IEEE
MAGNETICS SOCIETY
NEWSLETTER

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RICHARD M. JOSEPHS, EDITOR • SPERRY UNIVAC • P.O. BOX 500 • BLUE BELL, PA 19424

FRED E. LUBORSKY, 1st RECIPIENT OF MAGNETICS ACHIEVEMENT AWARD

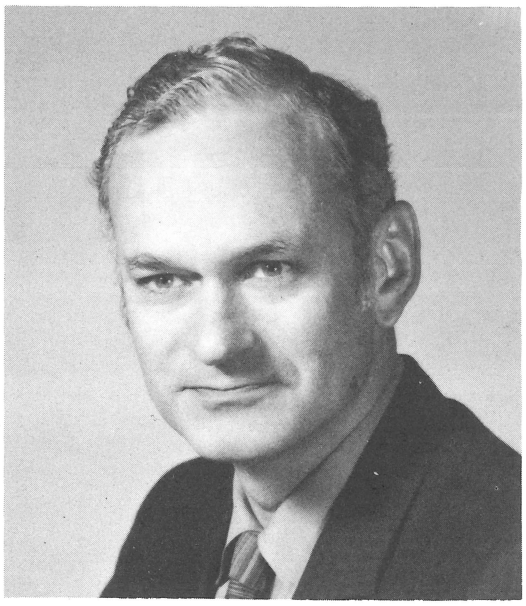
The first recipient of the IEEE Magnetics Society's Achievement Award, a new annual award for outstanding achievements in magnetics, is Fred E. Luborsky, a Research Staff Member, Corporate Research and Development, of General Electric Company.

Dr. Luborsky was presented with a plaque and $1,000 at the plenary session of the 1981 Intermag Conference at Grenoble, France, May 14, 1981. His home is in Schenectady, N. Y.

Dr. Luborsky is a Fellow of IEEE, of the American Institute of Chemists, and of the New York Academy of Sciences. He served as a Distinguished Lecturer, IEEE Magnetics Society in 1979, and received a fellowship from the British Science Research Council in 1977. He holds 12 patents and has authored or co-authored 140 papers in magnetics and magnetic materials.

He has served as President of the Magnetics Society in 1975 and 1976; Editor-in-Chief, IEEE Transactions on Magnetics, 1972, 1973, and 1974; Editor of Advances in Applied Magnetics for the IEEE Transactions on Magnetics, 1968 through 1971; and as Advisory Editor for the Journal of Magnetism and Magnetic Materials. In addition he has chaired or been a member of program committees for a number of magnetism conferences and was the chairman of the 1979 Intermag Conference.

Dr. Luborsky has made significant contributions to the advances in amorphous magnetic materials, high gradient magnetic separation, plated wire memories, magnetic disc recording media, and fine particle permanent magnetic materials. He is presently engaged in the development of high permeability, high saturation amorphous magnetic materials.



Fred E. Luborsky

TWO S-MAG MEMBERS ELECTED IEEE FELLOWS

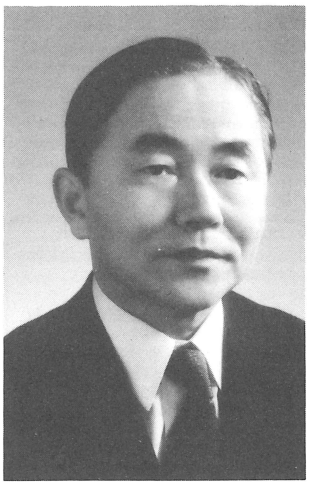
Professor Koosuke Harada of the Department of Electronics of Kyushu University in Japan was elected an IEEE Fellow. He was honored "for contributions to the development of combined magnetic and semiconductor devices for power control."

Prof. Harada was born in Fukuoka on November 10, 1929. He received the B.S. degree in electrical engineering and the D. Eng. degree from Kyushu University, Fukuoka, Japan in 1953 and 1958.

Since 1960, he has been with the Department of Electronics, Kyushu University, where he has been Professor since 1968. He has been active in the fields of nonlinear magnetics (magnetics of power applications, magnetic sensors and biomagnetics), power electronics (power supplies for electronic equipments, i.e., dc-to-dc converters, inverters and other power conditioning devices), and reliability engineering. The results of the researches have been published in a number of papers, in which about 30 papers are included in IEEE Transactions. He has published the translation of the book Magnetic Amplifiers written by H. F. Storm with the cooperation of S. Yamamura in 1959. He holds 30 patents.

Prof. Harada was awarded the Paper Prize from IEE, Japan in 1965 and Inoue Harushige Prize from the Research Development Cooperation of Japan in 1980. From 1973 to 1976, he served as chairman of the Applied Magnetics Committee of IEE, Japan. Since 1980, he has served as chairman of the Professional Group for Power Engineering in Electronics and Communications of IECE, Japan. He is now with advisory committee of International Telecommunications Energy Conference (INTELEC), IEEE and with the steering committee of Power Electronics Specialists Conference (PESC) IEEE. He is also a member of IEEE AESS Electrical Power/Energy System Panel.

Prof. Harada is a member of the Institute of Electrical Engineers (IEE) of Japan, the Institute of Electronics and Communications Engineers (IECE) of Japan, Magnetics Society of Japan, and Society of Instrument and Control Engineers (SICE) of Japan.



Prof. Koosuke Harada

George V. Jacoby

George V. Jacoby (M '51 - SM '58 - F '81) of the ISS Division of Sperry Univac in Santa Clara, California was cited "for contributions to coding and signal processing for digital magnetic recoreing." He received the Dipl. Ing. degree in electrical engineering from the Technical University of Budapest, Hungary, in 1941.

In the United States, he worked with Honeywell on research and development of industrial instruments, optimizing control methods and servo mechanisms. In 1958, he joined RCA, working on various phases of magnetic recording, servo systems and new equalization methods for digital tape recorders and disk files. In 1965-66, he invented and developed into a new product the Delay Modulation code, with which he doubled reliably the linear bit density of the previously standard Manchester code. Five years later, the same technique has become known and generally accepted by the digital recording industry as the MFM code. In 1971, he joined Sperry Univac working as Manager, Advanced Recording Techniques, and later as Senior Professional Consultant. In the mid-1970's, he invented the 3PM code with which he has developed a further reliable 50% density increase over the MFM code in a new high density disk file. For this invention, he received the ISS/Sperry Univac Outstanding Contributor's Award in 1978. He holds 18 patents with several pending.

Mr. Jacoby is a Fellow of the IEEE Magnetics Society, a Past-Chairman of various technical groups in the Philadelphia Chapter of IEEE, and is a Registered Professional Engineer in the State of Pennsylvania.

IEEE MAGNETICS SOCIETY EQUIPMENT AWARD

The Magnetics Society wishes to encourage the study of magnetism in universities and colleges by making annual awards of money to be used to obtain equipment for research or teaching purposes. Two awards, each of up to $5,000 will be made annually. Application for an award should be submitted as a proposal approximately two pages in length (the size of an INTERMAG digest article). The proposals should contain the following information:

about the proposer:	name, college address and brief biography emphasizing experience in magnetism. Preference will be given to members of the Magnetics Society.
about the equipment:	name and brief description. Say whether it will be bought or built and give a list of magnetic measurement equipment already in the department.
about the use:	description of how the equipment is to be used and who will use it (faculty, graduate students, undergraduates, etc.). Give any special reason why an award should be given in response to this proposal.
	In the case of apparatus for research, preference will be given to projects that conform to the scope of the Magnetics Society ("fundamental developments, design and certain applications of magnetic devices").
	Matching funds provided by the proposer's college are strongly encouraged but are not a condition for the granting of an award.

The proposals will be judged by a committee of three members of the Administrative Committee of the Magnetics Society appointed by the President of the Society. Equipment bought with money from a Magnetics Society Award will carry an identifying label.

The awards are not limited to North American colleges. Proposals for the 1981 awards should be submitted by 1 July 1981 (Ed. Note: Unfortunately, the deadline is past. Next year the announcement will appear earlier.) to

G. Bate, Director
Magnetics Society Equipment Awards
c/o Verbatim Corporation
323 Soquel Way
Sunnyvale, California 94086

MERIT SCHOLARSHIP WINNER

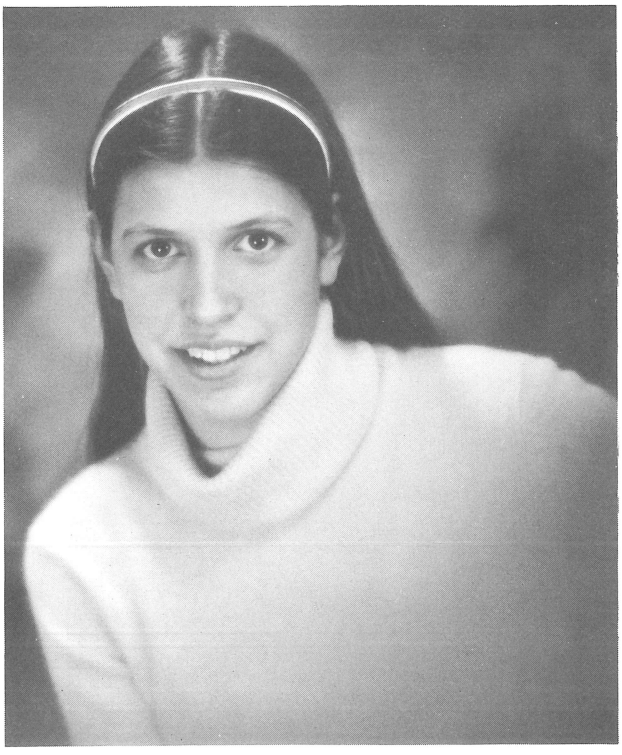
I am pleased to announce that the winner of the 1981 National Merit Scholarship, sponsored by the IEEE Magnetics Society, is Miss Christina L. Covino, daughter of Robert J. Covino of Wakefield, Massachusetts.

Christina will attend Harvard/Radcliffe where she will major in English, with particular interests in literature and creative writing. She is her Yearbook Editor-in-Chief and she has won the National Council of Teachers of English Achievement Award in Writing. Christina participated in the model United Nations at Harvard and New York. She also is her Honor Society President and she is active in cross country and track.

Christina will be formally awarded the scholarship at her graduation from Stoneham High School, Stoneham, Massachusetts.

This is the first National Merit Scholarship by the Magnetics Society. Christina is certainly a deserving recipient.

Richmond B. Clover
Scholarship Chairman



Christina L. Covino

The IEEE Magnetics Society Newsletter is published quarterly by the Institute of Electrical and Electronics Engineers, Inc., 345 East 47 Street, New York, New York 10017. The objective of the Newsletter is to publicize activities, conferences, workshops, and other information of interest to the membership of the Society and technical people in the general area of applied magnetics. Copy is solicited from the S-MAG membership, organizers of conferences, officers of the Society and local chapters, and other individuals or organizations with potentially relevant material. Copy should be sent to Dr. R. M. Josephs, Editor, Magnetics Society Newsletter, Sperry Univac, P. O. Box 500, Blue Bell, Pennsylvania 19424.

SESSION SUMMARIES, 1981 INTERMAG, MAY 12-15, GRENOBLE

A number of the session chairmen at INTERMAG have kindly provided the following summaries of their respective sessions.

Session #1. MAGNETIC PRINTING. J.J.P. Eltgen.

The papers presented in the Magnetic Printing Session received a good level of interest. Especially, paper 1.2 from Xerox, "High Resolution Recorder for Magnetic Printing," seemed to be awaited by a lot of people. Also, paper 1.3, "A New Thin Film Scanning Head for Magnetic Printing," brought some original future perspective for Magnetic Printing. It is to be emphasized that this Session on Magnetic Printing was the first one specially dedicated to this subject in INTERMAG. For a start, it consisted of only 3 papers (1 invited and 2 contributed). However, as it appeared at the January '81 meeting in Paris, the actual number of submitted papers related to Magnetic Printing was 8 to 9, but some of them had been initially oriented toward other sessions (Recording Heads, Media, Computer Methods). As it appeared from the letters I received when organizing the Session, more papers on Magnetic Printing will probably be available next year. So, my recommendation is that Magnetic Printing should be kept as a specific Session in the next INTERMAG.

Session #2. RECORDING PROCESS. Neal Bertram.

This session was dominated by papers on the vertical recording process. Swasaki and co-workers of Tohoku University discussed measurements on sputtered CoCr vertically anisotropic media with NiFe back layer. Spectra were presented which showed reproduction to 150K BPI. It was agreed that a best fit occurred assuming a uniform, perfect transition, no "transition loss" due to the NiFe layer, and a 0.2 μm spacing loss. The second paper by Yamamori et al of Toshiba discussed the importance of the NiFe back layer to improve the long wavelength response by moving the rear CoCr surface charge. Two papers on large scale modeling (5000:1) of the vertical recording process followed by Dugal et al of University of Minnesota and Monson et al of Harvey Mudd and IBM. The first noted that the back layer affects both read and write and yields greater output and less saturated write current. The latter measured pulses on single media and concluded that the recorded magnetization was only at 45° to the surface. The following paper by Johnson and Chi of Sperry discussed results of a computer iterative (magnetostatic) calculation which showed difficulties in saturation of the rear of a single layer vertical media. Improved modeling using columnar grains might alleviate this difficulty. Landland and Albert of IBM showed data of rigid disk recording with CoCr media ($M_g \cong$ 2700G, $H_c \cong$ 1100 Oe) flying at 0.2 μm. They found that a 3370 type thin film record head gave superior pulses to a NiZn conventional head. A study of the effect of a spread in switching fields (S*) on bias recording was presented by Koester et al of BASF. A reduction in S* lowered the optimum bias current and significantly reduced the short wavelength saturated output. The following paper by Baird et al of Sperry continued presentation of their microprobe studies of fields above recorded transitions. They showed good agreement of measurements of high density transitions with the "D.I.M." theoretical model. A final paper by Koren of I.S.S. calculated bit shift and showed that best agreement with multiple bit disk measurements occurred by using a mixed arc-tangent-error function transition model with the associated demagnetization fields.

Session #18. ION IMPLANTED BUBBLE DEVICES. I. L. Sanders.

The first five papers in this well-attended session dealt with recent progress being made in several laboratories toward developing practical bubble devices, based on ion-implantation. P. I. Bonyhard of Bell Laboratories described various chip architectures applicable to these devices, and presented operating margins for a half-megabit chip using an 8 μm period storage cell. K. Komenou of Fujitsu and I. Ikada of Hitachi both reported that work on 4 μm period devices, using 1 μm diameter bubbles, was progressing well; the data presented by the Hitachi team indicating that reliable bubble propagation could be obtained for chip temperatures up to at least 110°C. The research group from IBM Laboratories described some new bubble chip components designed for high density, high performance devices. Results showing highly reliable bubble switching and detection at a data rate of 400K Hz were presented. In the fifth paper, J. Magnin of Sagem, France described the performance of an experimental 7 μm period device. The final three papers addressed some of the problems associated with the understanding of physical phenomena in the ion-implanted layer. The general feeling at the conclusion of the session was that the ion-implanted bubble device technology had advanced significantly, and that the outlook for commercial application of the technology was extremely healthy.

Session #25. AMORPHOUS ALLOYS IV. Richard J. Gambino.

Y. Sakarai reported on the Preparation of Amorphous Magnetic Thin Films by Two Source Magnetron R.F. Sputtering (paper 25-7). Films of GdFe, GdCo, TbCo, TbFe and DyFe were deposited onto 350 mm diameter disks for thermomagnetic writing and magneto-optical reading applications. Two independently controlled magnetron sputtering sources with elemental targets were used for high deposition rates (100-200 Å/mm) and ease of composition control. Perpendicular anisotropy and good uniformity were obtained when the disk rotation speed during deposition was greater than 10 RPM. Amorphous materials are actively being developed for thermomagnetic recording as reported in other sessions. N. Imamura of KDD gave an invited paper (33-1) on an amorphous TbFe thin film disk with bits written with a 15 mw AlGaAs-diode laser. He reported read-write studies at a density of 5×10^6 bits/cm^2. S. Uchiyama (15-6) reported on a double layer film-amorphous GdFe exchange coupled to TbFe. The advantages of this type of recording medium are small stable bits (1 μm diameter) with an improved signal/noise ratio (20dB). M. Urner-Wille of Philips gave two papers related to thermomagnetic recording on amorphous films. Paper 5-10 concerned changes in the magnetic properties of amorphous GdFeBi with short, high intensity laser pulses. The temperature rise for thermomagnetic writing is 70K above ambient where as loss of anisotropy occurs at 340 K above ambient. She also reported (33-4) that Sn and Pb additions improve the magneto-optical signal of amorphous GdFe films.

Session #26. DOMAINS & WALLS. H. L. Glass.

Probably the most interesting papers in this session were the two invited talks. These talks described recent accomplishments in the use of neutron and X-ray diffraction topography. Michel Schlenker presented results which illustrated the unique capabilities of neutron topography. His results included the first observation of chirality domains (left- and right-handed helical spin structures) in terbium. Jacques Miltat demonstrated the capabilities of the synchrotron as a source of X-rays by showing a motion picture of domain wall motion in FeSi. This technique is being used to study the interactions between moving walls and crystal defects and to investigate the behavior of wall junctions.

Session #27. RECORDING HEADS II. T. Roscamp.

Two invited and eight contributed papers were presented covering Sendust and ferrite materials for conventional recording heads and two- and three-dimensional simulations and models for longitudinal and perpendicular recording with conventional and thin film heads. Chabrolle and Morell presented a monolithic ferrite head construction method for reduced gap erosion that incorporates hot pressed, non-magnetic ferrite as the gap material, providing heads with pole pieces and gaps of the same crystal structure. Van Herk presented a comprehensive analysis and review of two- and three-dimensional recording head modelling methods and results including a comparison of the side-fringing responses of longitudinal and perpendicular recording. He predicted that perpendicular recording should have improved track edge definition, thus potentially allowing higher track densities than with longitudinal recording. Lazzari, Torfeh, and Tual analyzed a thin film head and media configuration for perpendicular recording which they predict to have improved write process performance because of increased write field strength and higher trailing edge field gradients.

Session #28. BUBBLE DEVICE TESTING AND RELIABILITY WORKSHOP. F. B. Hagedorn.

The panel members for this workshop were J. Davies of Intel Magnetics, T. J. B. Hannom of Motorola, R. Kowalchuk of the Western Electric Reading Works, S. Orihara of Fujitsu Laboratories, and S. Yoshimoto of the Hitachi Mobara Works. Each panelist was asked to give a 20-minute presentation in which he summarized his organization's bubble device testing strategy and then emphasized one or two points of special interest or importance. During the remainder of this 3-hour workshop, the panelists responded to comments and questions from the audience. Davies emphasized testing bubble devices comprehensively only at the board level as a means of lowering testing costs. He estimated a test cost of $20 per megabit device now and projected a reduction to $3 by 1983-1984. Development of automatic handlers for temperature end-point testing (0°C and 70°C), as well as eliminating several intermediate test sequences, were the means by which he suggested these reductions could be achieved. The measured error rate for the Intel megabit system is 1 uncorrectable error in 1000 years at 25°C and 1 uncorrectable error in about 30 weeks at the 0°C or 70°C limits under worst-case conditions. Hannom reviewed the Motorola strategy for testing which for historical reasons is similar to the Rockwell strategy. Considerably more variational testing at the component level is done as compared with Intel, although subsystem testing is also done. Emphasis was placed on the problem of non-writeable defects, which were explained to be minor loops which could be successfully masked out but which would contaminate the good loops on the chip if bubbles were ever accidentally introduced into them. Hannom said he had no estimate of the yield implications of rejecting such chips. Other members of the panel suggested it would be a small effect. Kowalchuk concentrated his remarks on the testing experience obtained on the single-loop shift register chips that are packaged 4 together to make a 1/4 megabit device. Results of a failure mode analysis were presented, and an estimate of a FIT rate of less than 100 was presented for the present version of the device which has benefited from the failure mode analysis. A preliminary report was also given on a 40 Mbit store which uses major-minor loop chips in 4-chip packages. With this store operating at an 800 KHz data rate, no errors were observed in a 1 week period. Orihara emphasized the importance of good device design and careful characterization in order to achieve highly reliable operation of bubble memories. He illustrated these points by describing the Fujitsu testing experience with their megabit chip. At the present time, Fujitsu uses a complete loading of this chip at several different bias levels during the test in order to identify and mask out minor loops that contain defects which cause "low-probability" errors. This test requires 14 minutes to do at the 2 temperature extremes. However, field experience indicates an error rate of less than 10^{-14} without error correction, contrasting to the results reported by Davies about the Intel system which uses error correction. Yoshimoto emphasized Hitachi's large amount of field experience. He outlined critical steps in the design, fabrication, and assembly of the bubble devices in order to achieve high reliability. He reported the results of a testing program in which 25,000 bubble devices were operated at 0°C and at 70°C for 200,000 hours. No failures were observed. Another recent result came from a 20-chip (256 Kbit) unit which was operated for 480 hours. No errors were observed, indicating an error rate of less than 6×10^{-13}. Those who attended this workshop came away with the impression that bubble memories were operating with error-rates and reliability levels that are comparable with semiconductor memories. They also observed more openness in the discussion of testing and reliability evaluation on the part of the various manufacturers. While it was clear that standardized tests and testing criteria are not yet on the scene for bubble devices, it seems that this process is likely to begin in the near future.

DISTINGUISHED LECTURERS

The Magnetics Society is pleased to announce the Distinguished Lecturers for 1981. They are:

1. A. E. Berkowitz, General Electric Corporate Research & Development, Schenectady, NY 12301, "Magnetic Printing."

2. J. F. Dillon, Jr., Bell Laboratories, Murray Hill, NJ 07974, "Magneto-Optics."

3. C. D. Graham, Jr., Department of Materials Science and Engineering, and Laboratory for Research on the Structure of Matter, University of Pennsylvania, Phila., PA 19104, "Squeezing the Hysteresis Loop: Control of Energy Losses in Magnetic Materials & Devices."

The Distinguished Lecturer Program is intended to provide tutorial overviews of topical subjects in magnetics, to expose students to the excitement, challenge, and methods of technical innovation, and to introduce developments in magnetics to the non-technical community. It is an opportunity for local chapters, universities and other technical, educational and business groups to hear outstanding members of the magnetics community. The cost will be borne by the Society.

Any group interested in scheduling a Lecturer should contact the program coordinator, Geoffrey Bate, Verbatim Corporation, 321 Soquel Way, Sunnyvale, CA 94086, (408) 245-4400, X 214.

A MESSAGE FROM THE DIV. IV DIRECTOR — ALLAN C. SCHELL

The seven Groups and Societies of Division IV currently have excellent publications, a schedule of successful meetings and symposia, and financial strength. Membership growth of the Division is at about ten percent per annum. At the three Adcom meetings I have attended so far this year, I have seen the kind of responsive leadership that will lead to further improvement of our technical activities.

At the February meeting of the Technical Activities Board there was a discussion of the formation and funding of Chapters. The concern is that Chapters should receive the support necessary for effective functioning and growth from the Sections and Societies. If you have any comments or suggestions on this topic, please send them to me at RADC/EE, Hanscom AFB, MA 01731.

Good financial practices are important to the success of any operation, and one problem area has been the late reporting of the finances of some conferences and meetings. TAB passed a bylaw change requiring an interim financial report within 90 days, and a final report within a year of the end of a conference.

Among the items waiting in the wings is the allocation of general and administrative (G&A) costs to the segments of the Institute. The TAB Finance Committee has been wrestling with this topic. There is not too much dispute over what these costs are; on the list are corporate expenses, accounting charges, and similar costs that have not been assigned wither as direct charges or as overhead. The controversial issue is how to allocate these charges, and a commonly accepted practice (although it brought selective howls of protest) is to make them proportional to the expenses of the various entities. There will be much more debate on this topic before any formula meets with general acceptance.

Another issue of concern to TAB is the representation of the Groups, Societies, and Councils on the Board of Directors. A plan has evolved to increase the number of Divisional Directors to ten and to restructure the Divisions accordingly. The Society Presidents have been involved in this activity, and at their meeting in February, set the following goals:

1. The assignment of Societies to Divisions should be based on a commonality of technical areas of interest, and not arbitrarily to accommodate goals such as equal numbers of members per Division.

2. Alternate possibilities of having Directors-at-large or increasing the number of Directors in accordance with memberships should be considered.

3. The composition of the Divisions should recognize and accommodate the large range of membership numbers of the Groups, Societies and Councils, and any plan should be matched, as much as possible, to forecasts of the future IEEE composition.

This topic has been referred to the IEEE Long Range Planning Committee. Any comments you send to me will be relayed to that committee.

The year 1831 saw the discovery of electromagnetic induction by Michael Faraday and the birth of James Clerk Maxwell. This year the IEEE has prepared an exhibit to celebrate the accomplishments of these two pioneers of electromagnetism. The exhibit will make its first appearance at Electro 81 in New York City, and is being considered for the MTT-S Symposium in Los Angeles. The display, which is available for scheduling at other meetings, is the work of the new IEEE Center for the History of Electrical Engineering and is a precursor to the activities planned for the IEEE Centennial in 1984.

IEEE ADDS NEW EMPLOYMENT REFERRAL SERVICE

Engineers can now turn to a new employment referral service endorsed by the Institute of Electrical and Electronics Engineers (IEEE). Free to IEEE members, and available at a modest charge to non-members, the new service provides a mechanism for engineers to register their credentials on a personalized basis onto a computer data base which is accessed by subscriber/employers.

The new service, Professional Abstract Registries^{tm}, is an independent employment information system which has been endorsed by the IEEE following successful test studies. In addition to the IEE, PAR has been approved by the National Society of Professional Engineers and the Engineers' Society of Western Pennsylvania.

In operation, an engineer who wishes to register completes a PAR resume form. The information is entered into a computer system which can be directly accessed by the subscriber/employer. When the subscriber/employer indicates an interest, PAR informs the registrant who is free to follow-up the inquiry. Registrant information is updated quarterly, and complete confidentiality can be assured at the request of the registrant.

Unlike many "skills bank" systems in which registrant data is limited to key words and characteristics, the PAR system provides for free-vocabulary, full document data entry and search capability, and further allows the subscriber/employer to address the data interactively.

For example, the registrant can use free-vocabulary to indicate job objective, related academic courses, current relevant experience, patents and geographic preference.

Non-IEEE members may use the PAR system for a $14 per year fee. All inquiries should be directed to: PAR, Data Base Innovations, Inc., 28 Lower Main Street, Ossining, New York 10562. Toll free call: 800-431-2616; in New York: 914-762-2522.

HOUSE COMMITTEE'S TAX BILL PROPOSES TO LIBERALIZE LERA CONCEPT

If enacted, the Ways and Means Committee's forthcoming tax bill would liberalize pension legislation to allow employees to purchase their own IRAs even though they are already covered by an employer pension plan. Chairman Dan Rostenkowski outlined the general shape of the bill in a speech in Chicago on April 9. There is broad support on the Committee for several tax incentives specially targeted to personal savings and investment, and highest on the list, Rostenkowski said, is "a significant expansion of individual retirement accounts. From a tax policy point of view, we achieve two critical objectives: forced long-term savings and greater economic security for retiring workers."

As the chairman went on to describe the LERA concept being worked out, it became clear that the Committee members have heard and understood IEEE's testimony on the problems faced by engineers and other mobile workers in providing for their retirement years. Rostenkowski went on to say:

- We should extend the IRA concept to employees who are already covered by a pension plan, allowing tax deductible contributions of up to $1,000 of earned income.

- The present limit on deductible contributions should be increased from $1,500 to $2,000 of earned income for employees without a qualified pension plan.

- He supports an increase from $7,500 to $15,000 in the maximum limit on contributions to a Keough plan.

MILLIMETER & MICROWAVE FERRITE MATERIALS, JULY 20-22, 1981, GEORGIA INST. OF TECHNOLOGY

This course is an intensive study of the structure and properties of ferrite materials and the application of these materials in microwave signal processing and control functions. Specific applications will be discussed with emphasis on the importance of material considerations, including temperature dependence and high power effects. Both resonance and off-resonance (including digital) applications will be studied. A part of the study will be specifically devoted to addressing the status, needs, potential, and limitations of magnetic compounds for millimeter wave applications.

The study will include a review of the measurement and interpretation of the magnetic and microwave properties of ferrimagnetic compounds and the range of control, environmental dependence, and importance of each parameter to application technology.

The course will cover the fundamental structural aspects of ferrites and the molecular engineering and solid state chemistry utilized in the formulation and fabrication of these materials. The resultant magnetic and microwave properties of these compounds will be related to crystal structure and to the molecular chemistry and processing techniques utilized to selectively engineer and control these properties toward optimized values for specific engineering applications.

Special emphasis will be devoted to the material considerations, limitations and potential for ferrimagnetic signal control and processing functions at millimeter wave frequencies.

Registration deadline: July 10, 1981.

For additional information:

Department of Continuing Education
Georgia Institute of Technology
Atlanta, Georgia 30332
Telephone: (404) 894-2400

UNIV. OF S. CAL., 1981 SUMMER SHORT COURSES

Design and Application of Modern Permanent Magnet Materials: August 17-21.

Advances in the Design of Small Electrical Machines: August 24-28.

For more information, call (213) 743-6708.

URSI XXth GENERAL ASSEMBLY, AUG. 10-19, 1981, WASHINGTON, D.C.

The International Union of Radio Science (URSI) meets for its General Assembly once every three years. The last General Assembly held in the United States was 24 years ago. A very extensive program (including more than 500 papers from all over the world) is planned for Washington, D. C., August 10-19, 1981, presenting many original contributions in electromagnetics and electronics. For further details and registration material, please write to:

Mr. R. Y. Dow
Organizing Committee for URSI XX G. A.
National Academy of Sciences
2101 Constitution Avenue, N. W.
Washington, DC 20418

27th MMM CONF., NOV. 10-13, 1981, ATLANTA

The 27th Annual Conference on Magnetism and Magnetic Materials (MMM) will be held at the Sheraton-Atlanta Hotel in Atlanta, Georgia, from Tuesday, November 10 through Friday, November 13, 1981. The Conference is sponsored jointly by the American Institute of Physics and the Magnetics Society of the IEEE in cooperation with the Metallurgical Society of A.I.M.E., the Office

of Naval Research, the American Society for Testing and Materials, and the American Physical Society.

Members of domestic and international scientific and engineering communities interested in recent developments in magnetism and its associated technology are invited to attend the Conference and to contribute to its technical sessions.

SCOPE OF THE CONFERENCE: This conference will include all areas of basic and applied science related to magnetism. A list of categories follows:

1. Bubble physics and materials.
2. Bubble devices and systems.
3. Magnetic recording.
4. New techniques, new materials, new applications.
5. Hard magnetic materials.
6. Soft magnetic materials.
7. Amorphous materials.
8. Mixed valence systems, magnetic semiconductors.
9. Magnetic insulators.
10. Metals, alloys, intermetallic compounds, magnetic superconductors.
11. Spin glasses.
12. Critical phenomena and phase transitions.
13. Surfaces, adsorbed layers, and fine particles.
14. Microwave and magnetoelastic effects, resonance.
15. Magneto-optic effects.
16. Magnetic excitations, neutron scattering, solitons.
17. Electronic structure, spectroscopy, photoemission, itinerant magnetism.
18. Hyperfine fields, NMR, Mössbauer.
19. Transport properties, Hall and Kondo effects.
20. Cross-disciplinary and other topics.

Prospective authors should submit abstracts to be received by the deadline of July 20, 1981. Abstracts should be mailed to:

Dr. H. C. Wolfe
American Institute of Physics
335 East 45th Street
New York, NY 10017

CONFERENCE CALENDAR

URSI XXth General Assembly, Aug. 10-19, 1981, Washington, DC (see announcement).

1981 Cryogenics Engineering Conf., Aug. 10-14, 1981, San Diego, CA. Contact Dee Belsher, NBS, Boulder, CO 80303.

Magnetism Summer School, Aug. 9-29, 1981, Univ. of Dundee.

COMPUMAG Conf. on the Computation of Magnetic Fields, Sept. 13-17, 1981, Chicago, Illinois. Contact R. D. Smith, 362/C-132, Argonne National Lab., Argonne, Illinois 60439.

MMM Conf., Nov. 10-13, 1981, Atlanta (see announcement).

4th Int. Conf. on Video & Data Recording, April 5-7, 1982, London.

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Membership in the IEEE Magnetics Society entitles you to receive, for the low Society fee, the IEEE Transactions on Magnetics, and the quarterly Magnetics Society Newsletter. You are kept informed of latest developments, meetings, and conferences in your areas of interest, and are entitled to purchase informative conference records and other helpful educational aids at greatly reduced rates for members.

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