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.

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 IEEE, Japan in 1965 and Inoue Harushige Prize from the Research Development Cooperation of Japan in 1960. From 1973 to 1976, he served as chairman of the Applied Magnetics Committee of IEEE, 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 (INTERLEC), 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 (IEEE) 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.

Fred E. Luborsky

Prof. Koosuke Harada

George V. Jacoby
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. Rate, Director
Magnetics Society Equipment Awards
Verbatim Corporation
323 Sequoy 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 national awards for 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.

Richard B. Clover
Scholarship Chairman

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 INPEMAG membership, 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 Univar, F. O. Box 506, 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. Elten.

The papers presented in the Magnetic Printing Session received a good level of interest. Especially, paper 1.2 from Scxol, "High Resolution Magnetic Recording 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 perspectives for Magnetic Printing techniques to be expected. It is emphasized that this Session on Magnetic Printing was the first one specially dedicated to this subject in INTERMAG. For a start, it contained 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. Sasaki and co-workers of Tohoku University discussed measurement of domain structure for vertically anisotropic media with NiFe back layer. Spectra were presented which showed reproduction to 150 GPR. It was agreed that a high frequency assumption of a uniform, perfect transition, no "transition loss," due to the NiFe layer, and a 0.2 µm spacing loss. The second paper by Yamagushi et al. discussed the importance of the NiFe back layer to improve the long wavelength response by moving the coercive field of the magnetic media. The large interlap modeling (500011) of the vertical recording process followed by Fujii et al. at University of Minnesota and Monson et al. of IBM. The first noted that the back layer affects both read and write and greatly outperforms the standard saturation current. The latter measured pulses on single media and concluded that the recorded magnetization was only at 45º to the surface. The following paper by Johnson and Chl of Sperry discussed results of a computer iterative (magnetostatic) calculation which showed difficulties in saturation of the back of a single layer vertical media. Improved modeling of using columnar grains might alleviate this difficulty. Landzand and Albert of IBM showed data of rigid disk recording with Co-Cr media (25,000 GPR, H-W 1100 Oe) flying at 0.2 µm. They found that a 3370 type thin film record head gave superior pulses to a NiFe conventional head. A study of the effects of a spread in switching fields (S*) on bias recording was presented by Koester et al. of BASF. A reduction in S* lowered the optimal 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 "P.I.M." theoretical model. A final paper by Koren of J.E. calculated a bit shift and showed that a best agreement with multiple bit disk measurements occurred by using a mixed anisotropic error function for transition model with the associated demagnetization fields.

Session #18. ION IMPLANTED BEVERAGE DEVICES. I. L. Sandars.

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-implanted bubble media. Bell Laboratories described various chip architectures applicable to these devices, and presented operating margins for a half-repabit chip storage cell. K. Komonen of Fujitsu and I. Ikeda of Hitachi both reported that work on 4 µm period devices, using an implanted NiFe magnetic strip, worked well; the data presented by the Hitachi team indicating that reliable bubble propagation could be obtained for chip temperatures up to at least 110ºC. The research group from IBM Laboratories described some new bubble chip components designed for high density, high performance devices. Results showing high bubble switching and detecting at a data rate of 400K Hz were presented. In the fifth paper, J. Maginn of Sagem, France described the performance of an experimental 7 µm period device. 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. Sakurai reported on the Preparation of Amorphous Magnetic Thin Films by Two Source Magnetron R.F. Sputtering (paper 25-7). Films of Ge, Ga, Cu, Zn, Cd, Zn, and Cd were deposited on 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 was obtained where deposition speed during deposition was greater than 10 RPM. Amorphous materials are 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 nm AlAs-diode laser. He reported read/write studies at a density of 5x10¹⁶ bits/cm². S. Uchiyama (35-6) reported on a double layer film amorphous GdFeCo magnetic layer coupled to a TbFeCo permalloy layer on a NiCr substrate. The advantages of this type of recording medium are small stable bits (1 µm diameter) with an improved signal/noise ratio (20dB). M. Urner-Hille of Philips gave two papers related to thermomagnetic recording on amorphous films. Paper 5-10 concerned changes in the magnetic properties of amorphous GdFeCo with magnetic high intensity laser pulses. The temperature rise for thermomagnetic writing is 70K above ambient where loss of anisotropy occurred at 200 K. On the other hand she also reported (33-4) that Sn and Pb additions improve the magneto-optical signal of amorphous tape 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 both neutron and x-ray diffraction topography. Michel Schlener presented results which illustrated the unique capabilities of neutron topography including the first observation of chirality domains (left- and right-handed helical spin structures) in terbium. Jacques Millot demonstrated the feasibility of using thin film head and media 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. Cabrolle 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 piece and gaps of the same crystal structure. Van Herken presented a comprehensive analysis and review of two- and three-dimensional recording heads modelling results and recommendations for the comparison of the side-fringing responses of longitudinal and perpendicular recording. He predicted that perpendicular recording should include a track-edge definition, thus essentially allowing higher track densities with longitudinal recording. Laizzi, Tomphoto and Dull presented a thin film head and media configuration for perpendicular recording which they predict to have improved write performance because of increased write field strength and higher trailing edge field gradients.
The panel members for this workshop were J. Davies of Intel Magnetics, T. B. Hagedorn of Motorola, Kowalchuk of the Western Electric Reading Works, S. Oishi of Fujitsu Laboratories, and S. Yoshimoto of the Hitachi Mibara 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 on 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. Devices emphasized testing bubble devices comprehensively only at the board level as a means of lowering testing costs. He estimated a test cost of $150 per megabit device. The level projects and projected a reduction to $1 by 1983–1984. Development of automatic handlers for temperature-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 about 10 weeks at 25°C and 1 uncorrectable error in about 30 weeks at 0°C or 70°C limits under worst-case conditions. Hannon 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-writable defects, which were explained to be minor defects which cannot be successfully masked out but which would contaminate the good loops on the chip if bubbles were ever incidentally introduced into them. He had an estimate of the yield implications of rejecting such chips. Other members of the panel suggested it would be a small percentage of the total. Hannon emphasized his remarks on the testing experience obtained on the single-loop shift register chips that are packaged together and a 1/4 megabit device. Results of a failure mode analysis were presented, and an estimate of a P17 rate of less than 100 was presented for the present version of the device which has been found in the failure mode analysis. A preliminary report was also given on a 40 Mbit store which uses major-minor loop chips. With this store operating at an 800 KHz data rate, no errors were observed in a 2-week period. Oishi 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 it and mask out minor loops that contain defects which cause “low-probability” errors. This test requires 14 minutes to do at least four different temperatures. However, field experience indicates an error rate of less than 10^-14 without error correction, contrasting to the results reported by 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 x 10^-13. Those who attended this workshop came away with the impression that bubble memories are 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 standard test 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.

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 strong advisory committees. 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 a Symposia Committee. 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/ER, 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 the general corporate expenses, accounting charges, and similar costs that have not been assigned either as direct charges or as overhead. The controversial issue is how to allocate 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.

Distinguished Lecturers

The Magnetics Society is pleased to announce the Distinguished Lecturers of 1983:

1. A. E. Berkowitz, General Electric Corporate Research & Development, Schenectady, NY 12301,
   "Magnetic Printing."
2. J. P. Dillen, Jr., Bell Laboratories, Murray Hill, NJ 07974,
   "Magnetooptics."
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 accessible by subscriber/employers.

The new service, Professional Abstract Registries™, is an independent employment information system which has been endorsed by the IEEE following successful test studies. In addition to the IEEE, 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. Furthermore, it 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, Database 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 specified in 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 the IRS'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 $2,000 of earned income.
- The present limit on deductible contributions should be increased from $1,000 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

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, D.C. 20418

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

The 27th Annual Conference on Magnetics 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.
4. New techniques, new materials, new applications.
5. Hard magnetic materials.
7. Amorphous materials.
8. Mixed valence systems, magnetic semiconductors.
10. Metals, alloys, intermetallic compounds, magnetic superconductors.
11. Spin glasses.
13. Surfaces, adsorbed layers, and fine particles.
14. Microwave and magnetoelastic effects, resonance.
15. Magneto-optic effects.
17. Electronic structure, spectroscopy, photoemission, itinerant magnetism.
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


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


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

4th Int. Conf. on Video & Data Recording, April 5-7, 1982, London.
JOIN THE MAGNETICS SOCIETY TODAY

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.

Use the convenient coupon to become a member of the IEEE MAGNETICS Society. If you are not a member of the IEEE, but would like to join, please check the appropriate box on the coupon. Descriptive materials and an IEEE membership application will be sent to you upon receipt.

Society Fee: $7.00 for IEEE members of all grades except Student.
Student Fee: $3.00. These rates apply to payments received September 1 through February. On payments received March 1 through August 31, remit one-half of the above rates. (Payments received September 1 through December 31 apply through December 31 of the following year.)

MEMBERSHIP APPLICATION
IEEE MAGNETICS SOCIETY

Send to: IEEE Service Center, 745 Hoes Lane, Piscataway, NJ 08854.

[Boxes for options]

____ I am a ________ member of IEEE and hereby Grade ______ apply for membership in the MAGNETICS Society. I enclose a check for the Society Fee* (made payable to IEEE).

____ I am not a member of the IEEE but would like to join. Please send information.

____ I am interested in becoming a MAGNETICS Society affiliate. Please send information.

Name_________________________________________ IEEE No.___________

Mailing Address_____________________________________________________

City_____________________State/Country_________Zip_____

Company___________________________________________________________

Field of Interest_____________________________________________________
(Please show this message to a colleague in magnetics who could benefit from membership in the Magnetics Society.)

JOIN THE MAGNETICS SOCIETY

If you are not yet a member of the IEEE Magnetics Society and are involved in magnetics research, development or engineering, the Society could make a valuable contribution to your professional activities.

You will join over 2000 colleagues in belonging to the only society in this country devoted solely to the interests of those who work in magnetism.

You will have the opportunity of contributing to your profession through membership in its Society and participation in the work of its technical and administrative committees.

You will receive quarterly the Magnetics Transactions—recognized throughout the world as a leading publication in applied magnetics.

The Society sponsors the INTERMAG Conference and co-sponsors the Conference on Magnetism and Magnetic Materials, which jointly cover the whole subject of magnetism.

Fill out the application blank today. If you prefer, you may contact: E. J. Torok, Membership Chairman of the Magnetics Society, Sperry Univac, U1725, P. O. Box 3525, St. Paul, Minn. 55165.