PROGRAM

HMM 2001 - **Hysteresis and Micromagnetics Modeling** Symposium

May 21-23, 2001

The George Washington University

Virginia Campus, Ashburn, Virginia, U.S.A.

Monday (AM), May 21, 2001

8:00 Registration

8:50 Introductory Remarks
Irwin Price, Executive Dean, GWU Virginia Campus, Timothy Tong, Dean, SEAS, James A. Warren, Metallurgy Division, NIST and Lawrence H. Bennett, Symposium Chair, GWU

SESSION I Keynote Speakers (Session Chair: L. Bennett)

I-1 9:10 *Micromagnetics: Past, present and future*
A. Aharoni

I-2 9:45 *Micromagnetics and the 64 billion question: Will magnetic random access memory (MRAM) replace silicon (EPROM, Flash, DRAM and SRAM)?*
A. S. Arrott

10:20 **Break**

SESSION II Mathematics of Hysteresis I (Session Chair: I. Mayergoyz)

II-1 10:45 *Hysteresis and stochastic resonance*
M. I. Freidlin

II-2 11:10 *Preisach-type models of vector hysteresis*
A. Visintin

II-3 11:35 *Brownian motion on manifolds with application to thermal magnetization reversal*
D.R. Fredkin

12:00 **Lunch and Poster Break**

Monday (PM), May 21, 2001

SESSION III POSTERS: Micromagnetics and Field Calculations (12 Noon-2PM)
(Session Chairs: E. Cardelli and L. L. Diaz)

III-1 *From micromagnetic to multiscale modeling of the coupled magneto-elastic behavior of ferromagnetic materials*
N. Buiron, S. He, L. Hirsinger, S. Depeyre, M. Bernadou, R. Billardon

III-2 *Micromagnetic simulation of magnetization reversal in Co/Ni multilayers*
V. Tsiantos, T. Schrefl, D. Suess, W. Scholz, J. Fidler, J. M. Gonzales

III-3 *Standard problems in micromagnetics on fine grids*
A. S. Arrott

III-4 -

III-5 *OXS: An extensible public domain solver for micromagnetics*
M. J. Donahue, D. G. Porter

III-6 *Review of standard problems in micromagnetics*
R. D. McMichael, M. J. Donahue, D. G. Porter

III-7 Simulation of a fast saturation process of a quadratic thin film element
R. Hertel, J. Kirschner

III-8 *Micromagnetic studies of hystersis in nickel pillars*
S. L. Whittenburg, N. Dao

III-9 Perturbation Technique for Landau-Lifshitz-Gilbert Equation under Elliptically Polarized Fields
G. Bertotti, I. D. Mayergoyz, C. Serpico

III-10 *Effects of head-medium interaction on high density magnetic recording*
I. Saitoh, N. Takahashi

III-11 *Problems in nonlinear analysis of magnetic fields in permanent magnet type of MRI taking account of minor loop*
N. Takahashi, R. Suenaga, K. Miyata, K. Ohashi

III-12 *Magnetic material and motion*
A. Ivanyi, J. Fuzi

III-13 *Experimental analysis of hysteresis in low frequency magnetic shields*
E. Cardelli, A. Faba, A. Massinelli

III-14 *Hysteresis model for superconducting wire carrying transport current in transverse magnetic field*
Y. Zhilichev

III-15 *Dependence of the magnetic aftereffect on the moving parameter in the Preisach-Arrhenius model*
O. Alejos and E. Della Torre

SESSION IV Hysteresis and Preisach Modeling (Session Chair: C. E. Korman)

IV-1 2:00 *Isotropic media and the simplified vector model*
E. Della Torre, A. Reimers

IV-2 2:25 *Numerical investigation of wipe-out memory in hysteretic systems*
G. Friedman, K. Cha

IV-3 2:50 *Internal variables hysteresis models: an alternative to Preisach approach*
F. Ossart, R. Billardon

IV-4 3:15 *Magnetic properties of FePt granular media; Theoretical model and fit to experiment*
C. Verdes, R. W. Chantrell, D. Weller

3:40 **Break**

IV-5 4:05 *Hystersis operators for the modeling of transducers with giant magnetostriction*
C. Visone, C. Serpico

IV-6 4:30 *Materials exhibiting hysteresis and Preisach model identification: Are they compatible?*
A. Ktena, D. I. Fotiadis, C. V. Massalas, P. D. Spanos

IV-7 4:55 *Standard problems for phenomenological Preisach-type models*
A. Stancu, L. Stoleriu, M. Cerchez, P. Postolache, D. Cimpoiesu, L. Spinu

5:20 **Adjourn for the day**

6:00 **Dinner – Virginia Campus**

Tuesday (AM), May 22, 2001

SESSION V Micromagnetics I (Session Chair: G. Friedman)

V-1 9:05 *Intrinsic static and dynamic magnetization processes in nanocrystalline particles and assemblies of particles*
H. Kronmuller, T. Leineweber, M. Bachmann

V-2 9:30 *Identification of the damping coefficient in Landau-Lifshitz Equation*
G. Bertotti, I. D. Mayergoyz, C. Serpico

V-3 9:55 *Spin-wave instabilities in Landau-Lifshitz-Gilbert dynamics*
G. Bertotti, I. D. Mayergoyz, C. Serpico

10:20 **Break**

V-4 10:45 *Micromagnetic simulation of magnetisation reversal inrotational magnetic fields*
J. Fidler, T. Schrefl, W. Scholz, D. Suess

V-5 11:10 *Thermal and Dynamic effects in Langevin simulation of hysteresis in nanoscale pillars*
G. Brown, M. A. Novotny, P. A. Rikvold

V-6 11:35 *Magnetization dynamics in metallic thin films*
A. Magni, G. Bertotti, I. D. Mayergoyz, C. Serpico

12:00 **Lunch and Poster Break**

Tuesday (PM), May 22, 2001

SESSION VI POSTERS: Preisach and Hysteresis Modeling (12 Noon-2PM)
(Session Chairs: C. Visone and C. Serpico)

VI-1 *Implementation of the modified Preisach Scalar model in the finite difference-time domain numerical modeling*
E. Cardelli, F. Bertoncini, S. Di Fraia, B. Tellini

VI-2 *Models of hysteresis in the framework of the thermomechanics with internal variables*
D. Bernardini

VI-3 *Meso-phenomenological model of first magnetisation curve*
L. Hirsinger

VI-4 *Features of two models of rate dependent hysteresis*
J. Fuzi A. Ivanyi

VI-5 *Neural network model for vector hysteresis*
M. Kuczmann, A. Ivanyi, J. Fuzi

VI-6 *Parameter identification for Preisach operators with singular measures*
W. S. Galinaitis, D. Joseph, R. Rogers

VI-7 *Promotion of hysteresis characteristics for non-destructive testing of solid materials*
I. Tomas, J. Kadlecova, O. Perevertov, Y. Melikhov

VI-8 *Accomodation analysis using a physically-derived Preisach model*
F. Vajda

VI-9 *Static and light induced hysteresis in spin-crossover compounds: Experimental data and application of preisach-type models*
C. Enachescu, H. Constant-Machado, N. Menendez, E. Codjovi, J. Linares, F. Varret, A. Stancu

VI-10 *Identification and Compensation of Hysteresis for Magnetostrictive Actuators*
C. Natale, F. Velardi, C. Visone

VI-11 *Modeling of magnetization and demagnetization processes in nanostructured permanent magnetic materials*
G. P. Zhao, G. R. Liu, H. S. Lim, C. K. Ong, Y. P. Feng

VI-12 *Time and temperature-dependent Preisach models*
L. Spinu, I. D. Borcia, A. Stancu, C. J. O'Connor

VI-13 *Demagnetizing field in ferromagnetic sheet*
Z. Szabo, A. Ivanyi

VI-14 *Fast computation of the inverse CMH model*
U. Patel, E. Della Torre

SESSION VII Mathematics of Hysteresis II (Session Chair: A. Visintin)

VII-1 2:00 *Hysteresis Operators and Constitutive Laws in Ferromagnetism*
M. Brokate

VII-2 2:25 *Phase-field systems with Multidimensional Prandtl-Ishlinskii operators*
J. Sprekels, P. Krejci

VII-3 2:50 *Hyperbolic behaviour in systems with hysteresis nonlinearities*
A. Pokrovskii

3:15 **Break**

VII-4 3:40 *Conserving algorithms for micromagnetics*
P. S. Krishnaprasad, X. Tan

VII-5 4:05 *Dynammic programing for systems with hysteresis*
S. Belbas, I. D. Mayergoyz

VII-6 4:30 *The dynamics of the Fokker-Planck equation and consequences*
D. Kinderlehrer

VII-7 4:55 Hysteresis and EMU (Economic and Monetary Union): a Time-Dependent Preisach Model
Rod Cross, S. Krasnosel'skii, A. Pokrovskii

5:20 **Adjourn for the day**

7:00 **Symposium Banquet – Holiday Inn Dulles**

Wednesday (AM), May 23, 2001

SESSION VIII Micromagnetics II (Session Chair: G. Bertotti)

VIII-1	9:05	*Magnetic properties of narrow ring magnets* L. Lopez-Diaz, M. Klaui, J. Rothman, J. A. C. Bland
VIII-2	9:30	*Micromagnetic calculation of ferromagnetic resonance linewidth* J. Eicke, R. D. McMichael, M. J. Donahue, D. G. Porter
VIII-3	9:55	*Configurational anisotropy and thermally activated switching in magnetic nanosquares* L. Torres, L. Lopez-Diaz, E. Martinez, J. Iniguez
10:20		**Break**
VIII-4	10:45	*Instability classes in micromagnetics* A. J. Newell
VIII-5	11:10	*Micromagnetic study of reversible transverse susceptibility* L. Spinu, A. Stancu, H. Srikanth, C. J. O'Connor
VIII-6	11:35	*Magnetism: Closer to first-principles* R. E. Watson, M. Weinert, G. Schneider, G. W. Fernando
	12:00	**Lunch**

Wednesday (PM), May 23, 2001

SESSION IX Hysteretic Modeling of Materials (Session Chair: Robert D. Shull)

IX-1	1:00	*Modeling of intermediate behavior in Co/Pt Vertical magnetization multilayers* L. Bennett, E. Della Torre, R. A. Fry
IX-2	1:25	*Experimental observation of disorder-driven hysteresis-loop criticality* A. Berger, A. Inomata, J. S. Jiang, J. E. Pearson, S. D. Bader
IX-3	1:50	*Modeling of hysteresis and dynamic losses in soft ferrites up to radiofrequency level* E. Cardelli, E. Della Torre
	2:15	**Break**
IX-4	2:40	A Preisach characterization of the Barkhausen spectrum of a canonical ferromagnet $SrRuO_3$ R. M. Roshko, D. L. Hou
IX-5	3:05	Switching field distribution measurements of single domain particles in a two-dimensional array G. Vertesy, M. Pardavi-Horvath
IX-6	3:30	Possibilities and limitations of using Preisach model for hysteresis in superconductors M. Sjostrom
	3:55	**Symposium Wrap-up Panel**