

Adam J. Hauser

Assistant Professor, Department of Physics and Astronomy & MINT, University of Alabama

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EDUCATION

Ph.D. Physics, The Ohio State University (2010)

Advisor: Professor Fengyuan Yang

M.S. Physics, The Ohio State University (2008)

B.S. Physics (Honors), B.S. Astrophysics, Rutgers University (2004)

Advisor: Professor Eva Andrei

EMPLOYMENT AND POSITIONS

The University of Alabama

Assistant Professor, Department of Physics and Astronomy & MINT Center, 2015 – present

University of California, Santa Barbara

Elings Prize Postdoctoral Fellow, California Nanosystems Institute, 2012 - 2015

The Ohio State University

Postdoctoral Research Associate, Center for Emergent Materials, 2011 - 2012

Graduate Research Fellow, Center for Emergent Materials, 2008 - 2010

Graduate Teaching Assistant, Department of Physics, 2004 – 2008

RESEARCH INTERESTS

My interests lie in understanding the interplay of electronic, magnetic, structural, and plasmonic phenomena in complex functional materials in response to strain, gating, doping, and compositional modification. I look to combine magnetometry and magnetotransport with spectroscopic (XAS/XMCD, cathodoluminescence, impedance, FTIR, UV-vis) results to gain complete physical pictures of each system, and to create novel devices that leverage the intrinsic or modified properties of each material.

HONORS AND AWARDS

ARO Young Investigator Award, Army Research Office, 2016

Short-Term Innovative Research (STIR) Award, Army Research Office, 2015

Best Poster Award, FAME Center 1st Annual Review, Los Angeles, 2013

Elings Prize Postdoctoral Fellowship, California Nanosystems Institute, 2012-2014

Clifford Heer Memorial Graduate Student Award, The Ohio State University, 2010

Institute for Materials Research Best Poster Award, OSU Materials Week Conference, 2010

Hazel Brown Teaching Award, The Ohio State University, 2007

Richard J. Plano Summer Research Award, Rutgers University, 2004

PROFESSIONAL SERVICE AND COMMITTEES (University of Alabama)

Publication Reviewer, *Scripta Materialia*, *Indian Journal of Science*

American Physical Society Bridge Program Liaison

2016 -

Chair. Graduate Recruitment Committee, *Department of Physics and Astronomy*

2016 -

Facilities Committee, *MINT Center*

2016 -

Chair, Faculty Search Committee, Hire in Experimental Precision Timing

2016

Graduate Recruitment Committee, *Department of Physics and Astronomy*

2015 -

Educational Outreach Committee, *MINT Center*

2015 -

Colloquium Committee, *Department of Physics and Astronomy*

2015 -

Society of Physics Students Co-Advisor

2015 -

DIVERSITY, OUTREACH, AND MENTORSHIP (University of Alabama)

Girls in Science “Smart City Challenge” Program	2016 -
Founder, Veterans Graduate School Initiative	2016 -
American Physical Society Bridge Program Liaison	2016 -
Mentor, MINT International Summer Internship Program	2016 -
2016: Arina Luo	
Mentor, MINT High School Summer Internship Program	2016 -
2016: Noah Garner	
Undergraduate Mentorship, The University of Alabama	2015 -
2015-2016: 10. 2016-2017: 11.	
UA Safe Zone Ally	2015 -

PUBLICATIONS (>650 citations, h-index 13)

UNIVERSITY OF ALABAMA

39. Coleman R. Harris, Jennifer R. Soliz, Andrew D. Klevitch, Joseph A. Rossin, Augustus W. Fountain III, **Adam J. Hauser**, and Gregory W. Peterson, “Sensing of NO₂ with Zirconium Hydroxide via Electrical Impedance Spectroscopy.” *Under Review*
38. Joshua J. Phillips, Jennifer R. Soliz, and **Adam J. Hauser**, “XMCD and Impedance Analysis of Fe₂O₃ Nanoparticles for Explosive and Chemical Warfare Agent Sensing Applications.” *Under Review*
37. G. W. Peterson, M. McEntee, C. R. Harris, A. D. Klevitch, A. W. Fountain III, J. R. Soliz, A. Balboa, and **A.J. Hauser**, “Detection of an Explosive Simulant via Electrical Impedance Spectroscopy Utilizing UiO-66-NH₂ Metal-Organic Framework.” *Dalton Transactions* **45** (43), 17113-17116 (2016). [\[doi\]](#)
36. Jennifer R. Soliz, Andrew D. Klevitch, Coleman R. Harris, Joseph Anthony Rossin, Amy Ng, Rhonda Stroud, **Adam J. Hauser**, and Gregory W. Peterson, “Structural Impact on Dielectric Properties of Zirconia,” *J. Phys. Chem. C* (2016). [\[doi\]](#)
35. **Adam J. Hauser**, Evgeny Mikheev, Adam P. Kajdos, and Anderson Janotti, “Small polaron-related recombination in Ba_xSr_{1-x}TiO₃ thin films by cathodoluminescence spectroscopy.” *Appl. Phys. Lett.* **108** (10), 102901 (2016). [\[doi\]](#)

NON-UA AFFILIATED PAPERS

34. B.D. Esser, **A.J. Hauser**, R.E.A. Williams, L.J. Allen, P.M. Woodward, F.Y. Yang, and D.W. McComb, “Quantitative STEM imaging of order/disorder phenomena in complex oxide thin films.” *Accepted to Phys. Rev. Lett.* **117** (17), 176101 (2016) [\[doi\]](#)
33. Ryan Morrow, Jennifer R. Soliz, **Adam J. Hauser**, James C. Gallagher, Michael A. Susner, Michael D. Sumption, Adam A. Aczel, Jiaqiang Yan, Fengyuan Yang, and Patrick M. Woodward, “The effect of chemical pressure on the structure and properties of A₂CrOsO₆ (A= Sr, Ca) ferrimagnetic double perovskite.” *Journal of Solid State Chemistry* **238**, 46 (2016). [\[doi\]](#)
32. Evgeny Mikheev, **Adam J. Hauser**, Burak Himmetoglu, Nelson E. Moreno, Anderson Janotti, Chris G. Van de Wale, and Susanne Stemmer, “Tuning bad metal and non-Fermi liquid behavior in a Mott material: rare earth nickelate thin films.” *Science Advances* **1**, 10, e1500797 (2015) [\[doi\]](#)
31. Evgeny Mikheev, Jinwoo Hwang, Adam P. Kajdos, **Adam J. Hauser**, and Susanne Stemmer, “Tailoring resistive switching in Pt/SrTiO₃ junctions by stoichiometry control.” *Sci. Rep.* **5**, 11079 (2015). [\[doi\]](#)
30. Simon Bubel, **Adam J. Hauser**, Anne M. Glaudell, Thomas E. Mates, Susanne Stemmer, and Michael L. Chabiny, “The electrochemical impact of electrostatic modulation of the metal-insulator transition in nickelates.” *Appl. Phys. Lett.* **106**, 122102 (2015). [\[doi\]](#)
29. J.M. Lucy, **A.J. Hauser**, Y. Liu, H. Zhou, Y. Choi, D. Haskel, S.G.E. te Velthuis, and F.Y. Yang, “Depth-resolved magnetic and structural analysis of relaxing epitaxial Sr₂CrReO₆.” *Phys. Rev. B* **91**, 094413 (2015). [\[doi\]](#)

28. S. James Allen, **Adam J. Hauser**, Evgeny Mikheev, Jack Y. Zhang, Nelson E. Moreno, Junwoo Son, Daniel G. Ouellette, James Kally, Alex Kozhanov, Leon Balents and Susanne Stemmer, “Gaps and pseudo-gaps in perovskite rare earth nickelates.” *APL Materials* **3** (6), 062503 (2015). [[doi](#)]
27. **Adam J. Hauser**, Evgeny Mikheev, Nelson E. Moreno, Jinwoo Hwang, Jack Y. Zhang, and Susanne Stemmer, “Correlation between stoichiometry, strain, and metal-insulator transitions of NdNiO₃ films.” *Appl. Phys. Lett.* **106**, 092104 (2015). [[doi](#)]
26. J.M. Lucy, M.R. Ball, O.D. Restrepo, **A.J. Hauser**, J.R. Soliz, J.W. Freeland, W. Windl, P.M. Woodward, and F.Y. Yang, “Strain-tunable extraordinary magnetocrystalline anisotropy in Sr₂CrReO₆ Epitaxial Films.” *Phys. Rev. B: Rapid Communications* **90**, 180401(R) (2014). [[doi](#)]
25. **Adam J. Hauser**, Jeremy M. Lucy, Michael W. Gaultois, Molly R. Ball, Jennifer R. Soliz, Yongseong Choi, Oscar Restrepo, Wolfgang Windl, John W. Freeland, Daniel Haskel, Patrick M. Woodward, and Fengyuan Yang, “Magnetic structure in epitaxially strained Sr₂CrReO₆ thin films by element-specific XAS and XMCD.” *Phys. Rev. B: Rapid Communications* **89**, 180402(R) (2014). [[doi](#)]
24. T.R. Lemberger, M.J. Hinton, Jie Yong, J.M. Lucy, **A.J. Hauser**, and F.Y. Yang, “Anomalously weak Cooper pair-breaking by exchange energy in ferromagnet/superconductor bilayers.” *J Supercond Nov Magn* **27**:2249-2255 (2014). [[doi](#)]
23. **Adam J. Hauser**, Evgeny Mikheev, Nelson E. Moreno, Tyler A. Cain, Jinwoo Hwang, Jack Y. Zhang, and Susanne Stemmer, “Time-corrected Hall coefficient of NdNiO₃ thin films,” *Appl. Phys. Lett.* **103**, 182105 (2013). [[doi](#)]
22. J.M. Lucy, **A.J. Hauser**, H.L. Wang, J.R. Soliz, M. Dixit, R.E.A. Williams, A. Holcombe, P. Morris, H.L. Fraser, D.W. McComb, P.M. Woodward, and F.Y. Yang, “Buffer-layer enhanced structural and electronic quality in ferromagnetic Sr₂CrReO₆ epitaxial films,” *Appl. Phys. Lett.* **103**, 042414 (2013). [[doi](#)]
21. Chunhui Du, Rohan Adur, Hailong Wang, **Adam J. Hauser**, Fengyuan Yang, and P. Chris Hammel, “Control of Magnetocrystalline Anisotropy by Epitaxial Strain in Double Perovskite Sr₂FeMoO₆ Films,” *Phys. Rev. Lett.* **110**, 147204 (2013). [[doi](#)]
20. **Adam J. Hauser**, Jeremy M. Lucy, Hailong Wang, Jennifer R. Soliz, Alexanne Holcomb, Patricia Morris, Patrick M. Woodward and Fengyuan Yang, “Electronic and magnetic tunability of Sr₂CrReO₆ films by growth-mediated oxygen modulation,” *Appl. Phys. Lett.* **102**, 032403 (2013). [[doi](#)]
19. Evgeny Mikheev, Adam P. Kajdos, **Adam J. Hauser**, and Susanne Stemmer, “Electric field-tunable Ba_xSr_{1-x}TiO₃ films with high figures of merit grown by molecular beam epitaxy,” *Appl. Phys. Lett.* **101**, 252906 (2012). [[doi](#)]
18. **A.J. Hauser**, J.R. Soliz, M. Dixit, R.E.A. Williams, M.A. Susner, B. Peters, L.M. Mier, T.L. Gustafson, M.D. Sumption, H.L. Fraser, P.M. Woodward, and F.Y. Yang, “Fully Ordered Sr₂CrReO₆ Epitaxial Films: A High Temperature Ferrimagnetic Semiconductor,” *Phys. Rev. B: Rapid Communications (Selected as Editors’ Suggestion)* **85**, 161201(R) (2012). [[doi](#)]
17. D. Reaman, **A.J. Hauser**, F.Y. Yang, H. Colijn, and W. Panero, “Interdiffusion of Earth’s Core Materials to 65 GPa and 2200 K,” *Earth and Planetary Science Letters* **349-350**, 8-14 (2012). [[doi](#)]
16. Inhee Lee, Jongjoo Kim, Yuri Obukhov, Palash Banerjee, Gang Xiang, Denis V. Pelekhov, **Adam Hauser**, Fengyuan Yang, and P. Chris Hammel, “Magnetic force microscopy in the presence of a strong probe field,” *Appl. Phys. Lett.* **99**, 162514 (2011). [[doi](#)]
15. F. Wolny, Y. Obukhov, T. Mühl, U. Weißker, S. Philippi, A. Leonhardt, P. Banerjee, A. Reed, G. Xiang, R. Adur, I. Lee, **A.J. Hauser**, F.Y. Yang, D.V. Pelekhov, B. Büchner, P.C. Hammel, “Quantitative magnetic force microscopy on permalloy dots using an iron filled carbon nanotube probe,” *Ultramicroscopy* **111**, 1360-1365 (2011). [[doi](#)]
14. **Adam J. Hauser**, Robert E.A. Williams, Rebecca A. Ricciardo, Arda Genc, Manisha Dixit, Jeremy M. Lucy, Patrick M. Woodward, Hamish L. Fraser, and Fengyuan Yang, “Unlocking the potential of half-metallic Sr₂FeMoO₆ films through controlled stoichiometry and double-perovskite ordering,” *Phys. Rev. B* **83**, 014407 (2011). [[doi](#)]
13. A. Chen, G. Vieira, T. Henighan, M. Howdysheill, J.A. North, **A.J. Hauser**, F.Y. Yang, M.G. Poirier, C. Jayaprakash, and R. Sooryakumar, “Regulating Brownian Fluctuations with Tunable Microscopic Magnetic Traps,” *Phys. Rev. Lett.* **107**, 087206 (2011). [[doi](#)]

12. Inhee Lee, Yuri Obukhov, **A.J. Hauser**, F.Y. Yang, Denis V. Pelekhov, and P. Chris Hammel, “Nanoscale confined mode ferromagnetic resonance imaging of an individual $\text{Ni}_{81}\text{Fe}_{19}$ disk using magnetic resonance force microscopy,” *Journal of Applied Physics* **109**, 07D313 (2011). [[doi](#)]
11. M. Rutkowski, **A.J. Hauser**, F.Y. Yang, R. Ricciardo, T. Meyer, P.M. Woodward, A Holcombe, P.A. Morris, and L.J. Brillson, “X-ray photoemission spectroscopy of $\text{Sr}_2\text{FeMoO}_6$ film stoichiometry and valence state,” *J. Vac. Sci. Technol. A* **28**, 1240 (2010). [[doi](#)]
10. Inhee Lee, Yuri Obukhov, Gang Xiang, **Adam Hauser**, Fengyuan Yang, Palash Banerjee, Denis V. Pelekhov, and P. Chris Hammel, “Nanoscale scanning probe ferromagnetic resonance imaging using localized modes,” *Nature* **466**, 845-848 (2010). [[doi](#)]
9. T. Henighan, A. Chen, G. Vieira, **A.J. Hauser**, F.Y. Yang, J.J. Chalmers, R. Sooryakumar, “Manipulation of Magnetically Labeled and Unlabeled Cells with Mobile Magnetic Traps,” *Biophysical Journal* **98**, 412-417 (2010). [[doi](#)]
8. J. Pak, W. Lin, K. Wang, A. Chinchore, M. Shi, D.C. Ingram, A.R. Smith, K. Sun, J.M. Lucy, **A.J. Hauser**, and F.Y. Yang, “Growth of epitaxial iron nitride ultrathin film on zinc-blende gallium nitride,” *J. Vac. Sci. Technol. A* **28**, 536 (2010). [[doi](#)]
7. G. Vieira, T. Henighan, A. Chen, **A.J. Hauser**, F.Y. Yang, J.J. Chalmers, and R. Sooryakumar, “Magnetic Wire Traps and Programmable Manipulation of Biological Cells,” *Phys. Rev. Lett.* **76**, 128101 (2009). [[doi](#)]
6. Kangkang Wang, Abhijit Chinchore, Wenzhi Lin, David C. Ingram, Arthur R. Smith, **Adam J. Hauser**, and Fengyuan Yang, “Epitaxial growth of ferromagnetic δ -phase manganese gallium on semiconducting scandium nitride (001),” *Journal of Crystal Growth* **311**, 2265-2268 (2009). [[doi](#)]
5. R.A. Ricciardo, **A.J. Hauser**, F.Y. Yang, H. Kim, W. Lu and P.M. Woodward, “Structural, magnetic, and electronic characterization of double perovskites $\text{BixLa}_{2-x}\text{MnMO}_6$ (M = Ni, Co; x = 0.25, 0.50),” *Materials Research Bulletin* **44**, 239-247 (2009). [[doi](#)]
4. **A.J. Hauser**, J. Zhang, L. Mier, R. Ricciardo, P.M. Woodward, T. L. Gustafson, L.J.Brillson, and F.Y. Yang, “Characterization of electronic structure and defect states of thin epitaxial BiFeO_3 films by UV-visible absorption and cathodoluminescence spectroscopies,” *Appl. Phys. Lett.* **92**, 222901 (2008). [[doi](#)]
3. W.C. Liu, C.L. Mak, K.H. Wong, C.Y. Lo, S.W. Or, W. Zhou, **A. Hauser**, F.Y. Yang and R. Sooryakumar, “Magnetolectric and dielectric relaxation properties of the high Curie temperature composite $\text{Sr}_{1.9}\text{Ca}_{0.1}\text{NaNb}_5\text{O}_{15}\text{-CoFe}_2\text{O}_4$,” *J. Phys. D: Appl. Phys.* **41** 125402 (2008). [[doi](#)]
2. Thomas R. Lemberger, Iulian Hetel, **Adam J. Hauser** and F.Y. Yang, “Superfluid density of superconductor-ferromagnet bilayers,” *Journal of Applied Physics* **103**, 07C701 (2008). [[doi](#)]
1. X.W. Zhao, **A.J. Hauser**, T.R. Lemberger and F.Y. Yang, “Growth control of GaAs nanowires using pulsed laser deposition with arsenic over-pressure,” *Nanotechnology* **18**, 485608 (2007). [[doi](#)]

CONFERENCE PROCEEDINGS

5. B.D. Esser, T.M. Smith, **A.J. Hauser**, R.E.A. Williams, F. Yang, M.J. Mills, DW McComb, “Quantifying Ordering Phenomena Through High-Resolution Electron Microscopy, Spectroscopy, and Simulation,” *Microscopy and Microanalysis* **22 (S3)**, 1448-1449 (2016). [[doi](#)]
4. J. Hwang, J.Y. Zhang, J. Son, E. Mikheev, **A.J. Hauser**, and S. Stemmer, “Quantification of Epitaxial Strain and Crystal Structure in Nanoscale Oxide Films Using Position Averaged Convergent Beam Electron Diffraction,” *Microscopy and Microanalysis* **19 (S2)**, 686-687 (2013). [[doi](#)]
3. B.D. Esser, M. Dixit, **A. Hauser**, R.E. Williams, F. Yang, H.L. Fraser, D. McComb, “Viability of HAADF-STEM Imaging Contrast and Simulations as a Measure of B-site Ordering for Double Perovskites,” *Microscopy and Microanalysis* **19 (S2)**, 610-611 (2013). [[doi](#)]
2. R. Williams, M. Dixit, R. Mishra, W. Windl, D. McComb, H. Fraser, **A. Hauser**, F. Yang, T. Meyers, P. Woodward, “Comparative Study for Simulation of EELS Core Loss for Transition Metals in Double Perovskite Systems,” *Microscopy and Microanalysis* **18 (S2)**, 308-309 (2012). [[doi](#)]
1. R. Williams, **A. Hauser**, R. Ricciardo, Manisha Dixit, J. Lucy, P. Woodward, Fengyuan Yang, and H. Fraser, “HR-STEM Imaging and EELS Characterizing of Nano-Scale Defects in Sputter Deposited Thin Films of Double-Perovskite $\text{Sr}_2\text{FeMoO}_6$ (SFMO) and $\text{Sr}_2\text{CrReO}_6$ (SCRO),” *Microscopy and Microanalysis* **17 (S2)**, 1654-1655 (2011). [[doi](#)]

INVITED TALKS

13. "Form and Function: Materials physics for forming true functional materials," *Physics and Astronomy Seminar, Sewanee: The University of the South, Sewanee, TN, 2016*
12. "Deep magnetism: Techniques for building and understanding tomorrow's magnetic materials," *UAB Department of Physics Colloquium, Birmingham, AL, 2016*
11. "Off-axis combinatorial magnetron sputtering: A new way forward," *Western Digital Media, Inc, San Jose, CA, 2016*
10. "Solving material challenges by innovation in atomic-precision growth techniques," *Seagate Technology, Fremont, CA, 2016*
9. "Off-axis combinatorial sputtering and characterization for complex magnetic materials," *MINT Center Seminar, University of Alabama, Tuscaloosa, AL, 2015*
8. "Atomic-level ordering of complex oxide half-metals for high-performance spin-based electronics," *Department of Physics and Astronomy Colloquium, West Virginia University, Morgantown, WV, 2015*
7. "Atomic-level ordering of complex oxide half-metals for high-performance spin-based electronics," *Department of Physics & Astronomy Colloquium, University of Alabama, Tuscaloosa, AL, 2015*
6. "Tailoring dielectric response of custom chemical sensors," *Invited Seminar, Edgewood Chemical Biological Center, Aberdeen Proving Grounds, MD 2014*
5. "Atomic-level ordering of complex oxide half-metals for high-performance spin-based electronics," *University of Wyoming Physics and Astronomy Colloquium Series, Laramie, WY, 2014*
4. "Time-corrected Hall measurements in NdNiO₃ thin films," *Nanoscience Research Network in Baden-Wuttemberg visit to CNSI, Santa Barbara, CA, 2013*
3. "Growth and characterization of epitaxial films of the half-metallic ferromagnet Sr₂CrReO₆," *Cornell Center for Materials Research, Ithaca, NY, 2011*
2. "Unlocking the potential of half-metallic Sr₂FeMoO₆ films through controlled stoichiometry and double-perovskite ordering," *Novel Magnetic Materials Workshop, Dresden, Germany, 2010*
1. "Obstacles and solutions for achieving high double perovskite ordering in Sr₂FeMoO₆ epitaxial films," *Institute for Materials Research Materials Week, Columbus, OH, 2010*

CONTRIBUTED TALKS

11. "Probing the magnetic structure of Co₂Fe_xMn_{1-x}Si thin films by XAS/XMCD," *2016 American Physical Society March Meeting, Baltimore, MD.*
10. "Dielectric tuned surface plasmon resonance on metallic gratings," *2015 American Physical Society March Meeting, San Antonio, TX.*
9. "Magnetic structure in epitaxially strained Sr₂CrReO₆ thin films by element-specific XAS and XMCD," *59th Magnetism and Magnetic Materials Conference, Honolulu, HI, 2014*
8. "Magnetotransport of NdNiO₃ thin films," *2014 American Physical Society March Meeting, Denver, CO.*
7. "Effects of strain in highly ordered Sr₂CrReO₆ epitaxial films," *2012 American Physical Society March Meeting, Boston, MA.*
6. "Magnetic and structural properties of Sr₂CrReO₆ epitaxial films fabricated by ultra-high vacuum sputtering," *2011 American Physical Society March Meeting, Dallas TX.*
5. "Surface growth dependence in growth of half-metallic Sr₂FeMoO₆ epitaxial films fabricated by ultra-high vacuum sputtering," *2010 American Physical Society March Meeting, Portland, OR.*
4. "Magnetic and structural properties of half-metallic Sr₂FeMoO₆ epitaxial films fabricated by ultra-high vacuum sputtering," *2009 American Physical Society March Meeting, Pittsburgh, PA.*
3. "Magnetic and structural properties of half-metallic Sr₂FeMoO₆ epitaxial films fabricated by ultra-high vacuum sputtering," *53rd Magnetism and Magnetic Materials Conference, Austin, TX, 2008*
2. "Measurements of bandgap of epitaxial BiFeO₃ films by UV-Vis absorption and cathodoluminescence spectroscopies," *2008 American Physical Society March Meeting, New Orleans, LA.*

1. “Nonmonotonic superfluid density of Nb/Ni bilayers,” *52nd Magnetism and Magnetic Materials Conference, Tampa, FL, 2007*
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PATENTS

1. Peterson, G. W.; Soliz, J. R.; Hauser, A. J. (Harford Co., USA). “A Facile Approach Using Dielectrics for Explosives and Toxic Chemical Sensing via Impedance Spectroscopy.” **2016**. (Application Pending)
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