

Karl Hujsak

Curriculum Vitae

☎ (847) 467 2651
✉ khujesak@u.northwestern.edu
📄 [khujesak.github.io](https://github.com/khujesak)

Multi-Dimensional Materials Microscopy and Applied Machine Learning

Education

- 2013-2018 **Ph.D. Materials Science and Engineering**, *Northwestern University*, Advisor: Vinayak P. Dravid.
- 2009-2013 **B.S. NanoEngineering**, *The University of California, San Diego*, *Cum Laude*.

Publications

Karl Hujsak*, Benjamin D. Myers*, and Vinayak P. Dravid. Stage rastered electron channeling patterns of polycrystalline specimens. *Scientific Reports*, Under Review, 2018.

Karl Hujsak, Eric W. Roth, William Kellogg, Yue Li, and Vinayak P. Dravid. High speed/low dose analytical electron microscopy with dynamic sampling. *Micron*, Under Review, 2018.

Karl Hujsak, Ming-Siao Hsiao, William Kellogg, Vinayak P. Dravid, and Lawrence F. Drummy. Volumetric characterization of hairy nanoparticle hybrid composites with electron tomography and model-based reconstructions. *Macro Letters*, Submitted, 2018.

Gajendra S Shekhawat, Srinivasan Ramachandran, Hossein Jiryaei Sharahi, Souravi Sarkar, **Karl Hujsak**, Yuan Li, Karl Hagglund, Seonghwan Kim, Gary Aden, Ami Chand, et al. Micromachined chip scale thermal sensor for thermal imaging. 2018.

Doğa Gürsoy, Young P Hong, Kuan He, **Karl Hujsak**, Seunghwan Yoo, Si Chen, Yue Li, Mingyuan Ge, Lisa M Miller, Yong S Chu, et al. Rapid alignment of nanotomography data using joint iterative reconstruction and reprojection. *Scientific reports*, 7(1):11818, 2017.

Yue Li, Di Zhang, Ilker Capoglu, **Karl Hujsak**, Dhwanil Damania, Lusik Cherkezyan, Eric Roth, Reiner Bleher, Jinsong S Wu, Hariharan Subramanian, et al. Measuring the autocorrelation function of nanoscale three-dimensional density distribution in individual cells using scanning transmission electron microscopy, atomic force microscopy, and a new deconvolution algorithm. *Microscopy and Microanalysis*, pages 1-7, 2017.

Yue Li, Luay M Almassalha, John E Chandler, Xiang Zhou, Yolanda E Stypula-Cyrus, **Karl Hujsak**, Eric W Roth, Reiner Bleher, Hariharan Subramanian, Igal Szeifer,

et al. The effects of chemical fixation on the cellular nanostructure. *Experimental Cell Research*, 2017.

Magdalena Owczarek, **Karl Hujsak**, Daniel P Ferris, Aleksandrs Prokofjevs, Irena Majerz, Przemysław Szklarz, Huacheng Zhang, Amy A Sarjeant, Charlotte L Stern, Ryszard Jakubas, et al. Flexible ferroelectric organic crystals. *Nature communications*, 7, 2016.

Karl Hujsak, Benjamin D Myers, Eric Roth, Yue Li, and Vinayak P Dravid. Suppressing electron exposure artifacts: An electron scanning paradigm with bayesian machine learning. *Microscopy and Microanalysis*, pages 1–11, 2016.

Wangqiang Sun, Sumit Kewalramani, **Karl Hujsak**, Heng Zhang, Michael J Bedzyk, Vinayak P Dravid, and C Shad Thaxton. Mesophase in a thiolate-containing diacyl phospholipid self-assembled monolayer. *Langmuir*, 31(10):3232–3241, 2015.

Presentations

- 2017 **Smart Acquisitions for High Speed Analytical Imaging**, *Invited Speaker*, ER-C Invited Speaker Series - Ernst Ruska-Centre, Forschungszentrum Jülich, DE.
- 2017 **Materials Microscopy Meets Machine Learning**, *Invited Speaker*, Integrated Imaging Initiative Seminar Series, Center for Nanoscale Materials, Argonne National Laboratory, Lemont IL.
- 2016 **Sparse Imaging for *In-Situ* and Tomographic Imaging of Soft and Hybrid Materials**, *Invited Speaker*, Summer Seminar Series, Air Force Research Laboratory, Wright Patterson Air Force Base, Dayton OH.
- 2016 **Suppressing Electron Exposure Artifacts: An Electron Scanning Paradigm with Bayesian Machine Learning**, *Poster Presentation*, Microscopy and Microanalysis, Cambridge Univ Press, 1-11, Columbus, OH.
- 2016 **Self-Organizing Neural Networks: Parallels Between "Big Imaging" and Sparse Imaging in Electron Microscopy**, *Platform Presentation*, Microscopy and Microanalysis, Cambridge Univ Press, 22, 534-535, Columbus, OH.
- 2012 **Characterization of Nanografted DNA Motors For Drug Delivery Applications**, *Platform Presentation*, Biomedical Engineering Society, Atlanta GA.

Research Experience

- 2012–Present **Ph.D. Candidate**, *VPD Group*, Northwestern University.
Advisor: Vinayak P. Dravid
Developed and applied advanced characterization methods for the identification of material structure and properties at atomic, molecular, and nano length scales. Key focus on creative solutions to overcome limitations in cost, time, or destructiveness in conventional characterization of Materials leveraging computational methods.
- 2016 **Summer Researcher**, *Materials and Manufacturing Directorate*, Air Force Research Laboratory, Dayton OH.
- 2010-2013 **Research Assistant**, *Lal Lab for Nanolmaging and Devices*, The University of California, San Diego.

█ Awards

- 2014 National Science Foundation Graduate Research Fellow
- 2013 National Insitute for Cancer: Physical-Science Oncology Center Fellow
- 2010 SCRFF Fellowship Recipient
- 2009 BAE Systems Scholarship Recipient