

Tim Fister

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Professional Experience

- 2010 – Present. Assistant staff scientist, Chemical Sciences and Engineering, ANL
- 2007 – 2010. Postdoctoral Fellow, Materials Science Division, ANL
- 2007. Lecturer, Physics Department, University of Washington, Seattle, WA
- 2003 – 2007. Research Assistant, Physics Department, University of Washington, Seattle, WA

Research Highlights

- In-situ x-ray characterization of solid/gas and solid/liquid interfaces in model battery and fuel cell structures.
- Growth and characterization of complex oxide thin films in the presence of epitaxial strain and electrical/chemical boundary conditions.
- Development of resonant and inelastic x-ray scattering methods.

Education

- PhD, Physics, University of Washington, 2007
- MS, Physics, University of Washington, 2003
- BS, Physics, University of Minnesota, 2002

Awards

- Henderson Prize, University of Washington, 2007
- IT Leadership Award, University of Minnesota, 2000-2002
- Presidential Scholar, University of Minnesota

Publications

- T.T. Fister et al. "Real-Time Observations of Interfacial Lithiation in a Metal Silicide Thin Film," submitted J. Phys. Chem. C (2012).
- S. Chattopadhyay et al. "In Situ X-ray Study of the Solid Electrolyte Interphase (SEI) Formation on Graphene as a Model Li-ion Battery Anode," accepted, Chemistry of Materials (2012).
- B. Ingram et al. "In situ x-ray studies of oxygen surface exchange behavior in thin film $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$," accepted, Applied Physics Letters (2012).

- W. S. Choi et al. "Atomic layer engineering of perovskite oxides for chemically sharper heterointerfaces," submitted, Advanced Materials (2012).
- A. Lipson et al. "Enhanced Lithiation of Doped 6H-SiC (0001) via High Temperature Vacuum Growth of Epitaxial Graphene," submitted J. Phys. Chem. C. (2012).
- N. Karan et al., "Bulk Sensitive Characterization of the Discharged Products in Li-O₂ Batteries by Nonresonant Inelastic X-Ray Scattering," submitted J. Phys. Chem. C (2012).
- T.T. Fister et al. "Electronic structure of lithium battery interphase compounds: Comparison between inelastic x-ray scattering measurements and theory," J. Chem. Phys. 135, 224513 (2011).
- M.J. Highland et al. "Equilibrium Polarization of Ultrathin PbTiO₃ with Surface Compensation Controlled by Oxygen Partial Pressure," Physical Review Letters 107, 187602 (2011).
- R.L. Johnson-Wilke et al. "Tilt transitions in compressively strained AgTa_{0.5}Nb_{0.5}O₃ thin films," Physical Review B. 84, 134114 (2011).
- M. K. Y. Chan et al. "Structure of Lithium Peroxide," J. Phys. Chem. Lett. 2, 2483 (2011).
- D. S. Tinberg, "Octahedral tilt transitions in relaxed epitaxial Pb(Zr(1-x)Ti(x))O(3) films," J. App. Phys. 109, 094104 (2011).
- R. A. Gordon et al. "Studying low-energy core-valence transitions with bulk sensitivity using q-dependent NIXS," J. Elec. Spec. 184, 220 (2011).
- L. Yan, "Surface chemistry and activity of SOFC cathode materials as thin films," Abs. Am. Chem. Soc 241, 403 (2011).
- T.T. Fister et al., "Total reflection inelastic x-ray scattering from a 10 nm La_{0.6}Sr_{0.4}CoO_{3-δ} thin film," Phys. Rev. Lett. 106, 037401 (2011).
- D. D. Fong et al. "In situ synchrotron x-ray characterization of ZnO atomic layer deposition," App. Phys. Lett, 97 191904 (2010).
- M. J. Highland et al. "Polarization Switching without Domain Formation at the Intrinsic Coercive Field in Ultrathin Ferroelectric PbTiO₃," Phys. Rev. Lett. 105, 167601 (2010).
- Y. Han. "Structural phase transitions in AgTa_{0.5}Nb_{0.5}O₃ thin films," J. App. Phys. 107, 123517 (2010).
- O.M. Feroughi, et al. "Phase separation and Si nanocrystal formation in bulk SiO studied by x-ray scattering," App. Phys. Lett. 96, 081912 (2010).
- M-I, Richard et al., "In-situ synchrotron x-ray studies of strain and composition evolution during metal-organic chemical vapor deposition of InGaN", APL 96, 051911 (2010).
- D.L. Proffit et al. "Phase stabilization of δ-Bi₂O₃ nanoislands by epitaxial growth onto single crystal SrTiO₃ or DyScO₃ substrates" accepted, App. Phys. Lett. 96, 021905 (2010).
- T. Gog, et al. "Momentum-resolved resonant and nonresonant inelastic x-ray scattering at the Advanced Photon Source," Synchrotron Radiation News (2009).
- T.T. Fister and D.D.Fong, "In situ synchrotron characterization of complex oxide heterostructures," in Thin Film Oxides: Fundamentals and Applications in Electronics and Energy, Springer 2009.
- K.P. Nagle, T.T. Fister etal., "Final State Symmetry of Na 1s core-shell excitons in NaCl and NaF," Phys. Rev. B (accepted, 2009)

- T.T. Fister et al., “Intermediate-range order in water ices: nonresonant inelastic x-ray scattering measurements and real-space full multiple scattering calculations,” Phys. Rev. B 79, 174117 (2009)
- T.T. Fister et al., “In situ characterization of strontium surface segregation in epitaxial La_{0.7}Sr_{0.3}MnO₃ thin films as a function of oxygen partial pressure,” App. Phys. Lett. 93, 151904 (2008)
- B.B. Garcia et al., “Effect of pore morphology on the electrochemical properties of electric double layer carbon cryogel supercapacitors,” J. App. Phys. 104 014305 (2008)
- H. Sternemann, et al., “An extraction algorithm for core-level excitations in non-resonant inelastic X-ray scattering spectra,” J. Synch. Rad. 15, 162 (2008)
- R.A. Gordon, et al., “High multipole transitions in NIXS: Valence and hybridization in 4f systems, EPL 81, 26004 (2008).
- T.T. Fister et al., “Local electronic structure of dicarba-closo-dodecarboranes C₂B₁₀H₁₂,” J. Am. Chem. Soc, 130, 925 (2008)
- T.T. Fister et al., “Measurement of full XAFS spectrum of MgO using nonresonant inelastic x-ray scattering,” AIP conference proceedings 882, 156 (2007)
- G.T.Seidler, T.T. Fister et al, “The LERIX user facility,” AIP conference proceedings, 882, 911 (2007)
- M. Balasubramanian et al., Fine structure and chemical shifts in nonresonant inelastic xray scattering from Li-intercalated graphite, App. Phys. Lett. 91, 031904 (2007)
- T.T. Fister et al., “Deconvolving instrumental and intrinsic broadening in core-shell x-ray spectroscopies,” Phys. Rev. B, 75, 174106 (2007)
- T.T. Fister et al., “Background proportional enhancement of extended fine structure in nonresonant inelastic x-ray scattering,” Phys. Rev. B, 74, 214117 (2006)
- T.T. Fister et al. ,“Multielement spectrometer for efficient measurement of the momentum transfer dependence of inelastic x-ray scattering,” Rev. Sci. Inst. 77, 063901 (2006)