

IEEE Geoscience and Remote Sensing Society Newsletter

Editor: JoBea Cimino

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The Challenge Goes to Vancouver, Canada

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Notice to Contributors

Materials intended for publication in the *Newsletter* should be typed single-spaced in photo-ready condition; all typing must be kept within a 4½ inch column width. Any plain white paper can be used but the special paper with light blue column guidelines can be obtained from the IEEE Headquarters. An alternative method is to type on plain bond paper using heavy black guidelines on a back-up sheet.

Short interesting articles are more likely to be read by GRS-S members than long detailed articles; the recommended maximum length is 1000 words. In order to save column space in the *Newsletter*, the Editor may shorten articles which exceed the recommended length. All material must be received at the Editor's office by the following deadlines:

For publication in	Deadline is
May	March 15
August	June 15
October	August 15
November	September 15

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President's Message



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Time for some light reflection. Time to speculate, as they say in the mirror business. Time to play *WHAT IF*.
What if hydraulic feedback were used to moderate municipal water systems? One can imagine the result if the practice were adopted of disposing of waste water upstream of the drinking water inlet. There might be some resistance at first (*yuch!*), but should the idea catch on, it would benefit everyone. Quality of all level of products would improve . . . indeed, some would *have* to improve for sheer survival! The key, of course, is that suddenly everyone would have a vital interest in how the entire system works, and would be motivated to do their bit to keep it working to their benefit. Indeed, if it were accepted that that was the only way that the system really did work, then it need not even be strictly enforced. It would be structurally stable.

If you will bear with me, I'd like to reflect this back onto a system on which we in our Society depend. It is our paper submission, review, and publication system, a problem in paper flow, not fluid flow.

What if paper feedback were used to moderate our GRS Transactions publication system? One can imagine the result if the practice were adopted of sending papers for review only to authors whose own papers were awaiting completion of the publication process. There might be some resistance at first, but should the idea catch on, it would benefit everyone. The key, of course, is that suddenly everyone would have a vital interest in how the entire system works, and would be motivated to do their bit to keep it working to their benefit.

There are problems with this little analogy, but it has its points. Of course, one has to avoid an explicit comparison between city sewage and submitted papers. Reviewers do make helpful comments on manuscripts, but by and large the quality of papers sent to T-GRS is very good. No, the issue here is the response time of Reviewers themselves. The thought is that Reviewers might approach the review process with rather more eagerness if they perceived that their own papers would be published more rapidly as a result. Our Editor is concerned, justifiably, about the review delays. The Associate Editors have

plenty to do without having to harass reviewers. Paper feedback (raised here only as a thought experiment) would be one method of improving Reviewer response time.

The delays in Peer review have been discussed at AdCom. A target cycle time of two weeks for the peer review process was recommended by our Editor. Such efficient reviews are possible, I believe, if we all recognize the power of shared group action, or lethargy. AdCom has no intention of instituting a "review or paper perish" approach as lightly suggested above, but on reflection, it should not be necessary. There is a paper feedback process already at work, although distributed and subtle. Seen globally, we do review our own papers.

What if each of us, on receiving future "gifts" from an Associate Editor, were to respond rapidly, as we would do for our own galley proofs, for example? If it were accepted that this is the only way that the system really does work efficiently, then it need not even be strictly enforced. It would be structurally stable. We would all benefit.

R. Keith Raney

Editor's Comments



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First, I would like to thank the editors at IEEE for getting the last newsletter out on time. I hope this one makes it too, but if it is a bit late, it is my fault this time.

Another year, another IGARSS. The next issue will have all the news and photos but the cover of this issue really says it all! There will be an extra issue out in November (so expect one in September, November and December after this one) since we only had three last year.

The sports editor is on vacation this time so I hope you find some other interesting articles to read instead. I am also short on feature articles--doesn't anyone out there have something interesting to talk about???



IEEE

GEOSCIENCE AND REMOTE SENSING SOCIETY

Dr. R. Keith Raney
President

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Vice President Dan Quayle
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National Space Council
c/o The White House
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17 April 89

Dear Vice President Quayle:

Ref: LANDSAT and U.S. Policy

I am writing to you at the behest of the Administrative Committee and on behalf of the members of the IEEE Geoscience Remote Sensing Society, a professional organization of more than 2000 scientists in the United States and abroad. We feel an increasing sense of concern and dismay over the continuing uncertainty surrounding the LANDSAT program.

When the agreement with EOSAT was signed in 1985, it seemed that at long last the United States had worked out a satisfactory method to continue the LANDSAT satellite remote sensing program. Since 1985 the program has continued, with difficulty at times, but successfully. EOSAT has maintained global data collection to the benefit of all parties involved. Now, after months of renewed discussion about the future of LANDSAT 5, we watch with extreme concern the unbelievable prospect that the LANDSAT program may disappear or die of neglect.

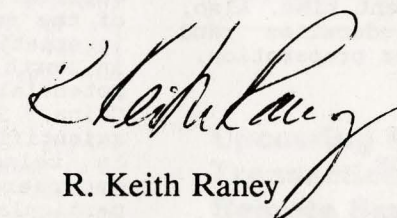
From our point of view, the LANDSAT earth observations program is one of the finest examples of the United States' global leadership, an evidence of genuine concern for the well-being of all humankind and not just for the economic bottom line. Whereas it is true that many thousands of jobs have been created in "high tech" industries as a direct consequence of the LANDSAT program, such as sensor development, image processing hardware and techniques, ground station equipment, etc., we feel that the value of the program to the United States and to the global community goes far beyond tangible and immediate financial benefits.

The program has been a notable scientific and technical success. LANDSAT, through both technical leadership and environmental information, has nurtured the science and applications of satellite observations to monitoring and management of earth resources. The LANDSAT heritage is now seen to have been extremely timely because we have the proof of the calibre of technical tools needed to monitor critical global changes the planet is undergoing. The LANDSAT series of satellites has provided a unique record of the landmass of the Earth and its change over a long period. Even though 17 years is a short time for many scientific purposes, it is the best and only such record in the world.

Whereas the program has demonstrated its value for better management of resources in many countries of the world, significant and long range consequences require substantial and long range employment of these techniques. Users of LANDSAT data are convinced of the value of the satellite program, but they require and deserve assurance of data continuity upon which to base their natural resource management plans. Indeed, a recent study of the global use of remote sensing technology showed that perceived concern about continued availability of LANDSAT data was one of the chief obstacles preventing its wider use.

The LANDSAT program illustrates the benefit of science and technology to the modern world. It is tangible evidence of the concern of the US citizens for the well-being of other nations. It has been a scientific and technical success worthy of national pride. It has yielded unparalleled data for scientific research and global change monitoring. We hope and trust that a way will be found to continue the operation of the LANDSAT series without a break.

Sincerely,



R. Keith Raney

International Space Year: Mission to Planet Earth

The International Space Year (ISY) is a program intended to "acknowledge, celebrate and further develop the benefits of space for all humanity". It will take place in 1992 which marks the 500th anniversary of Columbus' voyage of discovery as well as of several other significant events for various space nations.

ISY was initially proposed by the U.S. where the National Aeronautics and Space Administration was directed by President Reagan in 1986 to lead an interagency effort to develop the ISY concept. Subsequently, several international meetings were held in Kona, Hawaii (1987); Durham, New Hampshire (1988); Abingdon, U.K. (1989); and Frascati, Italy (1989). At the Durham meeting, Mission to Planet Earth was adopted as the principal theme of the ISY with support of all the space agencies present. A Space Agency Forum on the International Space Year (SAFISY) was also established at the meeting. SAFISY currently has 20 members representing space nations around the world. SAFISY formed two panels, Panel of Experts on Science and Technology and Panel on Education and Applications.

At the Abingdon meeting, specific proposals for activities that could culminate in 1992 or shortly thereafter were further developed. Currently, projects are being planned by the Panel of Experts in three categories: Space Data for Global Change; Global Information System Test; and Global Change Outreach. The following individual projects are under preparation (lead agencies and participants identified at the Frascati meeting are also shown). It should be noted, however, that this list is tentative at the present time. Also, detailed plan for the education and application activities is under preparation.

A. SPACE DATA FOR GLOBAL CHANGE

1. LAND COVER CHANGE PROJECT
LEAD: TBD
PARTICIPANTS: CANADA, FRANCE, US, ESA, ITALY, EEC, JAPAN, CHINA
2. GREENHOUSE EFFECT DETECTION PROJECT
LEAD: US (NASA)
PARTICIPANTS: CHINA, UK, JAPAN
3. OCEAN-CLIMATE INTERRELATIONSHIPS PROJECT
LEAD: ESA
PARTICIPANTS: UK, FRANCE, FRG, JAPAN, CANADA
4. POLAR OZONE HOLE PROJECT
LEAD: NASA/FRG
PARTICIPANTS: UK, CHINA, SWEDEN, ITALY, JAPAN

B. GLOBAL INFORMATION SYSTEM TEST

1. PRODUCTIVITY OF THE GLOBAL OCEAN
LEAD: TBD
PARTICIPANTS: EEC, FRANCE, CANADA

2. RATE OF DEFORESTATION
LEAD: ITALY
PARTICIPANTS: UK, CHINA, FRANCE, EEC, INDIA
3. SEA SURFACE TEMPERATURE
LEAD: JAPAN
PARTICIPANTS: UK, ITALY
4. POLAR ICE EXTENT
LEAD: ESA (FRG) / JAPAN
PARTICIPANTS: SWEDEN, ITALY

C. GLOBAL CHANGE OUTREACH

1. ENCYCLOPEDIA OF GLOBAL CHANGE DATA
LEAD: CANADA
PARTICIPANTS: CHINA, ITALY, JAPAN, FRG
2. GLOBAL CHANGE ATLAS
LEAD: TBD
PARTICIPANTS: CHINA, JAPAN

To give an idea of the type of activities planned, general information is given on two projects in which the writer is personally involved.

The **LAND COVER CHANGE** project aims to use space measurements to establish the foundation for the prediction of the global consequences of land cover change. As an initial step, a methodology will be established for mapping land cover in selected pilot areas. Because of the emphasis on the development and validation of a globally applicable methodology, the project will rely on AVHRR data which can provide global coverage over relatively short time periods; high resolution satellite as well as aircraft and ground data will be employed over selected sites to obtain more detailed information and to test the accuracy of the results. The project is a cooperative international effort with study sites located in North America, Europe, west Africa, and potentially several other regions including China, South America, and Australia. The scientific basis and direction for the project is being provided by the International Geosphere-Biosphere Programme (IGBP), particularly Working Group 1 (Data and Information Systems) chaired by S.I. Rasool from the U.S.; the ISY will thus provide an initial impetus and a direct contribution to the IGBP.

ENCYCLOPEDIA OF GLOBAL CHANGE DATA is an outreach project with the following objectives: to increase public awareness of the value of space observations of the Earth; and to make space data sets and tools for monitoring environmental phenomena available to scientists, teachers, students, decision makers and other potential users. The project is a more ambitious version of an existing IGBP Diskette Project (also coordinated by the IGBP WG 1) in which processed satellite data and ancillary environmental data of Africa will be distributed on floppy discs, free of charge, to interested individuals around the world. A basic software package will also be included, thus allowing the user to manipulate and analyze the data. An IBM PC-compatible microcomputer with a graphics card is the only required hardware. The **ENCYCLOPEDIA** project

will differ by the types and volume of data included (global and regional sets from AVHRR, CZCS and other sensors), the types and extent of ancillary data, software capabilities, and distribution media (diskettes as well as CD ROMs are being considered).

The ISY offers a unique opportunity for the remote sensing community to publicize the results and benefits of space observations, and to promote further progress of the science and technologies involved. Its theme **MISSION TO PLANET EARTH** also focusses on an area of intense current political and scientific, namely global change. As Professor T.F. Malone noted at the Durham meeting:

"WE STAND ON THE THRESHOLD OF A RENAISSANCE IN THE SCIENCES CONCERNED WITH THE PLANET EARTH, INCLUDING ITS FLORA, FAUNA, AND THE HUMANS WHO CALL IT THEIR HOME. THIS RENAISSANCE HAS ITS ORIGINS - IN NO SMALL PART - IN THE POWERFUL OBSERVATIONAL CAPABILITY PROVIDED BY SPACE TECHNOLOGY. ITS FULFILLMENT IS CONDITIONED -

IN NO SMALL MEASURE - ON THE INITIATIVE, IMAGINATION, AND ACTIVE INVOLVEMENT OF THE INTERNATIONAL COMMUNITY OF SPACE AGENCIES. THIS INVOLVEMENT IS MORE THAN MERELY SUPPLYING THE PROMISING NEW TECHNOLOGY OF "REMOTE SENSING". IT WILL REQUIRE INTENSIVE PARTICIPATION IN THE BIRTH OF A SWEEPING NEW SCIENCE, ONE THAT PROMISES TO ILLUMINATE OVER THE NEXT FEW DECADES THE INTIMATE INTERACTION OF THE GEOSPHERE AND BIOSPHERE AND THE ROLE OF HUMAN ACTIVITY IN INDUCING GLOBAL CHANGE. ..."

GRSS members can obtain more information from the various space agencies, or by contacting US International Space Year Association (600 Maryland Avenue S.W., Suite 600, Washington, D.C. 20024).

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Feature Articles Solicited for Future GRS-S Newsletters

The Editorial Staff of the Geoscience and Remote Sensing Society Newsletter continues to actively solicit feature articles which describe remote sensing activities taking place in industry, government, and universities. Emphasis is being placed on providing the reader with a general understanding of the technical problems being addressed by various organizations, as well as their capabilities to cope with these problems.

The multidisciplinary nature of GRS provide opportunities for interactions between different fields and use the resulting synergism for further advances in different areas. This also presents the challenge of becoming familiar with the applications, technologies and terminologies of too many fields. To help ease this problem, we are soliciting survey papers on remote sensing methods, applications and hardware pertaining to different disciplines. These survey articles will also be useful reference sources for newcomers to each field.

Consulting

Business cards (3" x 2 1/2") may be published for a fee of \$50 per card on the equivalent space. Payment should be made to "Geoscience and Remote Sensing Society" and should be submitted with the card to the Newsletter editor.

Upcoming Special Issues of the Transactions on Geoscience and Remote Sensing

May, 1990: DMSP's SSM/I

July, 1990: Special Issue on IGARSS 89
(Papers due September 30, 1989)

IEEE USA HOT LINES

IEEE-USA Hot Lines is designed to provide IEEE Sections and Societies with up-to-date information on United States Activities.

IEEE publication editors who receive IEEE-USA Hot Lines can use entirely or excerpt from the contents.

We invite your comments on format, content, and lead time.

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Joseph A. Edminister, Editor—Catherine S. McGowan, Associate Editor

DoD Testimony—IEEE-USA Defense R&D Committee Chairman Paul Hazan presented testimony before the House Subcommittee on Defense in April to address views about U.S. Department of Defense R&D programs and policies. He said DoD's technology base programs can be instrumental in promoting industrial, academic and government laboratory collaboration to defense mission needs, but to do so, "the proportion of funding directed toward technology base programs needs to be increased substantially."

He suggested that the effectiveness of DoD's Independent R&D reimbursement program could be improved further by switching to a two-year review and negotiation cycle. He also said that earmarking funds for colleges and universities can be controlled without adversely affecting smaller colleges or the flexibility DoD needs to obtain services cost-effectively.

Copies of Mr. Hazan's testimony are available from the IEEE-USA Office in Washington, D.C.

Salary Survey—The 1989 *IEEE U.S. Membership Salary and Fringe Benefit Survey* is now available. This year's *Survey* explores more than 50 variables that affect engineers' salaries and fringe benefits. Highlighted are retirement planning, pension practices, early retirement issues, and salary progression. *Survey* findings include:

- The 1988 mean, pre-tax income of non-student U.S. IEEE members was \$54,700. Survey respondents who were working fulltime in their primary area of technical competence in 1988 earned an average of \$56,000.
- Mean salaries in cities with the highest concentration of electrical and electronics engineers include \$59,000 (San Francisco); \$58,000 (New York City); and \$56,100 (Washington, D.C.).

According to IEEE-USA Salary Survey Committee Chairman James H. Beall, "electrical, electronics, and computer engineers may fare well in comparison with other professionals when considering inflation, salary compression, and unemployment. Despite large increases in mean nominal income, electrical engineers are staying even with inflation."

The *Survey* measures income by highest academic degree, experience, age, sex, primary area of technical competence, employment sector, job function, company size, and Metropolitan Statistical Areas. A section on fringe benefits covered employer and employee participation in life, health, and accident insurance, as well as medical plans, pensions, supplementary retirement plans, continuing education, and vacation allowances.

The 1989 *Survey* is available from the IEEE Service Center for \$59.95 (member) and \$79.95 (nonmember). Shipping and handling charges are additional, and New Jersey residents should add six percent sales tax. To order your copy, call the Service Center at (201) 981-1393. Please specify IEEE Catalog Number UH0183-4.

New Position—The United States Activities Board recently approved an IEEE-USA Position Statement on "Biological Effects of Power-Frequency Electric and Magnetic Fields." In preparing the position, IEEE analyzed six scientific committee reports related to power-frequency electric and magnetic fields in response to growing public interest in this issue.

"All of these reports concluded there is insufficient information to define safe and unsafe field levels," the position states. "In general, there is not enough relevant scientific data to establish whether common exposure to power-frequency fields should be considered a health hazard."

The group that prepared the position agreed that more research is needed to define safe limits of human exposure to these fields. Copies of this position are available from the IEEE-USA Office in Washington, D.C.

HDTV—United States Activities Board Chairman Edward C. Bertnolli sent a letter to Federal Aviation Administration (FAA) Acting Administrator Robert E. Whittington and to U.S. Secretary of Commerce Robert A. Mosbacher to express IEEE-USA's concern about recently publicized FAA plans to award a \$1 billion contract to a Japanese television manufacturer for advanced radar screens, or high-resolution displays, for U.S. air traffic control systems.

"The U.S. electronics technology base is in a crisis situation," Dr. Bertnolli wrote. "The advent of high-definition television presents both an opportunity and a challenge for this country to regain a competitive edge in consumer electronics, an industry the United States has lost to foreign competitors."

He said the magnitude of the proposed FAA purchase of foreign-owned HDTV technology "could create serious disincentives for U.S. industry." The fact that the foreign-owned manufacturer being considered is subcontracted by an American-owned firm is immaterial, according to Bertnolli, since the technology involved is foreign.

"In order to give U.S. industries the opportunity to develop a competitive technology, the rapid delivery requirements of the FAA should be reconsidered," he said, adding that U.S. technology should be available in the proper timeframe for FAA's upgrading plans.

Supercomputers—USAB Chairman Edward C. Bertnolli, IEEE-USA Committee on Communications and Information Policy (CCIP) Chairman John M. Richardson, CCIP Members John Riganati and Alan McAdams, and IEEE-USA staff member Heidi F. James briefed Rep. Richard A. Gephardt (D-Missouri) recently on issues related to supercomputers, semiconductors, and high-definition television, and on the relation of these issues to the competitive stance of the United States.

Rep. Gephardt, who requested the briefing after reading CCIP's report on "U.S. Supercomputer Vulnerability," found the briefing "very informative" and invited the IEEE-USA group to brief the House Democratic Task Force on Trade Competitiveness in early May. The Task Force has since asked the group to return for the June meeting.

The group, along with IEEE-USA Congressional Fellow Denis King, also met with Rep. Robert A. Roe (D-New Jersey) to discuss these issues. Rep. Roe asked the group to keep him informed of progress made in these areas and urged them to seek opportunities with other Members of Congress. The group has since arranged a briefing with Rep. Don Ritter (R-Pennsylvania).

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Joseph A. Edminister, Editor—Catherine S. McGowan, Associate Editor

Congressional Fellows—The United States Activities Board recently approved recommendations for two 1989–1990 Congressional Fellowships. Mr. Philip M. Paterno and Dr. Alfred E. Victor will take one-year leaves of absence to work in selected staff assignments on Capitol Hill. They will begin their Fellowships on January 1, 1990.

Mr. Paterno has been a district manager at AT&T since 1978. He is responsible for developing computer models to estimate and verify access expense from local exchange companies and for developing methods, computer tools, training and guidance for Bell System service costs groups.

Dr. Victor is program manager of the Joint Service Airborne Self-Protection Jammer at the Naval Air Systems Command in Washington, D.C. He manages the joint Navy-Air Force service's development, test and production of the Department of Defense's largest electronic warfare jammer for common application on tactical aircraft. He received his bachelor's degree in Naval Science from the U.S. Naval Academy, and his Master's and Ph.D. in Physics from Brown University.

Applications will be accepted until March 30, 1990 for the 1990–1991 IEEE-USA Congressional Fellowships. For more information on the program or for an application kit, contact the IEEE-USA Office in Washington, D.C.

Electronics—Seventy representatives of industry, government, academia and professional societies participated in a workshop in June to discuss the role of a U.S. dynamic random access memory (DRAM) initiative in revitalizing the U.S. electronics base. The attendees focused on the announcement of the formation of U.S. Memories, Inc. (USM). They endorsed the broad outlines of USM's DRAM initiative, endorsed establishment and support of similar ventures, and called on the U.S. government to respond affirmatively.

The workshop, convened by IEEE-USA, was the second held to discuss a national initiative for electronics industries. According to a consensus statement delivered to Capitol Hill after the workshop, the USM initiative is required, "if the United States is to reestablish a strong technology and manufacturing base." USM's and other initiatives can provide significant American-owned, controlled and secure sources of supply of DRAMs; can provide additional markets for the semiconductor manufacturing equipment sector; and can complement the overall efforts and contributions of SEMATECH, the semiconductor manufacturing industry consortium.

The group called on government to support industry-led initiatives for dual-use (civilian and military) technologies by providing an environment and incentives that are economically attractive and reduce risks to U.S. participants.

Careers Conference—"Engineers and Engineering Managers—Career Challenges of the 1990s" is the theme of the sixth biennial IEEE-USA Careers Conference, to be held at the TradeWinds Hotel in St. Petersburg, Florida, from November 1 through November 3. This two-and-a-half-day Conference will be sponsored by IEEE-USA's Career Maintenance and Development Committee.

This year's Conference will address such topics as the competitive environment for engineering in the 1990s; a comparison of U.S. and Japanese engineering careers; the impact of restructuring and new organizational structures on engineering careers; career transitions; and engineering productivity, among others.

The cost of the Conference is \$225 for members and \$300 for nonmembers. However, if you register before October 2, the cost will be \$175 for members and \$250 for nonmembers. The registration fee includes admission to all sessions, an opening reception, two lunches, all breaks, and a *Conference Record*. For more information or to register, contact the IEEE-USA Office in Washington, D.C.

Awards—The United States Activities Board recently announced the recipients of 1989 IEEE-USA achievement awards:

- Distinguished Public Service—Erich Bloch, Director of the National Science Foundation, for his efforts to enhance the understanding and status of engineering and technology on a Federal level.
- IEEE-USA Citation of Honor—William W. Middleton, for enhancing the IEEE-USA Awards program; John J. Miller, for originating, developing and documenting leadership in Section organizations, and training initiatives; and Ralph W. Russell, II, for attracting member support for state legislative programs and precollege math and science education programs.
- Regional Professional Leadership Award—Michael R. Andrews (Region 6), for developing precollege math and science education programs for students and teachers in the Phoenix, Arizona, area; Mark H. Arndt (Region 6), for his ongoing efforts in Washington state to increase the public's awareness of nuclear energy; Peter Bergsneider (Region 6), for developing a coalition of city government, local industry, local schools, parents and children to operate a Young Scientists and Engineers program in Fort Huachuca, Arizona; Carl K. Kintzel (Region 4), for his dedication to local and Regional congressional activities in Region 4; and Wallace A. Skelton (Region 2), for planning, publicizing and supporting career development workshops and presentations in Region 2.
- Professional Achievement—Walter Bury, for providing IEEE leadership in the Missouri Science Olympiad and for his efforts to establish an intersociety legislative group in the Kansas City area; Bernard H. Manheimer, for his activities related to environmental quality, energy and man-machine systems; and John E. Spencer, Jr., for promoting engineering awareness at Alabama's local political level.

Nominations are open until March 15 for IEEE-USA Awards for 1990. Other awards presented by IEEE-USA include awards for Distinguished Contributions to Engineering Professionalism and Divisional Professional Leadership, as well as two literary contributions awards. For information, award descriptions and nomination forms, contact the IEEE-USA Office in Washington, D.C.

Future IEEE International Geoscience and Remote Sensing Society (IGARSS) Symposia

Year	Place	Sponsors	Host	Dates
1989	Vancouver, B.C., Canada	IEEE/GRS, URSI Canadian Remote Sensing Society	University of British Columbia	July 10-14
1990	Washington, D.C.	IEEE/GRS, URSI	University of Maryland/GSFC	May 21-24
1991	Espoo, Finland	IEEE/GRS, URSI	Helsinki University of Technology	June 3-7
1992	Houston, Texas	IEEE/GRS	University of Houston/ Houston Area Research Center	May
1994	Pasadena, CA	IEEE/GRS	CalTech/JPL	

Proposals for Future Symposia

The Society is presently considering proposals to host IGARSS 1993 and soliciting proposals for 1995 and beyond. Interested parties should direct inquiries and submit proposals to:

Dr. Keith Carver
University of Massachusetts
Dept. of Electrical & Computer Engineering
Amherst, MA 01003

Proposals should include at least, but not limited to, the following:

- Year, Date (usually between May-September to last 3-4 days)
- Place (Country, State, City)
- Host Institutions, Groups or Agencies
- Conference Technical Chairman
- Steering Committee
- Conference Facilities
 - Technical Sessions
 - Hotel Accommodations
- Anticipated Number of Attendees
- Potential Sponsors (confirmed and unconfirmed)
- Preliminary Budget (in USA dollars at the prevailing rate of exchange)
 - Income
 - Registration Fees
 - Publication Sales of Conference Digest at Conference (include about 400 copies to IEEE @\$60/copy)
 - Exhibits
 - Social Functions
 - Other
 - Expenses
 - Promotional Costs
 - Administrative Costs
 - Publication of Conference Digest
 - Social Functions
 - Exhibits
 - Committee Expenses

Potential sponsors should consider in preparation and submission of proposals weather conditions, accessibility to travel, availability of reasonable accommodations (for technical meetings, meals, and lodgings), and no conflicts with other known meetings of closely related societies such as URSI (Commissions B and F), SEG, IEEE Antennas and Propagation Society, IEEE Microwave Theory and Techniques.

First Call for Papers

University of Maryland

College Park,
Maryland, U.S.A.

May 20-24, 1990

V. Salomonson,
General Chairman
NASA/Goddard
Space Flight Center



Institute of Electrical
and Electronics Engineers



Geoscience and Remote
Sensing Society

International Union
of Radio Science



U.S. National Committee
Commission F

Sponsors:
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1990 INTERNATIONAL GEOSCIENCE AND
REMOTE SENSING SYMPOSIUM
(IGARSS '90)



Remote Sensing Science for the Nineties

The 1990 IEEE International Geoscience and Remote Sensing Symposium (IGARSS '90) will be held jointly with URSI/USNC Commission F at the University of Maryland, College Park, from May 20 to May 24, 1990. This location is 10 miles from downtown Washington, D.C., the Nation's Capital.

IGARSS '90 will be the tenth of its kind and will provide extensive concurrent forums for technical presentations on instrumentation, theory, and experimentation.

The theme of IGARSS '90 emphasizes the full suite of advanced sensors and information systems becoming available during the last decade of this century. Specially organized sessions are planned to focus on our ability to exploit multifrequency measurements of media using inversion strategies, to bring together theorists and experimentalists in the various energy regimes, and to examine techniques for extracting important parameters and state variables for input into regional and global-scale process models.

The technical sessions will be coordinated to provide a comprehensive and well-balanced program of submitted and invited papers. Authors are encouraged to submit papers on all topics of interest to the Geoscience and Remote Sensing Society and URSI Commission F. The topics listed below are intended as suggestions; full consideration will be given to papers on other relevant subjects. Inquires regarding the technical program may be directed to the Technical Program Committee Chairmen indicated on the reverse.

Suggested Topics for URSI Commission F

- Subsurface Sensing and Inversion
- Electromagnetic Techniques:
 - Theoretical Models and Prediction
- Modeling and Measurement of Propagation Effects
- Optical Sensing of Atmospheric Parameters
- Polarimetric Scattering
- Propagation Through Random Media
- Radio Meteorology:
 - Precipitation Attenuation and Depolarization
- Radio Oceanography
- SAR Ocean Backscatter Modeling
- Rough Surface and Volume Scattering
- Scattering From Land and Vegetation
- Telecommunications Studies
- Tropospheric Effects on Propagation

Suggested Topics for IGARSS '90

- Advanced Sensors
- Agriculture and Land Use
- Artificial Intelligence and Expert Systems
- Atmospheric Remote Sensing
- Bidirectional Studies
- Biospheric Remote Sensing
- Coastal Processes
- Correction Techniques
- Dielectric Properties of Natural Media
- Ecology and Ecosystem Processes
- Emission From Natural Media
- Geodynamics
- Geologic Remote Sensing
- Geophysical Instrumentation and Methods
- Glaciology
- Hydrologic Remote Sensing
- Image Processing and Registration
- Infrared/Optical Instruments and Sensing
- Interdisciplinary Studies
- Inversion Methods
- Lidar Sensing
- Meteorologic Remote Sensing and Climatology
- Microwave Instruments and Sensing
- Millimeter Wave Instruments and Sensing
- Multisensor Approaches
- Oceanographic Remote Sensing
- Pattern Recognition
- Polarimetric Laser Sensing
- Radar Systems and Observations
- Remote Sensing Models
- Regional and Global-Scale Remote Sensing Inputs to Models
- Spaceborne and Airborne Remote Sensing Missions
- System Calibration

DEADLINE: All summaries and abstracts must be received by
November 17, 1989



IEEE

THE INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS, INC.,
BOMBAY SECTION

TENCON '89

SECOND CALL FOR PAPERS

TENCON '89

IEEE Region 10 Conference

*"Information Technologies for the 90s"*E²C²: Energy, Electronics, Computers, Communications
22, 23, 24 November 1989, Bombay, India

Organised by

The Institute of Electrical & Electronics Engineers, Inc., Bombay Section

In Co-operation with



IEEE Computer Society



IEEE Communications Society



IEEE Industrial Electronics Society



International Centre for Theoretical Physics (ICTP), and,

DOE, DOT, DST, C-DOT, IE(I), IETE, TRC, Nehru Centre, Nehru Science Centre, ITI, ET&T, IEEE Tokyo Section,
IEEE Hongkong section, IEEE Korea Section.

- ★ Tencon '89 is the fourth in a series of international conferences of IEEE Region 10 (Asia, Oceania and Japan), presenting work in all areas of electrical and electronics engineering.
- ★ An unique occasion for professionals, engineers and scientists from the academia, industries and public administrations from the region to exchange ideas and information between themselves and with participants from elsewhere.
- ★ Special emphasis on making science work for the development of the region and on socio-economic importance of modern technology. Suggested areas:

NETWORKS

ISDN, Standards, Transmission Media, Network Management, Local Area Networks, Global Networks, Special Networks.

COMMUNICATIONS SYSTEMS

Optical Communications, Microwave Communications, Satellite Communications, Computer Communications, Mobile Radio, Remote Area Communications, Transmission Media/Systems, Switching Technologies Analyses and Rural Communications.

SIGNAL PROCESSING

Speech Analysis and Recognition, Coding, Digital Modulation, Filters, Image Processing, Adaptive Signal Processing.

COMPUTERS AND APPLICATION

Parallel Processing, Distributed Processing, Fault Tolerant Computing, Networking, Office Automation, Pattern Recognition, AI, Expert Systems, Robotics, Automation, Databases.

CIRCUITS AND DEVICES

Devices, ICs, VLSI/ELSI/ASIC, Photonics, Super-conductors

ENERGY

Energy Conversion, Power Delivery Systems, Non-conventional Sources of Energy, Power electronics

SOCIO-ECONOMIC ISSUES

Regulatory Issues, Standards, Cost-benefits Analysis, Societal Issues, Public Policy Issues.



IEEE

TENCON '89

TENCON '89 invites proposals for papers in any of the technical areas listed overleaf. The Technical Programme Committee will select papers for presentation and organise the final programme. Papers accepted for presentation will be included in the proceedings to be brought out at the time of the conference. Submission of a proposal implies a commitment to present a paper, if accepted.

TO SUBMIT A PROPOSAL

Prepare a 400 word, 1 page summary of the paper (diagrams may be included if appropriate).

Send FIVE copies of the summary and Paper Description Cover to:

Chairman, Technical Programme Committee, TENCON '89
C/o Hakotronics Pvt. Ltd.,
Victoria Gardens,
Bombay - 400 027, (INDIA)

SCHEDULE FOR SUBMISSION

Proposal for submission of paper to be received by : May 31, 1989

Notification of acceptance will be mailed by : June 30, 1989.

Photo-ready paper to be received by : July 31, 1989.

For urgent communication contact:

M. V. Pitke, Bombay

Telex: 011-3009 TIFR IN

Thomas Kailath, Stanford

FAX: 415-723-8473

E-Mail: kailath@isl.stanford.edu

J. Srivastava, Uni. of Minnesota

Tel: (612) 625 4012

FAX: (612) 624 6369

C.C. Hang, NUS, Singapore

Tel: 7722194

Telex: RS 33943 UNISPO

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Radar — '90 Conference

- oo 7-10 May 1990, Marriott Crystal Gateway Hotel, Arlington, Virginia, USA
- oo Subject Matter: Radar systems quite broadly, subsystems and phenomena. Program composed of refereed contributed papers responding to call, with some, but very few, invited special presentations.
- oo Paper submittal: Substantial drafts (2000-3000 words, author convenient format) to Russell J. Lefevre, Technology Service Corporation, 2950 31st Street, Santa Monica, California 90405-3093, USA. Drafts due by 15 August 1989.
- oo Registration: Fees approximately \$200; tutorials at \$50 extra; luncheons and banquet planned.
- oo Committee Executives:
Robert T. Hill, General Chairman
Fred N. Nathanson, Deputy Chairman
C.J. Myers, Treasurer
- oo Conference Address: IEEE International Radar Conference - "RADAR-90"
c/o ITT Defense
1000 Wilson Blvd., 30th Floor
Arlington, VA 22209-3905
USA

Phone: (703) 247-2971

23rd International Symposium on Remote Sensing of Environment Bangkok, Thailand 18-25 April 1990

Abstract Due Date: 16 October 1989

Organized and conducted by: Environmental Research Institute of Michigan
P.O. Box 8618 Ann Arbor, MI 48107-8618
telephone: 313-994-1200, ext. 2290 or 3886
fax: 313-665-6559 telex: 4940991 ERIMARB

In cooperation with: Asian Association on Remote Sensing

PIERS 1989

Progress In Electromagnetics Research Symposium
and
NSF Workshop On Future Directions in Electromagnetics Research

July 25-27, 1989
Boston, Massachusetts

The first Progress in Electromagnetics Research Symposium (PIERS) will be held July 25-26, 1989, at the Boston Sheraton Hotel & Towers, Boston, Massachusetts. The NSF Workshop on Future Directions in Electromagnetics Research will take place on July 27, 1989.

PIERS

PIERS will provide an international forum for reporting progress and advances in the modern development of electromagnetic theory and its new and exciting applications. PIERS 1989 will consist of the following thirty-two technical sessions with a total of over 300 papers.

• System, Calibration, and Polarization of Micro and Millimeter Wave Remote Sensing • Basic Studies in Microwave Remote Sensing • Optical Scattering in Terrain and Atmospheric Environments • Wave Propagation in Complex Media • Singular Expansion Method (SEM) Review and Future Directions • Electromagnetism and Semiconductors • Antennas • Electromagnetic Theory and Wave Guidance • Microwave Radiometry from Space • Rough Surface Scattering • Direct and Inverse Methods in Radar Polarimetry • Propagation, Diffraction, and Scattering in Fractal Media • New Vistas in Computational Electromagnetics • MM-Wave Transmission • Antenna Design • Numerical Methods and Strip Lines • Imaging Radar Polarimetry: Systems and Applications • Techniques in Random Media • Inverse Scattering and Its Applications • Electromagnetic Behavior of Bianisotropic Media • Numerical Methods - Time-Domain Problems • Ionosphere and Lightning Research • Electromagnetic Analysis and Applications • EM Theory and Solution Techniques • Radar Clutter Research • Waves in Random Media • Inverse Theory and Applications • Electromagnetic Propagation in Composite Media • Electromagnetic Field Computation • Medical Applications of Microwaves • Propagation and Radiation in Microstrip Structures • Waves in Inhomogeneous Media

NSF WORKSHOP

All participants are invited to attend the NSF Workshop on Future Directions in Electromagnetics Research following PIERS. The Workshop consists of a panel of experts in the various fields of electromagnetics who will report their summaries and recommendations at a plenary session planned for the morning of July 27, 1989. The panel members will be available to answer questions from the audience and to address issues related to the future developments in the research of electromagnetic theory and applications.

REGISTRATION FEES

The registration fee for all participants, including session chairpersons and authors, is US\$120 if payment is received by June 26, 1989. After June 26, and during the meeting, the registration fee will be increased to US\$160. The fee includes the reception, attendance at all sessions, refreshments, and the Symposium program and proceedings. Refunds will be made if requested before July 10, 1989, with a service charge of US\$25.

ADVANCE REGISTRATION

All participants are encouraged to preregister for PIERS. To preregister, complete the enclosed PIERS registration form, with your check, money order, or bank draft in US Currency, made payable to PIERS, and send to the PIERS OFFICE. Remittance not in US currency will be returned.

ON-SITE REGISTRATION

Registration for all participants will be at the Sheraton Boston Hotel & Towers July 24, 1 pm through 7 pm, and July 25-26, 7:30 am through 5 pm. Badges and Symposium programs and proceedings will be waiting for those who have preregistered.

SYMPOSIUM SITE AND OFFICE LOCATION

All PIERS technical functions will be held in the Sheraton Boston Hotel & Towers, Boston, Massachusetts, USA, Tel: 617-236-2000. Technical sessions of PIERS will be on the third floor, Conference Level, July 25-26. All participants are invited to attend the NSF Workshop on July 27.

The PIERS Office will be at MIT, Room 26-305, Cambridge, MA 02139, USA, Tel: 617-253-8535, before July 24, 1989 and after July 27, 1989. The PIERS Office will be in the Kent Room at the Sheraton Boston Hotel during the Symposium from 1 pm July 24 to 1 pm July 27, 1989.

Inquiries should be addressed to:

Professor J. A. Kong
MIT Room 26-305
77 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139, USA
TEL: 617-253-8535
FAX: 617-253-0987



IEEE

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

UNITED STATES ACTIVITIES

Announces the 18th Annual Competition for

1990-1991

IEEE-USA Congressional Fellowships

A CONGRESSIONAL INTERNSHIP FOR MEMBERS OF IEEE

PROGRAM: Electrical and Electronics Engineers and Allied Scientists are competitively selected to serve a one-year term on the personal staff of individual Senators or Representatives or on the professional staff of Congressional Committees. The program includes an orientation session with other Science-Engineering Fellows sponsored by the American Association for the Advancement of Science (AAAS).

PURPOSE: To make practical contributions to more effective use of scientific and technical knowledge in government, to educate the scientific communities regarding the public policy process, and to broaden the perspective of both the scientific and governmental communities regarding the value of such science-government interaction.

CRITERIA: Fellows shall be selected based on technical competence, on ability to serve in a public environment and on evidence of service to the Institute and the profession. Specifically *excluded* as selection criteria shall be age, sex, creed, race, ethnic background, and partisan political affiliations. However, the Fellow must be a U.S. citizen at the time of selection and must have been in the IEEE at Member grade or higher for at least four years. Additional criteria may be established by the selection committee.

AWARDS: IEEE-USA plans to award at least two Congressional Fellowships for the 1990-1991 term. Additional funding sources may permit expansion of awards.

APPLICATION: Further information and application forms can be obtained by calling W. Thomas Suttle (202) 785-0017 at the IEEE-USA Office in Washington, D.C. or by writing:

Before October 1:
Secretary, Congressional Fellows Program
The Institute of Electrical and Electronics
Engineers, Inc.
United States Activities
1111 Nineteenth St., N.W.
Suite 608
Washington, D.C. 20036

After October 1:
Secretary, Congressional Fellows Program
The Institute of Electrical and Electronics
Engineers, Inc.
United States Activities
1828 L Street, N.W.
Suite 1202
Washington, D.C. 20036

Applications must be postmarked no later than March 30, 1990 to be eligible for consideration.

IEEE UNITED STATES ACTIVITIES

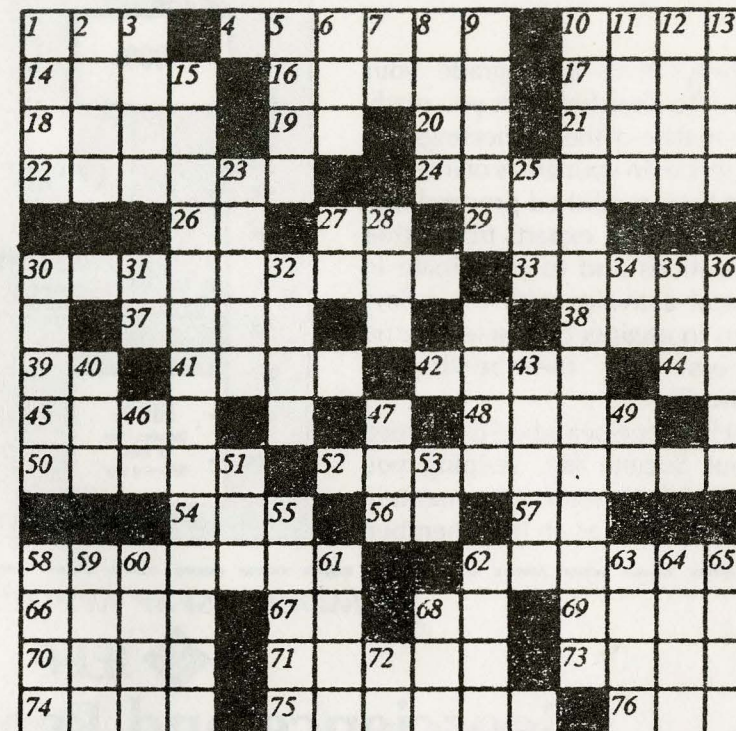
Across

1. And so forth to Nero.
4. Filter allowing DC drift.
10. This definition is not false.
14. Periods of time.
16. Half of Hispanola.
17. Harass using native tracker.
18. She rates a "ten" from Beaufort?
19. This one's for real, not just Ph.D.
20. All that glitters is not Au.
21. Prefix within?
22. Champagne bottles, riven.
24. Kelvin by his other name.
26. As opposed to jr.
27. Kin of 1. Across.
29. Suggests pleasant activities.
30. Reference to logical building block.
33. Author of wave domain downward continuation algorithm (seismics).
37. Home of Mother Lode?
38. Stravinsky to his friends.
39. Interference to noise ratio.
41. Computer driven simulation environment.
42. Magnesium silicate.
44. Famous WWII sort of soldier.
45. Analog infected digital system (a debugging computer virus)?
48. Adherents of firmly lodged idea?
50. Cumulo nimbus, for example.
52. Spatial pre-condition for combination of two images.
54. Old radio co. into satellites.
56. Direction taken by 80 m. band?
57. Temperature and Pressure as in Std. Raise.
62. Formal radar reflector?
66. "Walk a crooked ----"? Not in Metricland!
67. Macro command to enter Lap Link.
68. Hot band for the 8-14 set?
69. Ages and ages.
70. Level of confidence in cold fusion?
71. Noted Swedish GRS-S member.
73. Duty list.
74. Tactical electromagnetic system study (a Hardy damsel!)
75. Perceives at a distance.
76. DOS com. to list files.

Down

1. Medical R.S. records?
2. Pitfall, as in software.
3. Need a subroutine? Send for one!
5. You will meet resistance here.
6. Zero fill before fft?
7. Buzz words in intelligent circles.
8. Figs. don't lie, but liars sometimes use one of these.
9. Breaths of relief?
10. Competitor for SPOT.
11. Ball game scores.
12. Negates a "do" command?
13. College named after a collar?
15. Sound remote sensing practice.
23. Tendency, on average.
25. Operations cut short.
27. Visitor from outer space who wanted to phone home.
28. Petrol to Mrs. Thatcher.
30. Early computer.
31. Type size makes waves?
32. Within(within(within(...))).
34. .ot rof xiferP
35. Inverse op. to exp.
36. Triplet, as in chord.
40. Nothing goes in this space.
43. Milky prefix.

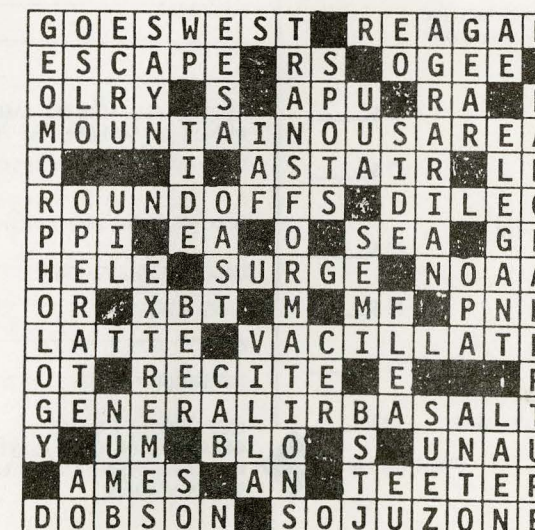
Remote Senses (#11)



R. K. Raney

- | | |
|--|--|
| 46. Initiates Fortran loop. | 60. Extremely low frequency systems. |
| 47. Japanese R.S. satellite. | 61. Logical alternative in if statement. |
| 49. Fast WWII patrol boat. | 62. Branched structure. |
| 51. Airport designator, Washington. | 63. Portable darkroom for old time photographer? |
| 53. Wave length band used in Europe. | 64. Opposed to. |
| 55. Book of maps. | 65. Tyrant should've avoided revolution. |
| 58. Radiator's active function. | 68. Elected ones. |
| 59. Concern of reliability people, and insurers. | 72. Nautical m. per hour. |

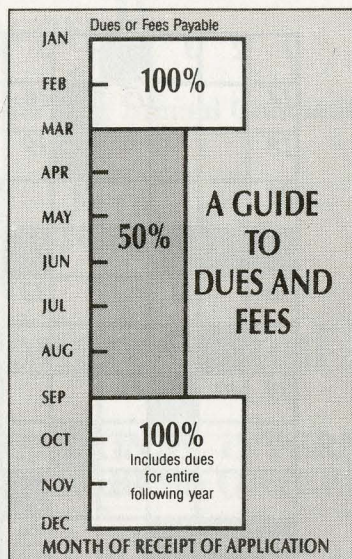
Remote Senses (#10)



Join your society today...

It's always time to upgrade your career. Membership gives you ready access to state-of-the-art meetings and conferences in your areas of interest, and to their published proceedings. You get to meet experts from other organizations and to participate in technical activities with the prime movers in engineering, science and business. Our membership is worldwide.

At least one periodical is included in your Society fee, keeping you abreast of the latest developments in your field. And, as an IEEE member,



you may choose from a wide range of books, Standards, conference records, employment surveys, short courses and other career-building aids—all at discounted member prices.

Please take this opportunity, now, to broaden your outlook, open your mind to new concepts, new techniques, new fields of interest. There will be no better time. Return the Membership Application form below.

(Students should contact their IEEE counselor or write for a Student Membership brochure.)

MEMBERSHIP APPLICATION



IEEE

Geoscience and Remote Sensing Society

Please check appropriate box(es) below:

All dues and fees below are annual rates. Indicate here whether you are remitting either 100% or 50% of these rates. (See chart above.)

☐ 100% ☐ 50%

Society fee: \$10.00 ☐ \$ _____
(Includes *Trans. on Geoscience and Remote Sensing*)

IEEE membership annual dues and (if applicable) Regional assessment payments.

U.S. \$73.00 ☐ \$ _____

Canada \$67.00 ☐ \$ _____

Europe, Africa & Mid. East \$68.00 ☐ \$ _____

Latin America \$57.00 ☐ \$ _____

Asia & Pacific \$59.00 ☐ \$ _____

TOTAL AMOUNT ENCLOSED ☐ \$ _____

Please mail to:



I am applying for the following as indicated:

☐ I am an IEEE member. Please enroll me in the above society.

IEEE member No.

☐ IEEE membership plus society membership.

☐ IEEE membership only.

☐ Check enclosed. Remit in U.S. dollars drawn on a U.S. bank. Make check payable to IEEE. Note: Payments made in local currency must include an additional 2% currency exchange fee and a \$15.00 U.S. bank fee.

☐ Charge to my credit card. (Minimum \$10.00 charges only.)

☐ VISA

☐ MasterCard

☐ American Express

☐ Diners Club

Full signature _____

Date _____

First name (print) _____

Middle initial(s) _____

Last name _____

Street address _____

City _____

State/Country _____

Postal Code _____

APPLICANTS FOR IEEE MEMBERSHIP

PLEASE COMPLETE THE FOLLOWING INFORMATION:

Were you ever a member of IEEE ☐ Yes ☐ No If Yes, please furnish (if known):

☐ No

Grade _____

Membership No. _____

Years in professional practice _____

Date of Birth _____

Month _____ Day _____ Year _____

☐ Male

☐ Female

Education (Highest level completed) _____

Name of educational institution _____

City/State _____

Course _____

Degree received _____

Date _____

ENDORSEMENT (Signature of one IEEE member who knows you professionally) _____

IEEE Member Number _____

IEEE SERVICE CENTER

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