

## CURRICULUM VITAE

---

**NATALIE A. FREY HULS**

<http://myweb.usf.edu/~nafrey/>

Department of Physics  
University of South Florida  
4202 East Fowler Avenue, PHY 114  
Tampa, FL 33620  
nafrey@mail.usf.edu

---

### EDUCATION

Fall 2006      Ph.D. Candidacy Approved, Applied Physics.  
University of South Florida, Tampa, FL  
Fall 2004      Master of Science, Physics.  
University of South Florida, Tampa, FL  
Spring 2002    Bachelor of Arts, Physics.  
Bachelor of Science, Astrophysics.  
Minor, Mathematics.  
University of Minnesota, Minneapolis, MN.

**PH.D. CANDIDACY PROPOSAL:** *Surface and Interface Phenomena in Magnetic Nanostructures and Thin Films*

**MASTER'S THESIS:** *Microstructure and Magnetism in Ferrite-Ferroelectric Multilayer Thin Films*

### FELLOWSHIPS

Spring 2006-present    NSF IGERT Fellowship  
Spring 2004            University of South Florida Tharp Fellowship  
Summer 2003            Southeastern Universities Research Association Fellowship

---

### RESEARCH EXPERIENCE

2003-present    Member, Functional Materials Laboratory  
Dr. Hariharan Srikanth, Department of Physics, University of South Florida.  
Summer 2003    SURF Fellow, Condensed Matter Division, Oak Ridge National Laboratory  
Dr. Nancy Dudney, ORNL  
2001-2002      Undergraduate Researcher

Dr. Liliya Williams, University of Minnesota

2000-2002 Member, Automated Plate Scanner Laboratory  
Dr. Roberta Humphreys, Department of Physics and Astronomy, University  
of Minnesota

## TEACHING EXPERIENCE

2005-present Teaching Assistant  
2002-2003 University of South Florida  
Department of Physics  
2000-2002 Teaching Assistant  
University of Minnesota  
Department of Physics and Astronomy

---

## PUBLICATIONS AND PRESENTATIONS

### Journal Articles

**Natalie A. Frey**, Sanyadanam Srinath, Hariharan Srikanth, Chao Wang and Shouheng Sun. *Static and dynamic magnetic properties of composite Au-Fe<sub>3</sub>O<sub>4</sub> nanoparticles*. Accepted, IEEE Transactions on Magnetics.

**N.A. Frey**, S. Srinath, H. Srikanth, M. Varela, S. Pennycook, G. X. Miao, and A. Gupta. *Magnetic anisotropy in epitaxial CrO<sub>2</sub> and CrO<sub>2</sub>/Cr<sub>2</sub>O<sub>3</sub> bilayer thin films*. Physical Review, B, **74** 024420 (2006).

**N.A. Frey**, R. Heindl, S. Srinath, H. Srikanth, and N.J. Dudney. *Microstructure and Magnetism in Barium Strontium Titanate (BSTO)-Barium Hexaferrite (BaM) multilayers*. Materials Research Bulletin, **40**, 1286 (2005).

S. Srinath, **N.A. Frey**, R. Hajndl, H. Srikanth, K.R. Coffey, and N.J. Dudney. *Growth and Characterization of Sputtered BST/BaF Multilayers*. Journal of Applied Physics. **97** 10J115 (2005).

J.L. Wilson, P. Poddar, **N.A. Frey**, H. Srikanth, K. Mohomed, J.P. Harmon, S. Kotha, and J. Wachsmuth. *Synthesis and magnetic properties of polymer nanocomposites with embedded iron nanoparticles*, Journal of Applied Physics, **95**, 1439 (2004).

L.L.R. Williams and N. Frey. *Angular Distribution of Gamma-ray Bursts and Weak Lensing* Astrophysical Journal, **583**, 594 (2003)

## Conference Proceedings

J.Gass, **N. A. Frey**, M. B. Morales, M. J. Miner, S. Srinath and H. Srikanth. *Magnetic Anisotropy and Magnetocaloric Effect (MCE) in NiFe<sub>2</sub>O<sub>4</sub> Nanoparticles*. Accepted, Proceedings of the 2006 Materials Research Society Fall Meeting.

S. Srinath, **N.A. Frey**, H. Srikanth, G. X. Miao and A. Gupta. *Exchange bias in CrO<sub>2</sub>/Cr<sub>2</sub>O<sub>3</sub> bilayer thin films*. Proceedings of the 11<sup>th</sup> International Conferences on Modern Materials & Technologies.

## Conference Presentations

**N.A. Frey**, S. Srinath, H. Srikanth, Chao Wang, and Shouheng Sun. Static and dynamic magnetic properties of "dumbbell" and "flower" shaped Au-Fe<sub>3</sub>O<sub>4</sub> nanoparticles. Session P14.12 American Physical Society March Meeting, Denver, CO. (2007)

**N. A. Frey**, S. Srinath, H. Srikanth, Chao Wang, and Shouheng Sun. *Static and dynamic magnetic properties of "dumbbell" and "flower" shaped Au-Fe<sub>3</sub>O<sub>4</sub> nanoparticles*. Magnetism and Magnetic Materials Conference, **Session BB-05**. Baltimore, MD (2007).

S. Srinath, **N. A. Frey**, H. Srikanth, G. X. Miao and A. Gupta. *Magnetic anisotropy and exchange bias in epitaxial CrO<sub>2</sub>/Cr<sub>2</sub>O<sub>3</sub> bilayer thin films*. (Poster) Magnetism and Magnetic Materials Conference, **Session CP-13**. Baltimore, MD (2007).

**N.A. Frey**, S. Srinath, H. Srikanth, G.X. Miao, and A. Gupta *Magnetic anisotropy in CrO<sub>2</sub> and CrO<sub>2</sub>/Cr<sub>2</sub>O<sub>3</sub> bilayer thin films*. **Session Y22.10** APS March Meeting, Baltimore, MD. (2006)

**N.A. Frey**, R. Heindl, S. Srinath, H. Srikanth, K.R. Coffey, and N.J. Dudney. *Growth and Characterization of tunable BSTO/BaM multilayers as substrates for magnetic nanoparticles*. **Session S42.6** American Physical Society March Meeting, Los Angeles, CA. (2005)

**N.A. Frey**, H. Hajndl, P. Poddar, H. Srikanth, and N.J. Dudney. *Growth and characterization of BSTO/Barium Hexaferrite multilayered films as tunable substrates for nanoparticles*. **Session N23.12** American Physical Society March Meeting Montreal, Quebec, Canada. (2004)

## Conference Abstracts

**H. Srikanth**, **N.A. Frey**, C. Visani, and J. Santamaria. *Magnetic anisotropy and vortex dynamics in LCMO/YBCO heterostructures*. **Session L13.5** American Physical Society March Meeting, Denver, CO. (2007)

J.Gass, M. B. Morales, **N. A. Frey**, M. J. Miner, S. Srinath and H. Srikanth. *Magnetocaloric effect (MCE) in Nickel Ferrite nanoparticles*. **Session W14.8** American Physical Society March Meeting, Denver, CO. (2007)

S.L. Morrow, **N.A. Frey**, S. Srinath, and H. Srikanth. *Synthesis of Barium Hexaferrite nanoparticles for functional multilayers*. **Session W22.6** American Physical Society March Meeting, Baltimore, MD. (2006)

R. Hajndl, S. Srinath, **N.A. Frey**, H. Srikanth, S. Balachandran, and T. Weller. *Growth and Characterization of BSTO/Barium hexaferrite multilayers*. International Conference on Ferroelectrics, San Francisco, CA. (2004)

S. Srinath, **N.A. Frey**, R. Hajndl, H. Srikanth, K.R. Coffey, and N.J. Dudney. *Growth of electrically and magnetically tunable BSTO/BaF multilayers*. Magnetism and Magnetic Materials Conference Jacksonville, FL. (2004)

**N. Frey**, R. Hajndl, P. Poddar, and H. Srikanth. *Microstructure and magnetism in BSTO/hexaferrite composite films*. 2<sup>nd</sup> International Conference on Materials for Advanced Technologies & IUMRS, Singapore. (2003)