

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

2024-	Associate Professor, Materials Science	University of Michigan	MI
	Associate Professor, Physics		
2017-2023	Assistant Professor, Materials Science	University of Michigan	MI
2014-2017	Postdoctoral Associate, (Lena Kourkoutis)	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 86, Google scholar: *h*-index 45, 10600+ 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. *Imaging 3D chemistry at 1 nm resolution with fused multi-modal electron tomography* **Nature Communications** 15, 3555 (2024)
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 α -RuCl₃*, 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** 22, 50-56 (2023)

INVITED TALKS

43. *Pushing Atoms by Picometers in Low Dimensional Materials*
Department Seminar, Materials Science, U.I.U.C., Jan. 2025
42. *Chemical Electron Tomography at Lower Dose and Higher Resolution*
Department Seminar, Chemistry, University of Waterloo, Nov. 2024
41. *Pushing Atoms by Picometers in Low Dimensional Materials*
Department Seminar, Materials Science, Northwestern, Nov. 2024
40. *Pushing Atoms by Picometers in Low Dimensional Materials*
Condensed Matter Department Seminar, Physics, GaTech, Mar. 2024
39. *Pushing Atoms by Picometers*
Condensed Matter Department Seminar, Physics, U.C. Irvine, Feb. 2024
38. *Fused Multi-Modal Electron Microscopy and Tomography*
International Microscopy Conference, Sept. 2023
37. *The Structure of Charge Density Waves in TaS₂ Across Temperature and Dimensionality*
Microscopy & Microanalysis, Aug. 2023
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 TaS₂ 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 TaS₂ 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 TaS₂ 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

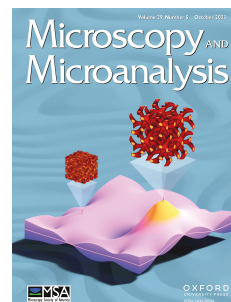
SYNERGISTIC ACTIVITIES

- . Outreach through art. “When Art Exceeds Perception” brought nanoscience to millions using art. The work was featured on CNET, Wired, The Verge, among many other media outlets. Financed through an art foundation, the project explicitly communicated to nonscientific audiences.
- . Developed free, open source software (over 18k downloads) for the processing and visualization of hyperspectral microscopy data (<http://code.google.com/p/cornell-spectrum-imager/>), 3D tomographic data (www.tomviz.org), and ronchigram.com. While commercial software solutions exist, they are often incomplete and locked to a single computer. This is a problem in microscope user facilities, which serves a broad community of hundreds of users, many from outside the institution. Our software allows users to process their data offline, and ensure their retained data is readable.
- . Published multiple open-source software tutorials for *Microscopy Today*, *Opensource.com*, and provided several conference talks at *Microscopy & Microanalysis* that foster open scientific development in the microscopy community.

PUBLICATION LIST

SCIENTIFIC PAPERS

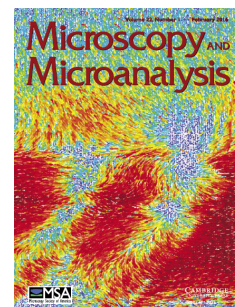
86. *Imaging 3D chemistry at 1 nm resolution with fused multi-modal electron tomography*
J. Schwartz, Z. Wendy Di, Y. Jiang, J. Manassa, J. Pietryga, Y. Qian, M. G. Cho, J. L. Rowell, H. Zheng, R. D. Robinson, J. Gu, A. Kirilin, S. Rozeveld, P. Ercius, J. A. Fessler, T. Xu, M. Scott, R. Hovden **Nature Communications** **15**, 3555 (2024)
85. *Endotaxial stabilization of 2D charge density waves with long-range order*,
S. H. Sung, N. Agarwal, I. El Baggari, P. Kezer, Y.M. Goh, N. Schnitzer, J. M. Shen, T. Chiang, Y. Liu, W. Lu, Y. Sun, L. F. Kourkoutis, J. T. Heron, K. Sun, R. Hovden
Nature Communications **15**, 1403 (2024)
84. *Revealing intrinsic domains and fluctuations of moiré magnetism by a wide-field quantum microscope*, M. Huang, Z. Sun, G. Yan, H. Xie, N. Agarwal, G. Ye, S. H. Sung, H. Lu, J. Zhou, S. Yan, S. Tian, H. Lei, R. Hovden, R. He, H. Wang, L. Zhao, C. R. Du
Nature Communications **14**, 5259 (2023)
83. *Evidence of non-collinear spin texture in magnetic moiré superlattices*, H. Xie, X. Luo, Z. Ye, Z. Sun, G. Ye, S. H. Sung, H. Ge, S. Yan, Y. Fu, S. Tian, H. Lei, K. Sun, R. Hovden, R. He, L. Zhao
Nature Physics **19**, 1150 (2023)
82. *On Infinite Series of Bessel functions of the First Kind: $\sum vJNv+p(x), \sum v(-1)vJNv+p(x)$* ,
S.H. Sung, R. Hovden, **arxiv** 2211.01148 (2023)
81. *Autonomous Electron Tomography Reconstruction with Machine Learning*
W. Millsaps, J. Schwartz, Z. W. Di, Y. Jiang, R. Hovden,
Microsc. & Microanalys. **29** 1650-1657 (2023)
80. *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)
79. *Ferrotational domain walls revealed by electric quadrupole second harmonic generation microscopy*, X. Guo, R. Owen, A. Kaczmarek, X. Fang, C. De, Y. Ahn, W. Hu, N. Agarwal, S.H. Sung, R. Hovden, S.W. Cheong, L. Zhao, **Phys. Rev. B** **107**, L180102 (2023)
78. *Magnetic anisotropy reversal driven by structural symmetry-breaking in monolayer α -RuCl₃*, 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** **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)
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.



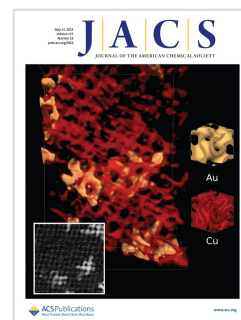
- Kondusamy, X. Wang, H. Zhao, D. Berman, R. Hovden, L. Zhao, B. Lv, **ACS Nano** **16**, 15917 (2022)
73. *Scalable Synthesis of Monolayer Hexagonal Boron Nitride on Graphene with Giant Bandgap Renormalization*, P. Wang, W. Lee, J. P. Corbett, W. H. Koll, N. M. Vu, D. A. Laleyan, Q. Wen, Y. Wu, A. Pandey, 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 AlGaN 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 InGaIn 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-TaS₂, 2H-MoS₂) 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)

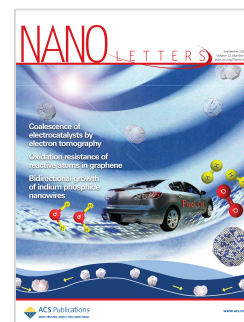
43. *Nature and evolution of incommensurate charge order in manganites visualized with cryogenic scanning transmission electron microscopy*, I. El Baggari, B.H Savitzky, A.S. Admasu, J. Kim, S.W. Cheong, R. Hovden, L.F. Kourkoutis, **Proc. Natl. Acad. Sci. U.S.A.** **115**, 1445 (2018)
42. *Solar Water 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)
38. *Physical Confinement Promoting Formation of Cu₂O–Au Heterostructures with Au Nanoparticles Entrapped within Crystalline Cu₂O 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-TaS₂)*, 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-TaS₂*, 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 Co₃-xMn_xO₄ 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. & Microanal.** **21**, 436 (2015).
25. *Solid-Solid Phase Transformations Induced through Cation Exchange and Strain, in 2D Heterostructured Copper Sulfide Nanocrystals*, D.H. Ha, A.H. Caldwell, M.J. Ward, S. Honrao, K. Mathew, R. Hovden, M.K.A. Koker, D.A. Muller, R.G. Hennig, and R.D. Robinson, **Nano Letters** **14**, 7090 (2014)
24. *Nanoparticle Metamorphosis: An in Situ High-Temperature Transmission Electron Microscopy Study of the Structural Evolution of Heterogeneous Au:Fe₂O₃ Nanoparticles*, W.J. Baumgardner, Y. Yu, R. Hovden, S. Honrao, R.G. Hennig, H.D. Abruña, D.A. Muller, T. Hanrath, **ACS Nano** **8**, 5315 (2014).
23. *Breaking the Crowther limit: Combining depth-sectioning and tilt tomography for high-resolution, wide-field 3D reconstructions*, R. Hovden, P. Ercius, Y. Jiang, D. Wang, Y. Yu, H.D. Abruña, V. Elser, D.A. Muller, **Ultramicroscopy** **140**, 26 (2014).
22. *Atomic Imaging with Highly Convergent Electron Beams*, R. Hovden, **Ph.D. Dissertation, Cornell University** (2014).
21. *Stacking Order Dependent Second Harmonic Generation and Topological Defects in h-BN Bilayers*, C.J. Kim, L. Brown, M.W. Graham, R. Hovden, R.W. Havener, P.L. McEuen, D.A. Muller, J. Park, **Nano Letters** **13**, 5660 (2013).
20. *Hierarchical Porous Polymer Scaffolds from Block Copolymers*, H. Sai, K.W. Tan, K. Hur, E. Asenath-Smith, R. Hovden, Y. Jiang, M. Riccio, D.A. Muller, V. Elser, L.A. Estroff, S.M. Gruner, U. Wiesner, **Science** **341**, 6145 (2013).
19. *Strain Solitons and Topological Defects in Bilayer Graphene*, J. S. Alden, A.W. Tsen, P.Y. Huang, R. Hovden, L. Brown, J. Park, D.A. Muller, and P.L. McEuen, **Proc. Natl. Acad. Sci. U.S.A.** **110**, 11256 (2013).
18. *Multicompart ment Mesoporous Silica Nanoparticles with Branched Shapes: An Epitaxial Growth Mechanism*, T. Suteewong, H. Sai, R. Hovden, D.A. Muller, M. Bradbury, S.M. Gruner, U. Wiesner, **Science** **340**, 6130 (2013).
17. *Bibliometrics for Internet Media: Applying the h-Index to YouTube*, R. Hovden, **J. Am. Soc. Inf. Sci. Tec** **64**, 2326 (2013).



16. *Defining Crystalline/Amorphous Phases of Nanoparticles through X-ray Absorption Spectroscopy and X-ray Diffraction: The Case of Nickel Phosphide*, L.M. Moreau, D.H. Ha, H. Zhang, R. Hovden, D.A. Muller, and R.D. Robinson, **Chem. Mater.** **25**, 2394 (2013).
15. *Channeling of a subangstrom electron beam in a crystal mapped to two-dimensional molecular orbitals*, R. Hovden, H.L. Xin, D.A. Muller, **Phys. Rev. B** **86**, 195415 (2012).
14. *Structurally ordered intermetallic platinum–cobalt core–shell nanoparticles with enhanced activity and stability as oxygen reduction electrocatalysts*, D. Wang, H.L. Xin, R. Hovden, H. Wang, Y. Yu, D.A. Muller, F. J. DiSalvo, H.D. Abruña, **Nature Materials** **12**, 81 (2012).
13. *Tuning ORR Activity via Controllable Dealloying: A Model Study of Ordered Cu₃Pt/C Intermetallic Nanocatalysts*, D. Wang, Y. Yu, H.L. Xin, R. Hovden, P. Ercius, J.A. Mundy, H. Chen, JH Richard, D.A. Muller, F.J. DiSalvo, and H.D. Abruña, **Nano Letters** **12**, 5230 (2012).
12. *Data Processing for Atomic Resolution Electron Energy Loss Spectroscopy*, P. Cueva, R. Hovden*, J A Mundy, H. Xin, D A Muller, **Microsc. & Microanaly.** **18**, 667 (2012) *corr. author
11. *Efficient elastic imaging of single atoms on ultrathin supports in a scanning transmission electron microscope*, R. Hovden, D.A. Muller, **Ultramicroscopy** **123**, 59 (2012).
10. *Twinning and Twisting of Tri- and Bilayer Graphene*, L. Brown*, R. Hovden*, P. Huang, M. Wojcik, D.A. Muller, J. Park, **Nano Letters** **12**, 1609 (2012) *co-first author
9. *Direct Imaging of a Two-Dimensional Silica Glass on Graphene*, P.Y. Huang, S. Kurasch, A. Srivastava, V. Skakalova, J. Kotakoski, A.V. Krasheninnikov, R. Hovden, Q. Mao, J.C. Meyer, J. Smet, D.A. Muller, U. Kaiser, **Nano Letters** **12**, 1081(2012).
8. *Three-Dimensional Tracking and Visualization of Hundreds of Pt–Co Fuel Cell Nanocatalysts During Electrochemical Aging*, Y. Yu, H.L. Xin, R. Hovden, D. Wang, E.D. Rus, J.A. Mundy, D. A. Muller, and H.D. Abruña, **Nano Letters** **12**, 4417 (2012).
7. *Atomic-Resolution Spectroscopic Imaging of Ensembles of Nanocatalyst Particles Across the Life of a Fuel Cell*, H.L. Xin*, J.A. Mundy*, Z. Liu, R. Cabezas , R. Hovden, L.F. Kourkoutis, J. Zhang, N Subramanian, R Makharia, F Wagner, and DA Muller, **Nano Letters** **12**, 490 (2011)
6. *Networked and chiral nanocomposites from ABC triblock terpolymer coassembly with transition metal oxide nanoparticles*, M. Stefik, S. Wang , R. Hovden, H. Sai, M.W. Tate , D.A. Muller , U. Steiner , S.M. Grunerand, U. Wiesner, **J. Mater. Chem.** **22**, 1078 (2011).
5. *Surfactant Ligand Removal and Rational Fabrication of Inorganically Connected Quantum Dots*, H. Zhang, B. Hu, L. Sun, R. Hovden, F.W. Wise, D.A. Muller, and R.D. Robinson, **Nano Letters** **11**, 5356 (2011).
4. *Extended Depth of Field for High-Resolution Scanning Transmission Electron Microscopy*, R. Hovden, H.L. Xin, D.A. Muller, **Microsc. & Microanaly.** **17**, 75 (2011).
3. *Controlled Synthesis of Uniform Cobalt Phosphide Hyperbranched Nanocrystals Using Tri-n-octylphosphine Oxide as a Phosphorus Source*, H. Zhang, D.H. Ha, R. Hovden, L.F. Kourkoutis, R.D. Robinson, **Nano Letters** **11**, 188 (2011).
2. *Deep Space Network Scheduling Using Evolutionary Computational Methods*, A. Guillaume, S. Lee, Y. Wang, H. Zheng, R. Hovden, S. Chau, Y. Tung, R.J. Terrile, **IEEE Aerospace Conference 2007** paper #1210 (2007).

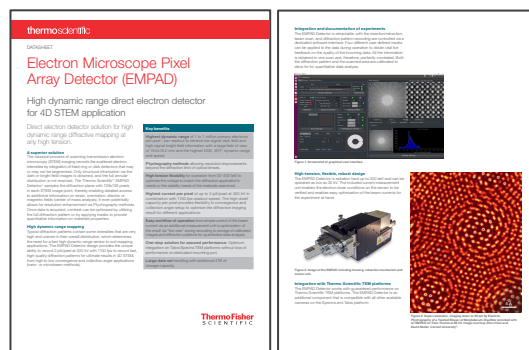


1. *Analysis and Enhancement of Carding and Spinning*, A. Saxena, A. Kansal, P. He, R. Hovden, Y. Jeong, M.L. Realff, R. Parachuru, J.L. Dorrity, B.C. Goswami, F.L. Cook, Y. Wang, **National Textile Center Annual Report**; NTC Project: F01-GT06 (2003).

PATENTS AND LICENSED TECHNOLOGY

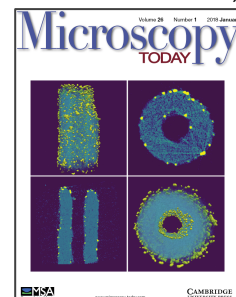
3. Patent Pending (2023): STABLE ELECTRON MICROSCOPY SPECIMEN HOLDER OPERATING AT LIQUID HELIUM TEMPERATURES, Ismail El Baggari (Harvard), Emily Rennich (Harvard), Robert Hovden (U. Michigan)
2. RECOVERING ATOMIC-SCALE CHEMISTRY FROM FUSED MULTI-MODAL ELECTRON MICROSCOPY, R. Hovden (U. Mich.), J. Schwartz (U. Mich.), Y. Jiang (Argonne), Z. Wendy Di (Argonne), S. Rozeveld (Dow)

1. *Electron Microscope Detector (EM-PAD) for STEM*, Docket Number D-7319, Inventors: Sol M. Gruner, David A. Muller, Kayla X. Nguyen, Prafull Purohit, Mark W. Tate, Katherine Shanks, Hugh Phillipp, Robert Hovden
[Licensed to Thermo Fisher Scientific, >\$10M Worldwide Sales]



ADDITIONAL PUBLICATIONS

15. *Ronchigram Simulation and Aberration Correction Training Using Ronchigram.com*, **Microscopy Today 30**, Sept 2022 [peer reviewed]
14. *Atomic Defect Identification with Sparse Sampling and Deep Learning*, **SMC Data Challenge: Springer Journal**, 103 (2021) [peer reviewed]
13. *Introduction to the Ronchigram and its Calculation with Ronchigram.com*, **Microscopy Today 27**, 3 May 2019 [peer reviewed]
12. *Read the Scientific American article the government deemed too dangerous to publish*, **Muckrock.com**, January 2019
11. *Tutorial on the Visualization of Volumetric Data Using tomviz*, **Microscopy Today 26**, 12 January 2018 [peer reviewed]
10. *The Cold War comes to Cornell: The FBI's fight to safeguard Hans Bethe's atomic secrets*, **Muckrock.com**, March 2018.
9. *Peering into complex, tiny structures with 3D analysis tool tomviz*, **OpenSource.com**, Mar. 2017
8. *Visualizing nanotechnology in 3D with open source software*, **OpenSource.com**, Sept. 2014
7. *Natural Rights, Scarcity & Intellectual Property*, **New York University Journal of Law & Liberty**, Fall 2013. [peer reviewed]
6. *Episode 1: The Feynman Files*, **Muckrock, the Podcast**, August 2013.
5. *The Open-Source Cornell Spectrum Imager*, **Microscopy Today**, January 2013 [peer reviewed]
4. *The Feynman Files: The professor's invitation past the Iron Curtain*, **MuckRock.com**, June 2012. (Featured on: Slashdot, MSNBC, DailyMail, Boing Boing, LiveScience, Gizmodo, Yahoo)
3. *Running Digital Micrograph on Linux and Mac OSX*, **Microscopy Today**, March 2012.
2. *A Visit With Daryl Bem, Who Found Precognition In the Men Who Stare at Porn*, **Motherboard / Vice**, 2011.
1. *Evolutionary Scheduler for the Deep Space Network*, **NASA Tech Briefs**, July 2010.



PRIME NUMBERS DISCOVERED

850825168695*2¹²⁹⁰⁰⁰⁰-1, 7905*2¹²¹⁶³⁴²+1, 9125*2¹¹⁸⁶⁰⁵¹+1

PRESS & MEDIA

Slashdot.com (frontpage), *Breakthrough Achieved In Nanometer-Resolution Imaging of 3D Chemistry*, May 2024

MRS Bulletin Podcast, *Episode 2: Real-time 3D imaging software for electron microscopy developed*, Feb. 2023

Nature Materials, News and Views, *Structural Tweaking of 2D Quantum Magnetism* by H. Miao, G. B. Halasz, Dec. 2022

Pluralistic: *John Deere's repair fake-out; Good riddance to the Open Gaming License*, Cory Doctorow, Jan 2023

Popular Mechanics, *This Natural Treasure Contains the Secret to Stronger Armor*, by Leila Sloman, Mar. 2022

Smithsonian Magazine, *How Pearls Obtain Their Remarkable Symmetry*, by Elizabeth Gamillo, Nov. 2021

Science News Magazine, *Researchers have unlocked the secret to pearls' incredible symmetry*, by Rachel Crowell, Nov. 2021

World Intellectual Property Review, *Wizards and demons: does a copyright claim spell trouble for card gamers?* By Ben Wodecki, Aug. 2021 — talk by Lisa Ferrari J.D.

The Spotlight, *Canada: Stacked Deck — A Claim For Copyright In A Magic: The Gathering Deck*, by Lawrence Veregin J.D. Aug. 2021

MEDIUM (Cory Doctorow), *Provocateur copyrights a Magic: The Gathering Deck Come for the compilation copyright, stay for the free IP Law Casebook*, by Cory Doctorow, Aug. 2021

Polygon, *A provocative new copyright for Magic: The Gathering cards raises unusual questions*, by Charlie Hall, Aug. 2021

Hypebeast, *Someone Successfully Copyrighted a 'Magic: The Gathering' Deck*, by Jeff Yeung, Aug. 2021

Star City Games, *Physics Professor Registers First Copyrighted Magic: The Gathering Deck* by John Hall, Aug. 2021

MTG Arena Zone, *For the First Time Ever, a Magic: The Gathering Deck has been Copyrighted*, by Paul, Aug. 2021

Microscopy Today, *Finding New Synthetic Routes to Complex Structural Materials*, by Stephen W. Carmichael, March 2020

Evolution News, *Design in the First Animals*, Nov 27 2019

The American Ceramic Society, *In lockstep: Nacre's microstructure locks together to provide superior material strength*, by April Gocha, Nov 12, 2019

Futurity, *How the World's Toughest Material Fends off Cracks*, by Nicole Moore, Oct 25, 2019

REVVUH, *Mother of pearl recovered after 80% ultimate strain*, by Kamal Saini, Oct 24, 2019

The Engineer, *Researchers reveal secrets of nature's toughest material*, Oct 24, 2019

Nano Magazine, *Researchers reveal secrets of nature's toughest material*, Oct 25, 2019



ScienceAlert, *We Might Finally Know Why Nacre Is So Incredibly Tough*, by David Nield, Oct 27, 2019

U Mich. Youtube Channel, *Real-time, nanoscale view of what makes nacre so tough*, Oct 23, 2019

The Michigan Engineer News Center, *Cracking the mystery of nature's toughest material*, by Gabe Cherry, Oct 23 2019

Cornell Chronical, *Cryogenic microscopy reveals atomic shifts of a manganite*, Feb 5, 2018, by Tom Fleischman

Cornell Chronical, *Group maps atomic shifts in charge-ordered manganite*, Dec 7, 2017 by Tom Fleischman

Microscopy and Analysis, *Free software eases 3D image reconstruction*, Apr 4 2017

The University Record, *Nanomaterials in 3-D*, Apr 5 2017

U. Michigan News, *Open-source software unlocks 3-D view of nanomaterials*, by Gabe Cherry, Mar 31 2017

U Mich. Youtube Channel, *Tomviz | An Open-Source 3-D View of Nanomaterials*, Mar 30 2017

MSE U. Mich. Press Release, *Robert Hovden Joins UM MSE as Assistant Professor*, Feb 2017

Tech Times, *Tough Biomineral Lining Seashells Found To Have Faithfully Recorded Ancient Ocean Temperature*, by Kalyan Kumar, December 22, 2016

UPI, *Researchers discover mother-of-pearl production process*, by Brooks Hays, December 7, 2015

Cornell Chronicle, *Materials scientists learn how mother of pearl is made*, by Bill Steele, December 4, 2015

The Verge, *These are the tiniest copyright violations ever made: Good artists copy. Great artists steal, in nanoscale*, by Adi Robertson on November 19, 2014

CMOA Blog (Carnegie Museum of Art), *How Museums Affect the Brain, the Art of the Cover, and Other News*, By Matthew Newton, Associate Editor, November 21st, 2014

Art Law Journal, *Artist is in Trouble for Nanoscale Copies of an M.C. Escher*

by Steve Schlackman, November 22, 2014

CNET, *These works of art are too tiny to see (but trust us, they're there)* by Leslie Katz, December 3, 2014

Every Eye (Italy), *Robert Hovden: copyright e nanotecnologia –* by da Luca Chiappini, December 03, 2014

WIRED (Germany), *Robert Hovden schrumpft Raubkopien, bis sie keine mehr sind*

by von Max Biederbeck, 06 November 2014

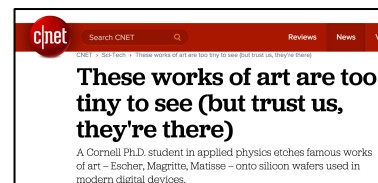
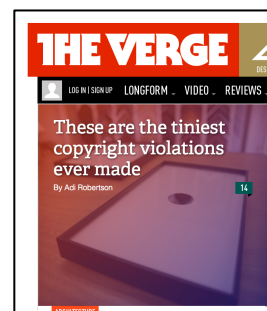
ACM News, *Cornell Biennial Celebrates Nanotech as Art*

by Anne Ju, November 4, 2014

Torrentfreak, *Scientist Deliberately Pirates Art on a Nanoscopic Scale*

by Andy on November 2, 2014

Cornell Council For the Arts Press Release, *Intimate Cosmologies: The Aesthetics of Scale in an Age of Nanotechnology*, November 2014



PROFESSIONAL SERVICE

- + Symposium Organizer for M&M 2023, APS March Meeting 2022, APS March Meeting 2020, M&M 2020 Milwaukee WI, M&M 2019 Portland OR
- + Symposium Chair for M&M 2024 Cleveland, APS March Meeting 2020 Denver CO, M&M 2020 Milwaukee WI, M&M 2019 Portland OR
- + Advisory Board member for U. Michigan Center for Materials Characterization (MC2) (2018 -)
- + U. Michigan Dept. Materials Science Graduate Committee, Graduate Selection Committee, Seminar Speaker Committee (2017 -)
- + Serve on the D.O.E. Proposal Review Board at the Lawrence Berkeley National Electron Microscopy Center and the Brookhaven National Center for Functional Nanomaterials.
- + Reviewer: *Nature*, *Nature Computer Science*, *Nature Communications*, *Nano Letters*, *ACS Nano*, *Microscopy and Microanalysis*, *Ultramicroscopy*, *IEEE Access*, *Advanced Functional Materials*
- + Board of Directors for *Ithaca Voice*, the most read newspaper in central NY (2014-2017)