

Editorial

Early History of the IEEE Magnetics Society and Introduction to IEEE MAGNETICS LETTERS

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Abstract—The IEEE Magnetics Group came into existence two years after the American Institute of Electrical Engineers and the Institute of Radio Engineers merged to form the Institute of Electrical and Electronics Engineers. Since the establishment of IEEE TRANSACTIONS ON MAGNETICS, scholarly publishing has been one of the organization's major activities. A new electronic journal, IEEE MAGNETICS LETTERS, follows in that tradition.

Index Terms—Editorial, IEEE MAGNETICS LETTERS, IEEE Magnetics Society, scholarly publishing, scientific and technical societies.

I. INTRODUCTION

The IEEE Magnetics Society, with endorsement from IEEE's Technical Activities Board, established IEEE MAGNETICS LETTERS in January 2010. MAGNETICS LETTERS is intended to meet the need for a rapid-publication, electronic, peer-reviewed journal dedicated to magnetics articles of substantial current interest. This article gives a brief history of the society, its founders, its conferences, and its publications.

II. MAGNETICS GROUP AND TRANSACTIONS ON MAGNETICS

When the Institute of Electrical and Electronics Engineers (IEEE) was formed in 1963 through the merger of the American Institute of Electrical Engineers (AIEE, founded in 1884) and the Institute of Radio Engineers (IRE, founded in 1912), it had 31 technical groups, each representing a different technical specialty [National Academy 1968]. On 26 August 1964, IEEE approved the formation of the IEEE Magnetics Group. Its scope was the "treatment of all matters in which the dominant factors are the fundamental developments, design, and certain applications of magnetic devices. This includes consideration of materials, and components as used therein, standardization of definitions, nomenclature, symbols, and operating characteristics; and exchange of information as by technical papers, conference sessions, and demonstrations" [Storm 1965]. The Magnetics Group became group number 33. The first chairman was Herbert F. Storm (General Electric) (Fig. 1). Subsequent executive officers are listed in Table 1. G. Frank Pittman Jr. (Westinghouse) had been a key person in convincing IEEE of the importance of such a group, and Charles J. Kriessman (Sperry Rand Univac Division) was responsible for obtaining corporate support [Shevel 2009].

One of the main goals of the Magnetics Group was to establish a magnetics journal. IEEE TRANSACTIONS ON MAGNETICS was first published in March 1965 as a quarterly. Joseph J.

Suozi (Bell Telephone Laboratories) (Fig. 1) was editor-in-chief (Table 2), Fritz J. Friedlaender (Purdue University) was the reviews editor, and E. J. Alexander (Bell Telephone) was the Newsletter editor. In 1968, Emerson W. Pugh (IBM) became editor-in-chief; he appointed Hsu Chang (IBM) as reviews editor and James M. Lommel (General Electric) as Newsletter editor, and initiated the "Advances in Applied Magnetics" series (renamed "Advances in Magnetics" in 1969), with Fred E. Luborsky (General Electric) as editor. The third rotation of editors came in 1971, when Hsu Chang became editor-in-chief and David A. Thompson (IBM) was appointed reviews editor [Chang 1971].

IEEE had registered the IEEE TRANSACTIONS trademark in 1964. Before IEEE's formation in 1963, the name TRANSACTIONS had been used by its two predecessor organizations: TRANSACTIONS OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS and IRE TRANSACTIONS. As used by AIEE, TRANSACTIONS were annual collections of the proceedings of its meetings. As used by IRE, TRANSACTIONS were the publications of its member groups, which became IEEE groups. However, IEEE's predecessors did not originate the "Transactions" name; the Royal Society of London's *Philosophical Transactions* was first published in March 1665, 300 years before TRANSACTIONS ON MAGNETICS.



Fig. 1. Herbert F. Storm (1909–1994) founder and first chairman of both the Magnetics Group and INTERMAG (left). W. L. Shevel Jr. (1932–) second chairman of the Magnetics Group and chairman of INTERMAG 1964 and MMM 1966 (center). J. J. Suozzi (1926–2003), third chairman of the Magnetics Group, chairman of INTERMAG 1965 and 1967, and first editor-in-chief of the TRANSACTIONS (right). [Photo sources: Storm 1965, Shevel 1968, Suozzi 1967.]

Table 1. Presidents of the IEEE Magnetics Society during 1965–2010.

President	Affiliation	Years
Herbert F. Storm ^a	General Electric	1965-1967
W. Lee Shevel Jr. ^a	IBM	1967-1969
Joseph J. Suozzi ^a	Bell Telephone Laboratories	1969-1971
Robert C. Byloff ^a	Louis Allis Company	1971-1972 ^b
Emerson W. Pugh	IBM	1973-1974
Fred E. Luborsky	General Electric	1975-1976
Fritz J. Friedlaender	Purdue University	1977-1978
Daniel I. Gordon	Naval Surface Warfare Center	1979-1980
James M. Lommel	General Electric	1981-1982
Clark E. Johnson Jr.	Vertimag Systems	1983-1984
Alan B. Smith	Digital Equipment	1985-1986
William D. Doyle	Eastman Kodak	1987-1988
Richard M. Josephs	Naval Air Development Center	1989-1990
Stanley H. Charap	Carnegie Mellon University	1991-1992
David A. Thompson	IBM	1993-1994
James E. Opfer	Hewlett-Packard	1995-1996
Daniel D. Stancil	Carnegie Mellon University	1997-1998
Edward Della Torre	George Washington University	1999-2000
Robert E. Fontana	IBM	2001-2002
Ronald S. Indeck	Washington University, St. Louis	2003-2004
Kevin O'Grady	University of York	2005-2006
Carl E. Patton	Colorado State University	2007-2008
Randall H. Victora	University of Minnesota	2009-2010

^a Chairman^b Magnetics Group accorded Society status in 1972

Table 2. Editors-in-chief of the TRANSACTIONS during 1965–2010.

Editor-in-Chief	Affiliation	Years
Joseph J. Suozzi	Bell Telephone Laboratories	1965-1967
Emerson W. Pugh	IBM	1968-1970
Hsu Chang	IBM	1971-1972
Fred E. Luborsky	General Electric	1972-1974
Paul W. Shumate	Bell Laboratories	1975-1978
Alan B. Smith	Sperry Research Center	1979-1981
Stanley H. Charap	Carnegie Mellon University	1982-1986
Carl E. Patton	Colorado State University	1987-1991
William Lord	Iowa State University	1992-1995
Ronald B. Goldfarb	National Inst. of Standards and Tech.	1995-2004
David C. Jiles	Cardiff University	2005-2010

Magnetics topics of interest in 1965 included “theory of magnetism, hard and soft magnetic materials, magnetic thin films, magnetic logic and memories, magnetic recording, magnetic amplifiers and controls, combination of magnetic with semiconductor components, cryogenic high-field magnets, microwave ferrite switches, Hall-effect and magnetoresistive devices, flux plotting, [and] permanent magnets” [Storm 1965]. The nominal similarity of this list to many of today’s active research areas in magnetics is remarkable.

Ann H. Burgmeyer served as the TRANSACTIONS’ IEEE production manager from 1969 through 1993. In 1975 the TRANSACTIONS increased its frequency of publication to six issues per year. In 2005, it became a monthly publication. It currently publishes about 4000 pages per year. Of more than 150 IEEE periodicals, it is the fourth most used, with over 800 000 annual electronic downloads from IEEE’s Xplore platform.

In 1985, the Magnetics Society began publishing the IEEE TRANSLATION JOURNAL ON MAGNETICS IN JAPAN. Editors were James E. Opfer (Hewlett-Packard), 1985–1990, and Takao Suzuki (IBM), 1990–1994. It allowed articles that were originally published in Japanese scholarly journals and conference proceedings to be more accessible to researchers. However, the need for the translation journal diminished as more research papers in Japan began to be published in English. The high

costs of translation and production contributed to the decision to discontinue the journal in 1994.

III. MAGNETICS CONFERENCES

In addition to publishing the TRANSACTIONS, the Magnetics Group took over sponsorship of the International Conference on Nonlinear Magnetics (INTERMAG) from the now subsumed IEEE Nonlinear Magnetics Committee (formerly a committee of the AIEE) [Storm 1965]. The first INTERMAG had been held in 1963 in Washington, D.C. The third conference in 1965 was renamed the International Conference on Magnetics; papers from that conference were published in the TRANSACTIONS, a practice that has endured. In many years, the conference was called just “INTERMAG” (Figs. 2 and 3). Since 1972, it has been the International Magnetics Conference. The first INTERMAG conferences held in Europe (Stuttgart 1966; Amsterdam 1969) were key events in giving the Magnetics Society a truly international character [Shevel 2009]. Except for those two, INTERMAG was held in Washington, D.C., through 1970. Edmund Adams (U.S. Naval Ordinance Laboratory) was in charge of local arrangements and obtained support from government laboratories [Shevel 2009].

The Conference on Magnetism and Magnetic Materials (MMM) is older than INTERMAG. The first one, founded by Richard M. Bozorth and sponsored by the Magnetics



Fig. 2. INTERMAG 1967 Management Committee. Seated, from left: E. Adams, E. J. Alexander, J. J. Suozzi, R. F. Elfant. Standing, from left: D. Katz, F. G. Timmel, B. Hershenov. [Photo source: Suozzi 1967.]



Fig. 3. Members of the INTERMAG 1969 Committee discussing plans for the Amsterdam conference during INTERMAG 1968 in Washington, D.C. From left: C. J. Kriessman (front), E. J. Alexander, F. J. Friedlaender, T. Holtwijk, U. F. Gianola, R. C. Byloff, R. R. Booth, H. Bosma. [Photo credit: Naval Ordinance Laboratory, in Pugh 1968.]

Subcommittee of the AIEE Committee on Basic Sciences, was held in 1955. Beginning with the third MMM, the proceedings were published in the American Institute of Physics' *Journal of Applied Physics* (except for the period 1971–1976, when they were published as AIP Conference Proceedings). In 1960, AIP became a joint sponsor of MMM [Bozorth 1961]. In 1964, the Magnetism Subcommittee became part of the Magnetism Group [Suozi 1965], thus transferring half-ownership of MMM to the Magnetism Group.

Israel S. Jacobs (General Electric) and Fred E. Luborsky were influential in forging cooperation between MMM and INTERMAG [Shevel 2009]. The first Joint MMM-INTERMAG Conference was in June 1976; it has been held triennially since then with two exceptions: 1) in 1985, MMM was not held, in deference to the International Conference on Magnetism (ICM, sponsored by the International Union of Pure and Applied Physics) held that year in San Francisco; 2) in 1998, the joint conference shifted forward from June/July to its current January schedule.

From 1974 through 1999, conference-related papers in the *Transactions* were formatted by the authors on oversized mats for photo-offset printing. In 1975, Editor-in-Chief Paul W. Shumate (Bell Laboratories) published papers from the Applied Superconductivity Conference (ASC) in the *TRANSACTIONS*, which doubled its number of pages for the year. In 1981, papers from the Conference on Magnet Technology (MT) were also included. After the establishment of *IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY* in 1991 (cosponsored by the Magnetism Society), ASC and MT eventually transferred their biennial publication to that journal. Other conferences whose papers have appeared regularly in the *TRANSACTIONS* include Symposium on Electromagnetic Launch Technology (since 1982), Conference on the Computation of Electromagnetic Fields (since 1982), Conference on Electromagnetic Field Computation (since 1989), The Magnetic Recording Conference (since 1990), Asia Pacific Magnetic Recording Conference (since 1996), and Asia Pacific Data Storage Conference (since 1998). The review standards for conference-related papers are the same as those for regular papers.

IV. MAGNETICS SOCIETY

In 1972, the IEEE Magnetism Group became the IEEE Magnetism Society, one of the first IEEE groups to be upgraded [Chang 1972]. "A Group may be accorded Society status by the IEEE Board of Directors if its technical field has a foreseeable, long, and important future. Furthermore, the Group must be able to demonstrate past performance of excellence in their *TRANSACTIONS*, Technical Conferences, especially with a view of international participation, and success in cooperating with technically oriented organizations outside of IEEE, in and outside of the U.S.A." [Storm 1972]. With the change from group to society, the executive officer's title changed from "chairman" to "president."

In 2000, 21 long-time contributors to the Magnetism Society, including many former officers and members who were active during the transition from group to society, were awarded IEEE Millennium Medals (Fig. 4).



Fig. 4. IEEE Millennium Medals were presented to Magnetism Society members at INTERMAG 2000 in Toronto, Canada. Front row, from left: K. Harada, A. Pohm, F. Friedlaender, S. Rubens, E. Pugh, R. Barker, and G. Slemon. Back row, from left: Y. Sakurai, C. Patton, C. Bajorek, F. Humphrey, M. Kryder, A. Bobeck, S. Charap, D. Thompson, W. Doyle, and F. Luborsky. Not present: S. Foner, H. Lord, S. Shtrikman, and J. Suozi. [Photo source: Nyenhuis 2000.]

V. MAGNETICS LETTERS

The *TRANSACTIONS* well serves the applied magnetism community but does not always meet the demands of fast-paced magnetism research groups. The Magnetism Society's Publications and Administrative Committees perceived a need for a rapid-publication, electronic, peer-reviewed journal that concentrated on magnetism articles of topical interest. This was the impetus for the establishment of *IEEE MAGNETICS LETTERS*.

The journal uses a dedicated editorial review board and a select pool of reviewers in order to minimize the time from submission to first decision. Each article is published on IEEE's archival Xplore platform, in fully citable form by article number, as soon as page proofs are approved by the corresponding author. That is, publication is continuous throughout the year. *MAGNETICS LETTERS* articles may be up to four pages in length. They have a modern design, easy-to-read typeface, and full color. There are no page charges.

Members of the Magnetism Society have free, on-line access. Following each publication year, members will also receive the entire volume on a compact disk. A black-and-white annual compilation will be printed and mailed to print subscribers. For a fee, authors have the option of making their articles freely available under "open access."

MAGNETICS LETTERS is part of IEEE's electronic and print subscription packages purchased by libraries all over the world, which makes the journal easily accessible to readers. Institutions may order individual subscriptions to *MAGNETICS LETTERS* at very reasonable prices. *MAGNETICS LETTERS*, like other IEEE publications, will be indexed by Scopus, Web of Science, and other services.

VI. SUBJECT AREAS

The scope of *MAGNETICS LETTERS* is the physics and engineering of magnetism, magnetic materials, applied magnetism,

design and application of magnetic devices, biomagnetics, magneto-electronics, and spin electronics. Submitted articles outside of the journal's scope may be administratively rejected before review. In particular, the journal welcomes articles in:

- 1) electromagnetics (including theory, analytical models, magnetostatics, eddy currents, Hall effect, magnetic shielding);
- 2) magnetism in solids (including ferromagnetism, antiferromagnetism, superparamagnetism, magnetocrystalline anisotropy, magnetic semiconductors, spin glasses, magnetic domains, magnetic order, magnetic phase transitions, critical phenomena);
- 3) biomagnetics (including magnetic resonance imaging, magnetic contrast agents, diagnosis, therapy, devices, fields in living systems);
- 4) magnetochemistry (including synthesis, molecular magnets, nanoparticles in protein shells, ferrofluids, microfluidics);
- 5) magneto-electronics (including anisotropic magnetoresistance, giant magnetoresistance, colossal magnetoresistance, tunneling magnetoresistance, spin valves, magneto-impedance, multiferroics);
- 6) spin electronics (including spin injection, spin-transfer torque, magnetic random-access memory);
- 7) magnetodynamics (including magnetic resonance, precession, switching, damping, micromagnetic models);
- 8) nanomagnetics (including structured magnetic materials, nanoparticles, multilayers, exchange bias, thin films, patterned films, nanostructures);
- 9) information storage (including magnetic recording, heads, media);
- 10) soft magnetic materials (including amorphous, nanocrystalline, ferrite, microwave);
- 11) hard magnetic materials (including permanent magnets, anisotropy, hysteresis models);
- 12) coupled phenomena (including magneto-optical, magneto-elastic, magnetocaloric);
- 13) magnetic instruments (including measurement techniques, magnetometers, magnetic imaging, magnetic microscopy, magnetic sensors, micro-electromechanical systems).

VII. REVIEW STANDARDS AND METRICS

MAGNETICS LETTERS applies rigorous review standards to submitted manuscripts. At least two reviewers must certify as to the quality, importance, timeliness, and relevance of each submission for rapid publication in a selective, letters-format journal. The Magnetism Society will evaluate MAGNETICS LETTERS over time by monitoring the number of submissions, acceptance rate, time from submission to first decision, time from submission to publication, and number of Xplore downloads—along with Impact Factor, eigenfactor, and journal h -index.

Impact Factor (<http://isiknowledge.com/JCR>) is a ratio of the number of citations to the number of articles published in a 2-year period. Unfortunately, it is often misused as a measure of journal quality, selectivity, and prestige, and is sometimes egregiously misrepresented as a measure of an individual

author's impact [Gowrishankar 1999, Adam 2002]. A journal's Impact Factor is mostly determined by citations to only relatively few papers [Seglen 1997, Adam 2002, Colquhoun 2003]. Journals in different fields have different average Impact Factors, which makes comparisons across disciplines tenuous [Seglen 1997].

An interesting and arguably more useful alternative is eigenfactor (<http://www.eigenfactor.org>), a measure of citations over a 5-year period. It includes an iterative analysis of citation networks and adjusts for citation differences across disciplines.

Hirsch indexes are gaining currency in evaluating individual authors' citations. The h -index measures an author's citations against the number of his or her publications: "A scientist has index h if h of his or her N_p papers have at least h citations each and the other ($N_p - h$) papers have $\leq h$ citations each" [Hirsch 2005]. Even journals have been ranked using h -indexes by SCImago on the basis of Elsevier's Scopus database (<http://www.scimagojr.com>).

VIII. CONCLUSION

IEEE founded the Magnetism Society 45 years ago to serve an international community of researchers and practitioners through publications, conferences, local chapters, education, and recognition. IEEE MAGNETICS LETTERS is the most recent effort to further those goals.

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