

Professor Janice L. Musfeldt

- * Professor, Physical & Materials Chemistry, University of Tennessee.
- * Co-Director, Chemical Physics Program.
- * Member, Joint Institute for Advanced Materials.

- * B.S., Chemical Engineering, University of Illinois.
- * Ph.D., Physical Chemistry with certification in Chemical Physics, University of Florida.
- * Postdoctoral Research Associate, Universite de Sherbrooke.

Research Interests

The overall goal of my research is to investigate the spectroscopic properties of novel nanoscale, molecular and lowdimensional electronic and magnetic solids. We seek to understand the relationship between chemical structure, morphology, and functionality, bulk vs. microscopic aspects to various physical phenomena, and the nature of high magnetic field excitations and ground states. These interests place our program at the heart of materials chemistry, with significant overlap in both chemistry and physics. We have on-going initiatives in several classes of complex materials, including inorganic bronzes, mesoscopic and nanoscopic analogs of these layered inorganics (such as inorganic nanotubes and nanooxions), spin-gap and spin Peierls materials, single molecule magnets, fullerene polymers, and organic molecular conductors and superconductors. A few of our recent publications are listed below.

I have active research collaborations at several National Laboratories. These include Argonne, Brookhaven, Los Alamos, the National High Magnetic Field Laboratory, and Oak Ridge. We also have numerous funded international collaborations. Students in my Group benefit significantly from these interactions.

My research group has strong external support from the National Science Foundation (through the Division of Materials Research), the U.S. Department of Energy (Materials Science Division, Basic Energy Sciences), and the Petroleum Research Fund sponsored by the American Chemical Society.

Selected Publications

1. *Pinned Low Energy Excitation in Metal Exchanged Vanadium Oxide Nanoscroll*, S J. Cao, J.L. Musfeldt, S. Mazumdar, N. Chernova, and M.S. Whittingham, *Nano. Lett.* **7**, 2351 (2007).
2. *Bulk vs. Nanoscale WS_2 : Finite Length Scale Effects and Solid State Lubrication*, S. Brown, J.L. Musfeldt, I. Mihut, J.B. Betts, A. Migliori, A. Zak, and R Tenne, *Nano. Lett.* **7**, 2365 (2007).
3. *Hydrogen Bonding and MultiPhonon Structure in Copper Pyrazine Coordination Polymers*, S. Brown, J.Cao, J.L. Musfeldt, M.M. Conner, A.C. McConnell, H.I. Southerland, J.L. Manson, J.A. Schlueter, M.D. Phillips, M.M. Turnbull, and C.P. Landee, *Inorg. Chem.* **46** 8577 (2007).
4. *Photoconductivity in $BiFeO_3$ Thin Films*, S.R. Basu, L.W. Martin, Y.H. Chu, M. Gajek, R. Ramesh, R.C. Rai, X. Xu, and J.L. Musfeldt, *Appl. Phys. Lett.* **92**, 091905 (2008).
5. *Spin-Lattice Interactions Mediated by Magnetic Field*, J. Cao, L.I. Vergara, J.L. Musfeldt, A.P. Litvinchuk, Y.J. Wang, S. Park, S.-W. Cheong, *Phys. Rev. Lett.* **100**, 177205 (2008).