IEEE Magnetics Society Newsletter July 1996

New Magnetics Society Fellows for 1996

Nine members of the Magnetics Society were recently elected to the grade of IEEE Fellow. The new Fellows were recognized by Fritz Friedlaender, chair of the Awards Department of the Magnetics Society, at the Plenary Session of the 1996 Intermag Conference in Seattle, Washington, USA. The new Fellows evaluated by the Magnetics Society and the contributions leading to their awards are as follows.

- James M. Daughton, "For pioneering work on commercial magnetic field sensors and memories using giant magnetoresistance materials".
- Robert Edward Fontana, Jr., "For development of novel processes for magnetic devices, most notably magneto-resistive thin film heads".
- Richard J. Gambino, "For discovery of perpendicular anisotropy amorphous magnetic materials and for development of these materials for the erasable, magneto-optical disk industry".
- Osama Abdel-Wahab Mohammed, "For contributions to three-dimensional electromagnetic field computation and for the development of intelligent systems techniques for the optimal design of electromagnetic devices and systems".
- Ching Hwa Tsang, "For contributions to the design of advanced magnetoresistive heads for rigid disk recording".

The following new Fellows are enrolled in the Magnetics Society but were evaluated by another Society:
Ion G. Boldea
Hisayasu Mitsui
Jean Robert
John L. Volakis

Nobutake Imamura honored with Information Storage Award at Intermag '96

The 1995 IEEE Reynold B. Johnson Information Storage award was presented to Nobutake Imamura by IEEE President-elect. Charles K. Alexander, at the plenary session of Intermag '96 in Seattle, Washington. The citation which accompanies Dr. Nobutake's award reads:
"For contributions to research, development, and commercialization of magneto-optic recording media and drive systems".

This award was established by the IEEE Board of Directors in 1991 and may be presented annully "for outstanding contributions to the field of information storage, with emphasis in the area of computer storage". The award is named in honor of Reynold B. Johnson, a pioneer in magnetic disk technology, who was founding manager of the IBM San Jose Research Engineering Laboratory in California. The award consists of a bronze medal, a certificate, and $5000. It is sponsored by IBM Corporation. Past recipients of the Information Storage Award are John M. Harker (1993), C. Dennis Mee (1994), and James U. Lemke (1995).

Dr. Nobutake Imamura was born on January 1, 1942 in Kyoto, Japan. He was awarded the Bachelor's and Doctoral degrees in Physics by the Gakushuin University in Tokyo in 1965 and 1970, respectively. His studies there in magnetic thin film physics were pursued under the guidance of Professor S. Chikazumi of the University of Tokyo.

Dr. Imamura began his professional career at Kokusai Denshin Denwa Co. (KDD) Research and Development Laboratories, Tokyo, in 1970. Initially, his research dealt with integrated high speed magnetic thin film memory.

In 1974, he was named a Group Leader at KDD and began research on rare earth transition metal amorphous alloy thin films. This work led to his discovery of TbFe for high density magnetic memory. His next major work was magneto-optical (MO) memory. In 1980, Dr. Imamura and his group produced the first MO recording system, using a GdTbFe disk. Starting in 1981, he developed application systems using the TbFeCo magneto-optical disk/drive, and following that, improved the dynamic read/write properties of the MO disk.

In 1986, Dr. Imamura left KDD to become Deputy General Manager of TOSCH Advanced Materials Research Laboratories. He was named General Manager in 1989, and is presently Director of TOSCH Corporation and General Manager of the MO Technology and Development Division.

Dr. Imamura is a pioneer in magneto-optical disk memory, but is perhaps most well known for his 1980 achievement in realizing a dynamic read/write test of magneto-optical disk memory. For this he used amorphous GdTbFe film as the disk media. The drive used a diode laser and fine servo techniques for auto-tracking and focusing; at that time this was an entirely new approach for making magneto-optical recording practical. From 1981, Dr. Imamura has been involved in several important high performance drive projects, and also in media development. Dr. Imamura is also co-inventor of magnetic field modulation for direct overwrite, which is utilized in the current Mini-Disk. Today, the TbFeCo based amorphous films which Dr. Imamura pioneered are the key media for MO recording.

Dr. Imamura is a Senior Member of the IEEE and a member of the Magnetic Society of Japan. He holds more than 30 patents and has published over 70 papers. He has received a number of awards, including the Award of the Minister of State for Science and Technology (1981), the K. Sakurai Award of the Optoelectronic Industry and Technology Development Associate (1987), and was co-recipient of the Prime Minister Award for Invention (1994).

Harada Honored with Achievement Award

The 1996 Magnetics Society Achievement Award was given to Prof. Koosuke Harada during the Plenary Session at the 1996 INTERMAG Conference in Seattle, Washington.

Professor Koosuke Harada was born in Fukuoka, Japan on November 10, 1929. He received B.S., M.S. and Dr. Eng. degrees, all in Electrical Engineering, from Kyushu University. In 1959, he joined the staff at Kyushu University and was promoted to Associate Professor in the following year. In 1968 he advanced to the rank of full professor. Professor Harada remained at Kyushu University until 1993 when he became Professor Emeritus. However, instead of retiring, he assumed the position of Director of the Applied Electronics Laboratory for Energy at the Kumamoto Institute of Technology.

For over 40 years Professor Harada's major research areas have been in power applications in nonlinear magnetics, magnetic-semiconductor hybrids, magnetic sensors and biomagnetics. When Professor Harada entered graduate school in the Electrical Engineering Department at Kyushu University in 1953 he followed in the footsteps of his father who had been a well-known authority on even-harmonic magnetometers and magnetic amplifiers and whose work had been published by the U.S. Naval mission in the USA in a 1946 report. As a graduate student, Dr. Harada carried out a detailed analysis of the even-harmonic magnetic amplifier with the magnetic modulator as a starting point. After completing his graduate studies in 1959, Dr. Harada prepared a Japanese translation of Dr. Storm's book "Magnetic Amplifiers". Since then Dr. Harada has made research in magnetics for power applications, including switching converters and other magnetic-semiconductor hybrids one of his major areas.

Professor Harada has developed many new circuits, new applications and new concepts in magnetics. He has published his results in more than 370 papers of which about 170 have appeared in IEEE publications, 55 in the IEEE Transactions on Magnetics. He holds about 50 patents on four continents.

Prof. Harada has had many outstanding graduate students in the fields of power magnetics, magnetic sensors and biomagnetics. Many of these now hold prominent positions.

From 1988 to 1993, Dr. Harada served as an Ad-Com member of the IEEE Magnetics Society. From 1993 to 1995, he served as president of the Magnetics Society of Japan. He also served as a general chairman of the 1988 IEEE PESC and the 1991 IEEE INTELEC Conference, both of which were held in Kyoto Japan and co-sponsored by the IEEE Power Electronics Society. He has also chaired a number of additional prestigious committees in Japan. Professor Harada has won a number of awards, including a best paper prize from the IEEE Industry Applications Society, the William E. Newell Power Electronics Award from the IEEE Power Electronic Society, a paper prize award from the IEE of Japan and the Inoue Harushige Prize from the Research Development Corporation of Japan.

Prof. Harada is the 15th recipient of the Achievement Award. Previous winners are
F.E. Luborsky,
H.W. Lord,
H.F. Storm,
J.J. Suozzi,
F.J. Friedlaender,
A. Bobeck,
F.B. Humphrey,
P.P. Biringer,
D.L. Gordon,
E.W. Pugh,
Y. Sakurai.
W.D. Doyle,
R.C. Barker
M. Kryder.

Intermag 1996 Held in Seattle, Washington

Scientists and engineers from around the world gathered in Seattle Washington from April 9 to 12 at Intermag '96. The following summary was prepared by the session chair.

Session GR - Magnetics in Life Sciences
By John Nyenhuis and Shoogo Ueno.

Session GR, Magnetics in the Life Sciences, was a poster session with well-presented papers. Many people were interested in the papers and the authors were busy explaining their work to conference attendees.

Four papers dealt with the effects of magnetic fields on mammalian tissues. Hyodo and Ueno presented results of their calculations on stimulation of finite length neurons with pulsed magnetic fields. It was found that nerve fibers are initially excited at the ends or at bends. Yamamda et al. found that a 1 T, 60 Hz magnetic field had no effects on the DNA synthesis velocity in vitro. Iwasaka and Ueno described a method by which a high gradient magnetic field can be used to enhance the dissolution of thrombi. Suda and Ueno observed red blood cells in a microscope and found that the cells and reoleaux in plasma were oriented by an 8 T magnetic field.

Authors of three papers described magnetic devices relevant to medical implants. Honda et al. investigated a linear oscillatory actuator for powering an artificial heart. A challenge in this endeavor is that the required thrust characteristics depend on aortic pressure and heart rate. Yamakata et al. described an efficient dc-dc converter for use in implantable heart. It is important that the power source for the artificial heart be efficient in order to avoid hazardous temperatures inside the body. Ofuji and Matsuki showed how Figure-of-eight coils are relatively insensitive to environmental noise in transcutaneous signal transmission.

Other papers dealt with different aspects of biomagnetism. Iwaki and Ueno showed that measuring the three components of the magnetic field about the human head will provide improved source estimation over measuring only the radial component. Molyneaux and Qureshi developed a quadrature phased array coil system for improved reception in magnetic resonance imaging. Ueno et al. showed that oxygen clusters in a magnetic

field with a strength of 8 T and gradient 50 T/m have enough magnetic energy to move 5 mm toward higher magnetic fields. Bahaj et al. subjected motile magnetotactic bacterial to magnetic field reversals and described an improved method for determining the magnetic moment from the resultant motion.

IEEE Magnetics Society Newsletter

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 magnetics. Copy is solicited from the Magnetics Society membership, organizers of conferences, officers of the Society and local chapters and other individuals with relevant material. The Newsletter is published in January, April, July and October. Submission deadlines are December 1, March 1, June 1, and September 1, respectively.

The Newsletter will also published on the World Wide Web on the IEEE Magnetics Society Home page at http://yara.ecn.purdue.edu/~smag
Back issues will be kept on this site as well.
Please send contributions to:

Dr. Jodie A. Christner
1135 Chippewa Drive N.W.
Rochester, MN 55901
TEL: (507) 286-7642

E-Mail: j.christner@ieee.org

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