



IEEE

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JODIE CHRISTNER, EDITOR

## EMERGING TECHNOLOGIES IN MAGNETICS, 1992

by Roger F. Hoyt

*(I would like to thank the IEEE Magnetics Society Officers, Technical Chairpersons, and ADCOM committee members for providing critical input to this summary.)*

Magnetism and technologies which are based on it currently account for revenues of at least \$95 billion worldwide. As such, the field is vibrant and active, with many recent scientific and engineering developments expected to result in "Emerging Technologies" over the next few years. Although some items could be considered evolutionary in nature, a few may provide timely revolutionary developments in devices and products.

The largest single commercial application of magnetism currently is in the area of **Magnetic Information Storage** (\$52B). This includes widely used rigid disk drives, floppy disk files, tape drives, and optical storage devices (R/W devices based on the magneto-optic effect). It is expected that recently announced magnetic components for rigid disk storage will have a major impact on the industry. For example, thin film material for rigid disks that dominates the low end and mid-range will in the next few years receive widespread use in high end systems (capacity > 10 GB). Additionally, two key developments for high density rigid disk recording are emerging: Magneto-resistive heads, introduced this year by IBM for rigid disks, and "Contract recording" (head-media clearance of about 10nm or less) as disclosed by companies such as Censtor, Visquus and others, will grow in importance in the industry. Recent work on closely coupled magnetic multilayers also may lead to application of read heads based on the so-called "Spin Valve" effect. Magneto-Optic storage devices, introduced in volume this year will continue to enable new applications for removable media, images, and libraries. The development of shorter wavelength (430nm) laser sources will allow optical storage areal densities to be approximately double in the foreseeable future. The consumer applications portion of magnetic information storage is about \$20B worldwide. This includes an annual production of about 4.2 billion each audio cassette tapes and floppy disks, as well as 1.7 billion video tapes

and the associated electronic units. The emerging Digital Compact Cassette (Phillips), and the recordable Mini Disc players (Sony), likely to be introduced this year, may further increase the demand for media. For magnetic tape recorders, it is possible that the well established helical scanning head technology may find further use in data recorders or consumer HDTV. The use of both magneto-optic and/or magnetic tape devices will continue to enable large capacity (> 1 TB) on-line data "libraries."

EMERGING TECHNOLOGIES (Continued on page 5)

## NEWLY ELECTED IEEE FELLOWS

Congratulations to the following new Fellows who were elected to Fellow grade of the IEEE through the Magnetics Society, effective January 1, 1992. The IEEE Bylaws define the Fellow grade as one of unusual distinction in the profession, to be conferred only by invitation of the Board of Directors upon a person of outstanding and extraordinary qualifications and experience who has made important individual contributions.

- |                       |   |
|-----------------------|---|
| Dr. Simon Foner       | For invention of the vibrating sample magnetometer; contributions to pulsed magnetic field technology, and the development of advanced superconducting materials. |
| Dr. A. Frank Mayadas  | For contributions to magnetic storage and thin film technology and systems.   |
| Dr. Juan A. Rodriguez | For technical leadership in the development of computer data storage devices.   |
| Prof. Susumu Uchiyama | For contributions to the research and development of magneto-optical recording.   |

## EXECUTIVE SEMINAR TO BE GIVEN AT INTERMAG '92

A one day Executive Seminar will be held prior to the start of Intermag '92 in St. Louis. The format will be similar to that of the highly successful first Executive Seminar that was held at the 1991 Joint Intermag-MMM Conference in Pittsburgh. There will be six presentations covering a wide range of topics in applied magnetism. The emphasis will be on "hot" topics of the Conference from the perspective of business opportunities. The seminar will provide an overview for those unable to attend the full conference and it will also provide insight to those new to technology before they attend the technical sessions. The talks will emphasize the commercial applications of the research topics with only the essential technical depth.

The Executive Seminar will be held on Sunday, April 12th, at the Adam's Mark Hotel and will run from 9:00 am until 5:00 pm. Breakfast and lunch will be served, and a closing reception will be hosted by the conference chairman, Marcel Muller. The attendance fee is \$600 per person. Attendance is also open to companies contributing \$600 or more to the Conference; multiple spaces will be available for the larger contributions.

The topics and speakers are as follows:

- The Current Status and Future Promise of Helical Scan Data Recording, Juan Rodriquez, Exabyte Corporation.
- Advances in Micromagnetic Measurements, Pantelis, Alexopoulos, IBM.
- Microtribology of Magnetic Storage Devices, Bharat Bhushan, Ohio State University.
- Ultrasoft Magnetic Materials, Carl Smith, Allied Signal, Inc.
- Advances in Control Theory, speaker to be announced.
- Partial Response Recording, speaker to be announced.

To register for the Executive Seminar, send a check for \$600 for each registrant made payable to "1992 Intermag Conference" to Clark E. Johnson, P.O. Box 50116, Minneapolis, MN 55405.

For additional information, please call Clark Johnson at (612) 377-2329.

Recipients of the SMAG Newsletter are encouraged to inform potential attendees of the seminar.

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## PROGRAM HIGHLIGHTS OF THE INTERNATIONAL MAGNETICS CONFERENCE

Adam's Mark Hotel  
St. Louis, Missouri April 13-16, 1992

A program of considerable diversity has been organized for the 1992 International Magnetism Conference, INTERMAG '92, by the program committee under the chairmanship of Robert Fontana, Jr. (IBM Almaden Research Center) and Barbara Shula (Hewlett-Packard).

There will be 32 invited and 505 contributed papers covering the latest developments in all branches of magnet-

ics. Approximately one fourth of the talks will be devoted to magnetic recording with topics such as media, heads, and systems being discussed. Other papers will describe the newest developments in fields such as magneto-optics, magnetic multilayers, domains and domain walls, magnetic measurement techniques, microwave magnetics, and sensors. In addition, three symposia will address the topics of giant magnetoresistance, magnetometers, and permanent magnets nitrogenation.

A one day Executive Seminar is scheduled for Sunday, April 12th. At this seminar, the emphasis will be on "hot" topics of the conference from the perspective of business opportunities, and will provide an overview for those unable to attend the full Conference or provide insight to those who are new to the technology before they attend the technical sessions. Emphasis will be on the commercial application of the research topic with only the essential technical depth. For more information, please see details in the accompanying article.

The Conference reception will be at the region's newest and most exciting attraction, the St. Louis Science Center.

Individuals not on the conference mailing list may obtain information by contacting either the Local Chairman, Ronald, S. Indeck, Department of Electrical Engineering, Campus Box 1127, Washington University, 1 Brookings Drive, St. Louis, MO 63130, (314) 935-4767, (314) 935-4434 (FAX), or Diane S. Suiters at Courtesy Associates, Inc., 655 15th St. NW, Suite 300, Washington, DC 20005, (202) 639-5088, (202) 347-6109 (FAX).

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## CONFERENCE ON RIGID DISK MAGNETIC MEDIA TO BE HELD JULY 21-23, 1992

The 1992 Magnetic Recording Conference will be held at Santa Clara University, Santa Clara, California. The subject of the Conference will be **magnetic recording media for rigid disks**. This is the third in a series of annual conferences sponsored by the IEEE Magnetism Society. The Conference addresses a single aspect of recording technology, with the purpose of providing a thorough review of current work of high scientific merit. The Conference will focus on the state-of-the-art in magnetic techniques which extend the limits of data density, reduce cost, reduce noise, or increase durability. The following topics will be covered: new recording materials, characterization techniques, recording models, substrates for rigid media, and tribology of the head-medium system. There will be only invited talks and plenary sessions.

Speakers' nominations are encouraged and should be addressed to the Program Chairman, Prof. R. L. White, Center for Research on Magnetic Storage Materials, Stanford University, Stanford, California 94305-2205, 415/723-4431, FAX 415/725-4034. The Conference Chairman is J. E. Opfer, Komag, Inc., Milpitas, California 95035, 408/957-4414, FAX 408/263-9449. For more information, please contact the Publicity Chairman, T. M. Coughlin, Micropolis Corp., Chatsworth, California 91311, 818/709-3366, FAX 818/709-3497.

## PRESIDENTIAL YOUNG INVESTIGATOR AWARD GIVEN FOR WORK IN MAGNETIC MATERIALS



*Dr. John A. Barnard*

A 1991 Presidential Young Investigator Award was presented to Dr. John A. Barnard for his work in multilayer thin magnetic films. Dr. Barnard is an assistant professor of Metallurgical and Materials Engineering at the University of Alabama. The awards, granted by the National Science Foundation, were created to encourage young engineering and science professors to remain in teaching. Winners may receive up to \$100,000 per year in grants and matching funds for up to five years.

Dr. Barnard is a 1987 graduate of Carnegie-Mellon University. He joined the faculty of the University of Alabama in 1988 and has worked as a visitor at CNRS Laboratoire Maurice Letort in France and at Liverpool University. He has published 20 papers on topics related to his research interests which include magnetic, electronic, and atomic structure of surfaces, interfaces, and thin films as well as thermodynamics of solids/continuum mechanics and phase transformations.

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## CLARK E. JOHNSON, JR. RUNNING FOR IEEE DIVISION IV DIRECTOR

Clark E. Johnson, Jr., former president of the Magnetics Society, is running for the directorship of Division IV of the IEEE. This is the division of IEEE societies that includes the Magnetics Society.

The other candidate for this position, who will be on the general IEEE ballot that you will all receive this summer, is W. Kenneth Dawson, who is sponsored by the Nuclear and Plasma Sciences Society.

The next IEEE Newsletter will give you biographical information on both candidates and a position statement by each candidate on what he thinks IEEE should be trying to accomplish. The officers of the Magnetics Society strongly endorse Clark Johnson for this election. We hope that after reading the additional biographical material that you will decide to vote in the election (many people do not bother), and that you will vote for Clark.

## SPECIAL SESSION PLANNED ON RECORDING CHANNELS

A special session on "Signal Processing and Coding for Recording Channels" is planned for the IEEE Global Telecommunications Conference (GLOBECOM '92). The conference is planned to be held in Orlando, Florida during December 6-9, 1992.

This session will cover signal processing and coding techniques for magnetic and optical storage systems, including disk and tape channels. Papers will present new techniques or results in the areas of:

- channel characterization
- detection methods
- run-length limited and modulation codes
- error-correcting codes
- equalization and filtering, adaptive equalization
- write precompensation and write equalization
- sequence detection and partial response methods
- high-speed VLSI implementation of read/write channel electronics and detection circuitry
- timing recovery
- signal processing or coding for servoing
- coding bounds, density, and channel capacity
- data compression for digital storage, including audio and video
- ac-bias or FM linearization techniques
- combined equalization and coding
- multiple-head systems
- coding techniques for disk arrays

Further information may be obtained from the session organizer: Michael W. Marcellin, Department of Electrical and Computer Engineering, The University of Arizona, Tucson, AZ 85721, (602) 621-6190, FAX (602) 621-8076, marcellin@ece.arizona.edu.

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The objective of the **IEEE Magnetics Society Newsletter** is to publicize activities, conferences, workshops and other information of interest to the Society membership and technical people in the general area of applied magnetism. Copy is solicited from the Magnetics Society membership, organizers of conferences, officers of the Society and local chapters and other individuals with relevant material. Send copy to Dr. Jodie A. Christner, Dept. 2H2, IBM Corporation, 3605 Hwy 52 North, Rochester, MN 55901-7829, Telephone: (507) 253-5513 FAX: (507) 253-4146.

## PHILADELPHIA PERMANENT MAGNET MEETING (PPMM '91)

By Bryen Lorenz  
Magnetics Chapter Chairman  
Philadelphia IEEE Section

On September 19, the first annual Philadelphia Permanent Magnet Meeting (PPMM '91) was held. Cosponsored by SPS Technologies and the Magnetics Society Chapter of the Philadelphia IEEE Section in cooperation with the Magnetics Society, the activity was a one day, regional meeting and exhibition entitled "New Materials, Methods and Processes for Rare Earth Permanent Magnets." This conference grew out of a desire to develop a platform for the discussion of current issues in the manufacture, production, design and theory of permanent magnets. This effort was spearheaded by Dr. Yakov Bogatin of SPS Technologies, Dr. Charles Graham of the University of Pennsylvania, and Dr. Bryen Lorenz of Widener University.

PPMM '91 proved to be a very successful meeting with some eighty attendees, eight speakers and ten exhibitors. The speakers, representing a diverse community of university, governmental and industry researchers, covered a wide variety of topics which are listed below:

"How can rapidly-quenched  $\text{Fe}_{14}\text{Nd}_2\text{B}$  magnets be hot-pressed when they contain no dislocations?,"  
C. D. Graham and Lin Li, University of Pennsylvania

"The Aquanide process for producing corrosion-resistant  $\text{Fe}_{14}\text{Nd}_2\text{B}$  magnets," John Ormerod, Arnold Engineering/SPS Technologies

"Rare-earth magnet applications," Marlin Walmer, Electron Energy Corporation

"The Lanthanides: what every magnetician should know about them," Stanley Trout, Molycorp

"Rare-earth iron nitrides and carbides," George Hadjipanayis, University of Delaware

"Corrosion of Nd-Fe-B magnets in humid environments," Andrew Kim, Crucible Research

"Novel magnet designs using rare-earth materials," Herbert Leupold, Ft. Monmouth

"Magnetocrystalline anisotropy in rare earth magnetic materials," S. G. Sankar, Carnegie-Mellon University

The Magnetics Chapter would like to express their appreciation to SPS Technologies for their strong commitment to PPMM '91 in making available facilities, secretarial support, as well as providing substantial financial assistance so that the meeting (including lunch) was free to all those who wished to attend. The chapter would also like to acknowledge the Philadelphia Section for covering other incidental costs associated with the meeting.

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## INTERNATIONAL CONFERENCE ON MAGNETIC RECORDING MEDIA, 1992

The 5th MRM Conference will be held during September 2-4, 1992 in Perugia, Italy. This event, which is traditionally held in Italy every 3 years, has met an increasing success among Scientists, Engineers and Marketing Experts in the field of Magnetic Recording Technology and Media.

Since its last edition in 1989, MRM has become a regular event among the monographic conferences sponsored by the IEEE Magnetic Society. The technical contents of MRM are focused on **magnetic recording media with emphasis on flexible media and components**. The Conference will also maintain a section on optical media and advanced film deposition for flexible media. As a result of the increased interest in the MRM contents, the format for MRM'92 will differ in the organization of its technical sessions. Each session will consist of invited and contributed presentations and the session chairperson and

cochairperson will assign the contributed papers to oral or poster sessions depending on the number of contributions received.

The session topics are as follows: 1). magnetic, chemical and physical properties of particulate recording media, 2). magnetostatic and magnetodynamic properties of recording materials and 3). thin film media: magnetic and magneto-optical.

Additional information is available from the conference chairperson: Dr. Eberhard Köster, BASF Magnetics GmbH, V/Q, Head Test Center Magnetic Media, D-6700 Ludwigshafen, Germany, or the executive secretary's offices: Dr. A.R. Corradi, MAGNOX INC., Via P. Viani 11, 42010 Borzano (RE), Italy, Tel.: (522) 910660, FAX: (522) 910661, or E. Secretary, Conference Corp., 92 Meeting Road, Conf-site, PA 020992 (USA), Tel.: (222) 999-8888, FAX: (222) 999-0000.

## ANNUAL CONFERENCE ON MAGNETISM AND MAGNETIC MATERIALS

The Thirty-Seventh Annual Conference on Magnetism and Magnetic Materials will be held at the Westin Galleria, Houston, Texas on December 1-4, 1992. The Conference annually brings together scientists and engineers interested in recent developments in all branches of fundamental and applied magnetism. Emphasis is traditionally placed on experimental and theoretical research in magnetism, the properties and synthesis of new magnetic materials and advances in magnetic technology. The program will consist of invited and contributed papers. Selection of contributed papers is based on abstracts whose submission deadline is June 10, 1992. The Conference Proceedings will be published in the *Journal of Applied Physics*.

This topical conference is sponsored jointly by the American Institute of Physics and the Magnetics Society of the IEEE, in cooperation with the Minerals, Metals and Materials Society, the Office of Naval Research, the American Society for Testing and Materials, the American Physical Society and the American Ceramic Society.

The General Chairman of the Conference is Gordon E. Fish and the Local Chairman is George Reiter. Individuals who are not on the Conference mailing list may obtain Conference information and details concerning the preparation of abstracts in the prescribed format by writing Dr. John T. Scott, American Institute of Physics, 500 Sunnyside Boulevard, Woodbury, NY 11797. For general information about the conference contact Diane Suiters, Courtesy Associates, 655 15th Street NW, Suite 300, Washington DC 20005 (202) 639-5088.

## NOMINATIONS SOUGHT FOR THE IEEE HEINRICH HERTZ MEDAL

The IEEE Awards Board established the Heinrich Hertz Medal as a major IEEE Annual Award in 1987 under the sponsorship of Industry in Region 8 (Europe). It consists of a gold medal, a bronze replica, a certificate and an honorarium of \$10,000. The distinguishing feature of the award is,

"To recognize an individual for outstanding achievements in Hertzian (electromagnetic) waves. The contribution may be theoretical or experimental in nature; desirably it should be both. It must have been reported widely and with clarity, to enable others to make further contributions."

Previous recipients of the award have been *Nathan Marcovitz* (1989), *John D. Kraus* (1990) and *Leopold B. Felsen* (1991).

The Board wishes to publicize this award more widely and actively seeks the suggestions of all members for potential candidates in future years. These should be communicated to me by letter or telephone at my home. If you feel very strongly about a potential candidate you may make the nomination yourself. The proper form and instructions may be obtained by writing or calling the office of the Secretary of the IEEE Awards Board, 345 East 47th Street, New York, NY 10017 (tel. 212 705 7882). The deadline for submitting 1992 nominations is July 1, 1992.

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### EMERGING TECHNOLOGIES (Continued from page 1)

**Magnetic Materials** (\$7B) and **Magnetically-based Electrical Equipment** (\$21B) will continue to play key roles for improved performance and sensitivity. This includes amorphous magnetic materials for power transformer applications, as well as ferrites and permanent magnets for compact motors, generators, meters, magnetometers, and magnetic resonance imaging (MRI) systems. The recently introduced very high  $4\pi M$  NdFeB permanent magnets will continue to grow in importance, enabling the design of more compact and efficient machinery. With continued materials and fabrication process improvements, the rare-earth oxide based high  $T_c$  superconductors may begin to find applications for high magnetic field generation for power or imaging or magnetic bearings for levitation. In the area of magnetic separation, the emergence of new materials will allow application to materials processing, minerals beneficiation, and immunotherapy industries.

The application of **Magnetic Electronic Components** (\$14B) is broad and refinements of the technology can be

expected. This area includes electronic devices such as signal transformers, inductor meters, relays, speakers, headphones, microphones, microwave tubes, etc. which rely on magnetic materials for their function. Materials, design, and processing improvements will enable more compact and efficient devices.

Finally a number of novel **Magnetic Measurement and Imaging Instruments** which have been developed over the recent past should be mentioned as playing an increasing role in science and technology. These include the Superconducting Quantum Interferometer (SQUIDS), being used for some medical and higher sensitivity applications, Magnetic Resonance Imaging (MRI) at higher spatial resolution, and a number of techniques for imaging of domains on surfaces, including the Magnetic Force Microscope (MFM), Pulsed Kerr-effect Microscopy, Secondary Electron Polarization Analysis (SEMPA), and Differential Phase Contrast Lorenz Imaging.

## LETTER TO THE EDITOR

Dear Editor:

I have been a strong supporter — an initiator — of professional activities in the IEEE since the early 1970s. These activities are not part of our constitutional charter, and they should remain so. Lately, however, I have come to believe that it is time for us to examine the way we support them through US Activities Board.

USAB has an annual budget of about \$3.5 M, primarily funded through a \$20/member mandatory Regional Assessment from all US members (Regions 1-6). Non-US Regions (Regions 7-10) also have such assessments, but they are much smaller, and only \$1 or \$2 per member are spent on professional activities.

By contrast, IEEE does not have a mandatory assessment to support Technical Activities — although these are also in the charter and are our primary mission. Membership in Technical Societies is purely voluntary, and a member is free to drop the Society if he or she feels the Society's activities are going in the wrong direction, or if in his judgment the dues are not worth the benefits.

I strongly believe that we should apply the same criteria and principles to both types of activities. Thus, we should establish a number of Professional Activities Societies (on say Pensions, Career Development, R&D Policy, etc.) under a Professional Activities Board, just as we have Technical Societies under a Technical Activities Board; and membership in each Society should be entirely voluntary.

The issue boils down to freedom of choice, and trust in good judgment of members. Unfortunately, many USAB leaders believe that freedom will lead to renunciation, because of ignorance on the part of members; and they believe "Father Knows Best" what is good for us naive engineers. (They may be partially right: members may indeed renounce their programs, but because of the ability to see that the Emperor has no clothes, not because of ignorance!)

The argument of those supporting mandatory assessments goes something like this: (1) Mandatory dues are the price of belonging to the group, just as taxes are the price of a free society. (2) Each constituent does not decide the amount or the purpose of the tax; elected representatives do. Similarly, let the Board of Directors, not members, decide the amount and purpose of dues. (3) Since professional activities help all engineers, therefore all members should pay for them. (4) Given the choice, no one likes to pay taxes; and engineers are very frugal ("cheap"), so they won't pay anything at all.

These arguments are evidently specious. (1) Not all taxes are mandatory; only those that provide basic services are. Many other taxes are optional, depending on extra goods or services used — e.g., sales tax to buy non-essential goods, highway tolls to use a turnpike, fees to use a recreational facility, etc. Thus the issue is: to what extent does USAB provide basic services for the common good that need to be supported by mandatory assessments?

(2) Constituents in many States have asserted their right to override their representatives when it comes to taxes: witness Proposition 13 in California, and demands for a constitutional amendment to balance the US budget.

Some time ago I suggested that we need a Constitutional Amendment stating that mandatory dues should be used primarily to support basic services, and additional dues to support special interest activities — whether they are technical or professional — should be voluntary. However, several IEEE leaders whose opinion I respect feel that this may be divisive, so I am putting the idea on hold. Yet, I hope we can have an open debate on the issue: How much should be spent on USAB, and What should be the primary focus of USAB projects in order to maximize the benefits?

(3) Our technical activities also help all engineers, by producing new technologies, new jobs, and so on, but we have not made it mandatory for all members to join a technical society. Why make an exception for professional activities?

(4) Joining a Technical Society is voluntary, and only about half of IEEE members do so — but those who do, join more than 2 Societies on the average. Obviously, given the choice, many engineers are willing to pay voluntarily to support worthy causes. The key is the value they perceive in the cause, or in the way it is being served.

USAB has been around for about 15 years, and has been fortunate to be served by a dedicated core of volunteers and an excellent staff. Yet, it is not clear if the actual benefits of USAB's efforts have been worth the cost — mostly because we have a minor role in the broad scheme of things. Take lobbying the Congress. After years of effort, we got a legislative victory in pension reform, but the big guns there were the labor unions. We can claim a share of the victory, but let's not overdo it — lest we sound like the proverbial army sergeant who claimed that "I and the Generals won the war." Take lobbying the Administration: we have not succeeded in changing the procurement regulations that lead to white-collar wage-busting practices. Take any of the issues before State governments; we have made very little progress.

Most of the USAB's \$3.5 M budget goes to support pet projects perceived to be important by a few "Central Planners," but which do not result in valuable products or measurable benefits. People everywhere are relying on competition and a free market — of ideas and services, not just economy and politics. We should let the "consumer" decide how much value he puts on our product, instead of bundling it with some basic commodities. Let each member decide, freely, which society he wishes to join and support, instead of having to pay mandatory dues and assessments to support what someone else thinks is important.

This is not to say that we should give up professional activities; indeed we should redouble the effort. However, we will get results only when we give up monopolistic and paternalistic attitudes, let the members choose the areas needing our effort, and let each individual make his or her decision as to the value received. When Professional Activ-

ities really reflect the members' needs and their priorities, they will attract members in large numbers. And these members will be happy to pay \$15 or \$20 or more for the privilege to join a Professional Society on say Pensions or Career Development, just as they do to join a Technical Society on say Computers or Communications.

We have a new Administration in the IEEE. The new President and the new Vice President for Professional Activities have an opportunity to make a difference. It is hoped that they will take a hard look at the USAB programs, and will consider the challenge of setting up several Professional Societies with voluntary participation — perhaps in parallel with the existing mandatory dues structure.

Sincerely,

S. H. Durrani

*Dr. Durrani has served as Chairman, Washington Section; President, Aerospace and Electronics Systems Society, and Director of the IEEE. He also served on USAB and many of its Committees, and was awarded its Citation of Honor in 1980.*

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## A NATO - ASI SUMMER SCHOOL IN APPLIED MAGNETISM

Erice, Sicily is the site of the NATO-ASI summer school course in applied magnetism to be held from July 1-12, 1992.

The course aims to bring together leading senior scientists and young post-doctoral and post-graduate researchers in a pedagogic review of applied magnetism. The key objective is for young researchers to gain a full appreciation of the opportunities and complexities involved in various aspects of applied magnetism research. The course is designed in such a manner as to encourage the active participation of students, with conventional lectures being supplemented with a variety of tutorials and workshops to engender open forum debate amongst lecturers and students. There will be an opportunity for some students to present posters outlining aspects of their own work.

The program and lecturers are to be:

*Hard Magnets*, G. ASTI;

*The Physics of Magnetic Recording*, H.N. BERTRAM;

*Magnetic Fine Particles*, R.W. CHANTRELL;

*Magnetic Separation*, R. GERBER;

*Magnetic Recording Devices and Media*, M.H. KRYDER;

*Magneto-Optic Media and Systems*, M.H. KRYDER;

*The Physics of Magneto-Optics*, P. LISSBERGER;

*Domains and Walls in Soft Magnetic Materials*, Mainly,

J. MILTAT;

*Microwave Magnetism*, D. STANCIL;

*Computational Magnetism*, P. SYLVESTER.

Anyone wishing further information or to attend the course should contact:

Dr. C.D. Wright

Scientific Secretary

Department of Electrical Engineering

The University of Manchester

Manchester M13 9PL

England

TEL +44 61 275 4550

FAX +44 61 275 4512

Applicants should specify: i) date and place of birth, together with present nationality; ii) degree and other academic qualifications; iii) list of publications; iv) present position, field of interest and place of work. Young persons with limited experience, such as postgraduate students, should enclose a letter of recommendation from their supervisor or head of research. The total fee for the Course, including full board and lodging is US \$900. A substantial number of bursaries are available to help deserving students meet these costs and travel expenses. Requests for such financial support should accompany the letter of application. **Closing date for applications: May 1, 1992.** A letter of acceptance, including more detailed information regarding travel and accommodation arrangements etc., will be sent to successful applicants by May 15th 1992.

# REPORT ON THE IEEE PUBLICATIONS PRODUCTS COUNCIL MEETING

By Chester L. Smith, Division IV Representative

The final meeting of the IEEE Publications Products Council for the year, 1991, was held at the Headquarters Building in Piscataway, New Jersey on Tuesday, 24 September. The formal and detailed minutes may be obtained from IEEE TechPubs in Piscataway. This report is to highlight some of the issues that may be of special interest to the Societies of Division IV.

**CD-ROMs** For some time IEEE has been negotiating with University Microfilms, Inc. (UMI) to put IEEE Transactions and other documents onto CD-ROMs. The plan is to grant UMI exclusive marketing rights for three years, after which the rights are to revert to IEEE. Evidently, there is (or was as of 9-24-91) some technical legal flaw in the arrangement as there was no contract as of the meeting date.

**BOOKS** IEEE is actively pursuing the publishing of new technical books, but the program has not progressed as fast as some had hoped. The Council, on the whole, seemed satisfied with the results. The problem seems to be that the financial end of the business is somewhat behind expectations. The Council, however, took the view that the purpose of the Institute's activities is primarily to serve the membership, not necessarily promote the finances. Of course, it is nice if the book program can break even or show some surplus. The prospects are good that it will do so in time. Mainly, the book program is in need of authors.

**OFFICIAL LANGUAGE** The comment was made by someone that "English is the 'Official Language' of the IEEE". This is interesting, since at one time some Transactions papers were published in French. I asked if Bilingual Conference Records were under the interdict and was told that they were. This rule, it seems, would apply to the EMC Conferences in Wroclaw, Poland, (Russian & English) and to Geneva, Switzerland (English and French). In both of these simultaneous translation of oral presentations are made and all papers have abstracts in both languages. IEEE has been an active participant in these Conferences as well as others where English and another language is used.

**PRICES** As usual there was a lively discussion of future changes in the pricing of IEEE publications. The All Transactions Package (ATP) has been losing subscribers as the recession deepened. There was some talk of allowing some subscribers to purchase a smaller set of publications more, presumably, in line with their interests. This idea may be pursued further if customers are interested. As it

is, their only recourse is to drop ATP and buy only those publications of most value as determined by user activity. No action was taken.

**IEEE TECHPUBS AT CONFERENCES** The thirty plus Societies in the IEEE hold a large number of Symposia/Conferences each year. These draw a good showing of non-IEEE participants. At the recent IEEE Symposium on EMC the Book Program had a booth in the Exhibits area, but the IEEE Membership booth was in the hotel lobby. There was some book activity, but one of the lessons learned was that TechPubs should be collocated with the Society Membership booth and that Society personnel should be briefed on what TechPubs has to offer.

Some Societies offer non-members an incentive to join IEEE such as paying the Society dues for the first year. It was suggested that IEEE books be sold at 20% discount to members with 5% to go to the sponsoring Society. Of course, non-IEEE attendees would pay full price for books, unless they stepped next door and signed up!

**CD-ROM/OPTICAL DISK STANDARD** Because of a Society project I enquired as to what the IEEE Standards on Disk were since we have the well known IEEE 488 bus. At the present time there are no IEEE Standards on these devices, but I understand the Computer Society has some committees hard at work on them.

**FAX COPIES OF IEEE PAPERS** This is another of those areas where the law enforcement is a few megaparsecs behind the technology. The United Engineering Center (UEC), New York, provides a FAX service. UEC will FAX a copy of any paper they have on hand to a customer within about 20 minutes for a fee of \$24, \$3 of which is paid to IEEE as a royalty. This is fair and legal.

The problem, however, concerns some of those notorious "beltway bandits". Evidently the practice is to send "some kid in tennis shoes" to some library and dry photo copy the paper for 3 to 10¢/page and then FAX it to the "customer" for a suitable fee, usually within 24 hours. The view at IEEE is that this does not fall within the "fair use" provision of the copyright laws. Sooner or later this one will end up in court and it will be interesting to see how it goes.

**OTHER TOPICS** There were a number of other topics and issues discussed. Among these were new publication products on electronic media and also some problems involving the production of abstracts. Inquiries on this report or the full minutes should go to Piscataway.



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# MAGNETICS SOCIETY OFFICERS FOR 1992 SELECTED

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The election of officers and administrative committee members for the calendar year 1992 has been completed. Congratulations and best wishes for continued progress!

## MAGNETICS SOCIETY ADMINISTRATIVE COMMITTEE 1992

### Officers

President: S. H. Charap  
Vice President: D. A. Thompson  
Secretary/Treasurer: C. E. Yeack-Scranton

### Elected Members

Terms Expire 31 December 1992:

J. D. Adam	P. P. Biringer	G. E. Fish	R. Gerber
F. B. Hagedorn	J. E. Opfer	C. E. Patton	P. E. Wigen

Terms Expire 31 December 1993:

R. E. Fontana, Jr.	K. Harada	R. Indeck	T. M. Jagielinski
H. Jouve	M. H. Kryder	H. A. Leupold	R. Wood

Newly Elected Members, Terms Expire 31 December 1994:

J. Christner	E. Della Torre	W. Doyle	F. Friedlaender
C. Perlov	B. Shula	D. Stancil	T. Suzuki

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## SIXTH INTERNATIONAL CONFERENCE ON MAGNETIC FLUIDS Paris, France, July 20-24, 1992

International conferences on magnetic fluids have been traditionally organized since 1977. A principal aim of the present conference is to bring together persons working on different approaches: physics, chemistry, physico-chemistry, engineering, mechanics, medicine, in order to create a cross-fertilization of ideas. The conference will include plenary lectures, poster sessions and round tables. Each lecture session will be opened by a distinguished scientist,

not directly involved in magnetic fluids, but active in the topic discussed during the session. A proceedings will be published in the Journal of Magnetism and Magnetic Materials, North-Holland. For further information write to the Conference Secretariat: Dr. V. Cabuil—ICMF 6, Université P. et M. Curie, Box 740, Laboratory of Inorganic Physical Chemistry, 4 place Jussieu, 75252 Paris Cedex 05, France, FAX (33-1) 44 27 38 41 or 44 27 38 66.

# CONFERENCE CALENDAR

**APRIL 12, 1992**

**INTERMAG Executive Seminar.**

St. Louis, Missouri.

Clark E. Johnson, P.O. Box 50116, Minneapolis, MN 55405.  
TEL: 612-377-2329. Details on p. 2.

**APRIL 13-16, 1992**

**International Magnetics Conference (INTERMAG).**

St. Louis, Missouri.

Ronald S. Indeck, Department of Electrical Engineering,  
Campus Box 1127, Washington University, 1 Brookings Drive,  
St. Louis, MO 63130. TEL: 314-935-4767, FAX: 314-935-4434, or  
Ms. Diane Suiters, Courtesy Associates, 655 15th St NW,  
Suite 300, Washington, DC 20005, TEL: 202-639-5088,  
FAX: 202-347-6109. Details on p. 2.

**JUNE 7-19, 1992**

**NATO-Advanced Study Institute on High Density Digital Recording.**

Il Ciocco, Italy.

Prof. G. J. Long, Department of Chemistry, University of Missouri-Rolla,  
Rolla, MO 65401, USA. TEL: 314-341-4438, FAX: 314-341-6033,  
BITNET/EARN: C3126A at UMRVMA, or Prof. F. Grandjean,  
Institut de Physique, B5 Universite de Liege, B-4000 Sart Tilman,  
Belgium. TEL: 32-41-563632, FAX: 32-41-562355.  
BITNET/EARN: U2121FG at BLIULG11.

**JULY 1-12, 1992**

**NATO-ASI Summer School in Applied Magnetism.**

Erice, Sicily.

Dr. C. D. Wright, Scientific Secretary, Department of Electrical Engineering,  
The University of Manchester, Manchester M13 9PL, England.  
TEL: +44 61 275 4550, FAX: +44 61 275 4512. Details on p. 7.

**JULY 3-8, 1992**

**Second International Symposium on Physics of Magnetic Materials.**

Beijing, China.

Prof. Yang LUO, San Huan R/D Center, Academia Sinica, PO Box 603,  
Beijing 100080, PR China, Telex: 222592 SHI CN, FAX: 2561268, or  
Dr. Karl Strnat, KSJ Associates, 1616 Hillrose Pl, Fairborn, OH 45324.

**JULY 16, 1992**

**Rare-Earth Magnets and Their Applications, Twelfth International Workshop.**

Canberra, Australia.

Robert Street, Dept. of Physics, U of Western Australia, Nedlands WA  
6009 Australia. TEL: (90) 380-2751, FAX: (09) 380-1014.

**JULY 20-24, 1992**

**International Conference on Magnetic Fluids.**

Dr. V. Cabuil, ICMF 6, Universite P. et M. Curie, Box 740,  
Laboratory of Inorganic Physical Chemistry, 4 place Jussieu,  
75252 Paris Cedex 05, France. FAX: 33-1 44 27 38 41 or  
33-1 44 27 38 66. Details on p. 9.

**JULY 21-23, 1992**

**The Magnetic Recording Conference (TMRC): Magnetic Recording Media for Rigid Disks.**

Santa Clara University, Santa Clara, California.

T. M. Coughlin, Micropolis Corp., Chatsworth, California 91311,  
TEL: 818-709-3366, FAX: 818-709-3497. Details on p. 2.

**AUGUST 3-5, 1992**

**Conference on Electromagnetic Field Computation.**

Harvey Mudd College, Claremont, CA, USA. CEFC Secretariat,  
Harvey Mudd College, Claremont, CA 91711. TEL: 714-621-8019,  
FAX: 714-621-8465. CEFC@HMCVAX.BITNET.

**SEPTEMBER 2-4, 1992**

**International Conference on Magnetic Recording Media (MRM).**

Perugia, Italy.

Executive Secretary, Conference Corp., 92 Meeting Rd., Confsite, PA  
020992 (USA). TEL: 222-999-8888, FAX: 222-999-0000. Details on p. 4.

**DECEMBER 1-4, 1992**

**Conference on Magnetism and Magnetic Materials.**

Houston, Texas.

Ms. Diane Suiters, Courtesy Associates, 655 15th St. NW, Suite 300,  
Washington, DC 20005, TEL: 202-639-5088, FAX: 202-347-6109.  
Details on p. 5.

**DECEMBER 6-9, 1992**

**Special Session at GLOBECOM on Signal Processing and Coding for Recording Channels**

Michael W. Marcellin, Department of Electrical and Computer Engineering,  
The Univ. of Arizona, Tucson, AZ 85721. TEL: 602-621-6190,  
FAX: 602-621-8076. marcellin@ece.arizona.edu. Details on p. 3.

**AUGUST 23-28, 1993**

**European Magnetic Materials and Applications (EMMA).**

Kosice, Czecho-Slovakia.

P. Sovak, Dept. of Exp. Physics, Faculty of Sciences, nam.Febr.vitazstva 9,  
041 54 Kosice, Czecho-Slovakia. TEL: xx42-95-21128.