Exponent®
Engineering & Scientific Consulting

Blanka Janicek, Ph.D.

Senior Scientist | Materials Science and Electrochemistry
Menlo Park
+1-650-688-7129 | bjanicek@exponent.com

Professional Profile

Dr. Janicek is a materials scientist who specializes in energy materials and device characterization with specific expertise in electron microscopy and diffraction, including scanning electron microscopy (SEM), focused ion beam milling (FIB), transmission electron microscopy (TEM), scanning transmission electron microscopy (STEM), energy dispersive x-ray spectroscopy (EDS), and electron energy loss spectroscopy (EELS). Her work spans organic and inorganic materials, specializing in silicon semiconductor devices, batteries, fuel cells, and nanomaterials. Dr. Janicek specializes in novel technique development for materials characterization, including advanced image processing and programming for batch data analysis. She currently helps identify and understand failures in consumer products as well as providing technical expertise in support of intellectual property investigation and litigation.

Dr. Janicek has spent over 8 years leading and executing materials characterization studies at the micro- and nano-scale. Before joining Exponent, she was an engineer at Applied Materials focusing on root causes analysis of semiconductor device failure, supporting device scaling and miniaturization processes. She performed her post-doctoral research at Lawrence Berkeley National Laboratory (LBNL) establishing air-free, low-dose, cryogenic characterization methods to enable the discovery of emerging solid electrolyte materials for next-generation batteries. Dr. Janicek completed her doctoral work at the University of Illinois Urbana-Champaign where she developed new electron microscopy methods for nano- and atomic-scale studies of organic materials and interfaces.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Illinois at Urbana-Champaign, 2021

B.A., Chemistry, Barnard College, 2014

University of Illinois Racheff-Intel Award 2021

Microscopy and Microanalysis Postdoctoral Scholar Award 2021

Microscopy and Microanalysis Student Scholar Award 2018

Prior Experience

Engineer, Applied Materials, 2022-2023

Post-doctoral Scholar, Lawrence Berkeley National Laboratory, 2021-2022

Publications

Kharel P, Janicek BE, Bae SH, Loutris AL, Carmichael PT, Huang PY. Atomic-Resolution Imaging of Small Organic Molecules on Graphene. Nano Letters 2022; 22 (9):3628–3635. *Authors contributed equally

Janicek BE, Hinman JG, Hinman JJ, Bae SH, Wu M, Turner J, Chang HH, Park E, Lawless R, Suslick KS, Murphy CJ, Huang PY. Quantitative Imaging of Organic Ligand Density on Anisotropic Inorganic Nanocrystals. Nano Letters 2019; 19 (9):6308-6314.

Ryu H, Lee Y, Kim HJ, Kang SH, Kang Y, Kim K, Kim J, Janicek BE, …, Lee GH. Anomalous Dimensionality-driven Phase Transition of MoTe2 in van der Waals Heterostructure. Advanced Functional Materials 2021; 31 (1):2107376.

Dziatko RA, Janicek BE, Karten JL, Harris KA, Gibson MM, Crowther AC. Solvent-Mediated Chemical Hole Doping of Graphene by Iodine. Journal of Physical Chemistry C 2020 124 (6), 3827-3834.

Li Q, Shang X, Janicek BE, Huang PY, Bellon P, Averback RS. Evolution of Nb oxide nanoprecipitates in Cu during reactive mechanical alloying. Journal of Materials Research 2020;35 (1):98-111.

Al-Zoubi T, Zhou Y, Yin X, Janicek, BE, Sun C, Schulz CE, Zhang X, Gewirth AA, Huang PY, Zelenay P, Yang H. Preparation of Nonprecious Metal Electrocatalysts for the Reduction of Oxygen Using a Low-Temperature Sacrificial Metal. Journal of the American Chemical Society 2020;142 (12):5477-548.

Lee CH, Khan A, Luo D, Santos TP, Shi C, Janicek BE, …, Huang PY. Deep Learning Enabled Strain Mapping of Single-Atom Defects in Two-Dimensional Transition Metal Dichalcogenides with Sub-Picometer Precision. Nano Letters 2020;20 (5): 3369-3377.

Hinman JG, Hinman JJ, Janicek, BE, Huang PY, Suslick KS, Murphy CJ. Ultrasonic Nebulization for TEM Sample Preparation on Single-Layer Graphene Grids. Nano Letters 2019;10 (3):1938-1943.

Zhang Y, Heiranian M, Janicek BE, Budrikis Z, Zapperi S, Huang PY, Johnson HT, Aluru NR, Lyding JW, Mason N. Strain Modulation of Graphene by Nanoscale Substrate Curvatures: A Molecular View. Nano Letters 2018;18 (3):2098-2104.

Gill ST, Damasco J, Janicek BE, Durkin MS, Humbert V, Gazibegovic S, Car D, Bakkers E, Huang PY, Mason N. Selective-Area Superconductor Epitaxy to Ballistic Semiconductor Nanowires. Nano Letters 2018;18 (10):6121-6128.

Rhodes D, Chenet DA, Janicek, BE, Nyby C, Lin Y, Jin W, Edelberg D, Manneback E, Finney N, Antony A, Schiros T, Klarr T, Mazzoni A, …, Balicas L. Engineering the structural and electronic phases of MoTe2 through W substitution. Nano Letters 2017;17 (3):1616-1622.

Presentations

Janicek BE, Mair S, Chiang YM, Ophus C, Jiang X. Dynamic atomic-scale imaging of cluster-ion anti-perovskites using low-dose cryogenic HRTEM. Presented at 2022 Microscopy and Microanalysis Meeting, Portland, OR.

Janicek BE, Mair S, Chiang YM, Ophus C, Jiang X. Atomic-scale investigations of solid electrolytes using transmission electron microscopy. Presented at the Joint Center for Energy Storage Research Full Program Virtual Meeting.

Janicek BE, Kharel P, Bae SH, Huang PY. Understanding graphene's role as a protective substrate for atomic-resolution electron microscopy of small organic molecules. Presented at the 2021 Annual Microscopy and Microanalysis Virtual Meeting.

Janicek BE, Kharel P, Bae SH, Loutris AL, Carmichael PT, Huang PY. Atomic-resolution imaging of small organic molecules on graphene. Invited presentation Materials Science and Engineering Colloquium presented at the University of Illinois Urbana-Champaign May 2021.

Janicek BE, Kharel P, Bae SH, Loutris AL, Carmichael PT, Huang PY. Atomic-resolution imaging of coordination compounds on graphene. Presented at the 2021 Annual Spring American Chemical Society Virtual Meeting.

Janicek BE, Kharel P, Bae SH, Huang PY. Quantifying the protection factor of graphene substrates for atomic-scale imaging of organic crystals. Presented at the 2020 Annual Microscopy and Microanalysis Virtual Meeting.

Janicek BE, Hinman JG, Hinman JJ, Bae SH, Wu M, Turner J, Chang HH, Park E, Lawless R, Suslick KS, Murphy CJ, Huang PY. Quantitative Chemical Mapping of Anisotropic Molecular Distributions on Gold Nanorods. Presented at the 2019 Annual Microscopy and Microanalysis Meeting, Portland, OR.

Janicek BE, Hinman JG, Hinman JJ, Bae SH, Wu M, Turner J, Chang HH, Park E, Lawless R, Suslick KS, Murphy CJ, Huang PY. Quantitative Chemical Mapping of Soft-Hard Interfaces on Gold Nanorods. Presented at the 2018 Annual Fall Materials Research Society Meeting, Boston, MA.

Janicek BE, Hinman JG, Bae SH, Chang HH, Murphy CJ, Huang PY. Quantitative Chemical Mapping of Soft-Hard Interfaces on Gold Nanorods. Presented at the 2018 Annual Microscopy and Microanalysis Meeting, Baltimore, MD.