

## EDUCATION

Ph.D. Applied Physics (Advisor: David Muller)	2014, Cornell University
M.Sc. Applied Physics	2010, Cornell University
B.Sc. Summa Cum Laude, Physics	2007, Georgia Institute of Technology

## APPOINTMENTS

2017-	Assistant Professor, Materials Science	University of Michigan	MI
2014-2017	Postdoctoral Associate, Applied Physics	Cornell University	NY
2007-2013	Research Assistant, Applied Physics	Cornell University	NY
2006, 2005	Summer Researcher, Computer Science	Jet Propulsion Labs	CA
2007-2008, 2010	Teaching Assistant, Applied Physics	Cornell University	NY
2004-2007	Teaching Assistant, Mathematics	Georgia Tech	GA

## SELECTED PUBLICATIONS (10 of 79, Google scholar: *h*-index 38, 8000+ citations, Erdős # 4)

10. *Limits of Three-Dimensional Resolution and Dose for Aberration-Corrected Electron Tomography*, R Yalisove, SH Sung, P Ercius, R Hovden, **Physical Review Applied** 15, 014003 (2021)
9. *Nanoscale deformation mechanics reveal resilience in nacre of Pinna nobilis shell*, J. Gim, N. Schnitzer, L. M. Otter, Y. Cui, S. Motreuil, F. Marin, S. E. Wolf, D. E. Jacob, A. Misra, R. Hovden, **Nature Communications** 10, 4822 (2019)
8. *The mesoscale order of nacreous pearls*, J. Gim, A. Koch, L. M. Otter, B. H. Savitzky, S. Erland, L. A. Estroff, D. E. Jacob, R. Hovden, **Proc. Natl. Acad. Sci. U.S.A.** 118, 42 (2021)
7. *Two-dimensional charge order stabilized in clean polytype heterostructures*, S. H. Sung, N. Schnitzer, S. Novakov, I. El Baggari, X. Luo, J. Gim, N. Vu, Z. Li, T. Brintlinger, Y. Liu, W. Lu, Y. Sun, P. Deotare, K. Sun, L. Zhao, L. F. Kourkoutis, J. T. Heron, R. Hovden **Nature Communications**, 13 413 (2022)
6. *Atomic lattice disorder in charge-density-wave phases of exfoliated dichalcogenides (1T-TaS<sub>2</sub>)*, R. Hovden, A. W. Tsen, B. H. Savitzky, P. Liu, I. El Baggari, Y. Liu, W.J. Lu, Y. Sun, P. Kim, A. N. Pasupathy, L. F. Kourkoutis, **Proc. Natl. Acad. Sci. U.S.A.** 113, 11420 (2016)
5. *Stacking, strain, and twist in 2D materials quantified by 3D electron diffraction*, S.H. Sung, N. Schnitzer, L. Brown, J. Park, R. Hovden, **Physical Review Materials** 3, 064003 (2019)
4. *Robotic Four-Dimensional Pixel Assembly of van der Waals Solids*, A. J. Mannix, A. Ye, S. H. Sung, A. Ray, F. Mujid, C Park, M. Lee, J. H. Kang, R. Shreiner, A. A. High, D. A. Muller, R. Hovden, J. Park, **Nature Nanotech** 17, 361 (2022)
3. *Imaging Atomic-Scale Chemistry from Fused Multi-Modal Electron Microscopy*, J. Schwartz, Z. Di, Y. Jiang, A. Fielitz, D. Ha, S. Perera, I. El Baggari, R. Robinson, J. Fessler, C. Ophus, S. Rozeveld, R. Hovden, **NPJ Computational Materials**, 8 16 (2022)
2. *Atomic and electronic reconstruction at the van der Waals interface in twisted bilayer*, H. Yoo, R. Engelke, S. Carr, S. Fang, K. Zhang, P. Cazeaux, S.H. Sung, R. Hovden, A.W. Tsen, T. Taniguchi, K. Watanabe, G.C. Yi, M. Kim, M. Luskin, E.B. Tadmor, E. Kaxiras, P. Kim, **Nature Materials** 18, 448–453 (2019)
1. *Magnetic anisotropy reversal driven by structural symmetry-breaking in monolayer  $\alpha$ -RuCl<sub>3</sub>*, B. Yang, Y. M. Goh, S.H. Sung, G. Ye, S. Biswas, D.A.S. Kaib, R. Dhakal, S. Yan, C. Li, S. Jiang, F. Chen, H. Lei, R. He, R. Valentí, S.M. Winter, R. Hovden, A.W. Tsen, **Nature Materials**, in-press, (2022)

**INVITED TALKS**

36. *Periodic Lattice Distortions in Low Dimensional Materials*  
**Wayne State Physics Seminar**, Feb. 2023
35. *Real-Time 3D Analysis During Electron Tomography Experiments*,  
**MIT, Automation AI and Machine Learning in Electron Microscopy**, Nov. 2022
34. *Periodic Lattice Distortions in Low Dimensional Materials*,  
**AVS 68**, Pittsburgh PA, Nov 2022
33. *Measuring with Pixels and Voxels*,  
**Open Metrology, MIT Center for Bits and Atoms**, Aug. 2022
32. *Periodic Lattice Distortions in Low Dimensional Materials*, **University of Michigan**, Department of Physics, Condensed Matter – Quantum Computing Seminars, Apr. 2022
31. *Stabilizing 2D Charge Density Waves using Confined TaS<sub>2</sub> Polytypes*, **3rd Joint Annual Meeting IEEE Magnetics Society and Nanotechnology**, COVID, Dec. 2021
30. *2D Electronic Order Stabilized in Clean Polytype Heterostructures*,  
**LBL Molecular Foundry Seminar**, COVID, Sept. 2021
29. *Room-Temperature Stabilization of Commensurate 2D Charge Density Waves in Confined TaS<sub>2</sub> Polytypes*, **IEEE RAPID**, COVID, August 2021
29. *Linear Imaging Theory*, **Cornell University**, NSF-PARADIM Summer School and Workshop on Electron Microscopy, COVID, June 2021
27. *Defining Theoretical Limits of Aberration-Corrected Electron Tomography: New Bounds for Resolution, Object Size, and Dose*, **APS March Meeting**, COVID, March 2021
28. *Room-Temperature Stabilization of Commensurate 2D Charge Density Waves in Confined TaS<sub>2</sub> Polytypes*, **Cornell University, NSF-PARADIM User Meeting**, COVID, Dec. 2020
26. *Electron Tomography for Functional Nanomaterials*, Robert Hovden, University of Michigan,  
**MRS OnDemand Webinar Series**, April 2020 (560 attendees)
25. *Maximal Resolution from the Ronchigram: Human vs. Deep Learning*,  
**AI for Atoms, Oak Ridge National Lab**, December 2020
24. *Defining Theoretical Limits of Aberration-Corrected Electron Tomography: New Bounds for Resolution, Object Size, and Dose*, **APS March Meeting**, Denver CO, March 2020 (cancelled COVID-19)
23. *Probing Atomic Structure Across Higher Dimensional Materials Using sub-Angstrom Electron Beams*, **Physics Colloquium at Wayne State University**, Detroit MI, Jan 2020
22. *Defining Theoretical Limits of Aberration-Corrected Electron Tomography: New Bounds for Resolution, Object Size, and Dose*, **Frontiers of Electron Microscopy and Materials Science**, Ashville NC, Sept 2019
21. *From 2D to 3D with High-Resolution Electron Tomography and Live Reconstruction*, **Leadership Computer Facility, Argonne National Lab**, Lemont IL, July 2019
20. *Probing Atomic Lattice Distortions Across Scale & Dimensions with sub-Angstrom Electron Beams*, **DOW Chemical**, Midland MI, Dec. 2018
19. *Determining atomic structure from 2D to 3D with high-energy electron beams*, **Midwest Imaging and Micro-analysis Workshop at Notre Dame**, Notre Dame University, May 2018
18. *Removing Stripes, Scratches, and Curtaining with Irrecoverable Compressed Sensing*, Jonathan Schwartz, Robert Hovden, **11th Annual FIB SEM Workshop**, Canadian Center for Electron Microscopy, McMaster University May 2018.
17. *Probing Atomic Structure across Scale and Dimensions with Highly Convergent Electron Beams*. [Keynote], **Michigan Microscopy & Microanalysis Society**, Ann Arbor MI, Nov. 2017

16. *Applications of Advanced Electron Microscopy Methods in Materials/Chemistry Research*, **McMaster University**, Hamilton ON, Jun. 2017
15. *Reconstruction Algorithms and Data Processing for Nanoscale Tomography*, **Canadian Centre for Electron Microscopy**, Hamilton ON, Jun. 2017
14. *Tomography practical aspects*, **Cornell University, PARADIM Summer School** and Workshop on Electron Microscopy, Ithaca NY
13. *Linear Imaging Theory*, **Cornell University, PARADIM Summer School** and Workshop on Electron Microscopy, Ithaca NY, June 2017
12. *Probing Atomic Structure Across Scale and Dimensions with sub-Angstrom Electron Beams*, **Applied Physics Program at University of Michigan**, Mar. 2017
11. *Probing Atomic Structure Across Scale and Dimensions with sub-Angstrom Electron Beams* **Dept. of Materials Science, University of Michigan**, Mar. 2016
10. *Structure, Symmetry, and Stacking of 2D Materials*, **U. Penn Dept. of Materials Science Colloquium**, Feb. 2016
9. *Determining Atomic Structure in 3D with the Modern Electron Microscope*, **NION Inc.** Kirkland WA, Feb. 2016
8. *Atomic Imaging of 2D and 3D Materials with Scanning Transmission Electron Microscopy*, **Portland State Physics Colloquium**, Portland OR, Feb. 2016
7. *Observing Symmetry and Stacking Order in 2D Materials with Electron Microscopy*, **Molecular Foundry at Lawrence Berkeley Lab**, Berkeley CA, Jan. 2016
6. *Atomic Imaging of 2D and 3D Materials with Scanning Transmission Electron Microscopy*, **Naval Research Lab**, Washington D.C., Oct. 2014
5. *When Art Exceeds Perception*, **CCA Biennial Symposium: Intimate Cosmologies**, Ithaca NY, Sept. 2014
4. *Artifact Reduction in Fourier Analysis of Atomic Resolution Images / The Cornell Spectrum Imager*, **NION Intl. Workshop on Electron Microscopy Software**, Iceland, Mar. 2014
3. *Open-Source Visualization of 3D Data: From Tomography to Spectroscopy*, **Kitware Inc.** Albany NY, Mar. 2014
2. *Imaging Limitations from 2D to 3D in Scanning Transmission Electron Microscopes*, **NION Inc.** Kirkland WA, Sept. 2013
1. *3D and Spectroscopic Characterization of Devices At The Atomic Scale Using Aberration-Corrected Electron Microscopy*, **Frontiers of Characterization and Metrology for Nanoelectronics at NIST**, Gaithersburg MD, Mar. 2013

## PUBLICATION LIST

## SCIENTIFIC PAPERS

79. *Photonicallly Active Bowtie Nanoassemblies with Chirality Continuum*, P. Kumar, T. Vo, M. Cha, A. Visheratina, J. Kim, W. Xu, J. Schwartz, A. Simon, D. Katz, V.P. Nicu, E. Marino, W. Choi, M. Veksler, S. Chen, C. Murray, R. Hovden, S. Glotzer, N.A. Kotov, **Nature** **615**, 418-424 (2023)
78. Magnetic anisotropy reversal driven by structural symmetry-breaking in monolayer  $\alpha$ -RuCl<sub>3</sub>, B. Yang, Y. M. Goh, S.H. Sung, G. Ye, S. Biswas, D.A.S. Kaib, R. Dhakal, S. Yan, C. Li, S. Jiang, F. Chen, H. Lei, R. He, R. Valentí, S.M. Winter\*, R. Hovden\*, A.W. Tseng\*, **Nature Materials** **22**, 50-56 (2023)
77. *Batch Production of High-Quality Graphene Grids for Cryo-EM: Cryo-EM Structure of Methylococcus capsulatus Soluble Methane Monooxygenase Hydroxylase*, E. Ahn, B. Kim, S. Park, A.L. Erwin, S.H. Sung, R. Hovden, S. Mosalaganti, U.S. Cho, **ACS Nano** **17**, 6011 (2023)

## 2022

76. *Torsional Periodic Lattice Distortions and Diffraction of Twisted 2D Materials*, S. H. Sung, Y.M. Goh, H. Yoo, R. Engelke, H. Xie, K. Zhang, Z. Li, A. Ye, P.B. Deotare, E.B. Tadmor, A.J. Mannix, J. Park, L. Zhao, P. Kim, R. Hovden, **Nature Communications** **13**, 7826 (2022)
75. *Real-time 3D analysis during electron tomography using tomviz*, J. Schwartz, C. Harris, J. Pietryga, H. Zheng, P. Kumar, A. Visheratina, N. A. Kotov, B. Major, P. Avery, P. Ercius, U. Ayachit, B. Geveci, D.A. Muller, A. Genova, Y. Jiang, M. Hanwell, R. Hovden, **Nature Communications** **13**, 4458 (2022)
74. *A Three-Stage Magnetic Phase Transition Revealed in Ultrahigh-Quality van der Waals Bulk Magnet CrSBr*, W. Liu, X. Guo, J. Schwartz, H. Xie, N. U. Dhale, S. H. Sung, A. L. N. Kondusamy, X. Wang, H. Zhao, D. Berman, R. Hovden, L. Zhao, B. Lv, **ACS Nano** **16**, 15917 (2022)
73. *Scalable Synthesis of Monolayer Hexagonal Boron Nitride on Graphene with Giant Bandgap Renormalization*, P. Wang, W. Lee, J. P. Corbett, W. H. Koll, N. M. Vu, D. A. Laleyan, Q. Wen, Y. Wu, A. Pandey, J. Gim, D. Wang, D. Y. Qiu, R. Hovden, M. Kira, J. T. Heron, J. A. Gupta, E. Kioupakis, Z. Mi, **Advanced Materials**, 2201387 (2022)
72. *Imaging Atomic-Scale Chemistry from Fused Multi-Modal Electron Microscopy*, J. Schwartz, Z. Di, Y. Jiang, A. Fielitz, D. Ha, S. Perera, I. El Baggari, R. Robinson, J. Fessler, C. Ophus, S. Rozeveld, R. Hovden, **NPJ Computational Materials**, **8** 16 (2022)
71. *Two-dimensional charge order stabilized in clean polytype heterostructures*, S. H. Sung, N. Schnitzer, S. Novakov, I. El Baggari, X. Luo, J. Gim, N. Vu, Z. Li, T. Brintlinger, Y. Liu, W. Lu, Y. Sun, P. Deotare, K. Sun, L. Zhao, L. F. Kourkoutis, J. T. Heron, R. Hovden, **Nature Communications**, **13** 413 (2022)
70. *Robotic Four-Dimensional Pixel Assembly of van der Waals Solids*, A. J. Mannix, A. Ye, S. H. Sung, A. Ray, F. Mujid, C. Park, M. Lee, J. H. Kang, R. Shreiner, A. A. High, D. A. Muller, R. Hovden, J. Park, **Nature Nanotech**, **17** 361 (2022)
69. *Twist engineering of the two-dimensional magnetism in double bilayer chromium triiodide homostructures*, H. Xie, X. Luo, G. Ye, Z. Ye, H. Ge, S. H. Sung, E. Rennich, S. Yan, Y. Fu, S. Tian, H. Lei, R. Hovden, K. Sun, R. He, L. Zhao, **Nature Physics** **42**, 1548 (2021)
68. *The mesoscale order of nacreous pearls*, J. Gim, A. Koch, L. M. Otter, B. H. Savitzky, S. Erland, L. A. Estroff, D. E. Jacob, R. Hovden, **Proc. Natl. Acad. Sci. U.S.A.** **118**, 42 (2021)
67. *Ultrafast Modulations and Detection of a Ferro-rotational Charge Density Wave Using Time-resolved Electric Quadrupole Second Harmonic Generation*, X. Luo, D. Obeysekera, C. Won,

- S.H. Sung, N. Schnitzer, R. Hovden, S.W. Cheong, J. Yang, K. Sun, L. Zhao, **Physical Review Letters** **127**, 126401 (2021)
66. *Electron overflow of AlGaIn deep ultraviolet light emitting diodes*, A Pandey, J Gim, R Hovden, Z Mi, **Appl. Physics Letters** **118** (24), 241109 (2021)
65. *Engineering new limits to magnetostriction through metastability in iron-gallium alloys*, P. Meisenheimer, R. Steinhardt, S.H. Sung, L. Williams, S. Zhuang, M. Nowakowski, S. Novakov, M. Torunbalci, B. Prasad, C. Zollner, Z. Wang, N. Dawley, J. Schubert, A. Hunter, S. Manipatruni, D. Nikonov, I. Young, L. Chen, J. Bokor, S. Bhawe, R. Ramesh, J. Hu, E. Kioupakis, R. Hovden, D. Schlom, J. Heron, **Nature Communications** **12**, 2757 (2021)
64. *Limits of Three-Dimensional Resolution and Dose for Aberration-Corrected Electron Tomography*, R Yalisove, SH Sung, P Ercius, R Hovden, **Physical Review Applied** **15**, 014003 (2021) [Editor's Choice]
63. *An AlGaIn tunnel junction light emitting diode operating at 255 nm*, A Pandey, J Gim, R Hovden, Z Mi, **Applied Physics Letters** **117**, 241101 (2020)
62. *Dynamic Compressed Sensing for Real-Time Tomographic Reconstruction*, J Schwartz, H Zheng, M Hanwell, Y Jiang, R Hovden, **Ultramicroscopy** **219**, 113122 (2020)
61. *Optimal STEM Convergence Angle Selection using a Convolutional Neural Network and the Strehl Ratio*, N Schnitzer, SH Sung, R Hovden, **Microsc. & Microanaly.** **26**, 921-928 (2020)
60. *Contamination of TEM Holders Quantified and Mitigated with Open-Hardware, High-Vacuum Bakeout System* YM Goh, J Schwartz, E Rennich, T Ma, B Kerns, R Hovden, **Microsc. & Microanaly.** **26**, p906-912 (2020)
59. *Imaging Polarity in Two Dimensional Materials by Breaking Friedel's Law*, P Deb, MC Cao, Y Han, ME Holtz, S Xie, J Park, R. Hovden, DA Muller, **Ultramicroscopy** **215**, 113019 (2020)
58. *Graphene-assisted molecular beam epitaxy of AlN for AlGaIn deep-ultraviolet light-emitting diodes*, P. Wang, A. Pandey, J. Gim, W. Jin Shin, E.T. Reid, D.A. Laleyan, Y. Sun, D. Zhang, Z Liu, Z. Zhong, R. Hovden, Z. Mi, **Appl. Phys. Lett.** **116**, 171905 (2020)
57. *Electron Tomography for Functional Nanomaterials*, R. Hovden, D. A. Muller, **MRS Bulletin** **45**, 298-304 (2020) [Invited]
56. *High-efficiency AlGaIn/GaN/AlGaIn tunnel junction ultraviolet light-emitting diodes*, A. Pandey, W.J. Shin, J. Gim, R. Hovden, Z. Mi, **Photonics Research** **8**, 331-337 (2020)
55. *Nanoscale deformation mechanics reveal resilience in nacre of Pinna nobilis shell*, J. Gim, N. Schnitzer, L. M. Otter, Y. Cui, S. Motreuil, F. Marin, S. E. Wolf, D. E. Jacob, A. Misra, R. Hovden, **Nature Communications** **10**, 4822 (2019)
54. *Magnetic frustration control through tunable stereochemically driven disorder in entropy-stabilized oxides*, 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, J. T. Heron, **Physical Review Materials** **3**, 104420 (2019)
53. *Deep Ultraviolet Luminescence Due to Extreme Confinement in Monolayer GaN/Al (Ga) N Nanowire and Planar Heterostructures*, A. Aiello, Y. Wu, A. Pandey, P. Wang, W. Lee, D. Bayerl, N. Sanders, Z. Deng, J. Gim, K. Sun, R. Hovden, E. Kioupakis, Z. Mi, P. Bhattacharya, **Nano Letters** **19**, 7852-7858 (2019)
52. *A Single Junction Cathodic Approach for Stable Unassisted Solar Water Splitting*, Y. Wang, Y. Wu, J. Schwartz, S. H. Sung, R. Hovden, Z. Mi, **Joule** **3**, 2444-2456 (2019)
51. *Stacking, strain, and twist in 2D materials quantified by 3D electron diffraction*, S.H. Sung, N. Schnitzer, L. Brown, J. Park, R. Hovden, **Physical Review Materials** **3**, 064003 (2019)

50. *Atomic and electronic reconstruction at the van der Waals interface in twisted bilayer*, H. Yoo, R. Engelke, S. Carr, S. Fang, K. Zhang, P. Cazeaux, S.H. Sung, R. Hovden, A.W. Tsen, T. Taniguchi, K. Watanabe, G.C. Yi, M. Kim, M. Luskin, E.B. Tadmor, E. Kaxiras, P. Kim, **Nature Materials** **18**, 448–453 (2019)
49. *Removing Stripes, Scratches, and Curtaining with Non-Recoverable Compressed Sensing*, J. Schwartz, Y. Jiang, Y. Wang, A. Aiello, P. Bhattacharya, H. Yuan, Z. Mi, N. Bassim, R. Hovden, **Microsc. & Microanaly.** **25**, 705-710 (2019)
48. *An  $In_{0.42}Ga_{0.58}N$  Tunnel Junction Nanowire Photocathode Monolithically Integrated on a Nonplanar Si Wafer*, Y. Wang, S. Vankaa, J. Gim, Y. Wu, R. Fan, Y. Zhang, J. Shie, M. Shend, R. Hovden, Z. Mi, **Nano Energy** **57**, 405–413 (2019)
47. *Optical and Interface Characteristics of  $Al_{0.56}Ga_{0.44}N/Al_{0.62}Ga_{0.38}N$  Multiquantum Wells with ~280nm Emission Grown by Plasma-Assisted Molecular Beam Epitaxy*, A. Aiello, A. Pandey, A. Bhattacharya, J. Gim, X. Liu, D.A. Laleyan, R. Hovden, Z. Mi, P. Bhattacharya **Journal of Crystal Growth** **508**, 66–71 (2019)
46. *Heteroepitaxy of Fin-Shaped InGaN Nanoridge Using Molecular Beam Epitaxy*, Y.B. Park, J. Gim, R. Yalisove, R. Hovden, Z. Mi, **Cryst. Growth Des.** **18**, 5750–5756 (2018)
45. *Thickness and Stacking Sequence Determination of Exfoliated Dichalcogenides (1T-TaS<sub>2</sub>, 2H-MoS<sub>2</sub>) Using Scanning Transmission Electron Microscopy*, R. Hovden, P. Liu, N. Schnitzer, A.W. Tsen, Y. Liu, W. Lu, Y. Sun, L.F. Kourkoutis, **Microsc. & Microanaly.** (2018) **[Awarded Best M&M Paper 2018]**
44. *Image registration of low signal-to-noise cryo-STEM data*, B.H. Savitzky, I. El Baggari, C. Clement, E. Waite, J.P. Sheckelton, C. Pasco, A.S. Admasu, J. Kim, S.W. Cheong, T.M. McQueen, R. Hovden, L.F. Kourkoutis, **Ultramicroscopy** **191**, 56-65 (2018)
43. *Nature and evolution of incommensurate charge order in manganites visualized with cryogenic scanning transmission electron microscopy*, I. El Baggari, B.H Savitzky, A.S. Admasu, J. Kim, S.W. Cheong, R. Hovden, L.F. Kourkoutis, **Proc. Natl. Acad. Sci. U.S.A.** **115**, 1445 (2018)
42. *Solar Water Oxidation by an InGaN Nanowire Photoanode with a Bandgap of 1.7 eV*, S. Chu, S. Vanka, Y. Wang, J. Gim, Y. Wang, Y.H. Ra, R. Hovden, H. Guo, I. Shih, Z. Mi, **ACS Energy Letters** **3**, 307 (2018)
41. *Sampling limits for electron tomography with sparsity-exploiting reconstructions*, Y. Jiang, E. Padgett, R. Hovden, D.A. Muller, **Ultramicroscopy** **186**, 94 (2018)
40. *A Simple Preparation Method for Full-Range Electron Tomography of Nanoparticles and Fine Powders*, E. Padgett, R. Hovden, J.C. DaSilva, B.D. Levin, J.L. Grazul, T. Hanrath, D.A. Muller, **Microsc. & Microanaly.** **23**, 1150 (2017)
39. *Bending and breaking of stripes in a charge ordered manganite*, B.H. Savitzky, I. El Baggari, A.S. Admasu, J. Kim, S.W. Cheong, R. Hovden, L.F. Kourkoutis, **Nature Communications** **8**, 1883 (2017)
- 2016**
38. *Physical Confinement Promoting Formation of  $Cu_2O$ -Au Heterostructures with Au Nanoparticles Entrapped within Crystalline  $Cu_2O$  Nanorods*, E. Asenath-Smith, J.M. Noble, R. Hovden, A.M. Uhl, A. DiCorato, Y.Y. Kim, A.N. Kulak, F.C. Meldrum, L.F. Kourkoutis, L.A. Estroff, **Chemistry of Materials** **29**, 555(2016)

37. *Atomic lattice disorder in charge-density-wave phases of exfoliated dichalcogenides (1T-TaS<sub>2</sub>)*, R. Hovden, A. W. Tsen, B. H. Savitzky, P. Liu, I. El Baggari, Y. Liu, W.J. Lu, Y. Sun, P. Kim, A. N. Pasupathy, L. F. Kourkoutis, **Proc. Natl. Acad. Sci. U.S.A.** **113**, 11420 (2016)
36. *Atomically engineered ferroic layers yield a room-temperature magnetoelectric multiferroic* Mundy, Brooks, Holtz, Moyer, Das, Rébola, Heron, Clarkson, Disseler, Liu, Farhan, Held, Hovden, Padgett, Mao, Paik, Misra, Kourkoutis, Arenholz, Scholl, Borchers, Ratcliff, Ramesh, Fennie, Schiffer, Muller, Schlom, **Nature** **537**, 523 (2016)
35. *Propagation of Structural Disorder in Epitaxially Connected Quantum Dot Solids from Atomic to Micron Scale*, B.H. Savitzky, R. Hovden, K. Whitham, J. Yang, F. Wise, T. Hanrath, L.F. Kourkoutis **Nano Letters** **19**, 5714 (2016)
34. *Nanomaterial datasets to advance tomography in scanning transmission electron microscopy*, B. Levin, E. Padgett, C.C. Chen, M.C. Scott, R. Xu, W. Theis, Y. Jiang, Y. Yang, C. Ophus, H. Zhang, D. Ha, D. Wang, Y. Yu, H. D. Abruña, R. D. Robinson, P. Ercius, L. F. Kourkoutis, J. Miao, D. A. Muller & R. Hovden **Nature Scientific Data** 160041 (2016)
33. *High Dynamic Range Pixel Array Detector for Scanning Transmission Electron Microscopy* M.W. Tate, P. Purohit, D. Chamberlain, K.X. Nguyen, R. Hovden, C.S. Chang, P. Deb, E. Turgut, J.T. Heron, D.G. Schlom, D.C. Ralph, G.D. Fuchs, K.S. Shanks, H.T. Philipp, D.A. Muller, S.M. Gruner, **Microsc. & Microanaly.** **22**, 237 (2016)
32. *Nanoscale assembly processes revealed in the nacreprismatic transition zone of Pinna nobilismollusc shells*, R. Hovden\*, S.E. Wolf\*, M.E. Holtz, F. Marin, D.A. Muller, L.A. Estroff **Nature Comm.** **6**, 1097 (2015)
31. *Control of Metastable Charge Density Wave Phases in Ultrathin 1T-TaS<sub>2</sub>*, A.W. Tsen, R. Hovden, D.Z. Wang, Y.D. Kim, J. Okamoto, K.A. Spoth, Y. Liu, W.J. Lu, Y.P. Sun, J. Hone, L. F. Kourkoutis, P. Kim, A.N. Pasupathy **Proc. Natl. Acad. Sci. U.S.A.** **112**, 15054 (2015)
30. *Enhanced Supercapacitor Performance for Equal Co–Mn Stoichiometry in Colloidal Co<sub>3-x</sub>Mn<sub>x</sub>O<sub>4</sub> Nanoparticles, in Additive-Free Electrodes*, S.D. Perera, X. Ding, A. Bhargava, R. Hovden, A. Nelson, L.F. Kourkoutis, R.D. Robinson **Chemistry of Materials** **27**, 7861 (2015)
29. *IL-TEM Imaging of Site-Selective Pt Nanocatalysts: Electrochemical Activation and Surface Disorder*, R. Arán-Ais, Y. Yu, R. Hovden, J. Solla-Gullon, E. Herrero, J. Feliu, H. Abruña, J. **Am. Chem. Soc.** **137**, 14922 (2015)
28. *Hierarchically Structured Hematite Architectures Achieved by Growth in a Silica Hydrogel*, E. Asenath-Smith, R. Hovden, L.F. Kourkoutis, L.A. Estroff, **J. Am. Chem. Soc.** **137**, 5184 (2015)
27. *Multicomponent Nanomaterials with Complex Networked Architectures from Orthogonal Degradation and Binary Metal Backfilling in ABC Triblock Terpolymers*, C.D. Cowman, E. Padgett, K.W. Tan, R. Hovden, Y. Gu, N. Andrejevic, D.A. Muller, G.W. Coates, and U. Wiesner, **J. Am. Chem. Soc.** **137**, 6026 (2015)
26. *Periodic Artifact Reduction in Fourier Transforms of Full Field Atomic Resolution Images*, R. Hovden, Y. Jiang, H.L. Xin, L.F. Kourkoutis, **Microsc. & Microanaly.** **21**, 436 (2015).
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