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EDUCATION

Ph.D. Physics, University of Michigan, Ann Arbor, 2014
Dissertation: "*Synchrotron X-ray Diffraction Studies on Oxide Surfaces and Interfaces*"

B.S. Physics, Mathematical Science, Seoul National University, 2009

HONORS AND AWARDS

UCLA Chancellor's Award for Postdoctoral Research, 2017
Rackham Conference Travel Grant, May. 2011, Aug. 2011, Mar. 2013, Mar. 2014
Parkinson Travel Fund, Mar. 2014
Seoul National University: graduated Summa Cum Laude, 2009
LOTTE Foundation Fellowship for Science, 2008-2009
Seoul National University Alumni Association Fellowship, 2004

RESEARCH EXPERIENCE

2014-Present **Postdoctoral Scholar,** Department of Physics and Astronomy, UCLA

Advisor: Prof. Jianwei (John) Miao

- Atomic Electron Tomography (AET)
  - Determined the 3D coordinates of 6,569 iron and 16,627 platinum atoms in a model iron-platinum (FePt) nanoparticle system to correlate 3D atomic arrangements and chemical order/disorder with material properties at the single-atom level.
  - Measured individual atomic coordinates of 3,769 atoms in a tungsten needle with ~19 pm precision and determined atomic displacement field and the full strain tensor with a 3D resolution of ~1 nm^3 and a precision of ~10^{-3}.
- Coherent Diffractive Imaging (CDI)
  - Coherent x-ray diffractive imaging for high-resolution 3d-structural determination of Au/Pd core-shell nanoparticle.

2009-2014 **Research Assistant,** Department of Physics, University Of Michigan

Advisor: Prof. Roy Clarke

- Surface X-Ray Diffraction (SXRD) measurements on ZnO polar surfaces and Schottky interfaces for sub-ångstrom resolution atomic structure.
- Structural phase transition measurements of $BiFeO_3$ thin films induced by epitaxial misfit strain and film thickness.
- Behavior of oxygen octahedra network at the functional oxide film-substrate interfaces.
- In- and ex-situ synchrotron x-ray diffraction measurement on organic semiconductor thin films (Pentacene, SubPc on Si).

TEACHING EXPERIENCE

2009-2013 **Graduate Student Instructor**

Department of Physics, University of Michigan

- Physics 341 - Waves, Light and Heat Laboratory

2008-2009 **Undergraduate Teaching Assistant**

College of Natural Science, Seoul National University

- 007.099 - Basic Physics
- 007.098 - Basic Mathematics

PUBLICATIONS

1. **Y. Yang**, C.-C. Chen, M. C. Scott, C. Ophus, R. Xu, A. Pryor Jr., L. Wu, F. Sun, W. Theis, J. Zhou, M. Eisenbach, P. R. C. Kent, R. F. Sabirianov, H. Zeng, P. Ercius, and J. Miao, "Deciphering chemical order/disorder and material properties at the single-atom level", *Nature*, in press (2017), arXiv preprint: https://arxiv.org/abs/1607.02051.
2. N. Senabulya, N. Feldberg, R. A. Makin, **Y. Yang**, G. Shi, C. M. Jones, E. Kioupakis, J. Mathis, R. Clarke, and S. M. Durbin, "Stabilization of orthorhombic phase in single-crystal $ZnSnN_2$ films", *AIP Adv.* **6**, 075019 (2016). https://dx.doi.org/10.1063/1.4960109
3. B. D. A. Levin, E. Padgett, C.-C. Chen, M. C. Scott, R. Xu, W. Theis, Y. Jiang, **Y. Yang**, C. Ophus, H. Zhang, D.-H. Ha, D. Wang, Y. Yu, H. D. Abruna, R. D. Robinson, P. Ercius, L. F. Kourkoutis, J. Miao, D. A. Muller, and R. Hovden, "Nanomaterial datasets to advance tomography in scanning transmission electron microscopy", *Sci. Data* **3**, 160041 (2016). https://dx.doi.org/10.1038/sdata.2016.41

4. **Y. Yang**, C. Beekman, W. Siemons, C. M. Schlepütz, N. Senabulya, R. Clarke, and H. M. Christen, "Origin of thickness dependence of structural phase transition temperatures in highly strained $BiFeO_3$ thin films", *APL Mater*. **4**, 036106 (2016). https://dx.doi.org/10.1063/1.4944749
5. R. Xu, C.-C. Chen, L. Wu, M. C. Scott, W. Theis, C. Ophus, M. Bartels, **Y. Yang**, H. Ramezani-Dakhel, M. R. Sawaya, H. Heinz, L. D. Marks, P. Ercius, and J. Miao, "Three-dimensional coordinates of individual atoms in materials revealed by electron tomography", *Nature Mater*. **14**, 1099-1103 (2015). https://dx.doi.org/10.1038/NMAT4426
6. H. Dixit, C. Beekman, C. M. Schlepütz, W. Siemons, **Y. Yang**, N. Senabulya, R. Clarke, M. Chi, H. M. Christen, and V. R. Cooper, "Understanding Strain-Induced Phase Transformations in $BiFeO_3$ Thin Films", *Adv. Sci*. **2**, 1500041 (2015). https://dx.doi.org/10.1002/advs.201500041
7. O. Shalev, S. Biswas, **Y. Yang**, T. Eddir, W. Lu, R. Clarke, and M. Shtein, "Growth and modelling of spherical crystalline morphologies of molecular materials", *Nature Commun*. 5:5204, doi:10.1038/ncomms6204 (2014).
8. S. Biswas, **Y. Yang**, C. M. Schlepütz, N. Geva, R. L. Headrick, R. Pindak, R. Clarke, and M. Shtein, "Mapping of morphology and electronic properties of air-printed pentacene films", *Adv. Funct. Mater*. **24**, 3907 (2014). https://dx.doi.org/10.1002/adfm.201303983
9. **Y. Yang**, C. M. Schlepütz, C. Adamo, D. G. Schlom and R. Clarke, "Untilting $BiFeO_3$: the influence of substrate boundary conditions in ultrathin $BiFeO_3$ on $SrTiO_3$", *APL Mater*. **1**, 052102 (2013). https://dx.doi.org/10.1063/1.4827596
10. I. Cour, P. V. Chinta, C. M. Schlepütz, **Y. Yang**, R. Clarke, R. Pindak, and R. L. Headrick, "Origin of stress and enhanced carrier transport in solution-cast organic semiconductor films", *J. Appl. Phys*. **114**, 093501 (2013). https://dx.doi.org/10.1063/1.4820384
11. **Y. Yang**, C. M. Schlepütz, F. Bellucci, M. W. Allen, S. M. Durbin, and R. Clarke, "Structural Investigation of ZnO O-polar (000-1) Surfaces and Schottky Interfaces", *Surf. Sci*. **610**, 22 (2013). https://dx.doi.org/10.1016/j.susc.2012.12.018
12. Y. S. Chai, Y. S. Oh, L. J. Wang, N. Manivannan, S. M. Feng, **Y. S. Yang**, L. Q. Yan, C. Q. Jin, and K. H. Kim, "Intrinsic ferroelectric polarization of orthorhombic manganites with E-type spin order", *Phys. Rev. B* **85**, 184406 (2012). https://dx.doi.org/10.1103/PhysRevB.85.184406
13. C. M. Schlepütz, **Y. Yang**, R. Heinhold, N. S. Husseini, H.-S. Kim, M. W. Allen, S. M. Durbin, and R. Clarke, "Presence of a (1×1) oxygen overlayer on ZnO (0001) surfaces and at Schottky interfaces", *J. Phys.: Condens. Matter* **24**, 905007 (2012). https://dx.doi.org/10.1088/0953-8984/24/9/095007
14. S. M. Feng, Y. S. Chai, J. L. Zhu, N. Manivannan, Y. S. Oh, L. J. Wang, **Y. S. Yang**, C. Q. Jin, and K. H. Kim, "Determination of the intrinsic ferroelectric polarization in orthorhombic $HoMnO_3$", *New J. Phys*. **12**, 073006 (2010). https://dx.doi.org/10.1088/1367-2630/12/7/073006

INVITED PRESENTATIONS

1. 6th Edition of Transmission Electron Microscopy Summer School, "*Electron Tomography*", Brazilian Nanotechnology National Laboratory, Campinas, São Paulo, Brazil, Jan. 2016
2. Condensed-Matter Physics & Materials Science Seminar, "*Synchrotron X-ray Diffraction Studies on Oxide Surfaces and Interfaces*", Brookhaven National Laboratory, Jul. 2014

CONTRIBUTED PRESENTATIONS

1. Y. Yang, C. M. Schlepütz, N. Senabulya, C. Beekman, W. Siemons, C. Adamo, D. G. Schlom, H. Christen, and R. Clarke, "*Thickness-Induced Structural Phase Transition of $BiFeO_3$ Thin Films*", 2014 Advanced Photon Source users meeting, poster presentation.
2. Y. Yang, N. Senabulya, C. M. Schlepütz, C. Beekman, W. Siemons, H. M. Christen and R. Clarke, "*Symmetry of Highly-Strained $BiFeO_3$ Films in the Ultrathin Regime*", 2014 APS March Meeting, oral presentation.
3. Y. Yang, C. M. Schlepütz, C. Adamo, D. G. Schlom, and R. Clarke, "*Symmetry of Epitaxial $BiFeO_3$ Films in the Ultrathin Regime*", 2013 APS March Meeting, oral presentation.
4. Y. Yang, C. M. Schlepütz, C. Adamo, D. G. Schlom, and R. Clarke, "*Substrate-induced Structural Phase Transition in Ultra-thin $BiFeO_3$ Films*", 2012 Advanced Photon Source users meeting, poster presentation.
5. Y. Yang, C. M. Schlepütz, C. Adamo, D. G. Schlom and R. Clarke, "*Structural Investigation of Ultrathin $BiFeO_3$ Films on $SrTiO_3$ (001) Substrates*", Fundamental Physics of Ferroelectrics and Related Materials 2012, poster presentation.
6. Y. Yang, C. M. Schlepütz, N. S. Husseini, M. W. Allen, S. M. Durbin, and R. Clarke, "*Structural Investigations on ZnO Polar Surfaces and Schottky Interfaces with Surface X-Ray Diffraction*", 2011 MRS Fall Meeting, poster presentation.
7. Y. Yang, S. Biswas, C. M. Schlepütz, M. Shtein, and R. Clarke, "*In-Situ X-Ray Scattering Study of Organic Thin Film Growth by Vapor Jet Printing*", 2011 Gordon Research Conference - Thin Film and Crystal Growth Mechanisms, poster presentation.
8. Y. Yang, C. M. Schlepütz, N. S. Husseini, M. W. Allen, S. M. Durbin, and R. Clarke, "*Structural Investigations on ZnO (0001), (000-1) Polar Surfaces and Schottky Contacts*", 2011 Advanced Photon Source users meeting, poster presentation.

PROFESSIONAL ACTIVITIES

Member of American Physical Society (APS), Materials Research Society (MRS)
Referee/Reviewer: Physical Review Letter, Physical Review B, Physica Status Solidi B: Basic Solid State Physics