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EDUCATION

MS/Ph.D (Materials Science & Engineering), University of Michigan, Ann Arbor, MI — Current

- Research Emphasis: Electron Microscopy, Low-dimension Materials, Quantum Materials.

Bachelor of Science (Engineering Physics), Cornell University, Ithaca, NY — Aug. 2012 – Jan. 2016

- Study Emphasis: Solid State Physics, Materials Science
- Deans's List: Fall 2012, Fall 2013, Fall 2014, Spring 2015

PUBLICATIONS

R. Yalisove*, **S. H. Sung***, P. Ercius, and R. Hovden "The Limits of Resolution and Dose for Aberration-Corrected Tomography" *Physical Review Applied* **15**, *014003*, (2021)

N. Schnitzer*, **S. H. Sung***, and R. Hovden "Optimal STEM Convergence Angle Selection using a Convolutional Neural Network and Strehl Ratio" *Microscopy and Microanalysis* **26**,*52*, *160–161*, (2020)

P. B. Meisenheimer, L. D. Williams, **S. H. Sung**, J. Gim, P. Shafer, G. N. Kotsonis, J.-P. Maria, M. Trassin, R. Hovden, E. Kioupakis, et al. "Magnetic frustration control through tunable stereochemically driven disorder in entropy-stabilized oxides" *Physical Review Materials* **3**,*10*, *104420*, (2019)

Y. Wang, Y. Wu, J. Schwartz, **S. H. Sung**, R. Hovden, and Z. Mi "A Single-Junction Cathodic Approach for Stable Unassisted Solar Water Splitting" *Joule* **3**,*10*, *2444–2456*, (2019)

S. H. Sung*, N. Schnitzer*, L. Brown, J. Park, and R. Hovden "Stacking, strain, and twist in 2D materials quantified by 3D electron diffraction" *Physical Review Materials* **3**,*6*, *064003*, (2019)

N. Schnitzer, **S. H. Sung**†, and R. Hovden "Introduction to the Ronchigram and its Calculation with Ronchigram.com" *Microscopy Today* **27**,*3*, *12–15*, (2019)

H. Yoo, R. Engelke, S. Carr, S. Fang, K. Zhang, P. Cazeaux, **S. H. Sung**, R. Hovden, A. W. Tsen, T. Taniguchi, et al. "Atomic and electronic reconstruction at the van der Waals interface in twisted bilayer graphene" *Nature Materials* **18**,*5*, *448–453*, (2019)

S. Chatterjee, **S. H. Sung**, D. J. Baek, L. F. Kourkoutis, D. G. Schlom, and K. M. Shen "Epitaxial growth and electronic properties of mixed valence YbAl3 thin films" *Journal of Applied Physics* **120**,*3*, *035105*, (2016)

Y. Nie, Y. Zhu, C.-H. Lee, L. F. Kourkoutis, J. A. Mundy, J. Junquera, P. Ghosez, D. Baek, **S. Sung**, X. Xi, et al. "Atomically precise interfaces from non-stoichiometric deposition" *Nature Communications* **5**,*1*, *1–8*, (2014)

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CONFERENCE ABSTRACTS

‡R. Yalisove*, **S. H. Sung***, and R. Hovden "Defining Theoretical Limits of Aberation-Corrected Electron Tomography: New Bounds for Resolution, Ojbect Size, and Dose" *Microscopy and Microanalysis* **25**, *1810–1811*, (2019)

N. Schnitzer*, **S. H. Sung***, and R. Hovden "Maximal Resolution from the Ronchigram: Human vs. Deep Learning" *Microscopy and Microanalysis* **25**, *160–161*, (2019)

‡N. Schnitzer*, **S. H. Sung***, and R. Hovden "Stacking, Strain, & Stiffness of 2D Transition Metal Dichalcogenides Quantified through Reciprocal Space" *Microscopy and Microanalysis* **24**, *1586–1587*, (2018)

H. Yoo, K. Zhang, R. Engelke, P. Cazeaux, **S. H. Sung**, R. Hovden, A. Tsen, T. Taniguchi, K. Watanabe, G.-C. Yi, M. Kim, M. Luskin, E. Tadmor, and P. Kim "Atomic Scale Relaxation at the van der Waals Interface in Twisted Bilayer Graphene" *Bulletin of the American Physical Society* **63**, , ()

R. Engelke, h. yoo hyobin, K. Zhang, P. Cazeaux, **S. H. Sung**, R. Hovden, A. Tsen, T. Taniguchi, K. Watanabe, G.-C. Yi, M. Kim, M. Luskin, E. Tadmor, and P. Kim "Structural study of atomic relaxation and commensurate transition in twisted bilayer graphene" *Bulletin of the American Physical Society* **63**, , ()

‡ First Authors Received M & M Student Scholar Awards

PRESENTATIONS

S. H. Sung, N. Schnitzer, and R. Hovden "Maximal Resolution from the Ronchigram: Human vs. Deep Learning" *AI for Atoms: How to Machine Learn STEM* (2020) ORNL/CNMS Virtual Workshop

S. H. Sung, Y. M. Goh, H. Yoo, R. Engelke, P. Kim, and H. Robert "Torsional Periodic Lattice Distrtion in Twisted Bilayer Graphene" *Microscopy and Microanalysis* (2020) Milwaukee, WI

R. Yalisove*, **S. H. Sung***, J. Schwartz, C. Groschner, P. Pelz, H. Zheng, Y. Jiang, C. Ophus, M. C. Scott, P. Ercius, and H. Robert "Achieving High-Resolution of Large Specimens Using Aberration-Corrected Electron Tomography" *Microscopy and Microanalysis* (2020) Milwaukee, WI

R. Hovden, R. Yalisove, J. Schwartz, **S. H. Sung**, Y. Jiang, and P. Ercius "Filling in the Missing Wedge with Aberration-Corrected Electron Tomography" *Microscopy and Microanalysis* (2020) Milwaukee, WI

R. Engelke, H. Yoo, S. Carr, **S. H. Sung**, K. Zhang, A. M. Valdivia, E. Tadmor, R. Hovden, K. E., and P. Kim "Imaging of 2Dimensional Dislocation Networks in Twisted Bilayer Graphene and Beyond" *Microscopy and Microanalysis* (2020) Milwaukee, WI

R. Hovden, **S. H. Sung**, N. Schnitzer, S. Novakov, I. El Baggari, B. H. Savitzky, J. T. Heron, and L. F. Kourkoutis "The Structure of Charge Density Wave Phase Transitions in Atomically Thin Materials" *Microscopy and Microanalysis* (2020) Milwaukee, WI

R. Yalisove*, **S. H. Sung***, and R. Hovden "Defining Theoretical Limits of Aberation-Corrected Electron Tomography: New Bounds for Resolution, Ojbect Size, and Dose" *Frontiers of Electron Microscopy and Materials Science* (2018) Ashville, NC

‡R. Yalisove*, **S. H. Sung***, and R. Hovden "Defining Theoretical Limits of Aberation-Corrected Electron Tomography: New Bounds for Resolution, Ojbect Size, and Dose" *Microscopy and Microanalysis* (2019)

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N. Schnitzer*, **S. H. Sung***, and R. Hovden "Maximal Resolution from the Ronchigram: Human vs. Deep Learning" *Microscopy and Microanalysis* (2019) Portland, OR

‡N. Schnitzer*, **S. H. Sung***, and R. Hovden "Stacking, Strain, & Stiffness of 2D Transition Metal Dichalcogenides Quantified through Reciprocal Space" *Microscopy and Microanalysis* (2018) Baltimore, MD

*The authors contributed equally

RESEARCH EXPERIENCES

Graduate Student Research Assistant, Hovden Lab, University of Michigan — Apr. 2016 – Current

Research Emphasis: 2D Materials, Quantum Materials

Visiting Scientist, Kourkoutis Electron Microscopy Group, Cornell University — Jan. 2016 – Jun 2016

Research Emphasis: Nano-characterization of thin-film complex oxide heterostructure using scanning transmission electron microscopy (STEM), electron energy loss spectroscopy (EELS) and energy dispersive x-ray spectroscopy (EDS)

• Prepared epitaxially grown thin film YbAl3 on MgO substrate with LuAl3 and Al buffer into electron-transparently thin lamella using focused ion beam (FIB).
Performed STEM and EDS to examine and confirm the epitaxial growth of the film and separation of the YbAl3 layer from the intermediate buffer layers.
[Chatterjee, et al. Journal of Applied Physics, 120, 035105 (2016)]

• Examined epitaxially grown thin film $Nd_{0.5}Sr_{0.5}MnO_3$ on $SrTiO_3$ substrate the system was expected to show short-range A-site cation ordering behavior.
Confirmed the presence of the ordering using Z-contrast HAADF-STEM and atomic resolution EELS data. The result is in preparation for submission.

Undergraduate Researcher, Kourkoutis Electron Microscopy Group — Feb. 2014 – Dec. 2015

- Preparation of electron-transparent (S)TEM specimen via tripod polishing technique
- Multislice simulation of STEM

AWARDS

Dorothy & Fred Chau Award: Excellence in Undergraduate Rsearch — May. 2016

Engineering Learning Initiatives Undergraduate Research Award — Apr. 2014 & Sept. 2014

SKILLS

Electron Microscopy: TEM, STEM, SEM, Multislice Simulations

Spectroscopy: Quantitative EELS and EDS

TEM Sample Preparation: Tripod Polishing, Focused Ion Beam

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Software: MATLAB, Python, HTML/CSS/Javascript, C, ImageJ, Adobe Illustrator, Adobe Photoshop, Blender

TEACHING EXPERIENCES

Graduate Student Instructor, University of Michigan — Aug. 2019 – Dec. 2019

- Teaching assistant for 'Intorudction to Electron Microscopy (MSE 562)'

Undergraduate Teaching Assistant, Cornell University — Aug. 2015 – Dec. 2015

- Assisted graduated TA for 'Physics I: Mechanics and Heat (PHYS 1112)'

Paid Tutor — Jun. 2012 – Aug. 2017

- Tutored various high school/AP level mathematics and science courses

REFERENCE

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