



# IEEE Magnetics Society Newsletter

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October 2002

Martha Pardavi-Horvath, Editor

Romney Katti, Publicity

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  4. **HMM 2003**, the 4th International Symposium on Hysteresis and Micromagnetic Modeling, University of Salamanca, Spain, *May 28-30, 2003*
  5. **MIPE 2003** Joint conference on Micromechanotrics, Yokohama, Japan, *June, 2003*
  6. **COMPUMAG** 14th Conference on the Computation of Electromagnetic Fields, , Saratoga Springs, New York, USA, *July 13 - 18, 2003.*
  7. **ICMFS** The XVIII International Colloquium on Magnetic Films and Surfaces, Madrid, Spain, *22-25 July, 2003*
  8. **ICM2003** International Conference on Magnetism, Roma, Italy, *July 27-Aug 1, 2003*
  9. **HFM2003**, Highly Frustrated Magnetism 2003, Grenoble, France, *26-30 August 2003*
  10. **SMM16** 16<sup>th</sup> Soft Magnetic Materials Conference (SMM 16) Düsseldorf, Germany, *9-12 September, 2003*
- **Book review: Fundamentals of Solid-State Phase Transitions, Ferromagnetism and Ferroelectricity** by Yuri Mnyukh
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## **IEEE MAGNETICS SOCIETY officers for 2003**

(effective January 1, 2003)

- **RONALD INDECK**      President
- **KEVIN O'GRADY**      Vice President
- **CARL PATTON**      Secretary/Treasurer

**WELCOME ON BOARD!**

## 2002 IEEE Annual Elections

### IEEE MEMBERS SELECT ARTHUR W. WINSTON AS 2003 IEEE PRESIDENT-ELECT

PISCATAWAY, N.J., 8 Nov -- Arthur W. Winston, director of the Gordon Institute of Tufts University in Medford, Mass., has been selected 2003 IEEE president-elect. Pending acceptance of the Teller's Committee report by the IEEE Board of Directors, Winston will begin serving as IEEE president on 1 Jan. 2004. He will succeed 2003 IEEE President Michael S. Adler, Vice President of Technology at Mechanical Technology, Inc., Albany, N.Y., and Research Professor at Rensselaer Polytechnic Institute, Troy, N.Y.

Of the 249,352 ballots mailed, 39,059 valid ballots (15.66 percent) were returned. This compares with the 2001 return of 19.80 percent. All results are unofficial until the IEEE Board of Directors accepts the report of the Teller's Committee during the 16-17 November.

The other two candidates for IEEE president-elect were Vijay K. Bhargava, Canada Research Chair in Wireless Communication at the University of Victoria in British Columbia, Canada, and Luis T. Gandia, president of L. Gandia & Associates, Inc., of San Juan, Puerto Rico. Bhargava, Gandia and Winston all were nominated by the Board of Directors. Of the members who voted, 17,949 selected Winston. Bhargava received 11,122 votes and Gandia, 8,884 votes.

Winston, an IEEE Life Fellow, has been an IEEE member since joining in 1955. He served on the IEEE Board of Directors from 1996-1999, holding positions as vice president of Educational Activities and Region 1 director. He has served on numerous committees and taken on many other leadership roles within the organization, including chair of the Foundation Board and the Life Members Committee from 2000-2001. Winston has been very active in the IEEE Boston Section, serving in several capacities, such as chair in 1993 and secretary from 1991-1992. He was awarded an IEEE Third Millennium Medal in 2000.

Winston has worked at Bell Telephone and the National Research Council, both in Canada; The Massachusetts Institute of Technology; National Research Corporation and Allied Research Corporation before joining the faculty at Tufts University. His technical expertise includes the fields of test and measurement among other areas.

#### **Other Officers Named**

The following candidates were elected as IEEE division director, 2003-2004: Division II, Philip T. Krein; Division VI, Richard L. Doyle; and Division X, Enrique H. Ruspini. They will assume office on 1 Jan. 2003.

The following candidates were selected as director-elect for 2003: Division III, J. Roberto B. deMarca; Division V, Gene F. Hoffnagle; and Division IX, John A. Reagan. They will take office as director on 1 Jan. 2004. The following candidates were selected as director-elect for 2003-2004: Region 2, Thomas A. Tullia; Region 4, Ronald G. Jensen; Region 6, Robert L. Baldwin; and Region 10, Seiichi Takeuchi. They will take office on 1 Jan. 2005.

James T. Carlo was chosen as president-elect of the IEEE Standards Association. He will take office as IEEE-SA president on 1 Jan. 2004. Elected to serve two-year terms on the Standards Association Board of Governors as members-at-large are Nader Mehravri, Thomas A. Prevost, Dennis Bodson and Harold E. Epstein. They all will take office on 1 Jan. 2003.

IEEE members selected Ralph W. Wyndrum, Jr. to serve as vice president-elect of IEEE Technical Activities. He will succeed 2002 Technical Activities Vice-President Leah H. Jamieson on 1 Jan. 2004

Elected as IEEE-USA president-elect was John W. Steadman. He will assume the office of IEEE-USA president on 1 Jan. 2004. Taking office as IEEE-USA member-at-large on 1 Jan. 2003, will be Merrill W. Buckley, Jr.

For more information, visit the [2002 IEEE Annual Elections Web page](#).

## IEEE Magnetics Society NEWSLETTER

The IEEE is the world's largest technical professional society with over 370,000 members in approximately 150 countries. Through its members, the IEEE is a leading authority on areas ranging from aerospace, computers and telecommunications to biomedicine, electric power and consumer electronics.

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## IEEE Fiscal State of Affairs VI.

**Peter Staecker, Divison IV Director**

**September 2002**

[p.staecker@ieee.org](mailto:p.staecker@ieee.org)

Summer, specifically, the period of time between the June Board Series and Labor Day, is a time of preparation. TAB financial staff has been busy obtaining final inputs from Societies that will to be rolled up to the IEEE level by the next Board Series in November. Since June, the financial markets have been lurching around, net downward, and we all are feeling the pinch of tighter fiscal constraints. Societies whose technical areas of interest include telecommunications, optical networks, and semiconductors are seeing declining conference attendance and income. 2003 IEEE dues increases were approved in June. As of the end of July, year-to-date IEEE membership is up about 2%, while the total Society membership is flat compared to last year. Over this same period of time, membership across the Div IV Societies is down by about 2%.

In spite of the lackluster performance of the market, IEEE operations are still strong, and scrutiny of the infrastructure value proposition is continuing.

### **Infrastructure Expenses**

In July, an independent accounting firm began a review of IEEE operations, a study requested by Society Presidents. This study is scheduled for completion in August, and September and October are reserved for report finalization. The expense for this exercise is the only significant reporting event under **initiative programs** since my last report, and was approved as an out-of-cycle initiative expense in June by TAB and the Board of Directors.

In June, substantial additional infrastructure cuts were identified for the June view of the 2003 IEEE Budget. While over half of this impacts IEEE staffing, much of the remainder is targeted at reducing publications costs. One component of publications reduction is the proposal that manufacturing processes for our journals be changed. The recommendations are that the paper weight be reduced, and the trim size of the margins be reduced by 1/4 inch in width and 1/8 inch in depth. Although the Computer and Communications Societies have adopted these changes, the sense of many other Societies was that this proposal needed more thought. A solution is brewing. In a separate activity, the IEEE Awards Board and its cost infrastructure are under review by an adhoc committee of the BoD.

At the TAB level, as mentioned in the previous report, the distribution of *indirect* infrastructure charges is still being studied and is scheduled for re-presentation at the November meeting.

### **Business Rule Simplification**

In November 2001, the BoD charged RAB and TAB with identifying business rule changes to realize a possible \$3M annual savings in infrastructure charges associated with membership services. RAB and TAB Business Rule Simplification teams have been working the details since February. TAB committee discussion has focussed on simplifying the options available for Society membership, and the subscription process for members regarding optional Society publications. TAB's Strategic Planning and Review Committee is engaged in a wider discussion on the value proposition of Society Membership and optional publications.

In June, TAB endorsed the concept that, in general, member fees and prices should at least cover the *relevant variable costs*. To that end, each S/C will annually be provided with the appropriate variable costs and shall consider them seriously in setting member fees and prices. Modification of S/C financial reporting templates has started, allowing explicit tracking of the membership costs. But formatting the data is the easy part, compared to the task of defining and identifying the *relevant variable costs*. These efforts are currently slowed down because a parallel effort at the IEEE level to define the cost of membership has surfaced the need for consistency in the TAB and IEEE *definitions* of cost. While this consistency effort proceeds at the staff level, temporarily stalling the cost-of-membership progress, it is important to keep our eyes on the goal. And that goal has two parts:

- a. a simpler membership renewal process (reduced set of member categories)
- b. a simpler method of offering optional publications (reduced set of pricing categories by membership)

RAB is addressing other details of Membership Business Rules simplification, whose eventual success depends heavily on the acceptance of web renewal (35% in 2001, 47% in 2002 – comparing mid-June numbers).

### **2002 Forecast (Update)**

As of the July year-to-date actuals, the IEEE operations forecast is net positive while the TAB forecast is net negative. This is not as bad as it might seem. For 2002, there have also been substantial infrastructure cuts, which, because of the financial model, will flow to TAB's bottom line as substantial improvements. After the accounting adjustment, the S/C net will also be positive. On the investment side of

the balance sheet, news at this reporting time is not great, as the market fluctuation is negative as of July.

## **Discussion**

The principles of the IEEE Financial Model have partitioned operations from investments. Improvements in operations continue, together with identification and allocation of infrastructure costs. Infrastructure costs are being driven down, with net positive effect to the Societies and Councils of TAB. There is additional work to do. For those of you who read this before the IEEE elections, read the statements of the candidates carefully to see what ideas they have on our four favorite topics: initiatives (selection and management process), infrastructure review process, business rule simplification, and financial model. If the winners have already been selected, ask them to share their ideas for improvement!

One last note: The end of the year and my term as your Division IV Director is approaching. Although you may hear from me one more time, it is appropriate to ***introduce our Division IV Director for 2003-2004, Hal Flescher.*** He arrives fresh from handling the job of TAB Treasurer, and is eminently capable of carrying these discussions to the next level.

Welcome, Hal!

## Chapters Corner

by

**Dr. Richard H. Dee,**

Magnetics Society Chapters Chair

News from chapters.....

### ROMANIA CHAPTER

First and foremost I would like to officially welcome our newest chapter recently formed in Romania. It is running under the local chairmanship of:

**Alexandru Stancu**

Professor, D.Sc., Senior Member IEEE

Head of the Department of Electricity and Electronics

"Alexandru Ioan Cuza" University

Faculty of Physics

Bld. Carol I, 11,

Iasi, 6600, ROMANIA

and I recommend that those reside in that area contact him to get on his email list for activities in that area.

The Romania Chapter has its own web site!!!

<http://stoner.phys.uaic.ro/IEEE/index.php?page=office>

Check it out!

### POLAND CHAPTER

by *Marian Soinski*

We are trying to increase number on members from industry, because 80% comes from Universities (recently I encouraged 2 new members from ENERGOSERWIS - currently in Siemens-Westinghouse Group from Orlando/USA - but only 1 in Magnetics Society). One seminar on "rotational magnetization" was held in industry and second concerning 3 limbs amorphous cores distribution transformer (with power rating 200 KVA) will be held in Sillesian University later this calendar year.

### PITTSBURG CHAPTER

by *Miklos Gyimesi*

We had a successful meeting in June 10 at Seagate Research, Pittsburgh. Prof Phil Wigen, distinguished lecturer from Ohio State University kept a nice presentation on Ferromagnetic Resonance Force Microscopy.



We will have a meeting, also at Seagate, September 19.  
Shan Wang, distinguished lecturer from Stanford University will talk on Advanced  
Magnetic Materials and Transducers.

*Miklos Gyimesi*

*Chair of IEEE Pittsburgh and IEEE Pittsburgh Magnetics Chapter*

### **MILWAUKEE CHAPTER**

*by John Brauer*

We are still doing things here!

The Milwaukee Chapter of the IEEE Magnetics Society sponsored a half-day seminar on October 2nd, 2002. Our speakers were Mark Christini of Ansoft Corporation, Pittsburgh, PA, and John Brauer of Milwaukee School of Engineering. The seminar was held across the street from the Milwaukee airport.

IEEE Seminar Series Fall 2002 Program  
October 2, 2002, 11 AM - 5 PM

Four Points Hilton  
4747 South Howell Ave.  
Milwaukee, Wisconsin

Seminars are sponsored by Power Engineering Society, Control System Society and Magnetics Society plus IEEE Engineering Student Poster Presentations from Marquette, MSOE, and UWM.

IEEE Section Meeting: Student Night

Seminar Topics:

- Power Society "Distribution Automation: Fact or Fantasy"
- Control System Society "Computer Motor Control"
- Magnetics Society "Analysis and Design of Magnetic Power Apparatus"

To Register, Contact:  
Brian Cunningham  
Siemens Building Technologies  
135 W. Wells Street  
Milwaukee, WI 53203  
414-319-4265  
brian.cunningham@sbt.siemens.com

IEEE Member \$50.00  
Non-Member: \$75.00  
Student Members: \$30.00  
Exhibitor Fee: \$100.00

**DENVER, ROCKY MOUNTAIN CHAPTER**

by *Randy Rannow*

**IEEE Magnetics Society Denver Section:**

Randy K Rannow    Rajiv Kohli  
Chair                      Vice-chair

David Pappas  
Treasurer

The Denver Section chapter has had a number of interesting and instructional presentations over the past quarter. The topics include: nanolubrication, magnetic switching, value added storage, and ESD in magnetic recording. Society members continue to attend the presentations which are intended as ongoing informal education for practicing engineers in the information storage industry, academia, and government. It is the positive feedback that is helping to facilitate an agenda that is amenable to the majority of the members and make this chapter one of the most active in the country.

The coming fall schedule is earmarked with more magnetic topics including:

- Basic Properties of Ultra Thin Tunnel Junctions/Tunnel Head Performance,
- A New Magnetic Recording Configuration for Densities Beyond 1 Tbit/in<sup>2</sup> ,
- Data Rates Beyond 1 Gbit/s,
- Colossal Magnetoresistive Oxides – Their Basic Physics and Potential for Information Storage Applications,
- Spin Electronics, and Patterned Media Using Nanoimprint Lithography,
- 2D Coding and Iterative Detection Schemes.

The section Magnetics Society is very much welcomes the assistance of its members to help grow the society in an effort to expand the ability to serve its members. Additional details on upcoming presentations may be viewed at: <http://ccis.colorado.edu>  
--> seminars button.

I want to thank the members for their support of IEEE.

*Randy K. Rannow*  
*Chair, Denver Section Magnetics Society*

**NOTE** from Chapters Chair, Richard Dee. The Denver section chapter has been very active and vibrant under the guidance of Randy Rannow and I would like to thank him for making it so! (Especially the free pizza). Unfortunately he is leaving the area to take job in Oregon (how dare he!). Here in the Denver/Boulder area we wish him the best and are looking forward to seeing a new chapter formed in Oregon soon.

**\*\*\* NOTICE TO ALL MAGNETICS SOCIETY CHAPTER CHAIRS \*\*\***

Could you please update you contact information for me. I've noticed several emails bounce back implying that you've moved (at least email addresses). Let me know at [r.dee@ieee.org](mailto:r.dee@ieee.org) so we can still communicate. Also if your chapter is not doing so good and needs some help let me know!

For information on local chapters check the website [www.ieeemagnetics.org](http://www.ieeemagnetics.org).

## IEEE Magnetics Society Distinguished Lecturers 2003-2004

### Wall Watching: The Progress of Domains in Small Elements

*John Chapman*

University of Glasgow

An understanding of magnetization processes is of direct interest to physicists and is crucial for developing high performance magnetic devices. The domain structure, and the way it changes under the influence of a magnetic field, depends not only on basic material parameters but also on the physical shape and size of the magnetic material. Thus, quite different domain configurations are found in bulk materials, thin films, and small magnetic elements made from the same material. The same is true of domain walls, whose structure can change markedly as one or more of the dimensions of the material under investigation moves into the sub-micrometer regime. Given the extreme miniaturization that occurs in magnetic storage and sensing devices, as detailed a knowledge as possible of the magnetization configuration in small elements is essential.

For many years, the Lorentz imaging mode of transmission electron microscopy (TEM) has yielded high resolution magnetic images of domains and walls in magnetic films and elements. Since only a modest amount can be learned from a single image of an element, however, recent advances -- whereby *in situ* magnetizing capabilities within the TEM have been enhanced -- have made a considerable impact.

In this talk I will illustrate the radical changes that occur as the dimensions of magnetic elements are reduced from a few micrometers to tens of nanometers. While size is a very important parameter, the detailed shape can also exert a major role, and changes here offer a way of tailoring properties to meet specific requirements. Other important influences are coupling between layers (if the element is formed from a magnetic multilayer) and the nature of the substrate. It is hoped that many of the images, as well as revealing in a very direct way how the magnetization process proceeds, will appeal to the aesthetics of the audience.



**John Chapman** received both the M.A. degree in Natural Sciences and the Ph.D. degree from the University of Cambridge, United Kingdom, in 1973.

Following a Research Fellowship at Fitzwilliam College, Cambridge, he became a Lecturer at the University of Glasgow in the Department of Physics and Astronomy. Promotion to readership in 1984 and full professorship in 1988 followed; currently he is Head of Department. Professor Chapman's main research interest concerns the characterization, development, and application of advanced functional materials. Overall his aim is to gain understanding at a microscopic level of how various physical properties relate to material nanostructure and how the former can be improved by the ways in which materials are grown and processed. He studies magnetic materials extensively, with particular emphasis on magnetic nanostructures and multilayer films. Much of his work uses electron microscopy and related analytical techniques. He has co-authored about 250 papers.

In 1991 Professor Chapman was elected a Fellow of the Royal Society of Edinburgh. He is also a Fellow of the Institute of Physics and of the Royal Microscopical Society.

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e-mail: [j.chapman@physics.gla.ac.uk](mailto:j.chapman@physics.gla.ac.uk)

## Characterization of Magnetic Recording Channels: A Historical Perspective

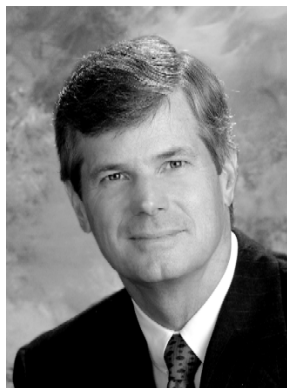
*Thomas D. Howell*

San Jose State University

The design of advanced signal processing systems for recovering data stored on magnetic media requires an accurate understanding of the input/output characteristics of the storage system. The designer must be able to predict the output resulting from an arbitrary input in order to select the optimum set of signals to represent the data. He or she should also know the statistical properties of the noise and the types of distortion affecting the storage and readback processes.

Early systems used simple models of channel behavior. As densities increased and signal processing schemes became more complex, more sophisticated models were needed. It is interesting to observe how effects once considered negligible became important, and conversely, how dominant distortions, once understood, became part of the expected signal and hence of negligible importance as disturbances.

In this lecture I will examine selected developments from the history of magnetic recording channel characterization. I will discuss the changing roles of intersymbol interference and nonlinear transition shift, along with some of the techniques used to measure and model them. Magnetic recording systems continue to evolve at a rapid pace; the lessons learned from history often help speed progress and avoid future pitfalls.



**Thomas D. Howell** (M'81, SM'89) received the B.S. degree in mathematics from the California Institute of Technology, Pasadena, CA, in 1973 and the Ph.D. degree in computer science from Cornell University, Ithaca, NY, in 1976.

He became a Lecturer in computer science and electrical engineering at San Jose State University, CA, in 2002. From 1977 to 1990 he was a research staff member in the IBM Research Division at their San Jose, Zurich, and Almaden centers, where he conducted research on the application of advanced signal processing techniques to magnetic recording channels. After joining Quantum Corporation in 1990, he managed advanced engineering groups in a variety of areas and helped introduce new technologies including digital channels, magnetoresistive and giant magnetoresistive heads into the company's products. He held a number of positions, ending as Vice President of Research. He served on the board of directors of the National Storage Industry Consortium and on industrial advisory councils at several university research centers during the 1990s.

Dr. Howell served as an editor of the *IEEE Transactions on Magnetics* (1997-2000) and chaired The Magnetic Recording Conference (2000).

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## Thermal Magnetization Noise and Fluctuation-Dissipation in Magnetoresistive Heads, Sensors, and Ferromagnetic Thin-Film Devices

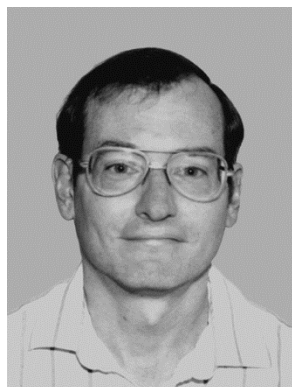
*Neil Smith*

IBM Almaden Research Center, IBM Corporation

Continuing technological development of giant magnetoresistive (GMR) spin-valve materials and devices, and tunneling magnetoresistive (TMR) sensors, has been largely driven by ever-increasing demands for greater areal storage density and data transfer rates for hard-disk drives. These technological demands will require future GMR (or TMR) materials with increasing MR coefficients  $\Delta R/R \gg 10\%$ , and read-head/sensor dimensions at and below the scale of 100 nm. In this regime, the sensor's intrinsic electrical noise can be exceeded by resistance noise arising from thermally-induced magnetization fluctuations ("mag-noise") in the very thin, magnetically soft, ferromagnetic sensing layers of the MR read head. This mag-noise contribution scales as  $P \cdot (\Delta R/R)^2 \cdot \chi_i^2/V$  (where  $P$  is the input power,  $\chi_i$  is the sensor's internal magnetic susceptibility, and  $V$  is the sensor volume), whereas the signal power similarly scales as  $P \cdot (\Delta R/R)^2 \cdot \chi_e^2$  (where  $\chi_e$  is the external field susceptibility). Hence, mag-noise serves as a fundamental limit on GMR sensor signal-to-noise ratio that does not substantially improve with further increases in  $\Delta R/R$  or sensitivity  $\chi$ , but which can become more severely limiting as sensor volume decreases.

In addition to its technological implications, observation of mag-noise in sub-micrometer MR sensors provides a relatively simple electrical measurement to study basic damping properties and loss mechanisms in the constituent ultra-thin ferromagnetic films. This can include geometric finite-size effects in very small (100 nm) structures not easily probed by traditional ferromagnetic resonance experiments. The basic relationships between intrinsic magnetic damping and measured thermal magnetization fluctuations can be described by application of the fluctuation-dissipation theorem.

In this talk I will offer a brief tutorial on the fluctuation-dissipation theorem and how it may be properly employed to quantitatively model the mag-noise amplitude and spectrum observed in MR sensors. I will review some recent measurements of mag-noise in MR devices, compare experimental with model expectations, and offer scaling projections of magnetic noise vs. sensor size. In addition, I will discuss how fluctuation-dissipation arguments can discriminate between alternative phenomenological damping models in ways not obvious using traditional uniform magnetization descriptions of damped ferromagnetic resonance, and conclude with a brief consideration of excess damping contributions from inhomogeneity and finite-size effects.



**Neil Smith** received the S.B. degree in physics from the Massachusetts Institute of Technology, Cambridge, in 1977, and the Ph.D. degree in physics, also from MIT, in 1983.

He joined the Eastman Kodak Company in 1984 and worked in the Magnetic Heads Division of Kodak Research Labs, San Diego, CA, until 1998. His work there primarily involved the physics of magnetic recording of magnetic tape heads and systems, with particular emphasis on the development of magnetoresistive read heads and very high sensitivity anisotropic and giant magnetoresistance magnetic field sensors. In 1998 he joined the IBM corporation, working in the Recording Heads Group at the IBM Almaden Research Center, San Jose, CA. At IBM he has concentrated on both write and read head technology for hard-disk drives, including research on the basic physical and technological limits of read heads for ultra-high disk storage densities. He has recently conducted some of the

first investigations into fundamental signal-to-noise limits of magnetoresistive read heads due to thermally induced magnetization fluctuations.

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## MAGNEWS

Exciting new achievements?

Share with us the news!

This is the place to inform the magnetics community about a new discovery, great achievement, theoretical or experimental breakthrough in magnetism, worth to share.

Submit a one page long information about your new accomplishment – pictures welcome!

Editor:

[mpardavi@gwu.edu](mailto:mpardavi@gwu.edu)

*Sorry, this is NOT the place for product description, or advertisement.*

## VISUAL MAGNETICS

**WHAT IS THIS?**



**SOLUTION?**

**GO TO THE END**





## Conference announcements 1

### **2ND NORTH AMERICAN PERPENDICULAR MAGNETIC RECORDING CONFERENCE**

#### **NAPMRC2003**

**Monterey, California,**

**January 6–8, 2003**

Following successful debut of the 1<sup>st</sup> North American Perpendicular Magnetic Recording Conference (NAPMRC2002), which was held January 7–9, 2002, in Miami, Fla., the second conference (NAPMRC2003) will be held jointly with the 6th Perpendicular Magnetic Recording Conference (PMRC2003) in Monterey, Calif., January 6–8, 2003. The object of the Joint conference is a highly focused review of the latest progress in the development of perpendicular magnetic recording.

The Joint [NA]PMRC will have a single session format, with invited presentations forming the body of the conference. A poster session will showcase contributed presentations. The conference is planned as a highly interactive meeting serving as a forum for evaluating the current status of development efforts in perpendicular magnetic recording. Among the major topics to be discussed are recording media and heads, theory and modeling, measurements and characterization, channels and signal processing, and system integration. A special session will be dedicated to the discussion of future and alternative technologies.

Subject to the usual peer-review process, the invited papers will be published in the July 2003 issue of *IEEE Transactions on Magnetics*. NAPMRC2003 is organized and co-chaired by *Sakhrat Khizroev* (University of Miami) and *Dmitri Litvinov* (Seagate Research) in collaboration with PMRC2003 program co-chairs *Hiroaki Muraoka* (Tohoku University) and *Hajime Aoi* (Hitachi). Honorary co-chairs for the Joint [NA]PMRC are *Stanley Charap* (Carnegie Mellon University) and by *Sun-ichi Iwasaki* (Tohoku Institute of Technology). To ensure broad representation of industry and academia, the conference program is being developed in close collaboration with a 37-member advisory board that includes top leaders from the key academic and industrial organizations worldwide.

The Joint [NA]PMRC is sponsored by

- ◆ Magnetics Society of the Institute of Electrical and Electronics Engineers
- ◆ Japanese Society for the Promotion of Science, Committee 144
- ◆ Magnetics Society of Japan

## IEEE Magnetics Society NEWSLETTER

The conference is endorsed by

- ◆ Materials Research Society
- ◆ Information Storage Industry Consortium
- ◆ American Physical Society

and by the following academic research centers

- ◆ Center for Micromagnetics and Information Technologies, University of Minnesota
- ◆ Center for Materials for Information Technology, University of Alabama
- ◆ Center for Magnetic Recording Research, University of California - San Diego
- ◆ Center for Research on Information Storage Materials, Stanford University
- ◆ Data Storage Systems Center, Carnegie Mellon University

The industrial sponsors for the conference are Veeco Instruments, Inc. and Marvell Semiconductor, Inc. Additional information about the conference can be accessed <http://ww.napmrc.org>

## Conference announcement 2



**INTERMAG  
2003**

## The 2003 IEEE International Magnetics Conference

**Boston Marriott at Copley Place**

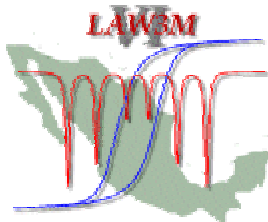
Boston, Massachusetts

**March 30 -April 3, 2003.**



The Intermag Management Committee would like to thank all the authors who submitted digests to the INTERMAG 2003 conference.

## Conference announcement 3



### VI LAW3M VI Latin American Workshop on Magnetism, Magnetic Materials and their Applications CIMAV, Chihuahua Mexico April 7th-11th 2003

#### **Important!**

NEW Abstract Submission Deadline - November 15th, 2002.

Due to multiple requests from world wide scientist, Organizing Committee has decided to extend the *Abstract Submission Deadline until November 15th*. Organizing Committee strongly encourage the authors to submit their abstracts using the online submission form. The new deadline will be strictly observed.

The **Sixth Latin American Workshop on Magnetism, Magnetic Materials and their Applications (VI LAW3M)** to be held at Advanced Materials Research Center (CIMAV) in Chihuahua, Mexico on April 7th-11th, 2003 continues a series of biennial meetings initiated in La Habana Cuba in 1991 and followed by workshops in Guanajuato Mexico (1993), Mérida Venezuela (1995), São Paulo Brazil (1998) and San Carlos de Bariloche Argentina (2001).

LAW3M is designed to support scientific exchanges among researchers and institutions interested on recent developments in all branches of fundamental and applied magnetism. This series of Workshops has grown as one of the most prestigious conferences in Latin America. Each successive edition has involved more specialized subjects, scientists and results, not only from the region but all around the world.

This 6th edition of LAW3M will provide an open forum to promote collaboration between different groups, where participants can discuss the latest information regarding to their experiences, new concepts and general developments in materials research and magnetic applications.

The participation of young graduate students is most welcome.

Workshop Proceedings will be published as a Special Issue of the Elsevier Science B.V. journal, **Journal of Alloys and Compounds**.

Fellowship Award for Graduate Studies in Magnetic Materials at CIMAV!!

<http://www.law3m.org.mx/>

## Conference announcement 4

## Conference announcement 5

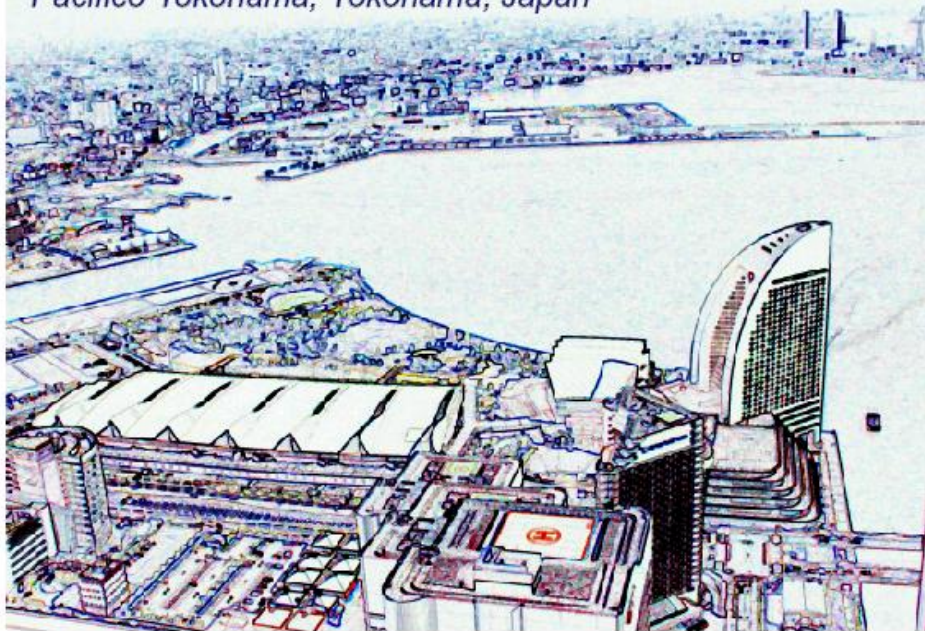
### MIPE 2003

Call for Papers

2003 JSME-IIP/ASME-ISPS Joint Conference on  
Micromechatronics for Information and  
Precision Equipment

***IIP/ISPS Joint MIPE***

June 16-18 (Mon-Wed), 2003  
Pacifico Yokohama, Yokohama, Japan



Sponsored by  
Information, Intelligence and Precision Equipment (IIP) Division of JSME  
Information Storage and Processing Systems (ISPS) Division of ASME

Participating Societies (Planned)

Japanese Society of Tribologists, The Japan Society for Precision Engineering, The Surface Science Society of Japan, The Horological Institute of Japan, The Magnetic Society of Japan, Japanese Society for Medical and Biological Engineering, The Institute of Electronics, Information and Communication Engineers, Sensors and Micromachines Society of the Institute of Electrical Engineers of Japan, Industry Applications Society of the Institute of Electrical Engineers of Japan, International Disk Drive Equipment Materials Association Japan, The Japan Society of Applied Physics, The Japan Fluid Power System Society, The Japan Society of Applied Electromagnetics and Mechanics, The Robotics Society of Japan, The Society of Instrument and Control Engineers, The Institute of the Systems, Control and Information Engineers, Storage Research Consortium, Magnetic Society of IEEE, The Society of Tribologists and Lubrication Engineers, The Institution of Mechanical Engineers, The Korean Society of Mechanical Engineers

<http://www.jsme.or.jp/iip/english.htm>

## Conference announcements 6



**Saratoga Springs  
July 13-18, 2003**

### **Welcome to COMPUMAG 2003**

The 14th Conference on the Computation of Electromagnetic Fields will be held July 13 - 18, 2003, in Saratoga Springs, New York, USA.

**Note:** Deadline extended. Papers are now due 15 November 2002. The Compumag Committee appreciates all the authors who have already submitted papers. To reach the widest possible audience, though, the Committee will consider papers submitted up to November 15.

**Note:** Server may become busy now that the deadline for papers is getting closer. If server seems unresponsive, please wait a few minutes and try again.

#### *Online Paper Submission*

To submit your paper for review, follow the instructions on the Information for Authors page. Secure connection no longer required. You can now upload your paper without an SSL-enabled browser.

Keyword selection has changed. If you have already submitted one paper,  
please note the change in selecting the keywords.

#### *Search*

The Paper Information page has a complete search feature. Find papers by title, author, conference number, or assigned author number.

#### *Frequently Asked Questions (FAQ)*

Questions, Comments, or Problems? Please see the new section of Frequently Asked Questions (updated 23 Oct 2002) to see if your question has already been answered. If you still have any questions about submitting your paper to Compumag, send email to the Secretariat ([secretariat@compumag2003.com](mailto:secretariat@compumag2003.com))

Contact at [www.compumag2003.com](http://www.compumag2003.com)

## Conference announcement 7

### ICMFS

The XVIII International Colloquium on Magnetic Films and Surfaces

Madrid, Spain

22-25 July, 2003

#### **Organized by:**

Prof. Antonio Hernando, IMA-UCM (Chairman) [ahernando@renfe.es](mailto:ahernando@renfe.es)

Prof. Juan M. Rojo, UCM (Co-chairman) [jmrojo@eucmax.sim.ucm.es](mailto:jmrojo@eucmax.sim.ucm.es)

Prof. Rodolfo Miranda, UAM (Co-chairman) [rodolfo.miranda@uam.es](mailto:rodolfo.miranda@uam.es)

Prof. Fernando Briones, CSIC (Co-chairman) [briones@imm.cnm.csic.es](mailto:briones@imm.cnm.csic.es)

#### **Suggested topics:**

- Nanogranular, nanostructured and nanopatterned thin films
- Exchange coupled multilayers
- Surface/Interface Magnetism, Anisotropy and Magnetostriction
- Tunneling phenomena and spintronics
- Epitaxial magnetic nanostructures and self-organized growth
- Thin film media for magnetic recording, GMR, MO recording
- Magnetization reversal and fast dynamics
- Magnetic semiconductors
- Specific characterization techniques for thin films and surfaces: MOKE, XMCD, ARPE, Mossbauer, FMR, Transport and Magnetoresistance, strain measurements, micromechanical devices, magnetic imaging

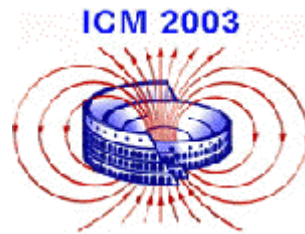
Hosted jointly by the CSIC (National Scientific Research Council of Spain) and the UAM and UCM Universities

with plenary and poster sessions taking place at the Conference Hall of the CSIC Serrano, 117 in a central area of Madrid. The Auditorium has a 300 seats capacity and modern presentation facilities

<http://www.ucm.es/info/magnet/>



## Conference announcement 8



**ICM2003**

**International Conference on Magnetism**

Roma, Italy

**July 27-Aug 1, 2003.**

Further information:

<http://www.icm2003.mlib.cnr.it/>

## Conference announcements 9

Welcome to

### Highly Frustrated Magnetism 2003

26-30th August 2003

Grenoble, France



Following the success of Highly Frustrated Magnetism Conference in Waterloo, Canada in June 2000 (HFM2000), we announce a second international conference on Highly Frustrated Magnetism.

**HFM2003** will be held at the Institute Laue Langevin (ILL) in Grenoble France, from 26-30th August 2003.

Highly Frustrated Magnetism continues to be a topical dynamic field of study inciting ground breaking research in many fields from the synthesis of new materials to fundamental questions in the quantum many body problem. We plan to welcome around 80 participants to HFM2003 working in all aspects of frustrated magnetism, with invited and contributed talks and poster sessions from the themes :

New Materials.

Frustrated quantum systems and low dimensional systems.

High degeneracy, degeneracy lifting and non-conventional ordering.

Itinerant frustrated systems.

He ring exchange and Wigner crystals.

Recent developments in spin glasses.

Orbital liquids.

Spin-lattice coupling.

Grenoble, situated in the heart of the French Alpes is easily accessible by TGV (High speed train), train or highway from Paris and elsewhere.

The Institute Laue Langevin (ILL), one of the key experimental installations in the development of the field of frustrated magnetism is an ideal venue for the conference, combining ease of access, scientific interest and agreeable surrounding and allowing a modest registration fee. Participants will be accommodated, in part in the ILL guest

house and in part in the town of Grenoble. Cafeteria facilities will be available at the conference site and a conference dinner will be included in the registration fee.

Looking forward to seeing you in Grenoble!

## Conference announcement 10

### First call

	<p><b>16<sup>th</sup> Soft Magnetic Materials Conference (SMM 16)</b></p> <p>9. -12. September 2003 Düsseldorf, Germany</p>
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### Scope of the Conference

This conference will be the 16th of a series of international meetings devoted to all kinds of soft magnetic materials placing particular emphasis on industrial and application aspects.

The Soft Magnetic Materials Conference provides a forum for the presentation of advances in the study, characterization, production and application of soft magnetic materials. It traditionally brings together scientists from universities, research institutions, and industry who are in the forefront of research on soft magnetic materials.

During the last three decades the SMM Conference has experienced increasing success due to the active participation of the academic world as well as of industry, the selective approach of the most relevant topics and sessions, the high scientific level of contributed and invited communications, and the permanent interest of the industrial world.

People attending the conference appreciate the friendly atmosphere and often meet in informal discussions. The exhibitors also benefit from this particular environment to present their latest technical developments.

### International Committee

A.J. Moses, Chairman, Cardiff, UK

J. M. Barandiaran, Bilbao, Spain

G. Bertotti, Torino, Italy

J. Bydzovsky, Bratislava, Slovakia

A. Coombs, Newport, UK

B. Cornut, Grenoble, France

F. Fiorillo, Torino, Italy

R. Grossinger, Vienna, Austria

R. Hasegawa, Parsippany, USA

T. Kubota, Chiba, Japan

H. K. Lachowicz, Warsaw, Poland

A. Lovas, Budapest, Hungary

Y. Okazaki, Gifu, Japan

K. Peters, Essen, Germany

R. West, Surahammar, Sweden  
K. Zaveta, Prague, Czech Republic

### Conference Time and Location

The conference will take place in Düsseldorf, Germany.  
9.-12. September 2003

### Conference Secretariat of SMM 16

#### D. Raabe

Department for Microstructure Physics and Metal Forming  
Max-Planck-Institut für Eisenforschung  
Max-Planck-Str. 1  
40237 Düsseldorf  
Germany  
Telefon: +49(0)211-67 92-340 / 278  
Telefax: +49(0)211 67 92 – 333  
Homepage: [www.soft-magnetic-materials16.mpie.de](http://www.soft-magnetic-materials16.mpie.de)  
email: [smm16@mpie.de](mailto:smm16@mpie.de)

### Topics

- basic problems, magnetization processes
- magnetic characterization, measurement techniques
- electrical steels: GO, NGO, thin electrical steels, higher Si-alloys
- FeNi, FeCo, Amorphous and Nanocrystalline Alloys
- Ferrites and other oxides, powder and composites
- design of electromagnetic components: modelling of magnetic circuit and numerical methods
- power applications (e.g. motors, transformers, actuators)
- electronic and high frequency applications

### Dates, Deadlines, and Registration

expression of interest for participation/ contribution	as soon as possible via email
second call	31. October 2002
deadline for abstracts (submission via website)	30. November 2002
indication about acceptance of contribution	31. January 2003
deadline for paper submission	30. April 2003
deadline for early registration	30. April 2003
conference	9.-12. September 2003
printed proceedings	31. May 2004

### Details for submitting Abstracts

Deadline: 30. November 2002

[www.soft-magnetic-materials16.mpie.de](http://www.soft-magnetic-materials16.mpie.de)

## Book Review

**Yuri Mnyukh**

### **Fundamentals of Solid-State Phase Transitions, Ferromagnetism and Ferroelectricity**

1stBooks Library; ISBN: 0759602190; (August 2001)

Dr. Mnyukh starts his treatise of the above title by quoting from Charles Dickens' Pickwick Papers. "The seventeen learned societies unanimously voted the presumptuous Blotton an ignorant meddler...". Dr. Mnyukh then writes a very presumptuous book, covering the three separate areas of phase transitions, ferromagnetism, and ferroelectricity in a unified way. As to ferromagnetism, his main point is that the Weiss molecular theory/ Heisenberg exchange energy theory of ferromagnetism is wrong! He replaces the conventional theory with a theory depending on the effect of the crystal field, and nucleation-and-growth phase transitions. Among his particulars is (1) the "sigmoid" shape of hysteresis loops is due to the balance between the increase in nucleation sites and the decrease in the amount of the original phase; (2) the Bloch wall between magnetic domains is meaningless, but is a structural twin interface having zero thickness; and (3) the Curie point is not a "critical" point and it is not a second-order transition! Instead it is a first-order transition and is due to nucleation and growth.

The fundamentals of magnetism is not at issue - atoms, spins, spin-orbits, etc. "Existence of the 'molecular field' is the principal point of the theory of ferromagnetism; its nonexistence is the principal point of the current presentation." Ferromagnetism is due to magnetic moments on atoms in crystals, ferroelectricity is due to electric dipoles on atoms in crystals. Ferromagnets and ferroelectrics are treated in analogous ways and are referred to as "ferroics" by the author.

An interesting feature of the book is a listing in Appendix V various comments from experts in ferromagnetism drawing attention to difficulties with the standard theory. As an example is a long series of quotes from Feynman, e.g. "The most recent calculations of the energy between the two electron spins in iron... still give the wrong sign."

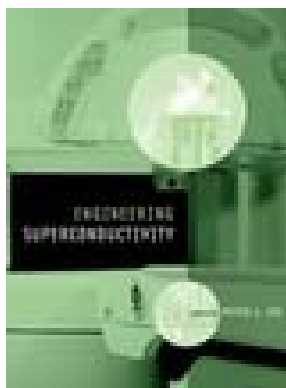
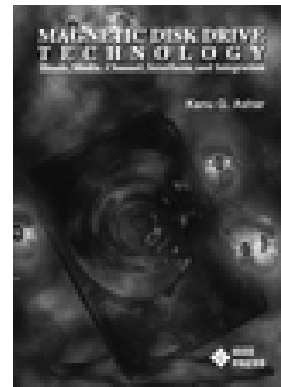
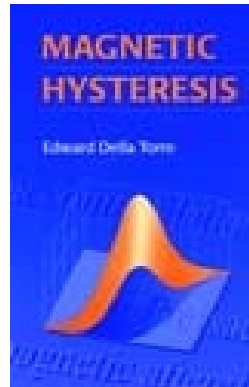
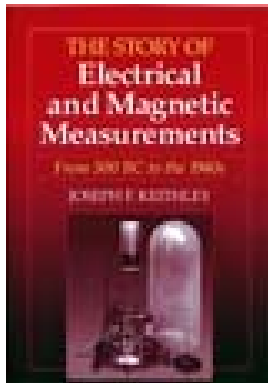
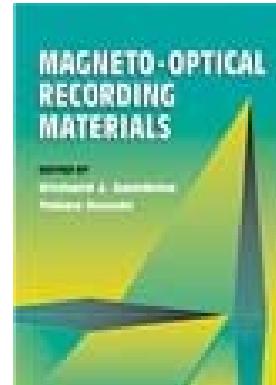
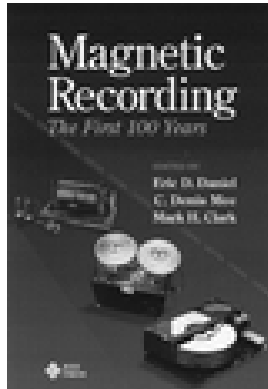
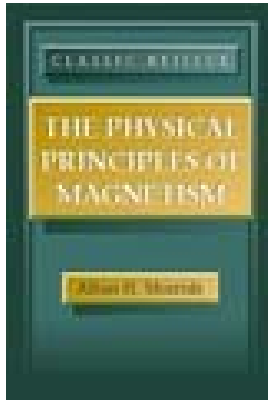
*L. H. Bennett*

[lbennett@seas.gwu.edu](mailto:lbennett@seas.gwu.edu)

## Books on magnetism

### WILEY-IEEE Press

<http://www.wiley.com/cda/sec/0,,9654|||9648:1,00.html>





<http://www.springer.de/press/about/index.html>



## SPIN ELECTRONICS

By Ziese, Michael, University of Leipzig, Germany;  
Thornton, Martin J., Oxford University, UK (Eds.)

2001 XVII,

493 pp.

Hardcover

3-540-41804-0

Recommended Retail Price: EUR 84,95 \*

For 50 years conventional electronics has ignored the electron spin. The manipulation and utilisation of the electron spin heralds an exciting and rapidly changing era in electronics, combining the disciplines of magnetism and traditional electronics. The first generation of "spintronic" devices (such as read heads based on giant magnetoresistance or non-volatile magnetic random access memories) have already gained dominant positions in the market place. This volume, the first of its kind on spin electronics, describes all the essential topics for new researchers entering the field. It covers magnetism and semiconductor basics, micromagnetism, experimental techniques, material science, device fabrication and new developments in spin-dependent processes. At the end of most chapters are a number of exercises and worked problems to aid the reader in understanding this fascinating new field.

**Series:** Lecture Notes in Physics. Volume. 569







## **MAGNETISM AND SUPERCONDUCTIVITY**

By Levy, Laurent-Patrick, MPI für Festkörperforschung, CNRS, Grenoble, France

2000 XII,  
467 pp. 129 figs., 13 tabs.  
Hardcover  
3-540-66688-5

Special Offer valid until 31.03.2003: EUR 34,95 \*\*\* Recommended Retail Price: EUR 49,95 \*

This work presents a modern vision of magnetism and superconductivity which covers both microscopic and phenomenological aspects. The basic information is illustrated with the help of current research topics such as the quantum Hall effect or mesoscopic aspects of superconductivity. The author systematically uses very intuitive examples and arguments in order to familiarize the reader with the underlying formalism. The present textbook addresses primarily graduate students but is also of interest to scientists working in this field.

**Series:** Texts and Monographs in Physics.





<http://www.wkap.nl/prod/b/0-89838-964-X>

## **Biological Effects of Magnetic and Electromagnetic Fields**

Edited by S. Ueno



## **Magnetic Components for Power Electronics**

**Alex Goldman**

Magnetic Components for Power Electronics concerns the important considerations necessary in the choice of the optimum magnetic component for power electronic applications. These include the topology of the converter circuit, the core material, shape, size and others such as cost and potential component suppliers. These are all important for the design engineer due to the emergence of new materials, changes in supplier management and the examples of several component choices. Suppliers using this volume will also understand the needs of designers.

*Kluwer Academic Publishers,  
Boston Hardbound,  
ISBN 0-7923-7587-4*





## **HYSTERESIS,**

2nd Edition

**ACADEMIC PRESS** by Isaak Mayergoyz

ISBN 0124808735 ·  
Hardback · 300 Pages  
Academic Press · Forthcoming Title  
Price: £ 83.95

This new edition has been significantly revised and updated to reflect advances in the field since the publication of the first edition, such as the systematic experimental testing of Preisach models of hysteresis. The author has, however, retained the two most salient features of the original, the emphasis on the universal nature of mathematical models of hysteresis and their applicability to the description of hysteresis phenomena in various areas of science, technology and economics and its accessibility to a broad audience of researchers, engineers, and students. **What's New** Four new chapters on Hysteresis Greater emphasis on applications Enriched with new theoretical and experimental results

<http://www.harcourt-international.com/catalogue/title.cfm?ISBN=0124808735>





## HANDBOOK OF MAGNETIC MATERIALS

Edited by K.H.J. Buschow, University of  
Amsterdam,

### Volume 14

Included in series: ***Handbook on Magnetic Materials, 14***

### Contents

1. III-V Ferromagnetic Semiconductors (F. Matsukara, H. Ohno, T. Dietl).
2. Magnetoelasticity in nanoscale heterogeneous materials (H.H. Duc, P.E. Brommer).
3. Magnetic and superconducting properties of rare earth borocarbides of the type  $RNi_2B_2C$  (K.H. Mueller, G. Fuchs, S.L. Drechsler, V.N. Narozhnyi).
4. Spontaneous magnetoelastic effects in gadolinium compounds (A. Lindbaum, M. Rotter).

Year 2002

Hardbound

ISBN: 0-444-51144-X

420 pages

Price: USD 200 EUR 200

<http://www.elsevier.nl/>

## VISUAL MAGNETICS – SOLUTION



**Ewing machine**

### Ewing's Magnetic Hysteresis Curve Tracer

Magnetic hysteresis is not something one usually worries about when paying the electricity bill, yet it is a fundamental property of the magnetic materials found in electric motors we use at home and the transformers that supply us with current. Magnetic hysteresis is responsible for some of the inefficiency in these and other devices. It also determines the usefulness of an alloy to act as a good magnet or the value of a compound as a magnetic memory medium.

The phenomenon was discovered and named only some 100 years ago by Professor J. Alfred Ewing, a Dundonian who was noted for his lifelong efforts to establish engineering education in Universities. He spelt out the properties of magnetic hysteresis in his important work *Magnetic Induction in Iron and Other Materials* published in **1891**. In the following year, Ewing designed an ingenious instrument for displaying the characteristic hysteresis loop of a magnetic material. In it he reflected a light spot from a mirror whose movements were controlled by the hysteresis of the material. The resulting light pattern was viewed on a screen, or through a small telescope to magnify the effect.

Our picture shows one of Ewing's pioneering instruments, with accessories, as made in the 1890s by Nalder Bros. and Co. of London.

*John S Reid*

<http://www.abdn.ac.uk/~nph126/items/nl41.htm>