences or 3000 IEEE seminars, workshops, or tutorials held annually around the world. You may even want to organize a conference or workshop in your own community. You not only learn at an IEEE conference or seminar, but you also meet leading individuals in your field, and you’re able to share your insights and help spur new ideas. You might also consider participating in an IEEE Standards Association working group. Right now, more than 15 000 members are involved in hundreds of such groups, with topics ranging from transportation and computer security to reliability and nanotechnology.

Your IEEE section or society chapter will welcome your involvement whether you want to serve on a committee, help to organize an event, or mentor a promising young person. You will enhance your career because these activities help you gain important skills that are not taught in a classroom but are vital to your profes-

sional advancement. These skills include leadership, finance, project planning, and communications. At the same time, you gain access to individuals at all levels of the profession, and you become a more valuable asset both to yourself and your associates.

But, as I stated, the advantage you gain from your IEEE membership is “as you will.”

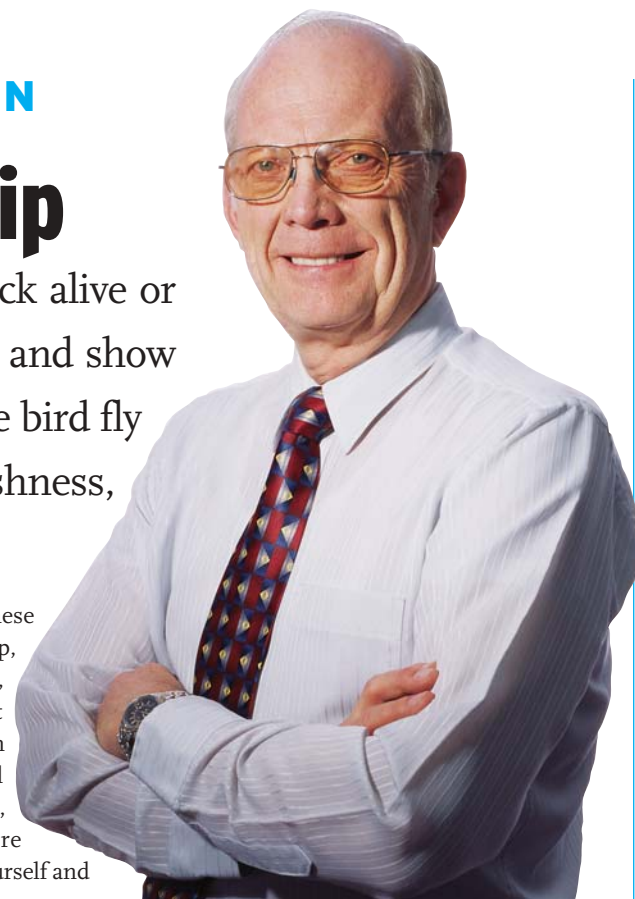
What you take from your membership is likely to vary at different stages of your career—which is one reason why “member advantage” encompasses such a variety of benefits and services, including a growing array available online. The new myIEEE members-only portal [see story, page 1], for example, provides information customized to each member.

Another advantage is the free, personalized @ieee.org portable e-mail alias with virus- and spam-protection features. Other services include more than 80 online communities dealing with career issues and

technical topics, as well as continuing-education courses available from several IEEE societies and educational partners.

But there is one, overarching member advantage: the respect and competitive edge associated with being an IEEE member. Your access to the IEEE’s information resources and your affiliation with other members underscore the worldwide renown that our organization enjoys for its vision of fostering technological innovation and enabling members’ careers.

I urge you, at every stage of your career, to find your own IEEE member advantage. Your membership creates the leverage for you to make a unique and personal contribution to our profession worldwide. ●



## The Institute

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Members may change their address, obtain information about section activities, learn about student resources, and more at the IEEE’s Member Services Web site, <http://www.ieee.org/membership>.

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“Being able to access personal information will help members in Latin America feel like part of the IEEE; to them this means the IEEE knows who its members are,” Martínez says.

He says giving members the ability to verify their postal addresses will be most useful to those in his region who often complain they aren't receiving their subscriptions because the IEEE has their address wrong. He explains that when members fill out paper applications, IEEE staff members sometimes have difficulty reading the information, so that incorrect addresses can be entered into the member database. Now that myIEEE lets members update their own contact information, Martínez predicts the number of missing-subscription complaints will decrease sharply.

Marc Apter, vice president of Regional Activities, the area within the IEEE responsible for membership, notes that while the portal is by no means perfect, “it's a good start.” He acknowledges that although the membership-related links

are now in one place, most information is still more than one click away.

“We're trying to reduce the number of jumps it takes to get to the right place,” Apter says [see “More to Come,” right].

**OPEN TO THE PUBLIC** As for the public site, Apter points out that it is designed to educate visitors about the IEEE. To this end, the site includes profiles of interesting current members, links to articles on engineering history by the IEEE History Center, and of course a link for joining the IEEE. What's more, it displays links to the IEEE Standards Association and to a list of the 39 IEEE societies, with links to their home pages.

If visitors to the site want information on specific benefits, they can find it in the Community, Knowledge, or Profession tabs at the top of the public portal page. Each tab has a drop-down menu with links to specific benefit descriptions, along with timely updates related to benefits. The Community menu contains links to the nuts-and-bolts pages that explain, for example, how student branches, tech-

nical chapters, and sections operate.

Under the Profession tab, visitors can find a list of IEEE awards and their deadlines for accepting nominations, plus links to the IEEE Job Site and to the database of IEEE members who are consulting engineers. From the Knowledge tab, they can link to the IEEE Xplore document delivery platform, to *IEEE Spectrum Online*, or to the *Proceedings of the IEEE* site.

Kam says he hopes the public site will be helpful for members as well. “Some people join the IEEE because they think they absolutely must be in the community of information theorists. Others join because they like the IEEE Financial Advantage Program's insurance policies,” he says. “Both have legitimate needs, but sometimes people who see the IEEE as an insurer forget it publishes standards, while those who are interested in information theory don't know we offer insurance.” ●

**FOR MORE INFORMATION**  
visit the IEEE Member Portal at  
<http://www.ieee.org/myieee>

## MORE TO COME

New features will be added to myIEEE by the end of the year. One is a “single sign-on,” which means that members have to log in only once to myIEEE with their Web Account number to do such things as renew their membership, update their records, or add new services. Currently, each of these sites requires members to log in separately.

Members' records will also soon include new information such as links to their section's and chapter's Web sites as well as ways to contact their section.

For members who volunteer to play a role within the IEEE, myIEEE will know who they are when they sign on and will display a so-called volunteer desktop. The desktop will list the positions they hold and will have links to resource pages for those involved with, for example, organizing conferences, developing standards, or publishing papers.

# Get the Card that Supports the Profession

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“The nice thing about Web radio is that people can listen to us regardless of where they live,” says Tippie, who has been co-hosting her show since the fall of 2003.

“Some of my friends don’t own radios, but having the station broadcast online lets them tune in to hear me on the Web.”

Over at WREK in Atlanta, at <http://www.wrek.org>, when station manager Aakash Jariwala is not in class you can find the senior electrical engineering student making sure his broadcast equipment is working smoothly. Other stations where IEEE student members are helping to run things include the ones at Binghamton University in New York, the Massachusetts Institute of Technology in Cambridge, and North Carolina State University in Raleigh. The stations offer a variety of music and talk-radio programming.

All a college radio station needs to turn its broadcasts into streaming audio is a streaming media server, a dedicated computer with encoding software, and a digital sound card. The audio enters the computer through the sound card, and the software compresses the information into streaming format so it can be sent over the Internet. The compressed audio is sent to the server, which has a high-bandwidth connection to the Internet. From the server the audio data stream hits the Internet and winds up in the listener’s player software or computer plug-in.

Student volunteers at campus stations learn the ins and outs of broadcasting, including not only how to use a microphone, work a CD player, or repair various pieces of equipment, but also the U.S. Federal Communications Commission’s broadcasting regulations.

**PREPPING FOR THE SHOW** Whether broadcasting over a transmitter or streaming over the Internet, it’s the job of the engineer, of course, to make sure all the equipment is working properly so the show can go on. Joining Jariwala at the 40 000-watt WREK is station engineer Peter Sahlstrom, who also doubles as a DJ.

WREK was one of the first college stations to stream its content over the Internet, says Sahlstrom, who graduates in August with a bachelor’s degree in computer engineering. In 1994 students wrote their own streaming software application, and today the station still uses homegrown streaming programs that combine open-source and proprietary software. The station also is one of the few that archives programs so listeners can download shows that were played within the previous week.

“We run a 128-kilobit stream, which is like CD-quality audio, so if you have a fast enough Internet connection, you can listen to a clearer quality broadcast than if you were listening over the airwaves,” Sahlstrom explains. Encouraged by a mutual friend already working at the station, Jariwala and Sahlstrom joined the WREK staff in 2002 to benefit from some hands-on engineering experience.



*Abbie Tippie says being a DJ has improved her verbal and written skills.*

“Like most college radio stations, we don’t get that much funding, so we end up just doing everything ourselves, like fixing speakers and repairing CD players,” Jariwala says.

“That do-it-yourself approach has given us some opportunities to do stuff we wouldn’t typically do in class,” Sahlstrom adds. The two recently helped relocate the station’s transmitter when WREK moved into a new building.

WREK doesn’t leave its budding engineers completely on their own. It maintains a list of station alumni and broadcast engineers living in Atlanta who have volunteered to be on call to give advice. Jariwala recently sought the volunteers’ help on the best guest microphones to buy for the station.

MIT’s WMBR (<http://www.wmbr.mit.edu>) depends on the skills of Bryan Cord, the 720-watt station’s techni-

cal director. Cord oversees operations and manages a staff of 10 students. A graduate student himself, Cord plans to work in semiconductor fabrication when he gets his doctoral degree in 2008. Two years ago, the station added Web-streaming capabilities, and it recently began offering an online archive of its broadcasts.

As the technical director, Cord can have a 10-hour weekly stint that might be as mundane as fixing a CD player or as complex as getting the radio transmitter back on line after it shorts out. He says he stays involved with the technical work at the station and delegates to others the software-oriented projects such as building a database to index the station’s music library, which is now cataloged in paper notebooks.

“I like music a lot, and I like technology a lot,” Cord says, explaining why he joined the station. “I’ve been an



electronics nerd ever since I was a little kid, so this job is a nice convergence of the two.”

Although Jariwala, Sahlstrom, and Cord don't plan to make a career out of broadcast engineering, they all say they've benefited from the experience. Cord says he has become more organized and more adept at delegating projects and tracking their progress. All three point out that working at the station gives them a mental break from their studies and the chance to interact with musicians.

“It's nice to come to the station and do something completely different than I would do in my classes,” Sahlstrom says. “I like the applied engineering side of this work, because I get to see from start to finish how everything works, not just my individual piece. I also learn about new bands.”

**MUSIC AND VIEWS** From 6 p.m. to midnight, so-called specialty shows come on the air at 10 000-watt KCSU, including alternative music like the Christian rock Tippie plays.

“It's fun doing my show because there's so much freedom,” she says. “I love being the host.”

Shortly after she arrived at school, she approached KCSU about hosting its first-ever show devoted to Christian rock, a type of music she has been listening to for years.

“I really believe it's a growing genre,” she says. “There are so many good artists who sing Christian rock music,

and many people don't even realize how great these performers are. Having a show like this on KCSU lets the audience know what's out there.”

Tippie says she believes her work at the station will help in her career and, no, she doesn't plan to give up engineering to become a full-time DJ.

“Doing a show like this requires good verbal and written skills. And because we must do so much preparation, we have to be go-getters,” she says. “Being a DJ also is a good way to get involved with activities on campus besides just engineering.”

Every Thursday from 6 to 8 p.m. Eastern time you can tune your Web browser to North Carolina State University's WKNC (<http://www.wknc.org>), a 25 000-watt station, and listen to John Kelly on a two-hour call-in sports talk show. Kelly, a senior studying computer and electrical engineering, talks with the host and four other cast members about college and professional sports. They also debate hot-button issues for sports talkers, such as whether Major League Baseball should ban players who use steroids.

Kelly says his radio work gives him a place to release the daily pressures of his engineering studies. “At first, doing the show made me nervous and added some stress, but it's a great two-hour break to talk sports and have some fun,” he says.

Kelly, whose hometown is Oak Ridge, Tenn., says his parents and friends from across the United States tune in to his webcasts. His radio experience will help him with public speaking and polish his interview skills as he pursues an engineering job, he says.

“If I can talk to who knows how many people on the radio, then I shouldn't have a problem talking to one person in an interview,” he reasons.

Binghamton University's 1450-watt WHRW (<http://www.whrwm.org>) is supposed to have a 50-kilometer radius, but senior Tom Triebwasser's program can be picked up by his family 240 kilometers away in Red Hook, N.Y. Triebwasser, an electrical engineering student, has been cohosting a daily talk show since the 2001 fall semester, though the station has been streaming only since February 2003. For a half-hour each morning, Triebwasser and his cohost banter about the news, perform scripted comedy sketches, play music, and discuss life in general.

“We fly by the seat of our pants because the program is broadcast live,” he says. “I've always wanted to be involved in radio, and I do my show for the love of being on the air.”

Being on the radio also helps Triebwasser break free of the “geek” image associated with engineers, he says, noting, “That stereotype is going by the wayside. I'm showing that engineers can do all sorts of interesting things.” ●



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In the first few days after the December tsunami that killed more than a quarter of a million people and devastated property across Southeast Asia, India, and East Africa, some relief efforts actually fed the chaos rather than easing it. For example, says Senior Member Mark Haselkorn, “Military helicopters performed their rescue mission so well, they contributed to the overcrowding of the region’s hospitals, while goods that were delivered efficiently from around the world sat in aircraft on runways and were not distributed for days.”

In the view of Haselkorn, professor and founding chairman of the Department of Technical Communication at the University of Washington (UW) in Seattle, such nightmares in logistics, communications, and coordination should—and can—be prevented. Driven by that conviction, he and UW colleagues founded the graduate-level Interdisciplinary Program in Humanitarian Relief (IPHR), a partnership between his university’s College of Engineering and its School of Public Affairs.

The IPHR’s first group of two dozen students is scheduled to begin in September studying communications, logistics, and a smattering of international law and public policy. In one year, they will earn a certificate in a program that supplements the graduate degrees they are pursuing in engineering or in other areas, such as public affairs, public health, the sciences, or social work.

**A SYSTEMS APPROACH** Many disaster relief challenges—such as providing clean water and sanitation, reestablishing transportation systems and power grids, and installing information and communication systems—require engineering solutions. “Immediate needs are tracking

medical goods and emergency supplies to make sure they get to the right places,” Haselkorn says. “But in a region whose infrastructure was just destroyed, securing communications may be as difficult as securing clean water.”

More important than actual tech-

nology, however, “engineers can bring a badly needed systems approach to disaster relief,” Haselkorn explains. One of the biggest problems in a widespread disaster is coordination. Much of the chaos right after December’s tsunami, for example, was in part “a natural outcome



*As part of her work with VillageReach, University of Washington student Kate Hulpke ensured delivery of vaccines to these children in Cabo Delgado, Mozambique.*

# ENGINEER

# Disaster Relief

of more than 50 loosely coordinated organizations rushing to a disaster area to do good," Haselkorn continues. "But it also reflects the complexity and interconnectedness of the task of disaster relief." A systems approach to orchestrating complex logistics, he says, "could offer techniques and problem-solving strategies that have proved effective in commercial industries."

Haselkorn says disaster relief is not just a matter of bringing immediate aid; it must also include long-term rebuilding of a stricken region's infrastructure—in large part to minimize loss of life and property in any future disaster. [This is a philosophy shared by Engineers Without Borders, an organization to which the IEEE has contributed funds for disaster relief; see sidebar, "Engineers Aid Post-Tsunami Rebuilding."]

Taking the longer view will require introducing into developing countries the same kinds of advance planning and preparation procedures routinely practiced in developed nations—including building codes for earthquake-resistant structures and emergency evacuation procedures for schools and office buildings. Introducing such practices, however, clearly involves not only engineering but also expertise in the political and legal systems of local and national governments—hence the need to combine engineering expertise with knowledge of international law and public policy.

Long-term mitigation would also

include instituting plans for emergency communications, Haselkorn says. For example, some of the losses suffered in the Southeast Asia tsunami might have been less severe had there been such a pre-existing plan: "Mobile phones could have been dropped by helicopter. Open the box, hit a button, and you're communicating via satellite," he suggests.

Even more important would be instituting a coordinated early warning system that could alert people to evacuate danger areas in advance of a tsunami or other disaster. "Sensors in a tsunami-warning system are great, but they are the easy part," says Haselkorn. "The hard part is planning what to do with the sensor warnings once you get them." In other words, whom do you call to say a tsunami is coming?

True area-wide systems may also involve international cooperative agreements, training of experts, and education of the general public, all of which "should be in place and continually maintained before a disaster strikes," he says.

In short, Haselkorn concludes, "technology is only one part of any effective approach to disaster relief, alongside people, public policy, and good practices."

Inspiration for the IPHR came in November 2003, when the UW's Marc Lindenberg Center for Humanitarian Action approached Haselkorn and Benita Beamon, a professor of industrial engineering, to explore

ways of applying engineering to humanitarian relief efforts. As Haselkorn and Beamon studied the issue, they realized that, unlike engineering or medicine, humanitarian relief was not really a profession.

"Although humanitarian relief is a US \$30 billion–\$40 billion industry worldwide," says Haselkorn, "there's no degree, no professional journal, no formal scholarship to enable relief workers to share information and advance their careers and the field."

That discovery fueled their proposal to the UW's Fund for Innovation and Redesign, which granted an award that enabled the College of Engineering and the Daniel Evans School of Public Affairs to establish the IPHR. The program's advisory board includes representatives from more than 30 industrial corporations, including Amazon.com, Boeing, Expeditors International, Microsoft, and Starbucks, in partnership with a number of nongovernmental relief organizations, such as CARE and Catholic Relief Services.

The 21-credit, one-year certificate program will have three core courses that introduce students to the management of humanitarian relief and emergencies; the application of commercial supply-chain strategies to the delivery of emergency goods and supplies; and the application of electronic information and supporting systems to relief efforts. Students also will select six credits' worth of electives from other disciplines, including

## ENGINEERS AID POST-TSUNAMI REBUILDING

The IEEE, along with four other engineering societies, has donated US \$25 000 to Engineers Without Borders-USA (EWB-USA), a group helping to rebuild tsunami-devastated areas of Sri Lanka. According to EWB-USA's executive director, Catherine A. Leslie, her organization is rebuilding schools and a children's home in the eastern and southern regions of that country, in conjunction with two other organizations, Teachers Without Borders and Asiana Education Development. "It is anticipated that the \$25 000 will cover two or three of the schools," Leslie says.

The goal of EWB-USA, a nonprofit organization established in 2000 and headquartered in Longmont, Colo., is to partner with developing communities around the world to help them improve their quality of life, while cultivating an awareness among engineering students of the humanitarian role they could play. EWB-USA now supports 80 projects worldwide, many devoted to post-tsunami reconstruction in Sri Lanka and Thailand.

EWB-USA volunteers are professionals specializing in energy, civil engineering, water resources, structures, and other infrastructure technologies, plus students earning their engineering or science degrees. An EWB-USA project is designed and implemented by professionals and students working with a community. Volunteers can serve on an individual project, for several years on a series of projects, or within the organization.

The IEEE's donation, combined with donations from the American Society of Civil Engineers, the American Society of Chemical Engineers, the American Institute of Mining Engineers, and the American Society of Mechanical Engineers, was made through the United Engineering Foundation (UEF), New York. While the UEF's donation may be "small in comparison to the overall need, it is sufficient to gain substantial attention inside and outside the engineering community and to stimulate others to offer similar financial support," says David L. Belden, UEF's executive director.

EWB-USA focuses its efforts "on long-term reconstruction, not immediate relief, for small or remote communities that are often not eligible for large aid projects," Leslie explains. A series of small projects for a village typically costs about \$100 000 and includes systems for water, sanitation, shelter, and energy. EE-related projects have included solar-powered water pumps, drip irrigation systems, vegetable-drying facilities, and lighting systems, as well as small hydroelectric power plants.

"We are looking for professional teams for design and implementation," Leslie says. "There are many ways for EE professionals to get involved. Fully 20 percent of our projects are energy-related. Most communities have no access to a power grid but need power. All housing, medical clinics, and schools need appropriate and sustainable technology for lighting, cooling, refrigeration, computers, and communication."

**MORE INFORMATION** about EWB-USA is at <http://www.ewb-usa.org>. The UEF's Web site is at <http://www.uefoundation.org>

# ING

University program applies engineering view to humanitarian programs

By Trudy E. Bell

urban planning, public affairs, international health, social work, nursing, anthropology, and technical communication.

**HANDS-ON HOURS** The program's centerpiece, however, is a 200-hour "practicum"—a five-week (or longer) tour of field work guided by IPHR faculty and leaders in relief organizations. To help develop ideas for such projects, professionals from international relief and development organizations will visit classes as guest speakers and advisors.

Two pioneers of the practicum—even before the IPHR began—were UW College of Engineering graduate students Kate Hulpke (studying technical communication) and Steve Kotleba (studying industrial engineering). Both second-year master's degree students pursued field studies in different parts of Africa in the summer of 2004.

Hulpke worked in Mozambique with VillageReach, an organization whose mission, she explains, is to "improve health and quality of life in the most remote regions of developing countries" [see photo p. 12]. She created a database for managing information about the transportation, stor-

age, and use of vaccines against childhood diseases in rural areas.

Her documentation of the supply chain went beyond just how VillageReach's field coordinators transport the supplies from the provincial warehouse to the rural clinics. It includes "the entire chain of decisions and actions that determine how supplies get from the national capital to the province to the clinics to the people," Hulpke explains.

Her purpose was to identify delays in shipping vaccines because of poor forecasting of needs—which resulted in "mothers and babies' being turned away for lack of vaccines and eroding public trust in the health care system," she says.

Hulpke's database is now being used by VillageReach to track and manage its field operations; moreover, information from it is being used by the Mozambique Ministry of Health to improve its forecasting of demand and the management of its inventory of vaccines in Cabo Delgado, the province that was the site of VillageReach's pilot program.

Kotleba worked at several places in Kenya with a consortium of seven non-governmental organizations called the East

Africa Inter-Agency Supply Chain Management Team. He focused on documenting the flow of food, blankets, tents, tarps, and other supplies during responses to rapid-onset emergencies (volcanic eruptions and earthquakes), slow-onset emergencies (droughts and famines), and complex humanitarian emergencies (civil wars and displacement of indigenous populations). His work resulted in a software model of a relief supply chain to help analyze inventory control and delivery of aid, and to identify ways the organizations might collaborate to improve their responses to different types of emergencies.

What do the two grad students have to say about their work in the field? Without field experience, "this whole area of opportunity—serving humanitarian causes by managing information to support better decision-making—would not have been evident to me as a technical communication major," Hulpke reflects. She was particularly enthusiastic about "learning by doing." She says she will continue to work with VillageReach after she gets her master's degree, expected this month.

"The experience was very exciting," says Kotleba, who completed his mas-

ter's degree in April with a focus on operations research and logistics. "The opportunity to study and work with humanitarian organizations and emergency relief awakened a sense of the 'greater good' within me," he says. "It's clear to me that these groups need engineering skills." He has relocated to Chicago, where he has become a supply-chain expert for a large consulting firm.

Haselkorn hopes his program eventually will encourage humanitarian disaster relief agencies to consider more than immediate, tangible needs such as water, food, medicine, and shelter. "This is necessary, to be sure," he acknowledges. "But the focus must also be on longer-term issues, such as establishing a strategic infrastructure for assessing a disaster's impact and coordinating response. The engineering profession has a lot to contribute to these areas." ●

**MORE INFORMATION** about Haselkorn's Interdisciplinary Program in Humanitarian Relief is at <http://depts.washington.edu/iphr/homepage.shtml>. More information about VillageReach appears at <http://villagereach.org>

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# Teaching Real-World Lessons

BY ERICA VONDERHEID

**K**EVIN KORNEGAY, an electrical and computer engineering professor, knows that for his students, there is life after school. New engineering graduates have to know how to handle the equipment used in the real world of industry, solve complex problems and, perhaps most important, as they say in elementary school, play well with others. With that in mind, Kornegay has forged a unique alliance between industry and academia for the benefit of his students.

For his efforts, Kornegay, an IEEE senior member, received the Janice Lumpkin Educator of the Year Award for 2005 from the (U.S) National Society of Black Engineers. This award is given annually in March to a faculty member committed to advancing education in engineering, science, and mathematics.

Kornegay's educational alchemy takes place in the Cornell University Broadband Communications Research Laboratory in Ithaca, N.Y., a lab Kornegay founded in 2000. Students work on designing and testing RF ICs such as transceivers in cellular phones and other wireless devices. They can work with state-of-the-art, production-line-quality equipment, such as an RF IC test system donated by Agilent Technologies and an RF/microwave 8-inch semiautomatic wafer probe station, courtesy of Cascade Microtech. Analog Devices, Cadence Design Systems, Intel, and Qualcomm also have donated money for research support, equipment, technology access, and software.

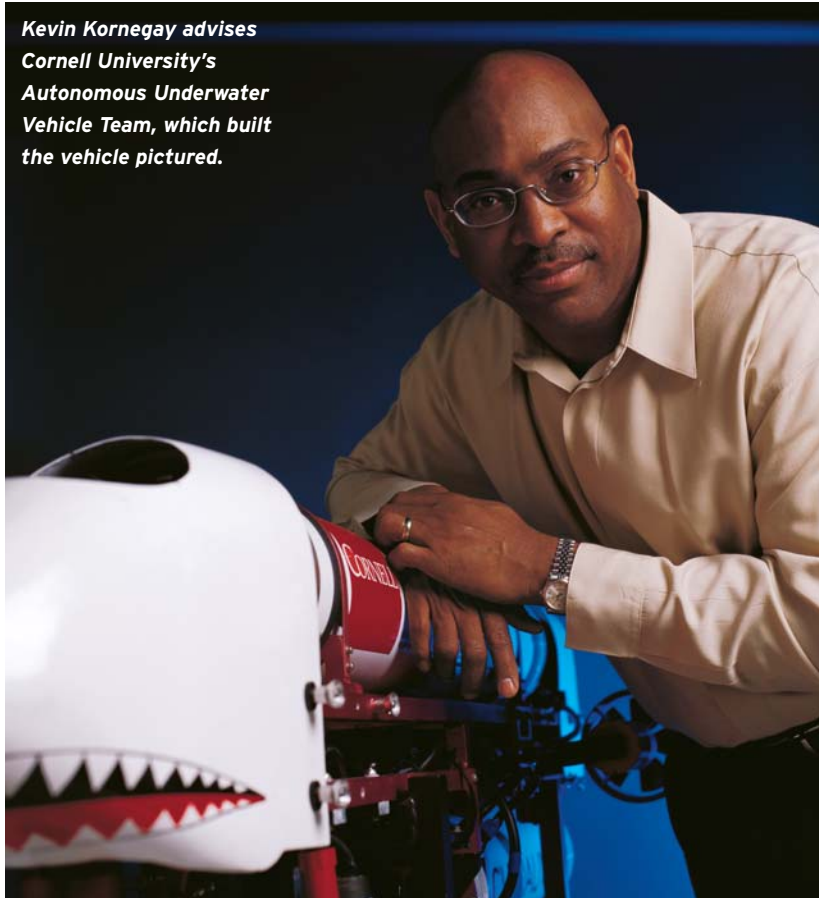
"I approached these companies with the idea of developing a lab for the best and brightest, to create the next generation of circuit designers," Kornegay says. "I emphasized that the students would use these companies' technologies as part of a practical hands-on RF circuit-design course."

At the lab, Kornegay and his students create high-speed digital very-large-scale-integration (VLSI) and analog and mixed-signal ICs for broadband wired and wireless communications. Students also tackle research projects, and they often do excellent work. Results of their research are published in IEEE journals such as the *IEEE Journal of Solid-State Circuits* or presented at conferences such as the IEEE International Solid-State Circuits Conference.

"We design chips that move information through a medium—air, fiber, or copper wire—as fast as possible with little data loss," Kornegay says. "I like to create a benchmark for circuit speed and low power and see how our devices fare against the best."

That hands-on training is Kornegay's educational signature. Rather than selecting research topics for his students, he allows them, especially the doctoral candidates, to choose their own projects to see through to

Kevin Kornegay advises Cornell University's Autonomous Underwater Vehicle Team, which built the vehicle pictured.



completion. Kornegay provides the vision, infrastructure, and guidance, and the students do the rest.

"You have to bring theory and practice together," Kornegay explains. "Theory is reinforced by practice, and practice derives much from theory." He says this approach inspires independent thinking, so students enter the workforce confident in their abilities.

He also likes to create student teams that are diverse in terms of technical prowess, national origin, and even political views, and then have them work together in a big open area. The result can be a tight-knit group that, say, dines on take-out Thai food for lunch every Friday and attends wine-tasting classes together. "I want to create a realistic work environment, because one will need to get along with people of different races, backgrounds, and cultures throughout one's career," Kornegay says.

His philosophy also inspires his work with the Cornell University Autonomous Underwater Vehicle Team. A group of 45 undergraduate students has 9 months to design and build an underwater vehicle that will have 15 minutes to perform a set of tasks, including inspecting a pipeline without human intervention. The effort is geared toward an international competition, held every summer at a U.S. Navy facility in San Diego, against teams from top engineering schools, including the Massachusetts Institute of Technology, Cambridge.

In 2003, the Cornell team earned first place in the competition, hosted by the Association for Unmanned Vehicle Systems International, whose members are

individuals and corporations involved in unmanned systems. Team leader Ryan Stenson, a senior electrical engineering student, says the project was the best educational experience he had at Cornell.

Kornegay explains that "learning happens in real time during competition when things break and the students have to come up with creative solutions." The solutions the teams have developed during the last several years have had an impact on the competition itself. Most other teams are now employing Cornell's modular double hull and modular open aluminum-frame architecture. The tubular hulls hold the vehicles' electronics, batteries, and motor controllers.

**BROOKLYN ENGINEER** The son of a New York City transportation worker and a paralegal, the soft-spoken Kornegay describes himself as a classic nerd. A natural tinkerer, he saved up money from cutting grass and shoveling snowy driveways to buy an oscilloscope kit that he put together.

Kornegay wanted to be a doctor before he discovered that he didn't like the sight of blood. Instead he became a math major at Pratt Institute in Brooklyn, N.Y. His natural ability in math led him to consider being an actuary for an insurance company or an engineer instead. A summer internship at AT&T Bell Laboratories in Murray Hill, N.J., during his last year of undergraduate school at Pratt helped cement the decision in favor of engineering.

Then, after earning master's and doctoral degrees in electrical engineering and computer science at the University of California, Berkeley, Kornegay joined the IBM Thomas J. Watson Research Center in Yorktown Heights, N.Y., as a research staff member. Later, he taught electrical engineering at Purdue University in West Lafayette, Ind., and served as the Dr. Martin Luther King Jr. visiting professor at the Massachusetts Institute of Technology before joining Cornell in 1998.

For Kornegay, learning extends beyond the students to himself and his two sons, ages 12 and 8, who accompany him to the underwater-vehicle competitions in San Diego. Although the boys' current career plans include being engineers or professional basketball players, Kornegay says that when his sons see the "big kids" studying, it inspires them to do their homework. And occasionally one of Kornegay's doctoral students, Javier Alvarado Jr., who is studying 60-gigahertz radio architectures, helps the boys with their math.

**FOR MORE INFORMATION** on Kornegay's lab, visit <http://cbcr1.ece.cornell.edu>. To read about the Cornell underwater-vehicle team, visit <http://www.cuauv.org>

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Space constraints prevent the listing of all donors, but here are the names of those in the Leadership Association—donors who gave \$1000 or more.

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## FUNDS HONOR FAMILY AND FRIENDS BY ELIANNA GOLDMAN

**WHILE MANY MEMBERS DONATE**

money to the IEEE Foundation to fund its numerous programs, some also give money specifically to honor a loved one. That's what the family of IEEE Fellow Chen-To Tai did. Tai, who died in July, was considered by many to be one of the most influential scientists in electromagnetics and antenna theory. He was professor emeritus of electrical engineering at the University of Michigan, in Ann Arbor, where he had

taught from 1964 to 1986 and conducted research in electromagnetics, antenna theory, and applied mathematics. He published two important books, *Dyadic Green's Function in Electromagnetic Theory* (IEEE Press, 1971) and *Generalized Vector and Dyadic Analysis* (IEEE Press and Oxford University Press, 1997).

Tai's devoted family set up a fund and an award in 2000 while Tai was still alive. The Chen-To Tai Fund's purpose is to provide for the IEEE Antennas and Propagation Society's Chen-To Tai Distinguished Educator Award. The annual award recognizes the outstanding service of an educator in the field of antennas and propagation.

Tai attended the first presentation of the award when it was made in 2001. After his death, his family asked that contributions in his memory be sent to the fund. More than US \$10 000 poured in. According to the IEEE Foundation, that was one of the largest amounts ever generated by memorial contributions to one of its funds. "Dr. Tai will be greatly missed by his former students and his fellow educators, as well as

his family," one donor wrote. "We thank you for providing this avenue as a means of showing appreciation of the contributions in education of such a distinguished educator as Dr. Tai."

Other memorial funds recently established with the IEEE Foundation include the Morton Antler Annual Lecture Award, created by his wife, Esther; the William Streifer Award for Scientific Achievement, created by his wife, Shirley, his friend Donald Scifres, Xerox Corp., and Spectra Diode Labs; and the Myron Zucker Undergraduate Student Design Awards, created by Zucker himself.



Members of the Tai family established the Chen-To Tai Fund, which recognizes an outstanding educator in the field of antennas and propagation.

# The Finer Points of Business Etiquette

BY ERICA VONDERHEID

**M**OST ENGINEERS know the basics of etiquette, such as which fork to use at dinner and saying please and thank you, but there are many finer points—from handling business cards to making small talk—that, if missed, could be noticed by a client and even lead to lost business.

Here are some tips for handling a few of the finer points of business etiquette, which is really good manners applied to a business situation. The pointers come from members of the IEEE Engineering Management Society (EMS).

“Etiquette should always be considered important, especially in the work environment where you’re not surrounded by friends and family who would cut you a lot of slack when you behave poorly,” says IEEE Member Beth Zimet, who is on the EMS Board of Governors. All too often, engineers are so focused on the technical aspects of the job—the very trait that makes them successful as engineers—that they end up in a sticky situation because they are misunderstood or inadvertently cause hurt feelings.

**CHOOSING YOUR WORDS** Many rely too much of the time on the classic engineering mindset, which emphasizes logic, ideas, and facts. But how engineers express their thoughts is very important, according to Senior Member Celia Desmond, president of World Class Telecommunications in Mississauga, Ont., Canada, and EMS vice president of membership services.

“Engineers are focused on the logic of the situation, not necessarily on the impact of what they’re saying,” Desmond says. “They don’t mean their statements to be negative, but they can come out that way.”

For example, an engineer might simply state what seem to be the facts of a situation, that a particular plan or project won’t work. Such a statement might not go over well with a colleague, who might think the engineer was making negative comments on his or her work. Desmond suggests that before critiquing another’s



work, you should take a moment to consider your choice of words and that person’s perspective.

Engineers also could hit a rough spot when a salesperson presents technical information that’s not quite correct or promises the client something the engineer knows is difficult to accomplish or even unnecessary. The engineer has to either contradict the salesperson in front of the client or be complicit in leading the client astray. Both problems have the same solution, Zimet says. She suggests talking with the salesperson beforehand to discuss the upcoming meeting, agreeing on the goals to be pursued, and being sure the salesperson understands the project’s technical aspects.

Then, when presenting technical information, something engineers excel at, they

should avoid overburdening their listeners with unnecessary detail. That would indicate they weren’t paying attention to the listeners, says Life Fellow Gerard Gaynor, vice president of publications for EMS. Instead, the engineer should consider what the listeners need to know, which usually means paring down the presentation.

**CROSSING CULTURES** Engineers—or any professionals, for that matter—may be well-versed in customs and manners in their home country but can make etiquette faux pas when overseas. For example, Senior Member Margaretha Eriksson, a systems management engineer for Irbis Konsult AB in Stockholm, notes that in some countries, an engineer who doesn’t engage in small talk can seem too eager and not make a good impression.

“It is part of business in places like France to find some common ground and shared interest first through chitchat, before you talk about business,” she says.

In some places, even exchanging business cards can be a manners minefield. Desmond says Japanese engineers present and accept cards in both hands and then leave the card on the table during the meeting—or, in the absence of a table, place the card carefully in a notebook or shirt pocket—and treat it with respect. Taking the card with one hand, writing a note on the back, and shoving it in a pants pocket—as an American might do—would seem disrespectful to a Japanese businessperson.

Other customs, from who picks up the check at a business lunch to shaking hands to allowing for appropriate personal space, vary from country to country. Americans often split the bill at a business lunch, whereas in France, for example, the host is expected to pay for the guests. In some cultures in the Middle East, women and men should not shake hands. Eriksson reports that often her fellow Scandinavians, who are accustomed to wide personal space, can get backed into a corner by a colleague from an Asian country who is used to being close. An engineer should research local customs—at the very least, the proper name and title to use when greeting a colleague—by looking on the Web or checking with a colleague who has traveled to the country.

Gaynor, who worked for 3M Co. in Italy for seven years, says that if you’re employed in a foreign country for any length of time, you can work with your colleagues to come up with a hybrid office culture. Incorporating aspects of your home and host customs will allow you to work effectively, he says. But in the short term, you just have to adapt to a new way of life.

“You have to recognize the fact that you’re going to live in a new culture,” Gaynor says.

The IEEE Transnational Committee has compiled a list of online sources of cross-cultural customs at its Web site, <http://www.ieee.org/tc>.

## DEADLINES AND REMINDERS

# Nominations Invited for Technical Field Awards

**THE IEEE AWARDS BOARD** seeks nominations for the 2007 IEEE Technical Field Awards. These technical and educational awards, along with their sponsors, are listed below. Deadline for nominations is 31 January 2006.

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For outstanding contributions to the advancement of speech or audio signal processing.  
Sponsor: *IEEE Signal Processing Society*

• **IEEE JOSEPH F. KEITHLEY AWARD IN INSTRUMENTATION AND MEASUREMENT**

For outstanding contributions in electrical measurements.  
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For an outstanding contribution to the fundamentals of any aspect of electronic circuits and systems that has long-term significance or impact.  
Sponsor: *IEEE Circuits and Systems Society*

• **IEEE KOJI KOBAYASHI COMPUTERS AND COMMUNICATIONS AWARD**

For outstanding contributions to the integration of computers and communications.  
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For outstanding contribution(s) to the advancement of power electronics.  
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For outstanding contributions to emerging technologies recognized within recent years.  
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For outstanding accomplishments in the management of research and development resulting in effective innovation in the electrical and electronics industry.  
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For outstanding achievement(s) in photonics.  
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• **IEEE EMANUEL R. PIORE AWARD**

For outstanding contributions in the field of information processing in relation to computer science.  
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• **IEEE JUDITH A. RESNIK AWARD**

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For contributions in the field of robotics and automation.  
Sponsor: *IEEE Robotics and Automation Society*



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# Job Site Takes Global View

BY WILLIAM LEVENTON

**T**he change is in its early stages. But thanks to volunteers and staff, the IEEE Job Site is becoming a more useful tool for members seeking jobs outside the United States.

The effort to create a more versatile Job Site makes sense, given the changing demographics of the organization, notes Ivan Jileta, president of Mexico's IEEE Guadalajara Section. "In 2006, IEEE members living outside the U.S. will be more than half the total," Jileta says. "And it's not fair if they pay more than US \$100 for a membership and only receive a magazine. More services [like the Job Site] should be available to them."

Last year, more than 5200 help-wanted notices were posted on the Job Site by a wide variety of firms looking to fill technical openings. IEEE members can search the site's job bank and post résumés for viewing by potential employers, all at no charge. Members can also take advantage of a site feature that lets them specify individualized criteria so that the system will automatically send notices of matching job openings to their e-mail addresses.

**REACHING OUT TO LATIN AMERICA** In late 2003, Jileta and several other members from IEEE's Region 9 (Latin America) contacted Michael Buryk, manager of recruitment advertising for IEEE Media, which manages the Job Site. They asked him if a plan could be developed for boosting the number of job openings from Latin American companies, given the difficult employment conditions in their countries. Buryk responded enthusiastically, and a liaison committee was formed, consisting of representatives from all 23 Region 9 countries.

The committee asked the leaders of the region's Graduates of the Last Decade (GOLD) groups to identify the main technology companies in their countries. The GOLD leaders sent the company names and contact information they collected to Buryk, who sent the firms English-language e-mail promoting the Job Site. The

messages generated little interest, but the response rate improved when Buryk switched to e-mail with Spanish text provided by Jileta and his Region 9 colleagues.

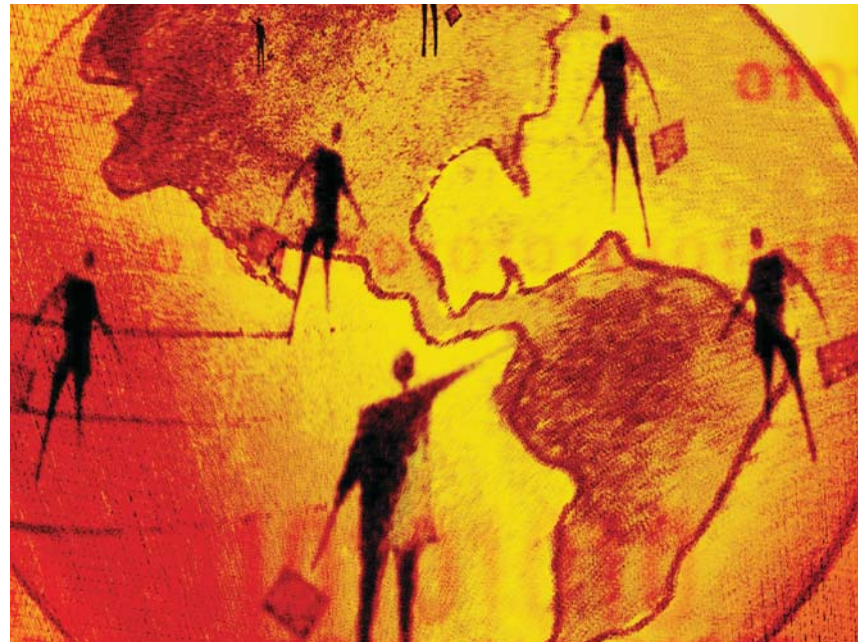
As part of the arrangement, Buryk offered the companies one free job posting on the site (it normally costs \$199 per posting). But of the roughly 100 companies he contacted, only four accepted the free posting. Buryk concluded that one reason for the disappointing response was the relatively small number of Region 9 members who had posted résumés on the Job Site. "Employers want to see large numbers of job candidates," he says.

In an effort to enlarge the pool of Region 9 job seekers, Buryk provided the committee with material encouraging the region's 12 000-plus members to register with the site. The committee translated the material into Spanish and distributed it to members in e-mail, at meetings, and in newsletters. According to Buryk, those efforts more than doubled the number of Region 9 registrations, from about 400 to almost 1000.

As for employers, Siemens, Philips Lighting, Schweitzer Engineering, and STMicroelectronics are among the companies that have posted openings in Latin America. "But the numbers are small compared to the numbers we want," Jileta says.

One problem: many Latin American companies don't use—and don't know much about—online job sites. Instead, Buryk says, Region 9 employers find job candidates using newspaper ads and by word of mouth, through networking.

So this year, Jileta says, Region 9 volunteers "are really going after the high-tech industry. We are going to talk to the managers of the companies and explain the Job Site so they see the strengths and opportunities offered by this kind of tool."



## INROADS IN EUROPE, CANADA AND ASIA

Encouraged by the progress in Region 9, Buryk visited representatives in IEEE's Region 8 (Europe, Middle East, and Africa) to see if a similar effort could be launched in Europe. To date, no European version of the Region 9 liaison committee has been formed. But Region 8 members have promoted the Job Site in their section newsletters and posted links to the site on their section Web pages. As a result, there has been a modest increase in Region 8 registrations, Buryk reports. Still, he adds, only about 1000 European members are registered, a small fraction of the total membership in that area.

These members can view job openings from employers such as Giraffo (Germany), Accenture (France), and the Swiss Federal Institute of Technology. When European employers buy print recruitment ads in *IEEE Spectrum* magazine, Buryk includes one or more Job Site postings in the hope that this will help demonstrate the usefulness of online job boards to companies unfamiliar with them.

In recent months, Buryk has been making a special effort to get postings from firms in Germany, where the employment outlook for engineers is a little brighter than in some other European countries. That has drawn praise from Peter Knott, who handles electronic communications in the IEEE Germany Section. In the past, German members "found that the Job Site

was not a very useful tool because most of the vacancies were within the U.S.," says Knott, a former chair of Germany's GOLD group. But recently, Knott sent an e-mail message announcing good news to his members: Deutsche Telekom had agreed to post 10 jobs on the IEEE site.

Besides Europe, Buryk has been focusing attention on Canada (Region 7). In 2004, Canadian firms posting jobs included Chipworks, GE Multilin, Cascade Aerospace, and Ballard Power Systems. To boost the number of postings, Buryk enlisted the help of CanWest, a firm that owns 11 English-language newspapers in major Canadian cities, including Montreal, Ottawa, and Vancouver. Now, the people selling space on CanWest's job board are also pitching the IEEE Job Site to Research In Motion and other firms.

According to Region 7 Director Bill Kennedy, Canadian volunteers have yet to take an active role in promoting the Job Site to fellow members. At present, Buryk notes, only about 1000 of Canada's 14 000 members are registered with the site. "We need a lot more of them registered to get employers excited about posting jobs," he says.

The news is better in India, in IEEE Region 10 (Asia and Pacific), where last year Buryk and his team launched a joint effort with the IEEE India Council. As a result, the number of registered Indian members nearly doubled, from about 1500 to approximately 2900, Buryk reports. ●

FOR MORE INFORMATION visit the IEEE Job Site at <http://www.ieee.org/jobs>

# Turning Volunteers into Leaders

BY PAT JANOWSKI

**T**HE IEEE IS BUILT ON THE HARD WORK of its volunteers. From the IEEE president on down, volunteers take on the lion's share of roles and responsibilities that make the organization vital and relevant. That includes publishing the latest in research and technology, writing standards, running conferences, and recruiting new members.

How does the IEEE find and retain the talented and energetic people who eventually rise to be leaders in the organization? One answer lies in the various training and leadership programs the IEEE offers at the chapter, section, region, and corporate levels.

For example, the IEEE Western Australia Section, in Region 10, has been holding an annual training workshop for more than five years. "For many of the new volunteers, their immediate focus is on the technical value of the IEEE. But, of course, there's more than that," says Harry McDonald, an engineer at Western Power Corp., in Perth. He is the 2005 chair of the section's combined Power Engineering and Power Electronics societies' chapter. "I provide an overview of the different organizations within the IEEE, and cover what they do and how they interact," McDonald says. "This way our attendees see a structured view of the IEEE with a focus that starts locally and ends globally."

At his workshops, McDonald also describes the information the IEEE has placed online for its volunteer leaders. That includes everything from financial reporting information to templates for various types of presentations. "The online IEEE resources can be very helpful, but it's



tal Area, which includes the Northern Virginia and Washington, D.C., sections.

The training covered such things as the logistics of running meetings, including how to choose topics and find speakers. "I also learned about the resources available, including who my points of contact are within the IEEE if I need any help," Yang adds. But she says the best part of the training workshop was the people.

University in Fairfax, Va., and chair of the IEEE Communications Society, Northern Virginia Chapter.

"You get to know who people are, and what their roles and responsibilities are, and this can be very valuable," Moen says, noting that the training sessions bring together not just leaders of the local section but of the whole region. The sessions not only helped Moen identify IEEE online support resources at the section, region, and national lev-

## Well-trained and enthusiastic volunteers tend to **REMAIN ACTIVE** in the IEEE

challenging for new volunteers to assimilate the vast amount of information there," he says.

Region 10 provides training for new student leaders, as well. At the region's first student congress, held in 2002 in Singapore, students were coached in leadership, communications, and project management skills. Student Congress chair Darrel Chong liked the results. "I received feedback from the region's section chairs that their student leaders had become more motivated and resourceful after attending the conference," Chong says.

Chong wears many IEEE hats. He is a member of the 2005 Graduates of the Last Decade committee, a representative of the Regional Activities Board, and a project leader for the Educational Activities Board.

**ESSENTIAL INFORMATION** Training workshops can help new chapter and section officers learn vital information about the responsibilities they're taking on. Yang Weng, an associate at Booz Allen Hamilton, an engineering consulting firm in McLean, Va., discovered that after she became secretary of the IEEE Communications Society chapter in Northern Virginia late last year. She received her first training at a group leadership workshop held in February by the IEEE National Capital

"In our sessions and workshops, experienced officials shared best practices—from managing effective meetings to running an effective chapter—which will help me to better communicate with people and to deal with people at different levels," she says. "It was a very pleasant and motivating environment."

The training session's organizer, Doug Holly, says he counts on a supportive environment. "With the instructors doing the coaching and making suggestions, the session provides a safe place to try things out, to put a new presentation together, or to stand up in front of a group and not be afraid of saying the wrong things," says Holly, vice president of Acterna LLC in Germantown, Md., and secretary and treasurer of the Washington, D.C., Section. "The National Capital Area has a good mix of senior people who are seasoned professionals with lots of experience," he says. "They can help you broaden your skills, and can show you how to relate effectively to those in academia, government, and industry."

Even the well-seasoned can profit from the training sessions. Take Dennis Moen, one of the more than 50 volunteers attending the February workshop. He is a system engineering principal at Lockheed Martin Corp. in Bethesda, Md., a research assistant at George Mason

els, but also provided networking opportunities and business ideas that may help him in his own job.

Even newly elected members of the IEEE's Board of Directors receive training, particularly on their legal and financial responsibilities.

And those conducting training sessions often benefit as well. "My experiences conducting the sessions were tremendous," Chong says. "I gradually saw that I am impacting lives. Ultimately, I became more confident in offering my ideas."

**STRONGER ORGANIZATION** Strong members make for a strong organization. McDonald, in Perth, notes that trained and enthusiastic volunteers tend to remain active in the IEEE. "Through the training, I get a better look at prospective new volunteers and identify those with particular talents and energy," he says. "If we can hang on to them long enough, they can be groomed for different roles and become chapter and section leaders themselves." ●

**FOR MORE INFORMATION** on officer training resources go to <http://www.ieee.org/officers>. For student training programs, visit <http://www.ieee.org/students>

# Viterbi Receives Franklin Medal

BY LINDSAY ELKINS

AS A YOUTH, Life Fellow Andrew Viterbi never envisioned that he'd create an algorithm used in every cellphone or that he would cofound Qualcomm, a Fortune 500 company that is a worldwide leader in wireless technology.

Viterbi came up with the idea for that algorithm while he was an engineering professor at the University of California at Los Angeles (UCLA) and then at the University of California at San Diego (UCSD), in the 1960s. Today, the algorithm is used in digital cellphones and satellite receivers to transmit messages so they won't be lost in noise. The result is a clear undamaged message thanks to a process called error correction coding. This algorithm is currently used in most cellphones.

"The algorithm was originally created for improving communication from space by being able to operate with a weak signal but today it has a multitude of applications," Viterbi says.

For the algorithm, which carries his name, he was awarded this year's Benjamin Franklin Medal in electrical engineering by the Franklin Institute in Philadelphia, one of the United States' oldest

centers of science education and development. The institute serves the public through its museum, outreach programs, and curatorial work. The medal, which Viterbi received in April, recognizes individuals who have benefited humanity, advanced science, and deepened the understanding of the universe. It also honors contributions in life sciences, physics, earth and environmental sciences, and computer and cognitive sciences.

Qualcomm wasn't the first company Viterbi started. In the late 1960s, he and some professors from UCLA and UCSD founded Linkabit, which developed a video scrambling system called Videocipher for the fledgling cable network Home Box Office. The Videocipher encrypts a video signal so hackers who haven't paid for the HBO service can't obtain it.

Viterbi, who immigrated to the United States as a four-year-old refugee from fascist Italy, left Linkabit to help start Qualcomm in 1985. One of the company's first successes was OmniTracs, a two-way satellite communication system used by truckers to communicate from the road with their home offices. The system involves signal processing and an



Andrew Viterbi

antenna with a directional control that moves as the truck moves so the antenna always faces the satellite. OmniTracs today is the transportation industry's largest satellite-based commercial mobile system.

Another successful venture for the company was the creation of code-division multiple access (CDMA), which was introduced commercially in 1995 in cellphones and is still big today. CDMA is a "spread-spectrum" technology—which means it allows many users to occupy the same

time and frequency allocations in a band or space. It assigns unique codes to each communication to differentiate it from others in the same spectrum.

Although Viterbi retired from Qualcomm as vice chairman and chief technical officer in 2000, he still keeps busy as the president of the Viterbi Group, a private investment company specializing in imaging technologies and biotechnology. He's also professor emeritus of electrical engineering systems at UCSD and distinguished visiting professor at Technion-Israel Institute of Technology in Technion City, Haifa. In March he and his wife donated US \$52 million to the University of Southern California in Los Angeles, the largest amount the school ever received from a single donor.

To honor his generosity, USC renamed its engineering school the Andrew and Erna Viterbi School of Engineering. It is one of four in the nation to house two active National Science Foundation-supported engineering research centers: the Integrated Media Systems Center (which focuses on multimedia and Internet research) and the Biomimetic Research Center (which studies the use of technology to mimic biological systems). ●

## IN MEMORIAM

# Bernard Gold Signal Processing Pioneer

BY JOSEPH TIERNEY

BERNARD ("BEN") GOLD was an internationally acknowledged expert in automated speech analysis and synthesis, and widely recognized as one of the founders and pioneers in the field of digital signal processing.

Ben joined the research staff of the Massachusetts Institute of Technology's Lincoln Laboratory in Cambridge in 1953 after three years at Hughes Aircraft Co. He spent almost all the rest of his career at the laboratory and in the MIT academic community, until he retired in 1988. His only absence was for a year when, as a senior Fulbright Fellow in 1954, he went to Rome, where he studied Italian and solved problems in statistical analysis and inference. He returned to his research in Cambridge in 1955.

Ben used pattern recognition techniques in his early research and applied

them to speech signals. In the late 1950s he invented a technique for estimating the fundamental "pitch" contour of a speech utterance. This pattern recognition technique was then widely used in a range of



Bernard Gold

speech transmission-reception voice coders (vocoders). His early pattern-recognition techniques were applied to translating hand-generated Morse code signals automatically.

Ben's work with colleagues at Lincoln Laboratory, MIT, and Bell Laboratories in developing the mathematics of signal processing led to the application of digital computers and microprocessors in place of complex analog equipment to spectrum analysis and the separation of signals. The need to explore the subjective intelligibility and quality of speech coders without building hardware motivated his invention of digital computer signal processing techniques not only for simulations but for simulations in real time.

Following his retirement, he continued to explore new signal processing techniques for speech and music that would lead to efficient analysis and storage. From 1993 until his death he taught a graduate course at the University of California, Berkeley, exploring those applications.

Ben was a mentor and friend to many colleagues and students in the MIT community as well as in the larger

### BERNARD GOLD 81

DIED 15 January 2005

MEMBER GRADE Fellow

EDUCATION Bachelor's degree in electrical engineering from City College of New York, 1944; Ph.D. in electrical engineering from Brooklyn Polytechnic Institute, New York City, 1948.

FIELDS OF INTEREST Signal processing, digital computer design, and speech transmission

VOLUNTEER ACTIVITIES Member of the National Academy of Engineering

AWARDS 1986 IEEE Signal Processing Award and co-recipient of the 1997 IEEE Jack S. Kilby Signal Processing Medal

international engineering community. He was always willing to take the time to explain what he and others had discovered, and he continued to be intensely interested in the work of younger colleagues as well as those in biology, music, and other fields.

Joseph Tierney was a friend and colleague of Ben Gold. This obituary is based upon one he wrote in IEEE Signal Processing Magazine, Vol. 15, Issue 2, 2005. ●

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