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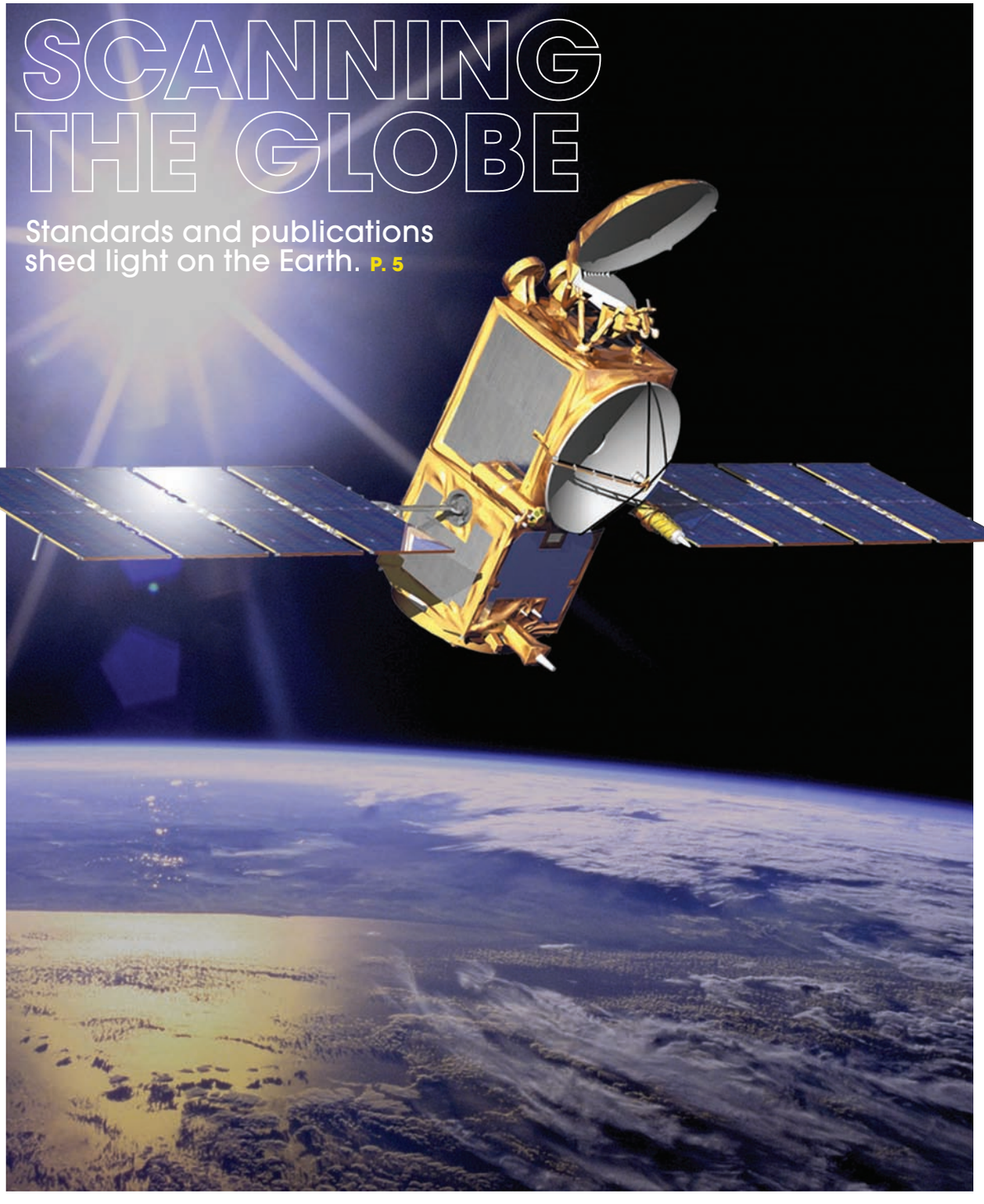

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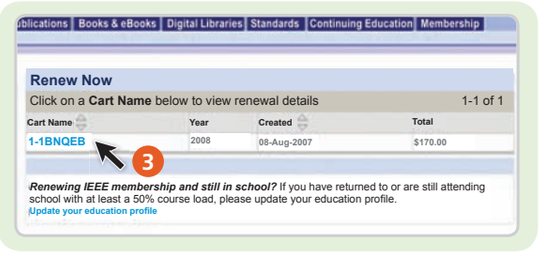

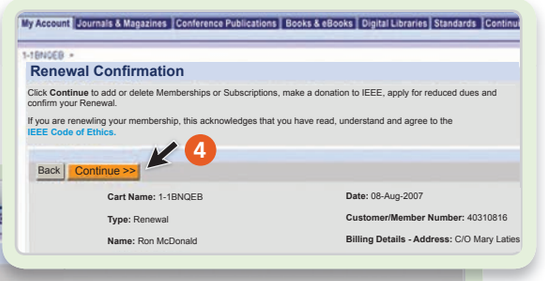

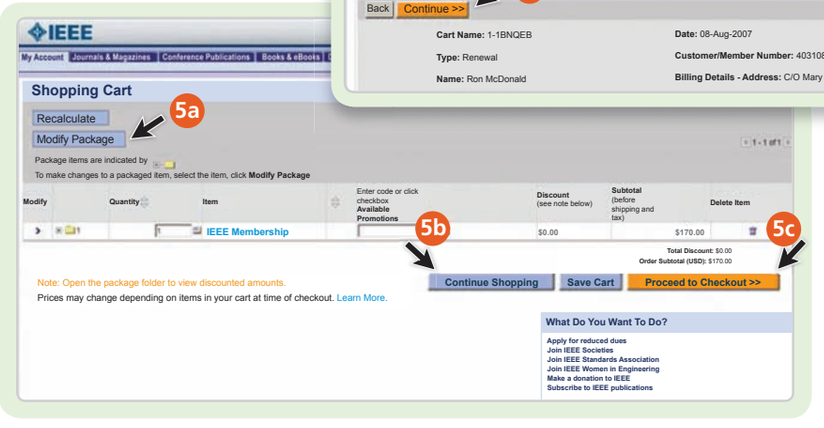

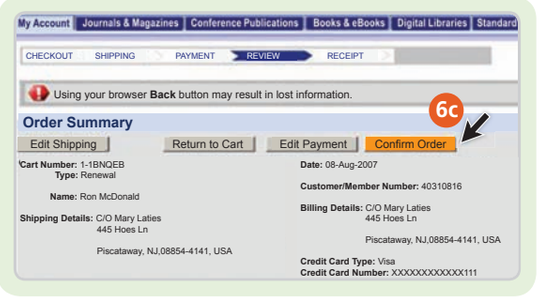

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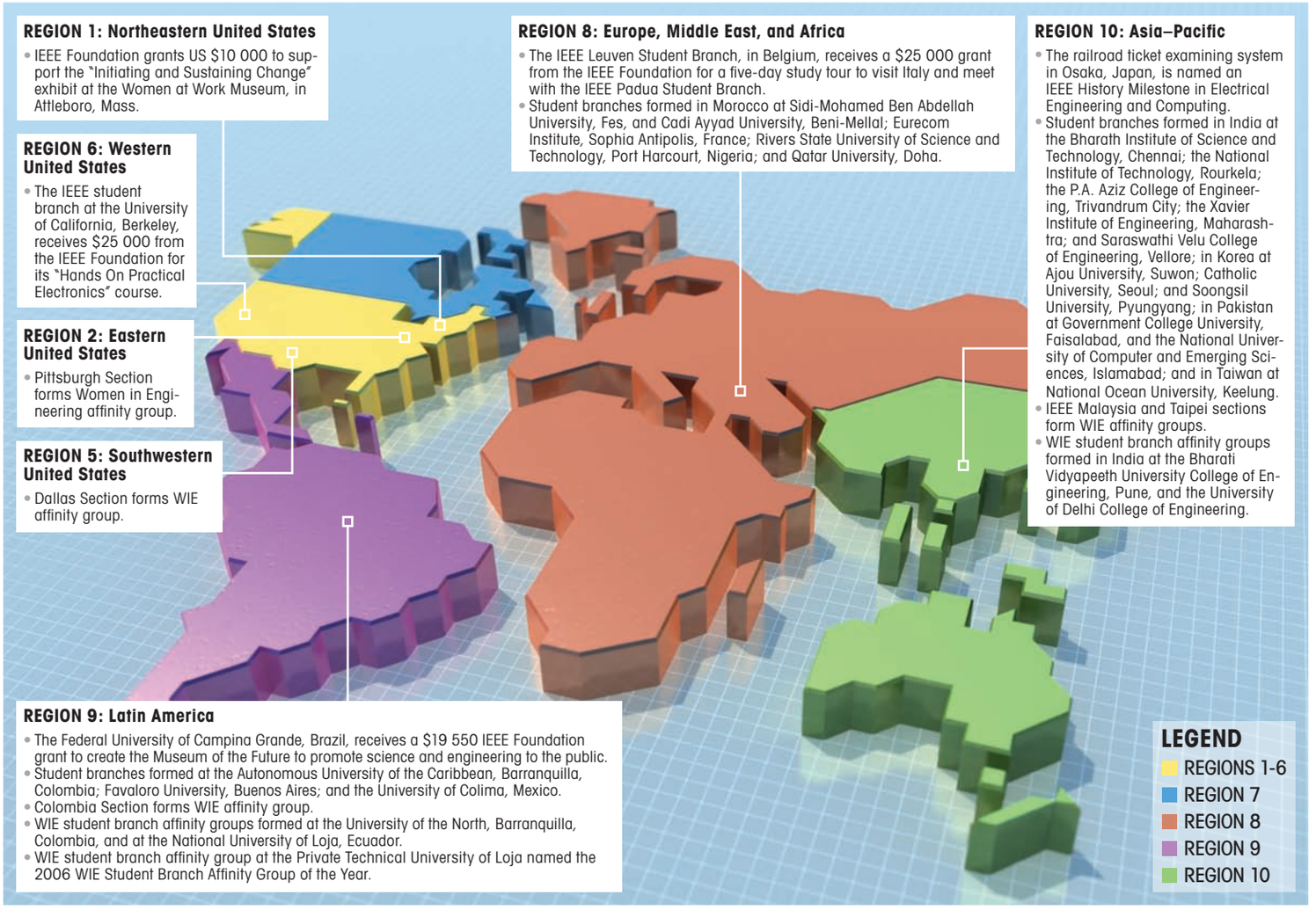
IEEE AROUND THE WORLD



Staff Member Recognized For Years of Service

William F. Van Der Vort, executive director of the IEEE Electron Devices Society, received this year's Eric Herz Outstanding Staff Member Award. The annual institute-sponsored award recognizes leadership and contributions to the success of the IEEE over a long period of time.

Van Der Vort was rewarded for his "leadership, management, and strategic planning," which have contributed to the success of the IEEE and the EDS for almost two decades. He received a certificate, an honorarium, and travel expenses to attend the award presentation, held on 17 November in Boston during the IEEE Board of Directors meeting.

Van Der Vort joined the IEEE in 1977 as a systems analyst, moved up to systems manager in 1982, and has been EDS executive director since 1990.

The IEEE Board of Directors created the award in 2005 to honor Herz, a longtime volunteer and former staff member who was IEEE general manager and executive director before retiring in 1992.


VAN DER VORT

The nomination deadline for the 2008 Herz Award is 31 January. For more information, visit http://www.ieee.org/portal/pages/about/awards/sums/ericherzsum.html.

IEEE Journals Rank at the Top

Two IEEE publications were the most frequently cited in their fields, according to the 2006 Journal Citation Reports.

Produced by the publisher Thomson Scientific, the JCRs cover more than 7500 peer-reviewed journals in approximately 200 disciplines, including categories relevant to the IEEE. The reports assess the influence academic journals have within their disciplines by recording the average number of times articles published in the last two years were cited in the most recent year, in this case in 2006.

The IEEE's two No. 1 journals were *IEEE Wireless Communication Magazine* (in the telecommunications field) and *IEEE Transactions on Automatic Control* (in automation control). What's more, the top 10 telecommunications journals were all published by the IEEE. In addition, *IEEE Transactions on Pattern Analysis* was ranked No. 2 in electrical and electronic engineering (the top-ranked journal in this category was *Progress in Quantum Electronics*, published by Elsevier).

The study revealed that the IEEE publishes:

- Seventeen of the top 20 electrical and electronic engineering journals.
- Seven of the top 10 computer science, hardware, and architecture journals.
- Nine of the top 20 software engineering journals.
- Seven of the top 20 information systems journals.

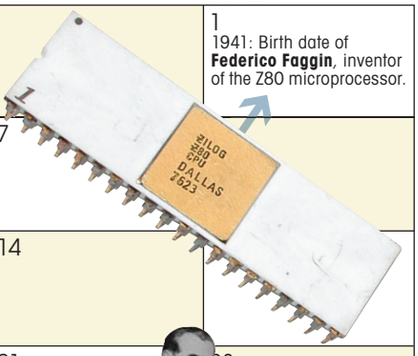
ON THE COVER: LEFT: JPL/NASA. RIGHT: JORDAN HOLLENDER
THIS PAGE: TOP: BRYAN CHRISTIE DESIGN; BOTTOM: IEEE

CALENDAR

December

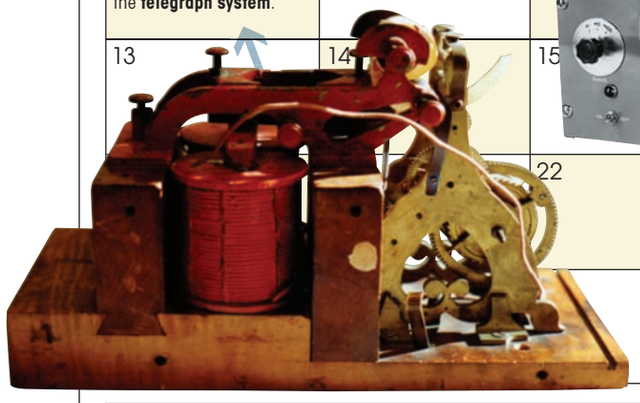
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 1941: Birth date of **Federico Faggin**, inventor of the Z80 microprocessor.
2	3	4		6	7	
9	10 1901: The first **Nobel prizes** are distributed by King Oscar II of Sweden.	11		13 1816: Birth date of **Ernst Werner von Siemens,** inventor of the lead-acid storage battery.	14	
16	17 1903: **Wilbur and Orville Wright** successfully test their flying machine at Kitty Hawk, N.C.	18		20	21	23
	24 31	25		7	28	

1879: Thomas Edison gives the first public demonstration of his incandescent light bulb, in Menlo Park, N.J.



January

		1 1939: **William Hewlett** and **David Packard** found their company, whose first product is an oscillator**.**	2	3	4	
6 1838: The first successful public demonstration of the **telegraph system**.	7	8		10	11 1895: Birth date of **Laurens Hammond**, inventor of the electrical musical keyboard.	
13	14	15		17 1706: Birth date of **Benjamin Franklin**.	18	19
		22	23	24 24 to 27 January: **Region 10 Student Congress** in Chennai, India.		26 1875: Inventor **George F. Green** patents the electric dental drill.
			30			



February

					1 1893: Thomas Edison completes work on the first **motion picture studio**, in West Orange, N.J.	2 2 and 3 February: **Region 10 meeting** in Gujarat, India.
3	4 1980: The **automatic implantable defibrillator** is first implanted in a human.	5		7 2003: A match between the **chess computer Deep Junior** and Garry Kasparov ends in a draw.	8	9 **Region 1 board of governors meeting** in New Brunswick, N.J.
10		12 12 to 17 February: **IEEE Organizational Units Meeting Series**, in Louisville, Ky.	13 1884: Birth date of **A.C. Gilbert**, inventor of the Erector set.	14	15	16
17			20 1962: **John Glenn** becomes the first American to orbit the Earth.			23
24			27			

Historical events provided by the IEEE History Center

IEEE events indicated in RED

DECEMBER: FROM LEFT: BETTMANN/CORBIS; SIEMENS CORPORATE ARCHIVES; ZILOG; HAMMOND SUZUKI.
JANUARY: FROM LEFT: JOHN CASALE/CORNELL UNIVERSITY; HEWLETT-PACKARD CO.; WALTER BIBIKOW/GETTY IMAGES; FEBRUARY: FROM LEFT: KATHY PUCKETT/ISTOCKPHOTO; MARIO TAMA/GETTY IMAGES; ERECTOR

Scanning the Globe

Standards and new publications focus on Earth observations

BY MICHAEL J. RIEZENMAN

Researchers from the U.S. National Severe Storms Laboratory struggle to launch a weather balloon into a violent thunderstorm.

It has become clear in recent years that human beings need to be much more careful in how we develop the Earth's resources if that development is to be sustainable for future generations. To support sustainable development, in turn, we need to know the present state of the Earth and the impact of our activities. Measuring that impact and sharing the results with decision makers around the world is the goal of a major international scientific effort, the Global Earth Observation System of Systems (GEOSS) [see "Taking the Pulse of the Earth," *The Institute,* September 2005, p. 1].

The IEEE is contributing to GEOSS by leading the effort to develop standards and by publishing two journals on Earth observation.

STANDARDS To help identify what standards are needed and to facilitate their development, the intergovernmental Group on Earth Observation (GEO) Architecture and Data Committee approved a proposal from the IEEE Committee on Earth Observation (ICEO) to initiate and guide an ongoing Standards and Interoperability Forum. This all-volunteer committee, which is designed to support the interoperability requirements of GEOSS, will not dictate standards. Rather, it will foster cooperation among the many GEOSS participants and help them agree on standards for the program's components, which fall into four categories: observation (acquiring data), processing (converting data into useful information), storage, and dissemination.

To determine how well the process for reaching interoperability among components works, a series of pilot projects has begun that involves four of the nine GEOSS application areas—biodiversity, seismology, weather, and water. Any of these pilots that successfully demonstrated interoperability were expected to be discussed at the end of November during the GEO ministerial meeting in Cape Town.

NEW JOURNALS The IEEE also is starting two publications dealing with the acquisition and use of data about the state of our planet. The publications—an online magazine for the general public and a peer-reviewed technical journal—join with other GEOSS-related endeavors of the ICEO. These include running Earth-observation workshops around the world, hosting a registry of GEOSS standards for such parameters as measurement units and data rates, and strengthening the ability of developing countries to acquire and use the Earth-observation data.

The journals support the GEO's effort to apply Earth-observation data to various goals. These include improved weather forecasting; better understanding of how environmental factors affect health; better management of natural resources; improved management of ecosystems; and learning to foster sustainable agriculture and combat desertification.

Earthzine (http://www.earthzine.org), written for the general public, went live on 30 November. The first issue of the professional journal, the *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (*J-STARS*), is to appear in the middle of next year.

Earthzine aims to increase awareness among the general population of global changes, and to promote community among the world's professional Earth observers, according to its editor, IEEE Member Paul E. Racette.

"The greatest challenges of implementing GEOSS are not technical but rather sociopolitical," Racette says. "There's the challenge of coming to an agreement on how data will be shared. And, of course, there are challenges in implementing agreements that mitigate the effects of harmful human activities."

The keys to overcoming the challenges, Racette says, are education and public outreach, the primary objectives of *Earthzine*. By making it a one-stop shop for the latest in Earth science and observations, Racette hopes the magazine will attract a broad range of readers. *Earthzine* will feature interviews with leaders in the Earth observation field, he says, along with profiles of organizations active in the field, announcements of upcoming events, news stories, opinion pieces, book reviews, and noteworthy items reprinted from other publications.

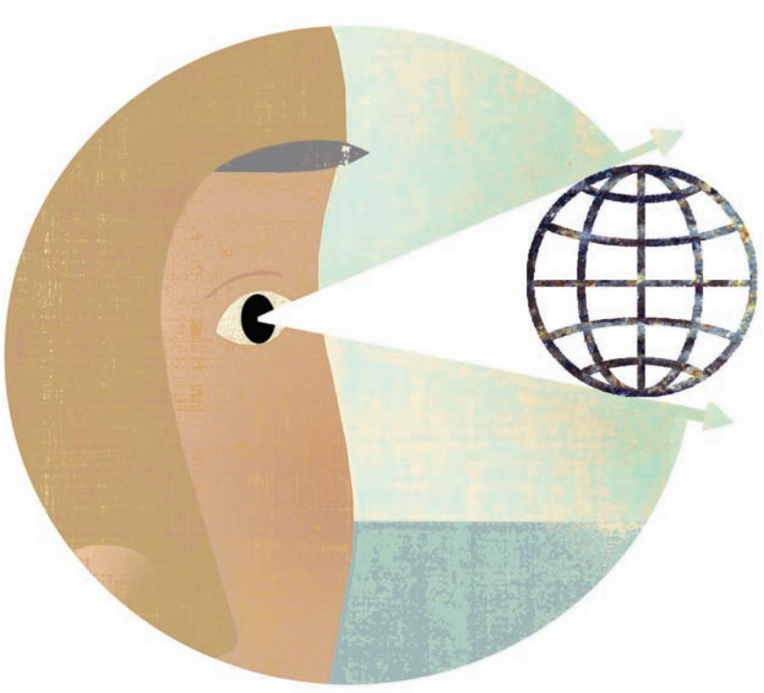
J-STARS, the new technical print journal, which is scheduled to appear quarterly, is being edited by IEEE Fellow Ellsworth F. LeDrew, a professor of geography at the University of Waterloo, in Ontario. LeDrew's research focuses on remote sensing of submerged coral reefs for coastal management, as well as on applying remote sensing to measure changes in sea ice.

At the start, at least, *J-STARS* will have special issues dedicated to particular subjects. The debut issue will concentrate on Earth observations and renewable wind energy. Two future issues are in the works: one devoted to remote sensing of human settlements, the other, wildfires and biomass burning. The first deals with population studies and determining where to place buildings; the second covers fire management.

Together, the new publications strengthen the IEEE's education and outreach efforts on behalf of GEOSS, efforts that Senior Member Jay Pearlman, ICEO chair, regards as equal in importance to the institute's technical contributions. ■

FOR MORE INFORMATION visit the ICEO Web site: http://www.ieee-earth.org

JIM REED/GETTY IMAGES



New Initiative Looks Far Into the Future

BY KATHY KOWALENKO

Much of the effort of the IEEE Board of Directors and staff this past year has focused on developing a new strategic plan for the institute and a new approach to develop strategies that support the plan's implementation. The strategic plan emphasizes long-term goals that will add value to the technical community and to the technical professions, rather than focusing on internal operations. "We committed to examining what we do, where we want to go, and what kind of organization we want to be," says IEEE President Leah Jamieson.

The vision for the new 10- to 15-year plan, known as the Envisioned Future, is for the IEEE "to be essential to the global technical community and to technical professionals everywhere, and to be universally recognized for the contributions of technology and of technical professionals in improving global conditions."

In achieving this vision, the IEEE expects that, among other things, members will have more productive and rewarding careers; governments will increasingly seek the IEEE's input as an unbiased source of technical information; industry will recognize and value the IEEE, eventually leading to supporting their employees' participation in the association; and the enterprise will be recognized as a global force in shaping research, technology commercialization, university curricula, and continuing education in its fields of interest.

The plan includes shorter-term goals, as well, to be accomplished in periods of three to five years. These goals will help the institute progress toward its long-range vision, and will help to serve as benchmarks of success along the way. The plan also articulates the IEEE's core values, which are the principles that will guide the organization and its decisions [see sidebar, "8 Core Values"].

Along with the creation of the strategic plan, the Board has changed the way it spends its meeting time. It is taking on more significant strategic issues for deliberation, such as the value of membership and alternative membership models, increasing the public visibility of the IEEE and the profession, and becoming a model global organization.

The Board is also changing the way it fulfills its operational responsibilities. The discussion of strategic issues is helping to set priorities, and this is now driving the budget process in a more focused way.

"Our objective is to ensure that the Board engages in issues that affect the IEEE and its members, focuses governance on outcomes rather than actions, leverages the intellectual capital of IEEE leadership, and aligns our actions with our priorities," Jamieson says.

Two goals that have received much attention in recent months are global advocacy and improving the public image of the IEEE and the profession. To accomplish its advocacy goal, the Board is determining how best to establish procedures to identify and solve societal issues through the application of technology. The new joint IEEE–United Nations Foundation's Humanitarian Technology Challenge is an example of a global advocacy project. It brings together humanitarian aid workers and technologists to solve public-health and disaster-relief problems.

"The IEEE is strategically engaging in high-impact projects to improve global conditions," says Lewis Terman, IEEE President-Elect. "Focusing on technology applications to societal issues is far more prevalent than in previous plans."

The intent behind the public image goal is to increase the public's awareness of the profession and the IEEE as contributors to the quality of life and to the enhancement of the environment. Young people deciding about their education and careers are high-priority audiences for the public visibility goal, says Jamieson.

IEEE staff and volunteers have begun to reevaluate the institute's operational planning processes to see if they are aligned with the strategic plan.

"Transforming the IEEE to an organization focused on strategy allows us to tackle issues of the greatest importance to our members and volunteers," Jamieson says. "It gives us a framework for data-driven strategy development and decision making, and processes for translating strategies into actions."

Other IEEE organizational units have begun to implement the strategy initiative. They are engaging in activities designed to clarify vision, values, and goals, and to ensure that the volunteer leadership's time is spent on issues that matter most to the institute's future. ■

8 CORE VALUES

The Board of Directors has outlined these core values it believes are the essential and enduring principles that guide the IEEE.

SERVICE TO HUMANITY: leveraging technology and engineering to benefit human welfare, and promoting public awareness and understanding of the engineering profession.

GLOBAL FOCUS: supporting and embracing the global nature of and need for technical work and engineering solutions.

TRUST AND RESPECT: promoting a culture where contributions at all levels are valued; encouraging member-driven, volunteer-led, knowledge-based projects; and building effective volunteer/staff partnerships.

GROWTH AND NURTURING OF THE PROFESSION: encouraging education as a fundamental activity of engineers, scientists, and technologists at all levels and at all times; ensuring a pipeline of students to preserve the profession.

COLLABORATION AND COMMUNITY BUILDING: cultivating active, vibrant, and honest exchange among cross-disciplinary and interdisciplinary global communities of technical professionals.

PROFESSIONALISM: creating a world in which engineers and scientists are respected for their exemplary ethical behavior and volunteerism.

INTELLECTUAL ACTIVITY: forward-thinking, and nurturing new and existing science and technology.

PEER REVIEW: using unbiased information to enhance the quality of life for all people.

FOR MORE INFORMATION or to offer suggestions, visit http://www.ieee.org/go/strategy.

MICK WIGGINS

DAVE ROBERTSON/MASTERFILE

More Than Just A Name Change

New IEEE board puts members front and center

BY KATHY KOWALENKO

Many IEEE groups took the slogan of a few years ago, "Membership is everyone's business," to heart. From sections and societies to IEEE-USA and Publication Services and Products, each area had a hand in attracting recruits, or persuading members to renew, and developing new products and services that would appeal to members.

And therein lay a problem. No one area within the IEEE had sole responsibility for membership. That's not the case anymore. Starting 1 January, the Member and Geographic Activities Board will be responsible for membership and member development. Never heard of it before? That's because it's the new name for the Regional Activities Board, which ceases to exist on 31 December.

But it's more than a name change. A motion approved in June 2005 by the IEEE Board of Directors identified RAB as the lead organization to take on the responsibility for recruitment, admission, retention, and member elevation, as well as developing programs to show the value of membership and new services. As a result, the entire RAB structure has been reorganized into the Member and Geographic Activities Board to focus on members. The board is responsible for the budgetary and operational functions that go along with its tasks.

"It's the biggest reorganization the IEEE has had in at least 10 years," says Pedro Ray, the vice president of Regional Activities, who is responsible for implementing the new approach. Ray built the new board with no preconceived notions about its structure.

TEAMWORK Ray didn't do it alone. In January 2006, he appointed Region 1 Director Barry Shoop to lead the Member Business Unit team. Shoop put together a small roster: William Ratcliff, Region 3 director-elect; Luiz Pilotto, Region 9 director; Cecelia Jankowski, managing director of Regional Activities; Daniel Benigni, a member of the RAB's Strategic Planning Committee; Jan Brown, chair of the Membership Development Committee; John Dentler, Region 2 director-elect; David Green, RAB treasurer; and Hilmi Turanli, vice chair of member activities. The team created a strategic view of how to build a member-focused organization. Its charter was to take a fresh look at the functions and processes of Regional Activities and other IEEE groups, and to make recommendations to the IEEE Board of Directors on how to make them more effective.

The team concentrated on five areas: improving the value of membership; strengthening the strategy and execution for recruiting, renewal, and retention of members, and recovery of lapsed members; improving the development and management of member-focused products and services; streamlining member activities by reducing duplicate services or consolidating them; freeing up resources to focus on value-added activities; and taking advantage of cost-savings opportunities. Working with outside consultants, the team found a comprehensive member strategy was lacking, and there was no one cross-functional group working on membership issues. With many IEEE business units handling member activities, there were unclear lines of responsibility and accountability. Also there was no way of knowing which products and services members really liked, and why.

MEMBERS FIRST The team worked nearly all of 2006 and delivered its recommendations in February. They included overhauling the RAB's structure and changing its name—which the Board of Directors approved in June.

"The Member and Geographic Activities Board is not just an evolution from RAB," Ratcliff says. "It's a transformation, a change and a shift in focus, and a fulfillment of what the IEEE Board charged RAB to do."

"We've now got an organization at the highest level of the IEEE focused solely on the member," Shoop adds, noting that its main mission is to engage members to participate in the IEEE, and to increase their use of its services. "It's really important to have one organization within the IEEE as the primary touch point for members throughout their careers. One of the guiding principles is that the member is the IEEE, and the IEEE is the member."

Among the new board's goals will be to make the process of joining and maintaining membership simple and straightforward; to track member engagement and development; and to become more transnational in look, feel, and language.

"We've now got an organization at the highest level focused solely on the member."
–Barry Shoop

"We will also attempt to understand members through their entire life cycle, from student to retiree, and to provide them with what they need when they need it to be successful in their profession, and in supporting the IEEE," Ratcliff says.

STAY TUNED Ray says it will take time before members see the impact of the changes. The volunteer committee that oversees the new board is just starting to be restructured. And staff reorganization is under way.

Some of the new volunteer positions include vice chairs for member development, information management, geographic unit operations, and strategic management and analysis. And as of November, Ray was still in discussions with the areas handling membership about how best to incorporate their activities into the new structure.

Ultimately, he says, members' experience with the IEEE will be enhanced: "Once we start on this reorganization, members will see real changes in services and benefits." ■

Ideas Get Cash in (Almost) a Flash

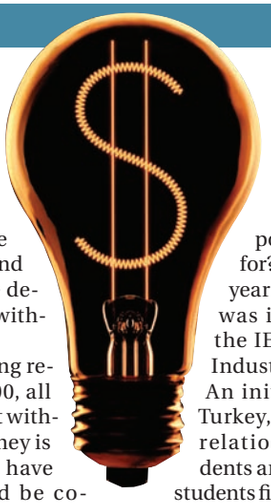
BY AMANDA DAVIS

Have a project in mind that can benefit the IEEE but need money to get it off the ground? As part of the IEEE's new initiatives process, IEEE volunteers can get the funds to turn good ideas into action. And the process has been dramatically shortened—from what sometimes took longer than eight months to only about three months.

IEEE members or organizational units can submit project ideas to the New Initiatives Committee, a standing unit of the Board of Directors that recommends proposals of strategic importance to the institute for funding. Chaired by 2007 IEEE President-Elect Lewis Terman, the NIC reviews proposals and chooses which ones to ask the Board to fund.

Previously, the NIC accepted proposals only once each year. The result was daunting: the committee was faced with processing a large number of proposals in a short time. It couldn't do it, and applicants often waited many months to learn if their project was approved. This year, the NIC has tried to speed things up by introducing a rolling submissions process. Now proposals can be submitted at any time.

HOW IT WORKS The new process has two phases. In the first, members submit a brief proposal outlining the idea. This includes stating the project's goals and desired outcomes, explaining how it supports the IEEE's strategic goals, and estimating how much money is needed. Within 15 business days of receipt, the NIC either gives a preliminary approval to the proposal or explains why it was rejected. If it's approved, the next step is to prepare a detailed second-phase project plan. If that is approved, the committee negotiates a start date and provides the funds. The decision must be reached within 45 days.



The minimum funding requirement is US $100 000, all of which should be spent within one year after the money is received. Projects must have a volunteer leader and be cosponsored by an IEEE operational unit that will provide guidance for the project.

ON A SMALLER SCALE Money is also available for riskier projects that require no more than $25 000 and up to one year to complete. The seed grant process requires a proposal for the project that states its objectives and provides a schedule for completion. The NIC approves or rejects the proposal within 45 days. If it is approved, the money is immediately released.

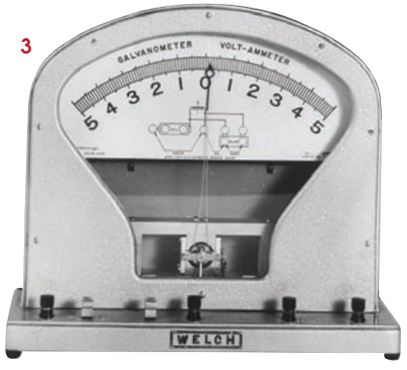
This program is very popular, according to Terman, outnumbering new initiative proposals received so far this year.

What kind of proposals is the IEEE looking for? Projects approved last year before the new process was implemented include the IEEE Student Branches Industry Relations program. An initiative of a branch in Turkey, it aims to strengthen relationships between students and industry and to help students find jobs with local firms. SBIR projects are now under way in other Region 8 branches as well.

A second project involves the IEEE Educational Activities Board's Committee on Global Accreditation running workshops to train members in establishing university accrediting bodies in countries where they don't exist. The committee is also expanding agreements among national accreditation bodies to recognize each other's credentials.

Downloadable forms for the rolling submission and seed grant processes are at http://www.ieee.org/web/aboutus/initiatives. ■

RANDY M. URY/CORBIS



Get Busy, Honor a Tech Breakthrough

The IEEE needs your nominations for its Milestones program

BY WILLIE D. JONES

The IEEE Executive Committee recently took time to reflect on the moment in history when the human voice was first transmitted long distance over copper wire. On 9 September, the committee agreed that the one-way voice transmission, on 10 November 1876, merited being named an IEEE Milestone in Electrical Engineering and Computing. Alexander Graham Bell, listening through a receiver at a telegraph office in Paris, Ont., heard the sweet sounds being belted out by singers gathered before a transmitter at another telegraph office in Brantford, 13 kilometers away.

In the run up to the IEEE's 125th anniversary in 2009, the IEEE History Committee wants to have as many IEEE sections, societies, and chapters as possible follow the lead of the Hamilton Section in Ontario, which nominated the Bell milestone. Because the process can take as long as 15 months, IEEE units wanting to name a milestone in conjunction with the institute's anniversary had better get busy and submit proposals. There are ample candidates. Some discoveries, the History Center notes, are conspicuously absent from the IEEE's milestone list. These include the electric motor, Ohm's Law, the storage battery, Maxwell's equations, and the slide rule [see "10 Great Achievements in Search of Nomination"].

The World Wide Web is but one example of inventions that are not eligible for milestone status because 25 years have not passed since their creation. The artificial heart, first implanted in a human in 1982, just makes the cut.

LOCAL HIGHLIGHT "Proposing a new milestone allows a local section or unit such as a technical society to highlight an achievement that came out of its region or technical area," notes Robert Colburn, research coordinator at the IEEE History Center, on the Rutgers University campus in New Brunswick, N.J. "We name milestones to raise public awareness of the IEEE and the role that engineering plays in making possible many of the things we consider indispensable."

The IEEE Hamilton Section plans to raise the awareness of that one-way voice transmission with a public dedication, whose date has yet to be announced. The IEEE will present the section with a plaque bearing a brief description of what the telephone's inventor accomplished.

Hamilton's milestone award follows the one given to the Kansai Section in Japan, which in November held a ceremony to mark the automatic railroad ticket-examining machine, first installed in 1974. The device was the first to scan rail passes to ensure that each pass corresponded to the route being traveled, that none had expired, and that none were used multiple times at the same station within a given period. Prior to the device's introduction, subway employees posted at entry gates performed cursory inspections of rail passes—even during rush hours when thousands of commuters rushed to the train platforms.

The IEEE has named more than 75 engineering and computing milestones from around the world. They include the first liquid-crystal display, in 1968; the Tokaido Shinkansen (Bullet Train) which, at speeds up to 210 km per hour, was the world's fastest train when it began operation in Japan in 1964; the Arecibo radio telescope in Puerto Rico, which began operating in 1963; the first transatlantic transmission of a television signal, in 1962; and Marconi's early wireless experiments in Italy, in 1895.

THE ROAD TO RECOGNITION Colburn says many worthy achievements have not been honored because the approval process can seem daunting. He concedes it can be a lot of work, depending on how obscure the milestone is. An initial short proposal describing the achievement must be approved by the Milestones Program coordinator. Currently, Bernard Carlson, a professor at the University of Virginia in Charlottesville whose work focuses on the history of American technology and business, fills the role.

If Carlson and his team feel that the achievement has merit, the History Committee then tells the nominator to complete the longer, formal nomination form. The committee also appoints an advocate—usually an expert in the subject—to offer advice on presenting a compelling argument in support of the nomination.

The nominator then has six months to gather source material, complete the formal nomination form, and file it with the History Committee. If the committee endorses the nomination, it goes to the IEEE Executive Committee for final approval.

Once the approval comes, the nominators can begin planning their dedication ceremony. Some events are sedate, but others are elaborate, high-profile affairs. "I attended one ceremony in Japan where members of the U.S. diplomatic corps were invited and there was heavy press turnout," Colburn says. ■

10 GREAT ACHIEVEMENTS IN SEARCH OF NOMINATION

IEEE SECTIONS TAKE NOTE: Here in chronological order are just a few technical achievements that have yet to be nominated as an IEEE Milestone in Electrical Engineering and Computing.

INVENTION	YEAR INVENTED	COUNTRY
Slide rule (1)	1621	England
Mechanical calculator	1623	Germany
Advanced calculator	1642	France
Reliable calculator	1671	Germany
Leyden jar (2)	1746	Netherlands
Galvanism	1790	Italy
Arc lighting	1808	England
Discovery of current/magnetic field	1819	Denmark
William Sturgeon's electromagnet	1823	England
Galvanometer (3)	1824	France

FOR MORE INFORMATION about the IEEE Milestones program or to view the first-stage proposal form, visit http://www.ieee.org/web/aboutus/history_center/about/milestones.html.

CLOCKWISE FROM TOP LEFT: SMART PROGRAM/ILLINOIS INSTITUTE OF TECHNOLOGY; THE DEPARTMENT OF PHYSICS AND ASTRONOMY/UNIVERSITY OF NEBRASKA-LINCOLN; HENRY GROSKINSKY/TIME LIFE PICTURES/GETTY IMAGES

OPINIONS

MARKETPLACE OF IDEAS

RESPONSES TO SEPTEMBER'S QUESTION

Deciding on the First Engineering Degree

The IEEE is considering following the recommendations of several other professional bodies by declaring that a master of science or master of engineering be an engineer's first professional degree.

SHOULD THE FIRST PROFESSIONAL DEGREE IN ENGINEERING BE A BACHELOR'S OR A MASTER'S?

It's About Time

Making the master's degree the first professional degree is an excellent idea, and long overdue. It is ludicrous to think that the four-year program adequate 100 years ago is still appropriate.

The legal and medical professions used to have four-year programs of study, but by the 1940s both demanded at least three years of pre-medical or pre-law courses, followed by professional study of three or four years. Only engineering has stuck to the four-year program, even though it has advanced enormously during the past 100 years.

HERBERT FREEMAN
Cranbury, N.J.

A Worthwhile Idea

Degree requirements should reflect contemporary technological advances, particularly the updated requirements of many engineering tasks. Although on-the-job learning is important, I have nothing against a master's degree becoming the first professional degree.

ROSNAY CARENA
Philadelphia

Cutting Corners

The first professional degree should be the master's. Technology is rapidly advancing, and engineers need more study.

Bachelor's degree requirements are also decreasing. I teach computer science part time at California Polytechnic State University, in San Luis Obispo. A few years ago, ABET forced us to reduce requirements for a bachelor's degree in engineering to only 180 credit hours. And with each catalog update we seem to require more general education—which means we have to drop another core course in our major. ABET will not allow us to increase the required units, and will probably continue to demand fewer as time goes on.

The most logical solution is to require the additional units of a master's degree to ensure our graduates have a sufficient professional background.

MARK HUTCHENREUTHER
San Luis Obispo, Calif.

Back to Basics

Delaying the professional's title to the master's or Ph.D. level can lead to universities realizing that at least the first three years should be focused on the basics. Engineering schools have been increasingly focused on specialist bachelor's degrees at the expense of a sound foundation in basic science and engineering.

As a hiring engineering manager, I have seen the damage done to students who thought they were getting a useful education. They spend their first years as a practicing engineer scrambling to pick up skills that the employer assumes they should already have. They make rookie mistakes and fail to gain the respect of senior engineers.

PETER STAATS
Loveland, Ohio

Maintain the Status Quo

Keep the bachelor's degree as the first degree. The fact that industry still recruits and hires engineers with bachelor's degrees indicates that the education level is not a problem.

More time in school would only discourage students from studying engineering. Companies that pay for engineers can always require an advanced degree for any position they offer.

JAMES N. PATTERSON
Sacramento, Calif.

Fewer Might Apply

I think a master's degree in engineering is well worth the effort to gain in-depth knowledge in specific areas. However, I don't think we should require one as the first degree for a professional engineer. That would make it harder to attract engineering students and might even increase their dropout rate.

JON OLSON
Ridgecrest, Calif.

On the Other Hand

The first professional degree should be a bachelor's. Most engineers would be better served by taking postgraduate courses in project management, business administration, entrepreneurship, law, or finance—rather than further technical studies—to become well-rounded and more productive. Those who choose to specialize in a technical area have the option of pursuing a master's or doctorate.

NICO DE JAGER
Pretoria, South Africa

Continuing Education

A bachelor's degree is adequate as the first professional degree for electrical engineers. However, the traditional bachelor's degree merely provides the foundation for further learning. Perhaps the most important part of an engineer's training is the experience acquired on the job. Theory taught in classrooms is one thing, but practical problem-solving skills come only from working in the field under the guidance of an experienced mentor. Many professions require continuing educa-

WIKIMEDIA FOUNDATION

THIS MONTH'S QUESTION

Wikipedia: Fact or Fiction?

A Caltech graduate student has developed a search tool that can trace who makes entries in Wikipedia, the online encyclopedia that lets anyone edit content on everything from Paris Hilton to the history of electricity. The Web site has become a popular one-stop research source, but there's a debate about its information. Entries have been found to be inaccurate; at least one person discovered his biography contained false, defamatory information. And the new search tool revealed that many companies delete negative, though factual, information about themselves.

HOW MUCH DO YOU TRUST WIKIPEDIA'S CONTENT?

MAIL: *The Institute,* IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08855-1331 USA;
FAX: +1 732 562 1746; **E-MAIL:** institute@ieee.org

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. Responses will appear in the March issue of *The Institute* and may be edited for brevity. Suggestions for questions are welcome.

MARKETPLACE OF IDEAS

tion units to retain a professional license. CEU requirements for engineers would be better than requiring an advanced degree up front. With technology continuously evolving, the CEU approach might be better to ensure engineers keep their skills up to date.

PIERRE LONCLE
Wasilla, Alaska

Just a Piece of Paper

I would take it as a personal insult if the IEEE supports a master's degree as a requirement to be considered a professional engineer. I have worked in the electrical and electronics industry for well over 50 years. After dealing with many engineers, I observed that their ability and contributions have little to do with their degrees, but rather their innate ability to understand a problem and solve it. Some of the best engineers I worked with didn't even have a college degree, and some of the weakest had advanced degrees.

TOM KARONES
Oak Lawn, Ill.

Why Not an M.D. Instead?

I don't believe industry will be willing to pay for graduates at a master's level. Even though it takes 4.8 years on average to earn a bachelor's degree in engineering, the proposed plan still requires at least 1.2 more years. Given the choice of studying for six years to be an entry-level engineer or seven or eight years to become a medical doctor or lawyer, prospective engineers may choose those much higher-paying professional fields. Raising the education requirements would be more work for universities and would increase the prospective engineer's investment in time and money.

F. ROSS OBLAD
Las Vegas

Don't Change the Rules

I hope the IEEE will fight to maintain the bachelor's degree as the first professional degree in engineering. I received my bachelor's in 2005, and it was difficult and challenging. My school crammed more than five years' worth of material into a four-year program, using a 10-week trimester system. I took 15 to 18 courses each year for four years. The degree I earned is not specific to any particular field; it provided me the tools to dive into any one of hundreds of areas. I didn't just graduate and immediately become an engineer. First I had to get into industry and start solving real-world problems—not just the problems in textbooks.

One of my goals is to become a licensed professional engineer, and that won't happen if the National Council of Examiners for Engineering and Surveying changes policy. I still need two more years of practical experience as an engineer before I can take the professional engineer exam, but I've already begun studying.

If I am not recognized as an engineer and I cannot even qualify to take the exam, why would I consider myself a member of the IEEE? I might not want to belong to an organization that does not recognize me as a "real" engineer because I have only a bachelor's degree.

KYLE KASPRZAK
Greenfield, Wis.

Too Expensive

I believe a bachelor's degree should be enough to get started in engineering. If the profession needs some kind of certification, another means should be found. Very few college-age people have enough financial support to get all the way through to a master's before they can work, so it would drastically limit the number of candidates. Improving the undergraduate work opportunities and curricula would be a better way. In addition, there may need to be some form of apprenticeship with licensing, but one that is valuable and not unachievable.

DOUG COOPER
Portland, Ore.

Don't Scare Them Off

The title "professional engineer" currently requires an engineer to have a four-year degree plus four years of working experience, as well as the successful completion of a 16-hour examination. Adding a fairly expensive graduate degree would not change the present eight-year requirement but would serve to eliminate a good number of competent candidates who, for any number of reasons, do not or cannot participate in a master's program.

DENIS DEVRIES
Kenmore, Wash.

LETTERS

Seal of Approval

I smiled a lot as I read the September issue. From learning about the candidates for IEEE President-Elect to enjoying the lives of my fellow members as they begin or end their careers, it was a treat.

I'm retired from power systems engineering, but I may buy Steve Blume's book, *Electric Power System Basics*, featured on p. 17, just to see if he got it right. And I'm still trying to persuade my daughter to pursue a career in engineering ["Women in Engineering: Why it Matters," p. 13]. Kudos to Robert Lang ["The Physics of Folding Paper," p. 19], Lewis Mozzini ["Waltzing to the Beat," p. 22], and Max Roesel ["Model Railroad Engineer," p. 22] on their fascinating hobbies, although I am hiding the issue from my wife to preclude joining a dance club. Nice work, and thanks for making me proud of my professional society.

PAUL DALPIAZ
St. George, Utah

Today I picked up my husband's September issue. I am a registered nurse, but I like to read his publications that catch my interest.

Thank you for the articles about Robert Lang and his origami career and also for "Women in Engineering: Why it Matters." I was able to talk about these topics with my children and spark a discussion about creativity in engineering (which is something I never thought about) and engineering as a good career choice for my daughter. Our children are young, but it is never too early to start dreaming.

JILL MORINEC
Cleveland

Building Awareness

It seems like hardly an issue goes by without a mention of, "How can we improve the engineering profession in the public's eyes?" I agree this must be done, but the approaches offered will fall short of making an impact.

I think the institute should link the terms "engineer" and "IEEE" to everyday objects. It's not enough to drum into people's heads all the good that is done by engineers, because people in general don't believe engineering is relevant to their lives.

"The institute should link the terms 'engineer' and 'IEEE' to everyday objects."

–Phil Parsons

Rather than constantly trying to tell people about all the good things engineers do, a campaign based on illustration would be a far better approach.

Television, for example, would reach a much wider and younger audience than print media. The IEEE could produce a simple commercial without dialogue in which a subject walks through life encountering everyday objects. When the person passes an object, the camera would zoom in and the object could morph into its design drawings. Or it can be labeled with names that illustrate some well-known IEEE standards. For instance, many people know of IEEE 802.11, but not many know what devices use it.

Be creative with a presentation like this and more people will realize that they can thank engineers and the IEEE for many everyday items. It also would lead to an increase in membership.

PHIL PARSONS
Newmarket, Ontario

Corrections

Frederick Terman was president of the Institute of Radio Engineers in 1941, not 1940 ("All in the Family," September, p. 9).

James A. Rooks's obituary (p. 23) should have said that his company, J&R Consulting, provided services to the pulp and paper industry, not pharmaceutical companies.

Send your letters and marketplace responses, which may be edited, to *The Institute*, IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08855-1331 USA; fax: +1 732 562 1746; e-mail: institute@ieee.org.

Engineering and (Yes!) Community

During the 2002 Grace Hopper Celebration of Women in Computing, I spoke on "Engineering, Community, Passion, and Balance." Over time, I began to refer to it as "The Oxymoron Talk."

At first glance, the phrase *engineering and community* might look like an oxymoron. After all, while we do a great job of supporting our own professional community, engineering is not known as one of the caring professions.

But in recent years, we engineers have more deliberately begun to connect engineering with society's well-being. We are contributing to such critical areas as clean water, energy, the environment, health care, and security. These are not new needs, or new areas for the IEEE, but they have become more urgent because global communications now connects us all, and the world's problems are becoming ours.

My greatest professional satisfaction comes from a unique program that ties together engineering and community. Twelve years ago, Edward Coyle, Hank Dietz, and I first envisioned Engineering Projects in Community Service, an engineering design program at Purdue University, in Lafayette, Ind., that enables undergraduates to earn academic credits for multiyear, multidisciplinary projects that solve engineering- and technology-based problems for community service and educational organizations. EPICS students have created hundreds of projects, including multimedia play environments for children with disabilities, database systems to improve services to the homeless, and hands-on museum exhibits to bring engineering—from electromagnetics to nanotechnology—to life. Now directed by Bill Oakes, EPICS programs are at 19 universities around the world, and high school pilot programs are under way in five U.S. states.

For about 10 years, EPICS took over my life. It was all passion and little balance. But because EPICS brought engineering into the real world and connected my work with my community, it became a part of the balance in my life. My daughter grew up with EPICS, and although she saw my 12-hour days, what she remembers most are my passion and the project's impact.

Many members today are connecting engineering with their own passion for making a difference. For example, representatives of about a dozen IEEE societies are participating in a worldwide effort to manage Earth's resources from a solid base of knowledge. When completed, the Global Earth Observation System of Systems will gather data and transform it into information to help governments address environmental changes [see "Scanning the Globe," p. 5].

Other members are working to improve technological literacy and to help young people develop an appreciation for science and technology. Activities include training pre-university educators to include engineering principles in classroom lessons and in-person visits to create awareness of how engineers contribute to society. Members have also reached out to young people through science fairs, math competitions, and career workshops in Australia, Japan, the United Arab Emirates, the United States, and other countries.

IEEE student branches also are connecting to their communities in exciting ways. At Bangladesh University of Engineering and Technology, student members created a solar-powered system that helps people in remote, off-grid areas to communicate. At the University of California, Berkeley, the branch developed and teaches an electronics workshop for local high school students and for non-engineering freshmen at the university.

Oliver Wendell Holmes Jr., the great U.S. Supreme Court jurist, said, "Life is action and passion." I urge you to act, to unite engineering with your community's needs. Your own passion will help you find the balance.

I am honored to have served as your 2007 IEEE President and thank the IEEE Board of Directors, the volunteers, and dedicated staff for their outstanding efforts this year. Thanks, too, to the many members who have shared their ideas and their support. Lewis Terman, your 2008 IEEE President, possesses exceptional experience and skills, and I know he will continue to move the IEEE forward.

I welcome your comments at: jamieson.column@ieee.org.

Leah H. Jamieson
IEEE President and CEO

EJ CARR

the institute

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IEEE Publishing Presses On

Every month, the IEEE publishes thousands of pages of new books and articles on new research from around the world. Three groups within IEEE Publication Services and Products provide authors, volunteer editors, and conference organizers the tools and services they need, helping to make the IEEE one of the world's largest publishers of technical information. **BY JOHN R. PLATT**

IEEE PRESS

http://www.ieee.org/web/publications/books

The institute's book-publishing arm, IEEE Press released approximately 20 titles this year and aims to increase that number to 35 next year. In cooperation with John Wiley & Sons, it publishes books that cover all the IEEE's technical fields of interest, as well as books on professional development, communication skills, and retirement planning.

The Press staff offers current and prospective authors help with preparing a proposal and arranging for its review by outside experts. The staff publishes guidelines for the information a book proposal should contain, such as a description of the topic, why a book on this subject is needed, who will want to buy it, its length, and when the author expects to finish writing it.

If a proposal is accepted, an editor helps the author through the process of preparing the final manuscript for production, including obtaining copyright forms when necessary, suggesting ideas for the cover, creating an electronic version, and generating publicity.

To learn about some of Wiley-IEEE Press's latest releases and to read an interview with the author of one of the books, check out "Books of Interest," p. 18.

CONFERENCE PROCEEDINGS

http://www.ieee.org/web/publications/confproc

With the IEEE sponsoring or directly operating more than 450 conferences each year, it's no wonder that publishing conference proceedings is a major operation. This year, with all the conferences the IEEE is involved in, the institute expects to publish almost 800 proceedings, up from nearly 750 last year. This number takes into account cosponsored meetings and non-IEEE conferences for which the institute publishes proceedings.

The majority of conferences are run by volunteers, for whom publishing proceedings in print and electronic formats can be daunting. But the IEEE staff tries to simplify the process with a variety of services, including helping organizers manage the collection of article manuscripts, converting the material into PDF documents, publishing the articles in hard copy and on CD-ROMs, and uploading the documents into the IEEE Xplore digital library. The staff can be a liaison between conference organizer and author, provide technical support to authors preparing manuscripts for publication, collect and organize the conference papers, obtain signed copyright forms, customize the conference Web site with the sponsoring society's logos, and design the cover of the printed proceedings or the CD-ROM.

PERIODICALS

http://www.ieee.org/web/publications/journmag

The IEEE publishes 134 transactions, journals, magazines, and letters sponsored by its 39 societies and five councils. A few of the societies publish periodicals on their own, but the rest turn to the IEEE Periodicals group for help with editorial, design, production, and mailing services.

This includes providing tools to help authors prepare their manuscript for electronic submission and peer review. The group is also developing tools for journal authors, including one designed to validate references cited in an article and another to verify that graphics are correctly formatted. The group can help design magazine covers, create graphics for math or scientific equations, and enhance the publication with multimedia features.

And the services don't stop when an edition goes to press. Researchers need to be able to find these papers. Enter the IEEE Indexing and Database Production departments. They upload the documents into the production database and from there into IEEE Xplore. And they generate the metadata for each abstract—for example, the author's name and the publication date and, where possible, data on scientific and technical articles supplied by the Institution of Engineering and Technology's Inspec information group.

FROM LEFT: PETER MLEKUZ/ISTOCKPHOTO; OLEG PRIKHODKO/ISTOCKPHOTO; RANDI SILBERMAN

FEATURED SOCIETY

IEEE Professional Communication Society

TO JOIN: http://www.ieeepcs.org
MEMBERSHIP: 1072
ESTABLISHED: 1957

Formed 50 years ago to advance technical and scientific communication, this society promotes professional communications as an essential element of engineering. Its objective is to help engineers, scientists, and other technical professionals communicate their ideas and findings effectively, both verbally and in writing.

PCS members provide editing services to other engineers, typically ensuring that their technical papers are written to convey ideas to both local and international audiences, as well as checking the documents for style and accuracy.

On 2 October the society celebrated its 50th anniversary during its annual conference in Seattle with a banquet and a sock hop.

Field of Interest Promoting effective communication of scientific and technical information in proposals and reports, printed and oral presentations, and electronic publishing.

Publications A quarterly journal, *IEEE Transactions on Professional Communication*, and the quarterly *PCS Newsletter*.

Conference The annual International Professional Communication Conference. Featured speakers at this year's conference, held from 30 September to 3 October, included Ray Kurzweill, a pioneer in optical character recognition, text-to-speech synthesis, speech recognition technology, and electronic keyboard instruments, and Chris Linnett, group manager of Microsoft Office Online.

Awards Four annual awards recognize professional achievements and contributions to the society and to engineering communication.

IEEE Education Society

TO JOIN: http://ewh.ieee.org/soc/es
MEMBERSHIP: 3130
ESTABLISHED: 1957

The Education Society also turned 50 this year. Its interests are focused on the methods used to teach electrical and computer engineering, including the use of technology in the classroom. Involved with accreditation activities around the world, the society works on pre-university programs for youngsters and professional development programs for adults.

The ES held an anniversary celebration in Milwaukee on 12 October, at its annual Frontiers in Education Conference. The conference, whose theme was "Looking Back," included a presentation by IEEE President Leah Jamieson on the society's history.

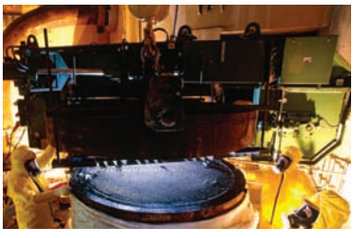
The society publishes the quarterly *IEEE Transactions on Education*; a journal, *The Interface,* three times a year; and the quarterly student publication *IEEE Multidisciplinary Engineering Education Magazine.*

IEEE Lasers & Electro-Optics Society

TO JOIN: http://www.ieee.org/portal/site/leos
MEMBERSHIP: 6840
ESTABLISHED: 1977

The society was formed 30 years ago following the invention of the laser and a vigorous debate within the IEEE about the need for a society focused on optoelectronics. Since the society's inception, lasers and optoelectronic devices have become vital components in LED displays, DVD players, medical instruments, and other modern devices.

The society publishes four monthly journals and the bimonthly newsletter *LEOS News*. The society held more than two dozen conferences this year, including the IEEE LEOS 30th Anniversary Program, on 22 May in Palo Alto, Calif. The program featured a question-and-answer session with IEEE Life Fellow Charles H. Townes, one of three laureates who shared the 1964 Nobel Prize in Physics for fundamental work in the field of quantum electronics.



IEEE Nuclear and Plasma Sciences Society

TO JOIN: http://ewh.ieee.org/soc/nps
MEMBERSHIP: 2800
ESTABLISHED: 1972

This society demonstrated the greatest increase last year in membership of all IEEE societies—up nearly 12 percent.

Members of this society are interested in radiation detection and monitoring instrumentation, radiation effects, instrumentation for nuclear power generation, nuclear biomedical applications, thermonuclear fusion, plasma dynamics, relativistic electron beams, laser-plasma interactions, and solid-state plasmas.

The society publishes the quarterly *IEEE Transactions on Medical Imaging* and two bimonthly journals—*IEEE Transactions on Nuclear Science* and *IEEE Transactions on Plasma Science.*

It also holds several annual conferences, including the International Conference on Plasma Science and the Nuclear and Space Radiation Effects Conference.

IEEE Signal Processing Society

TO JOIN: http://www.ieee.org/organizations/society/sp
MEMBERSHIP: 14351
ESTABLISHED: 1948

This year the society launched *The Journal of Selected Topics in Signal Processing*, which examines topics dealing with various types of signals, including audio, radar, sonar, and video. It published four issues this year, but next year, the society's 60th, the journal will come out monthly.

The society's areas of interest include coding, transmission, detection, and reproduction of signals through digital and analog means.

In addition to the new journal, the SPS publishes more than a dozen other journals, as well as the monthly electronic *Inside Signal Processing E-Newsletter.* The society also holds several international conferences that cover a wide range of signal-processing applications, including machine learning and speech recognition.

—compiled by Amanda Davis

CLOCKWISE FROM TOP LEFT: CHRISTOPH WILHELM/GETTY IMAGES; STEVE DUNWELL/GETTY IMAGES; LESTER LEFKOWITZ/GETTY IMAGES; PETER GINTER/GETTY IMAGES; JAMES WOODSON/GETTY IMAGES

STANDARDS

Three Popular Standards Products

IEEE Std. 1502-2007, released in September

IEEE Recommended Practice for Radar Cross-Section Test Procedures describes the process of measuring the radar cross section of objects on a test range. Radar cross section is defined, and the characteristics of different types of test ranges are presented.

Also covered are the responsibilities of test range operators—which include testing and calibrating the measurement systems. Techniques are described for each stage of the process.

IEEE Std. 1615-2007, released in July

The IEEE Recommended Practice for Network Communication in Electric Power Substations covers best practices for communication with, and interoperability of, devices connected through an electric power substation Internet protocol.

For the power engineer new to IP networking, IEEE Std. 1615-2007 provides an introduction to the concepts that must be mastered when deploying the technology, and it makes specific recommendations as well. For equipment manufacturers and system integrators, this standard outlines the requirements needed to run interoperable electric utility information networks.

IEEE Std. 493-2007, released in June

From the IEEE Standards Color Book series, the *IEEE Gold Book* covers a revision of IEEE Std. 493-1997, Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems.

The *Gold Book* covers the fundamentals of reliability analysis as applied to the planning and design of industrial and commercial electric power distribution systems. Examined are the basic concepts of reliability analysis by probability methods, the fundamentals of evaluating power system reliability, and economic evaluation of reliability. The book also addresses the lack of credible data relating to equipment reliability and the cost of power outages, and offers solutions to overcoming these obstacles.

FOR MORE INFORMATION on these and other IEEE standards, visit the IEEE Standards Association Web site at http://standards.ieee.org.

CONTINUING EDUCATION

Education Program Expands

Four more training providers have joined the IEEE Education Partners Program. The EPP offers IEEE members classes, seminars, and graduate-degree programs, online or on campus, at up to a 10 percent discount.

LeaderPoint: Courses on leadership and management cover topics that include how to correct dysfunctional group dynamics and how to develop a management mind-set for improving results.

Purdue University: Non-credit courses on integrated vehicle systems engineering, quality systems engineering, computational engineering, geomatics, and related topics.

Quadrelec Engineering Corp.: A four-day power system protection and coordination course. Covers principles applied to medium- and low-voltage power systems. Garners three continuing education units.

Rochester Institute of Technology: More than 45 online bachelor's, master's, and certificate programs on subjects such as information technology, telecommunications, and applied statistics.

FOR MORE INFORMATION on the four new partners and the other organizations that participate in the EPP, visit http://www.ieee.org/partners.

Eight Mentoring Myths Busted

BY CATHY DOWNER

Think about a mentoring relationship and you probably imagine the stereotype of an older mentor advising a younger professional, with just the mentee benefiting from the interaction. But that's just not so.

As more companies and organizations, including the IEEE, offer mentoring programs, misconceptions continue to exist about the mentoring relationship. Here are eight of them.

MYTH 1: Mentoring is a one-way street.
Both people can learn from each other's strengths and experiences. As a mentor, you can learn something new, too. Your protégé's perspective may make you think about things differently. A good mentoring partnership is always a two-way relationship.

MYTH 2: A mentoring relationship can only be face-to-face.
Many mentees want to meet with their mentors in person. That's possible if the two work in the same area, or when one travels for business and is in a mutually convenient place to meet. But face-to-face meetings may be impossible when, for example, mentoring partners live in different countries. Some mentees even prefer a mentor from another country in order to gain new perspectives, knowing the opportunity to meet face-to-face will be rare.

It's important for the two parties to establish ground rules for communicating. That includes discussing whether they will connect via e-mail or phone and, if possible, meet in person. Meeting times should be confirmed in advance, as well as the topics to be discussed.

MYTH 3: Mentoring is a time-consuming process.
Each mentoring relationship is unique, and so is the time and energy that goes into it. The amount of time depends on the mentor and protégé agreeing on the purpose and focus of their relationship. The IEEE's Mentoring Connection—a program that connects young professionals and recent grads with IEEE members willing to guide them in their professional development—recommends spending at least two hours each month. As one participant says, "The more you put into the partnership, the more you get back."

MYTH 4: Expectations are the same for everyone.
Although many mentoring partners share similar reasons for having such a relationship—for personal or professional growth—their individual expectations vary. Some mentors want to give back to their profession by sharing their knowledge and experiences with their partner. Others want to learn about industry trends and cutting-edge applications from their mentee.

MYTH 5: Mentors must be older.
Age should not qualify or disqualify someone from being a mentor. Mentors should be chosen for their understanding, skill, and capacity to share what they know. Often, recent graduates are looking for mentors who are also recent graduates. The key to finding the best mentors is for mentees to select them based on their own professional development needs.

MYTH 6: Developing a mentoring relationship is complicated.
The relationship is only as complicated as one makes it. The Web-based IEEE Mentoring Connection makes it easier to have meaningful relationships because it uses a step-by-step process to help match mentees with mentors. The program also provides a variety of resources to guide the mentoring partners. For example, partners can communicate through the program's discussion board or review mentoring guidelines and resources at its Web site.

MYTH 7: You need only one mentor at a time.
Each mentor brings unique knowledge to the mentee, so having more than one can offer greater learning experiences. However, it can be difficult to set expectations for each relationship unless each mentor has been chosen for a specific area of development. That's why it's important for mentees to openly share their objectives with their mentors. The IEEE asks that each mentor have no more than two mentoring partnerships at any one time.

MYTH 8: Mentoring relationships happen on their own.
The IEEE Mentoring Connection helps mentees select their mentors from a database of professionals, such as engineering professors, project managers, and research directors who have volunteered to participate in the program. It's up to the mentees to find someone they will respect and trust to help them reach their objectives.

IEEE members in the program have a wide range of knowledge and technical and professional expertise. Once the partnership is under way and working, it's up to the partners to make the relationship blossom.

MORE ON MENTORING The IEEE Mentoring Connection was launched in 2006 and is open to all members above student grade. The Web-based program connects young professionals and recent graduates with IEEE members willing to devote the time needed to advise mentees in their professional growth.

As of mid 2007, more than 200 mentoring partnerships have been established.

Mentors need to commit at least two hours a month to the one-on-one partnership, which lasts for a year. Communication with the mentee can be by phone, by e-mail, or in person.

Prospective mentors complete an application that asks for a short biography, including technical background, which is used to create an online mentor profile. Each mentee is asked to choose a mentor based on the contents of the profiles.

The Mentoring Connection program's online resources include an agreement document the partners fill out to clarify their expectations, short-term and final evaluation forms, and a mentor's guide. ■

For more information, visit http://www.ieee.org/mentoring.

ANDERS WENNGREN

FEATURED CONFERENCE

International Solid-State Circuits Conference

San Francisco, 3–7 February

This is the world's main forum for the presentation of advances in solid-state circuits and systems-on-a-chip. This year's conference, whose theme is "System Integration for Life and Style," is expected to include papers on data converters, high-performance and low-power digital technology, wireless technology, and advanced circuit techniques.
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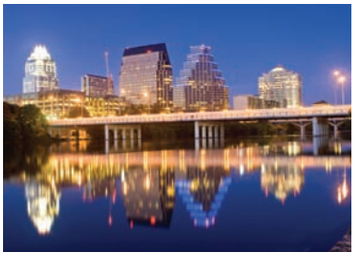
VISIT: http://www.isscc.org/isscc



IEEE Applied Power Electronics Conference and Exposition

Austin, Texas
24–28 February

This annual event focuses on the practical aspects of power electronics. Representatives from more than 150 companies involved in the design, development, manufacture, and procurement of power electronics systems, and components are expected to attend.

Topics include ac-dc converters, motor drives, semiconductors, energy storage components, and sensors.

The conference also will feature professional development courses taught by power electronics experts.
SPONSORS: IEEE Industrial Applications Society, IEEE Power Electronics Society, and Power Sources Manufacturers Association
VISIT: http://www.apec-conf.org

IEEE International Conference on Distributed Human-Machine Systems

Athens
9–12 March

Participants from universities, industry, and government agencies plan to address the challenges and future research possibilities in distributed human-machine systems. Besides theories and applications of human-robot interaction and interfaces, scheduled topics include distributed intelligent systems, swarm intelligence, and virtual enterprises.
SPONSORS: IEEE Systems, Man, and Cybernetics Society
VISIT: http://www.action-m.com/dhms2008

IEEE International Conference on Acoustics, Speech, and Signal Processing

Las Vegas
30 March–4 April

This is the world's largest and most comprehensive technical conference focused on signal processing. More than 50 lectures and exhibits will address signal processing theory and applications to audio, electroacoustics, bioimaging, communications, speech processing, information forensics and security, sensor array and multichannel systems, and machine learning.
SPONSOR: IEEE Signal Processing Society
VISIT: http://www.icassp2008.org

First International Conference on Software Testing, Verification, and Validation

Lillehammer, Norway
9–11 April

This new conference, expected to become an annual affair, aims to stimulate research on model-based software testing, domain-specific testing, empirical studies of testing techniques and their cost effectiveness, and the transfer of research results to software development practices.

Other topics to be discussed include embedded software, the education of test engineers, diagnosability, security testing, and quality assurance.

Keynote speakers include Annie Combelles, president of DNV/Q-Labs, and Mary Jean Harrold, a professor of computing at the Georgia Institute of Technology.
SPONSORS: IEEE Computer Society, IEEE Technical Council on Software Engineering
VISIT: http://www.cs.colostate.edu/icst2008

IEEE International Conference on Industrial Technology

Chengdu, China
21–24 April

This conference provides a forum for the exploration of emerging technologies in industrial electronics.

Topics include industrial informatics, flexible manufacturing systems, computer-control systems, and industrial applications of neural networks. Power electronics, energy conversion, robotics, mechatronics, and power systems are also on the program.

In addition, the conference features visits to various industrial and manufacturing companies in Chengdu.
SPONSORS: IEEE Chengdu Section, IEEE Industrial Electronics Society, Japanese Society of Instrument and Control Engineers
VISIT: http://www.scueei.net/icit08

—compiled by Amanda Davis

CLOCKWISE FROM TOP LEFT: KEITH REICHER/ISTOCKPHOTO; PAUL MORTON/ISTOCKPHOTO; BRIAN THOME; LILLEHAMMER TOURIST OFFICE; GABI COTRUTA/ISTOCKPHOTO; DAVID COLEMAN/ISTOCKPHOTO

FEATURED AUTHOR

Jake Baker on IC Design

When IEEE Senior Member R. Jacob "Jake" Baker began teaching electrical and computer engineering in 1993 at Boise State University, in Idaho, something was missing from his classroom: a book that covered the practical design of both analog and digital integrated circuits.

"I wanted my students to have a textbook that integrated chip layout and simulation with analog and digital design," Baker says. "There just wasn't any such book available."

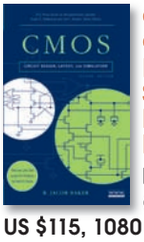
So he decided to write one himself. *CMOS: Circuit Design, Layout, and Simulation* came out in 1997. It became such a hit that a second edition was published in 2004, and two months ago the revised second edition hit the shelves. The book earned Baker the 2007 Frederick Emmons Terman Award from the American Society for Engineering Education. The award honors authors who have made original contributions in electrical engineering education.

As Baker notes, CMOS (complementary-metal-oxide semiconductor) technology has been the driving force behind IC design during the past 25 years. The new release of Baker's book covers CMOS technology's movement into nanometer dimensions—material unavailable in other textbooks covering analog design, he says. The book also explains design techniques for long- and short-channel CMOS technologies and then compares them.

Baker hopes the new edition of his book reaches a wider audience, including students and experienced engineers who are working on transistor-level CMOS chip designs. "The technology will continue to dominate circuit design for years to come," he predicts.

—Anna Bogdanowicz

Here is a selection of new books from Wiley-IEEE Press. Members can receive a 15 percent discount by using the promotional code INSAL when ordering from http://www.wiley.com/IEEE.



CMOS: Circuit Design, Layout, and Simulation, Revised Second Edition

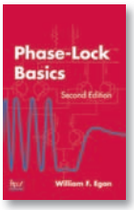
By R. Jacob Baker (November 2007, US $115, 1080 pp.)

Baker covers the practical design of analog and digital ICs, offering an up-to-date view of a wide range of circuit blocks, data converter architectures, analog and digital integrated chips, and more. The author takes a two-pronged approach to the topics: design techniques are developed for both long- and short-channel CMOS technologies and then compared. Topics are also covered in a multidimensional manner, giving the reader insight into the design process.

DRAM Circuit Design: Fundamental and High-Speed Topics

By Brent Keeth, R. Jacob Baker, Brian Johnson, and Feng Lin (November 2007, $105, 500 pp.)

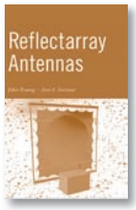
The authors strive to make DRAM IC design understandable to students and practicing engineers. Topics include the transistor-level design of DRAM building blocks, voltage regulators and pumps, and peripheral circuits. The book explains standard and high-speed implementations in a balanced approach to help IC designers prepare for the future, when DRAM will be embedded in logic devices for complete systems-on-a-chip.



Phase-Lock Basics, Second Edition

By William F. Egan (November 2007, $99.95, 472 pp.)

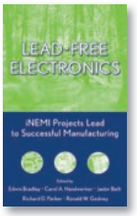
This book can be used as a theoretical introduction for graduate students or, with MATLAB simulation software, as a virtual laboratory for engineers who want to improve their understanding of the design process and apply it to specific situations. This edition features a large body of new statistical data obtained from simulations. Experimental data is included for confirmation of those results.



Reflectarray Antennas

By John Huang and José A. Encinar (October 2007, $99.95, 232 pp.)

The authors deal with the configuration and principles of the reflectarray antenna, its advantages over other antennas, the history of its development, and analysis techniques. Other topics include practical design procedures, bandwidth issues, and recent developments. Huang and Encinar are respected designers who have built reflectarray antennas and developed them for spaceflight.



Lead-Free Electronics: iNEMI Projects Lead to Successful Manufacturing

By Edwin Bradley, Carol A. Handwerker, Jasbir Bath, Richard D. Parker, and Ronald W. Gedney (October 2007, $99.95, 472 pp.)

A valuable resource for engineers and companies faced with switching to lead-free solder assembly, this book covers the issues surrounding the implementation of this approach to electronic board assembly. The book includes results of a two-year study of the 30-company International Electronic Manufacturing Initiative.

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PROFILE

ELEANOR BAUM

Rebel Engineer

Breaking gender boundaries for decades

BY ANNA BOGDANOWICZ

JORDAN HOLLENDER

When IEEE Fellow Eleanor Baum decided on an engineering career in high school, she got little support. Women just didn't become engineers in the 1950s.

"We were supposed to become teachers, secretaries, or nurses, and then quit when we got married," Baum says. She excelled at math, and after hearing her male classmates talk about how cool engineering was, it sounded like a good career for her, too. Her mother wasn't as excited.

"She gasped and said, 'You can't do that! People will think you're weird,'" Baum recalls. "Or worse," her mother cautioned, "no one will want to marry you."

Even her guidance counselor tried to dissuade her, saying schools wouldn't accept her because of her gender. "That's when my pursuing engineering became more about rebellion than about engineering itself," she says.

It's been a bumpy road, Baum says, but her decision has paid off. Ironically, she has been most successful in a field she tried hard to stay away from: education. In 1984 Baum became the first female dean of engineering in the United States, at Pratt Institute, in New York City. Today she's dean of engineering at the Cooper Union, also in New York City, and executive director of the Cooper Union Research Foundation. And she has spent the past 20 years encouraging women and members of minority groups through outreach projects to pursue engineering.

In October Baum was inducted into the National Women's Hall of Fame, which honors women who have made important contributions to the United States in various fields. "I've gotten lots of honors, but this is one of the most exciting," she says.

Although there is still a shortage of female engineers, Baum observes, times have certainly changed since she entered the field.

ODD ONE OUT As her guidance counselor predicted, getting into an engineering college wasn't easy. Baum was an excellent student and applied to several schools, but almost all rejected her. Sample reason: the school did not have separate bathrooms for women. One school opened its doors: the City College of New York, in New York City.

But being one of the only women in the engineering program was tough. "My grades were scrutinized in the beginning," she says. After earning her bachelor's degree in electrical engineering in 1959, Baum got a "lousy" job as an engineer in the aerospace industry—she prefers not to name the company, which "treated engineers as commodities, not as creative individuals," she says.

She returned to college and earned a master's and a doctorate in electrical engineering from Brooklyn Polytechnic Institute, now Polytechnic University, in New York City. She also joined the IEEE as a student member and has been active ever since.

After a few more disappointing jobs in aerospace, she decided to give academia a try. "It's ironic. I became an engineer because I didn't want to be a teacher," she says. "But I found I really loved teaching."

BREAKING THE MOLD Baum became a professor of electrical engineering at Pratt Institute in the late 1960s, eventually becoming the electrical engineering department chair. In 1984, Pratt was searching for a dean of engineering and offered the position to Baum because she had proven her leadership skills.

It was a big deal, she says, but it was also scary because of the increased workload and visibility. "In addition, I was afraid the job would take time away from being with my family," Baum adds. She was married and had two children. She decided to give it a try for a year but stayed for five.

She became involved in several engineering education organizations, including the American Society for Engineering Education, where she became the first female president in 1996. She has also been president of ABET and chair of the New York Academy of Sciences. She also began running programs at high schools and colleges to get women and minority-group members interested in engineering.

"Most people equate engineering with work that involves a lot of tough math, but there's so much more to it," she says. "Engineering is about working on interesting projects and making the world a better place. When that becomes the message, everyone can relate."

She wasn't looking for a new job in 1989 when Cooper came calling with an offer to become dean of its engineering school, but she liked its many community outreach projects and faculty research programs.

In her nearly 20 years there as dean, she has helped make the engineering program more project-based—which appeals to women and other underrepresented groups. Students get involved with projects as freshmen, so they can see how engineering can improve living conditions. Projects have included inexpensive, low-tech solutions for clean water in Ghana; a pollution-control computer model to eliminate odors coming from urban harbors; and working with surgeons to develop better ways to test artificial limbs.

Baum's passion for recruiting women and minorities to engineering is stronger than ever. She has initiated several projects, including lectures at high schools by successful female engineers. Another is Super Science, which involves Cooper's Society of Women Engineers group doing fun projects with third- and fourth-grade students. ■

Members of the Etisalat University College IEEE Student Branch with their winning robot

Robot Showdowns Sharpen Skills

BY JASON LADAY

IEEE student branches looking for ways to give their members hands-on engineering experience have a number of options to consider. They can take on a major project, like the computer-controlled dance floor built two years ago by students at Washington University, in St. Louis (it lights up in response to the pressure of dancing feet). They can schedule technical workshops on any number of topics. Or they can follow a popular trend and organize a robotics competition.

Students competing in those engineering strongman contests build robots and pit them against their peers' creations. The competitions present the students with a challenging problem and goals that stoke their competitive and technical fires.

Student branches are forming teams and competing at IEEE conventions around the world. A competition can attract dozens of IEEE student branches, allowing hundreds of students to gain technical experience and interact with each other. They can gain perspective by seeing how different teams approached the problem. Often there's the added incentive of cash prizes.

Student-built robots at recent contests have found their way through a maze, monitored a fire, and shot balls through a hoop.

A PRACTICAL BENT "The competitions let students see how theory learned in class can be applied to practical problems," says Hal Tharp, counselor to the IEEE student branch at the University of Arizona in Tucson. Students work in teams and learn how to budget their time and their money to accomplish a real task, as well as how to share their knowledge and skills with each other, Tharp points out.

Tharp advised three University of Arizona student branch teams competing with other schools in the MicroMouse competition held on 31 March. The goal was to build a robotic mouse able to navigate a 3.1-by-3.1-meter maze in the shortest possible time. The mouse had to maneuver its way from the starting square at the edge of the maze to the center square with no outside intervention.

Typically, the mouse consisted of wheels driven by electric motors and a sensor that told it when it ran into a wall or when it could turn and travel down an opening. Usually, the mouse also had a computer that helped it learn the best way through the maze.

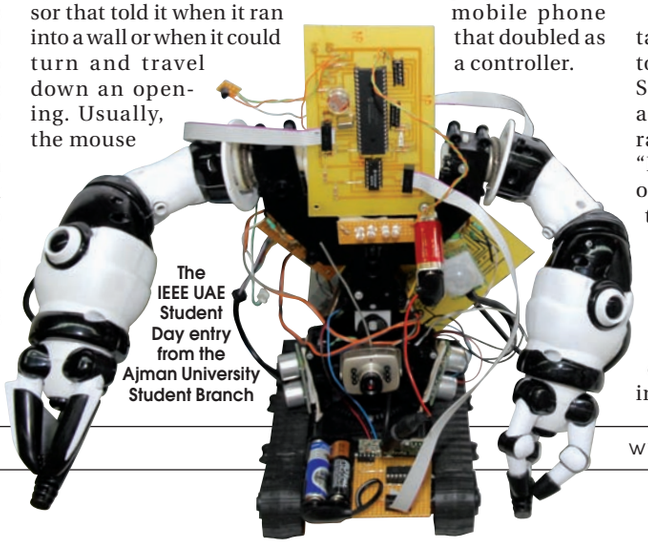
The winner of that local contest went on to a regional competition, held less than a month later at the University of Nevada in Las Vegas. One of the University of Arizona teams picked up the win, taking home US $500.

According to Tharp, a lot of programming went into the mouse's ability to navigate the maze. The winners spent 130 hours building their mouse from scratch, with some components reused but improved from previous years.

SMART MACHINES Back in May, Etisalat University College, in Sharjah, United Arab Emirates, held its annual IEEE UAE Student Day, which included the Common Design Project Competition, also known as the Remote-Controlled Smart Machine event. The contest drew nine student branches and about 200 students from around the country.

"The goals of the day were to enhance competition among students and encourage leadership qualities," says Mahmoud Al-Qutayri, the student branch counselor at Etisalat. "We also sought to introduce the public to the IEEE."

The competition challenged students to build a mobile robot for a specific job, such as guarding a perimeter or monitoring fires. Each team, composed of five IEEE student members, was given a budget of $1500 and lent a laptop and a GSM mobile phone that doubled as a controller.



The IEEE UAE Student Day entry from the Ajman University Student Branch

Etisalat took first place, building a robot that monitored temperature, smoke, and motion. The robot could be controlled from the Internet and the GSM mobile phone, theoretically allowing the operator to maneuver the robot from anywhere in the world. It also has a Wi-Fi camera capable of taking pictures and video and sending them back to the operator. If the remote control fails, the robot can function on its own, albeit with reduced capability.

"The students learned how to design systems within a particular set of constraints and deadlines," Al-Qutayri says. "They also gained experience with presenting their work to the public and interacting with other students from different parts of the country."

SHOOTIN' HOOPS The SoutheastCon meeting in March in Richmond, Va., included a student hardware competition, drawing IEEE student members from more than 40 colleges and universities in the southeastern United States and Jamaica. The contest involved a shoot-out among robots that tossed table-tennis balls through hoops. The robots raced against each other and the clock to get as many balls through a number of hoops as possible. The team from Mississippi State University, in Starkville, won. However, the organizers pointed out, the effort was not all about winning; it was also about overcoming challenges.

"In class, you're given a task and directions on how to solve it," one Mississippi State student noted in an article about the event that ran in a school newsletter. "Here, we had to develop our process from concept to completion."

Another participant raved about the experience he gained in such valuable skills as project management, allocating resources, delegating tasks, and building relationships. ■

ETISALAT UNIVERSITY COLLEGE IEEE STUDENT BRANCH

PASSION
Acting
PROFESSION
Electrical engineer
RESIDENCE
Lake Jackson, Texas

Michael Bayer

Stage Star

Performing before hundreds of people is no big deal for Michael Bayer. The 52-year-old IEEE member and senior engineer is an amateur thespian with more than 20 plays and musicals on his actor's résumé.

It wasn't always easy for him. The now confident actor was once a shy child, drawn to theater but too afraid to give it a shot.

The youngest of 10 children, Bayer was raised in Missouri in a family that appreciated the arts. His exposure to live theater began early; his parents brought him to musicals at the historic Muny theater, in nearby St. Louis, when he was 8 years old.

"I can still remember scenes from *Kismet*, *Showboat*, and especially *The Wizard of Oz*," he says. He got up the nerve to play one of the three witches in *Macbeth* in an eighth-grade play, but his stage fright kept him from acting again until college.

When he was a junior studying electrical engineering at the University of Missouri at Rolla, he auditioned for a student production of *Paint Your Wagon*, one of his favorite musicals. He hoped for a small part in the chorus and ended up as the romantic lead.

"It scared me to death, especially when the romantic female lead changed our simple kiss to a passionate French kiss on opening night, but I survived the experience and was hooked," he says. Bayer, a tenor, also joined the university's choir, and he acted and helped build sets for the rest of his college years. When he got a job as an EE for Dow Chemical Co. in Freeport, Texas, Bayer also got a role in a musical.

"The evening of my first day at work I went to the nearby theater, Brazosport Center Stages, and was offered the part of Sir Sagramore in *Camelot* because someone had quit the day before," he recalls. He started rehearsals that very night.

During the past 30 years he has performed in *The Comedy of Errors*, *As You Like It* [photo, left], *Oliver*, *The Sound of Music*, *Beauty and the Beast*, *The Wizard of Oz*, and other plays.

Just as his parents had, Bayer and his wife encouraged their two daughters to get involved in the arts. The family has even appeared on stage together in Center Stages's production of *Annie*.

Bayer may not retain his amateur status for long. For the past two years he has been taking voice lessons from opera singer Hope Shiver and hopes to audition for professional musicals and operas.

—Anna Bogdanowicz

Terrance Malkinson

Taking It to the Limit

PASSION
Triathlons
PROFESSION
Researcher, retired
RESIDENCE
Calgary, Alberta

For IEEE Senior Member Terrance Malkinson, it's not about reaching the finish line. It's all about the journey—even if that finish line is more than 200 kilometers away and he has to swim, pedal, and run all day to get there.

The 58-year-old editor of *Engineering Management*, the newsletter of the IEEE Engineering Management Society, competes in triathlons, which involve consecutive episodes of swimming, cycling, and running. Malkinson, who is also vice chair of the IEEE-USA Communications Committee, completed Ironman Canada in 2004, 2005, 2006, and 2007, and Ironman New Zealand this year.

He has been a triathlete since his early 50s, when he says he got a frightening wake-up call. "A lot of my friends were getting sick or dying of heart attacks and chronic diseases," Malkinson recalls. "I felt that if I wanted to avoid that same fate, I had to become more physically active."

Although he had been exercising regularly all along, he had a lot of training to do before his first triathlon. He began working out for about four hours each day, seven days a week.

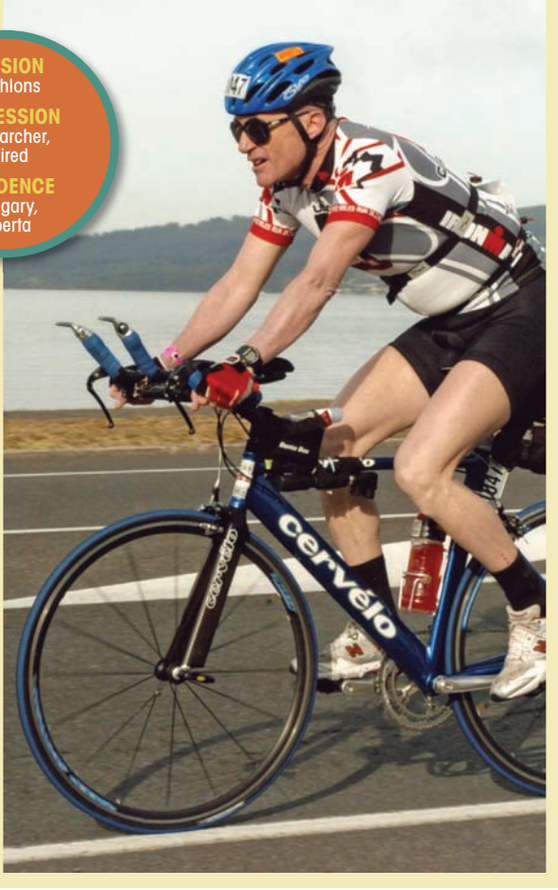
After a few beginner-level triathlons, he was ready for his first big one: Ironman Canada 2004, in Penticton, B.C. The day before the race, Malkinson was nervous. "I was worried about the swimming part because I had a fear of water," he says.

When the starting gun fired at 7 a.m., more than 2300 athletes dove into Okanagan Lake, and Malkinson forgot about his phobia. "Overcoming my fear was the most rewarding part of that triathlon," he says. An hour and 40 minutes later he finished the 4-km swim and hopped on his bike for the next leg of the race.

The riders pedal for more than 180 km. "It's a beautiful, scenic bike ride, and there are thousands of people cheering us on—which keeps us going," Malkinson says. The last part of the triathlon is a 42-km run. The final stretch can be tough, but it's all worth it when you accomplish your goal, he says.

"There's no experience like it," he concludes. "Even if you don't finish, it's OK. The most important part isn't necessarily the triathlon itself but the training you do to get to the starting line."

—A.B.



If you have an interesting hobby you'd like to share—such as mountain climbing, skydiving, sculpture, or playing in a band or orchestra—e-mail the editors: institute@ieee.org.

TOP: MICHAEL BAYER; BOTTOM: TERRANCE MALKINSON

RECOGNITIONS

FELLOW
MOSHE KAM

has been named head of the electrical and computer engineering department at Drexel University, in Philadelphia.

Kam is an internationally recognized authority on multisensor architectures and team decision processes. He has taught differential equations, system theory, and ethics at Drexel since 1986, when he joined the university. In 1989 he founded the university's Data Fusion Laboratory, which is devoted to the study of mobile robots and multiagent sensor fusion.

Kam's research interests include team decision and team estimation for multisensor architectures, decision fusion and sensor fusion, mobile robots, pattern recognition, and optimization and control. He is vice president of IEEE Educational Activities and a member of the IEEE Board of Directors and Executive Committee.

He received a bachelor's degree in electrical and electronics engineering in 1977 from Tel Aviv University. He went on to earn master of science and doctor of philosophy degrees from Drexel in 1985 and 1987, respectively.

FELLOW
JAMES M. TIEN

has been named dean of the College of Engineering at the University of Miami. He assumed the role on 1 September. Previously, he was a professor of decision science engineering systems and founding chair of the department of decision sciences and engineering systems at Rensselaer Polytechnic Institute, in Troy, N.Y.

Tien's areas of interest include probabilistic modeling, queuing theory, statistical computing, and decision informatics.

He has held several volunteer positions in the IEEE, including vice president of Educational Activities and vice president of Publication Services and Products. He was on the IEEE Board of Directors from 2000 to 2004.

Tien received a bachelor's degree in electrical engineering in 1966 from RPI. He earned a master's degree in electrical and systems engineering and his Ph.D. in systems engineering and operations research from MIT in 1967 and 1972, respectively.

MEMBER
MICHELLE F. TORTOLANI

has been appointed president of the Society of Women Engineers. Her term began in August.

SWE is a nonprofit education and service organization that attempts to boost women's interest in engineering. During her 20-year membership in the society, Tortolani has held many elected and appointed positions, including president-elect, vice president of membership initiatives, director of professional development, and director of external affairs. In those roles, she has helped strengthen the society's membership, professional development, and public policy programs.

She is a senior director of repeater engineering and operations at XM Satellite Radio, in Washington, D.C. She manages the operation, maintenance, and expansion of XM's ground repeater network, which supplements coverage in areas where tall buildings and other obstructions can interfere with satellite radio reception.

Tortolani received bachelor's and master's degrees in electrical engineering from Boston University.

IN MEMORIAM

WILLIAM L. ROOT
Pioneer in Statistical Communication and Information Theory

MEMBER GRADE: Fellow
AGE: 87
DIED: 22 April

Root, coauthor of a well-known book on signal theory, was instrumental in placing statistical communication theory on a sound mathematical footing.

He joined the Analysis Group at MIT's Lincoln Laboratory, in Lexington, Mass., in 1952, where he researched the statistical analysis of radar signals. Root headed the group from 1959 to 1961 and then left to become a professor of aerospace engineering at the University of Michigan in Ann Arbor. He retired from the university in 1987.

Root and Wilbur B. Davenport Jr. wrote *An Introduction to the Theory of Random Signals and Noise* (McGraw-Hill, 1958). The text, dubbed "Davenport and Root" and reprinted in 1987 by IEEE Press, introduced the basic approach to analyzing signals and systems in the presence of noise.

He received a bachelor's degree in electrical engineering in 1940 from Iowa State College, in Ames, and went on to earn a master's degree, also in electrical engineering, in 1943, from MIT. In 1952 he earned a Ph.D. in mathematics, also from MIT.

ARTHUR L. ROSSOFF
Transistor Electronics Engineer

MEMBER GRADE: Life Fellow
AGE: 85
DIED: 2 August

Rossoff cowrote a popular textbook on transistor electronics. He began his career in 1950 as a project engineer at the Radio Receptor Co., in New York City, where he helped develop microwave hardware for a U.S. Air Force UHF transmitter. In 1953 he became chief engineer of the company's new semiconductor division. There he researched transistor electronics and eventually began giving weekly lectures on transistors to his co-workers.

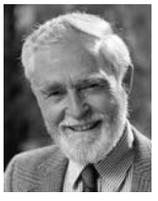
He went on to coauthor *Transistor Electronics* (McGraw-Hill, 1957) with David DeWitt, which became the required text at a number of universities.

In 1957 he became vice president of marketing for defense products at General Instruments, an electronics manufacturer in Chicago. He left GI in 1968 to join Northrop Corp., in Hawthorne, Calif., as an advisor to the chief engineer of the Apollo space program. In 1972 he became an assistant to the president of Polytechnic Institute of Brooklyn (now Polytechnic University), in New York City. He retired from there in 1987.

After he retired, Rossoff founded the Long Island Museum of Science and Technology, a hands-on facility currently being built in Garden City, N.Y.

He received a bachelor's degree in electrical engineering in 1943 from the City College of New York.

RONALD N. BRACEWELL
Radio Astronomy Pioneer



MEMBER GRADE: Life Fellow
AGE: 86
DIED: 12 August

Bracewell made a number of fundamental contributions to radio astronomy and computer-assisted tomography.

During World War II, he developed microwave radar equipment at the Radiophysics Laboratory of the Commonwealth Scientific and Industrial Research Organization in Sydney, Australia. He left in 1946 to earn his Ph.D. in physics at Cambridge University's Cavendish Lab and returned to CSIRO in 1949 as a senior research officer.

In 1955 he moved to the United States to lecture in radio astronomy at the University of California at Berkeley. That year, he joined Stanford University as a professor of electrical engineering and later worked in the university's Telecommunications and Radioscience Laboratory until his death.

In 1961 Bracewell built a complex 32-dish radio telescope west of Stanford's main campus. It produced daily solar maps that NASA used during the Apollo 11 mission. He also developed algorithms that contributed to the development of CAT scanning.

He was awarded the 1994 IEEE Heinrich Hertz Medal for pioneering work in aperture synthesis and image reconstruction.

Bracewell received a bachelor's degree in mathematics and physics in 1941 and bachelor's and master's degrees in engineering, all from the University of Sydney.

CLOCKWISE FROM TOP LEFT: DREXEL UNIVERSITY; JAMES M. TIEN; SOCIETY OF WOMEN ENGINEERS; LINDA A. CICERO/STANFORD NEWS SERVICE; CONNIE ROSSOFF; UNIVERSITY OF MICHIGAN COLLEGE OF ENGINEERING

DEADLINES & REMINDERS

Countdown to IEEE Award Nominations

Nominees are being sought for 2009 IEEE medals, awards, recognitions, and prize papers. The deadline for the IEEE Board of Directors to receive nominations is 1 July 2008.

IEEE MEDAL OF HONOR
For an exceptional contribution or an extraordinary career in the IEEE fields of interest.
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IEEE EDISON MEDAL
For a career of meritorious achievement in electrical science, electrical engineering, or the electrical arts.
SPONSOR: Samsung Electronics Co.

IEEE JAMES H. MULLIGAN JR. EDUCATION MEDAL
For a career of outstanding contributions to education in the fields of interest of the IEEE.
SPONSORS: Mathworks Inc., National Instruments Foundation, Pearson Prentice Hall, and IEEE Life Members Committee

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: QUALCOMM

IEEE JACK S. KILBY SIGNAL PROCESSING MEDAL
For outstanding achievements in signal processing.
SPONSOR: Texas Instruments

IEEE JUN-ICHI NISHIZAWA MEDAL
For outstanding contributions to material and device science and technology, including practical application.
SPONSORS: The Federation of Electric Power Companies, Japan, and the Semiconductor Research Foundation

IEEE ROBERT N. NOYCE MEDAL
For exceptional contributions to the microelectronics industry.
SPONSOR: Intel Foundation

IEEE SIMON RAMO MEDAL
For exceptional achievement in systems engineering and systems science.
SPONSOR: Northrop Grumman Co.

IEEE JOHN VON NEUMANN MEDAL
For outstanding achievements in computer-related science and technology.
SPONSOR: IBM Corp.

IEEE/ROYAL SOCIETY OF EDINBURGH WOLFSON JAMES CLERK MAXWELL AWARD
For groundbreaking contributions that have had an exceptional impact on the development of electronics and electrical engineering or related fields.
FUNDED BY: Wolfson Microelectronics plc

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For exceptional managerial leadership in the fields of interest to the IEEE.
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IEEE RICHARD M. EMBERSON AWARD
For distinguished service to the development, viability, advancement, and pursuit of the technical objectives of the IEEE.
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IEEE HARADEN PRATT AWARD
For outstanding service to the IEEE.
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IEEE DONALD G. FINK AWARD
For the outstanding survey, review, or tutorial paper in any of the IEEE transactions, journals, magazines, or proceedings.
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FOR MORE INFORMATION, visit http://www.ieee.org/about/awards or contact IEEE Awards Activities, 445 Hoes Lane, Piscataway, NJ 08855-1331 USA; tel.: +1 732 562 3844; fax: +1 732 981 9010; e-mail: awards@ieee.org.

IEEE BUSINESS

Office Opens In China

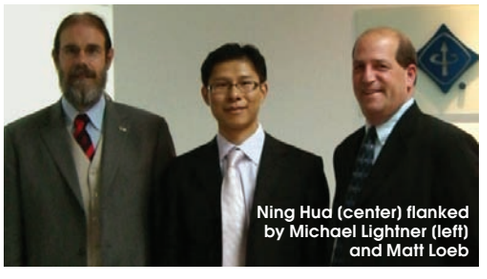
The IEEE office in China is now up and running, having opened its doors in Beijing's Haidian Science Park in June. "Although we've partnered with key Chinese technical and scientific organizations in the past, it became increasingly complex to work effectively in China without having a legal presence in the country," says 2006 IEEE President Michael Lightner. He, IEEE Executive Director Jeffry Raynes, and Matt Loeb, staff director of IEEE Corporate Strategy and Communications, the area that oversees the new office, were instrumental in getting the office opened.

The IEEE Board of Directors decided in 2006 to establish the office, which is expected to focus on standards development, improving engineering education, and increasing membership.

Ning Hua, a Chinese national, manages the Beijing office, working with various IEEE groups to develop programs. "Our mission is to help chart the IEEE's future direction in China and to execute and support the IEEE's activities around the country," Hua says. Two staff members will soon be added. Hua is an IEEE member and former chief technology officer of BII Group Holdings, a Chinese IT consulting company.

One of Hua's first priorities is to involve Chinese engineering companies in helping to develop IEEE standards. Since April 2006, the IEEE Standards Association has held three training seminars on the international standardization process in Beijing and Shenzhen. The group also met with ChinaMobile, Haier, and other companies.

Helping China accredit its universities and developing certification programs for engineers are other objectives. The IEEE Educational Activities Board and the China staff plan to work with Chinese government agencies and companies to develop the programs. To meet the IEEE's objectives, the China staff will develop relationships with key Chinese government agencies and engineering companies, Hua says.


Ning Hua (center) flanked by Michael Lightner (left) and Matt Loeb

To boost membership, the staff will hold seminars at Chinese engineering companies, explaining the benefits of joining the IEEE. At present, the country has seven sections and 4120 members. ■

—Anna Bogdanowicz

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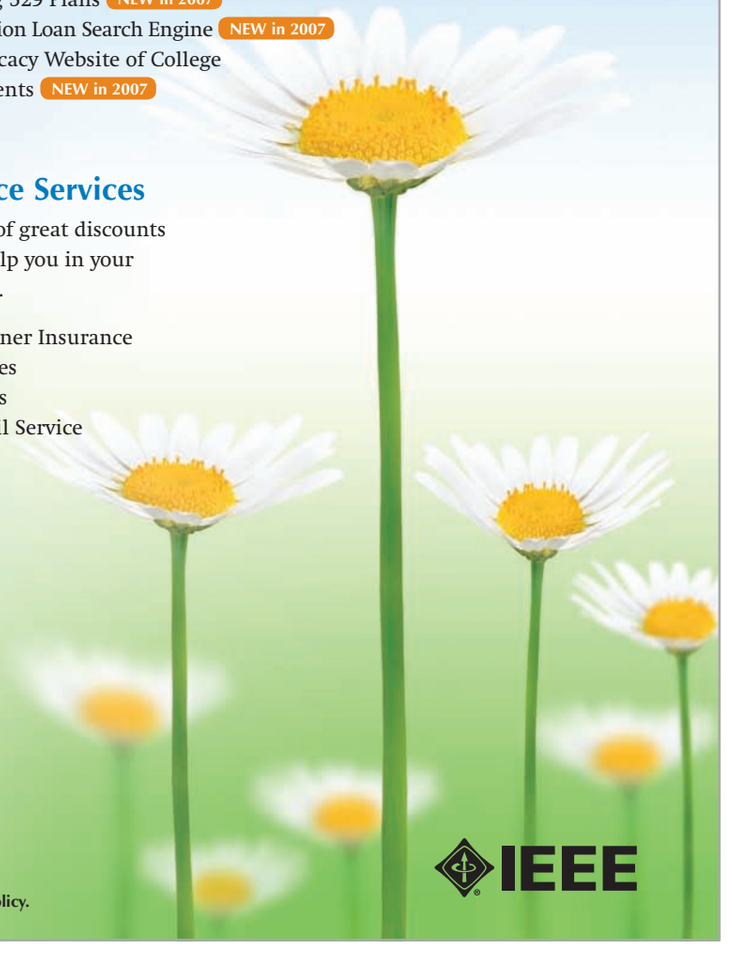

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