

MARIENETTE B. MORALES

222 Physics and Math Building, Functional Materials Lab
Department of Physics, University of South Florida
4202 East Fowler Ave., Tampa, FL 33620-5700

mbmorale@mail.usf.edu
<http://mbmorale.myweb.usf.edu>
phone: (813)-974-4714
fax: (813) 974-5813

Education

University of South Florida, Tampa, FL, USA
Ph.D. Applied Physics, 2005-present
3rd year, Functional Materials Lab
Supervisor: Hariharan Srikanth Ph.D.
Thesis: *Magnetic relaxation phenomena in nanoparticles, ferrofluids and nano-structures*

University of the Philippines, Diliman, Quezon City
M. S. Physics, 2004
Adviser: Christine Villagonzalo, Dr. rer. nat
Thesis: *Magnetization and anisotropy of Fe/Co multilayers: a first principles calculation*

University of the Philippines, Diliman, Quezon City
B. S. Physics, 2001
Adviser: Marlon Daza, Ph.D.
Thesis: *Vander Lugt filter: theory and application to optical pattern recognition*

Research Interests

Synthesis and surface functionalization of magnetic nanoparticles for biomedical applications
Fabrication and characterization of polymer nanocomposites
Static and magnetohydrodynamic studies of ferrofluids
Structural and magnetic characterization of various nanoparticle systems

Technical Skills

Significant experience in the operation and troubleshooting of:
– Physical Property Measurement System (Quantum Design, Model 6000)
– Transmission Electron Microscope (Morgagni 280)
– X-ray Diffractometer (Bruker D8)
– Atomic Force Microscope
– JEOL Scanning Electron Microscope
– NanoTrac Dynamic Light Scattering
– Brookhaven Instruments Corporation (BIC) Zeta Phase Analysis Light Scattering
– CPS Disc centrifuge nanoparticle analyzer
Working knowledge of Fortran, C++, MatLab, Mathematica, Latex, Origin and MS Office applications. I am able to work in Windows and Linux operating systems

Publications

M. B. Morales, M. H. Phan and H. Srikanth, *Effect of carrier liquids on magnetic relaxation in Fe₃O₄-based ferrofluids*, In Progress
M. B. Morales, M. H. Phan, H. Srikanth, C. N. Chinnasamy and V. E. Harris, *Magnetization Dynamics in Gd₃Fe₅O₁₂ garnet nanoparticles*, In Progress
M. B. Morales, M. H. Phan, S. Pal, N. A. Frey, and H. Srikanth, *Particle blocking and carrier fluid freezing effects on the magnetic properties of Fe₃O₄-based ferrofluids*, Accepted, Journ. App. Phys. (2008)
S. Pal, M. B. Morales, P. Mukherjee and H. Srikanth, *Synthesis and magnetic properties of gold coated iron oxide nanoparticles*, Accepted, Journ. App. Phys. (2008)
P. Poddar, M. B. Morales, N. A. Frey, S. A. Morrison, E. E. Carpenter and H. Srikanth, *Transverse susceptibility study of the effect of varying dipolar interactions on anisotropy peaks in a 3D assembly of soft ferrite nanoparticles*, Journ. App. Phys. 104, 063901 (2008)

- J. Gass, N. A. Frey, M. B. Morales, M. J. Miner, S. Srinath and H. Srikanth, *Magnetic anisotropy and magnetocaloric effect (MCE) in NiFe₂O₄ nanoparticles*, MRS Proceedings Vol. 962, 0962-P05-03 (2007)
- M. B. Morales and C. Villagonzalo, *Enhancement of Fe moments in Fe/Co multilayers*, Proc. of the 22nd National Physics Congress, 2004
- M. B. Morales, *Magnetic Properties of Fe/Co multilayers with perfect interfaces*, Proc. of the 6th National Physics Workshop, 2004
- M. B. Morales and C. Villagonzalo, *Magnetization and anisotropy of Fe/Co multilayers: a first-principles calculation*, Proc. of the 21st National Physics Congress, 2003.
- P. Almoró, M. B. Morales and M. Daza, *Holographic Studies on human femur with internal fixations*, Science Diliman, 1999.
- P. Almoró, M. B. Morales and M. Daza, *Holographic studies on human femur with internal fixations*, Proc. of the 17th National Physics Congress, 1999.

Awards and Grants

- Travel Grant Awardee (Aug 3-8, 2008), 1st Annual IEEE Magnetics Society Summer School, Colorado Springs, CO
- Research Assistantship (Fall 2007 to present), Center for Integrated Functional Materials (CIFM), University of South Florida
- Winter School/ Travel Grant (2005), Centre International de Mathematiques Pures et Appliquees (CIMPA) and International Mathematical Union (IMU), Ruhuna International School on Computational and Mathematical Physics, Sri Lanka
- National Scholarship (2001-2004), Department of Science and Technology - Philippine Council for Advanced Science and Technology Research and Development (DOST-PCASTRD)
- University Research Grant, 2003-2004, Office of the Vice President-Academic Affairs, University of the Philippines – Diliman

Presentations

- M. B. Morales, P. Poddar, N. A. Frey, S. A. Morrison, E. E. Carpenter and H. Srikanth, *Probing the effect of interparticle interactions in ferrite nanoparticles using transverse susceptibility*, APS March Meeting, New Orleans, Louisiana, March 2008. *Oral presentation*
- M. B. Morales, N. A. Frey, J. Gass, M. J. Miner and H. Srikanth, *A comparative study of magnetic properties of hexane and dodecane based ferrofluids with Fe₃O₄ and CoFe₂O₄ nanoparticle dispersions*, MMM Conference, Tampa, Florida, November 2007. *Poster presentation*
- M. B. Morales, J. Gass and H. Srikanth, *Magnetic Properties of Static Fe₃O₄ Ferrofluids*, APS March Meeting, Denver, Colorado, March 2007. *Oral presentation*
- M. Morales and C. Villagonzalo, *Enhancement of Fe magnetic moments in Fe/Co (001) multilayers*, Ruhuna International School on Computational and Mathematical Physics (RISCMAP) University of Ruhuna, Sri Lanka, December 20-31, 2004 *Poster presentation*
- M. Morales, *Magnetic Properties of Fe/Co multilayers with perfect interfaces*, Proc. of the 6th National Physics Workshop, 2004. *Poster presentation*
- M. Morales and C. Villagonzalo, *Magnetization and anisotropy of Fe/Co: a first-principles calculation*, Proc. of the 21st National Physics Congress, 2003. *Oral presentation*
- M. Morales, P. Almoró and M. Daza, *Optical pattern recognition in silver halide films*, Proc. of the 18th National Physics Congress, 2000. *Oral presentation*
- P. Almoró, M. Morales and M. Daza, *Holographic studies on human femur with internal fixations*, Proc. of the 17th National Physics Congress, 1999. *Plenary presentation*

Employment

Sinmat, Inc., Gainesville, Florida

Industrial Practicum

June 2008

Main tasks include physical characterization of nanoparticle abrasives in different chemical mechanical planarization (CMP) slurries using dynamic light scattering and disc centrifuge, systematic measurement of zeta potential, writing and presentation of progress reports and recommendation of optimal abrasive parameters, i.e. particle size, concentration and pH, affecting CMP performance.

Department of Physics, University of South Florida

Research Assistant

January 2007 to present

Fulfills duties required by the Center for Integrated Functional Materials projects, which are focused on synthesis of magnetic nanoparticles, ferrofluids and carbon nanotubes for biomedical applications. In charge of operation and troubleshooting of the Physical Property Measurement System (PPMS), performs DC and AC magnetization, AC transport, resistivity, transverse susceptibility, magnetocaloric effect measurements on nanoparticles, ferrofluids and nanostructures.

Teaching Assistant

August 2005 to December 2006

As a TA, I handled pre-lab activity discussions, supervised premedical students in experiments, and was in-charge of the writing and grading of quizzes.

Department of Physics, Ateneo de Manila University

Instructor

Apr 2004 to Apr 2005

Assistant Instructor

November 2000 to March 2004

Preparation and presentation of lectures, supervision of group work, writing and grading tests and quizzes, grading projects and papers, preparing and grading the final exam for the course. It was also necessary for me to create my own syllabus and homework problems.

National Institute of Physics, University of the Philippines – Diliman

Researcher, Structure and Dynamics Group

December 2002 to March 2005

Developed a numerical code for theoretical calculation of magnetization and anisotropy of magnetic multilayers and thin films from first-principles employing density functional theory

Researcher, Photonics Research Laboratory

June 1996 to November 2002

Performed research mainly on holography and its applications to non-destructive testing, optical pattern recognition and optical data encryption.

References

Available upon request.