Wenpei Gao

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Biography:

Dr. Wenpei Gao is an assistant professor in the Department of Materials Science and Engineering at North Carolina State University. He received his B.S. in Physics from Peking University in China in 2010 and his Ph.D. in Materials Science Engineering from University of Illinois at Urbana-Champaign in 2015. He was a postdoctoral research fellow in the Department of Materials Science and Engineering at the University of California, Irvine. His group focuses on developing correlative in situ imaging techniques in state-of-the-art advanced Scanning/Transmission Electron Microscopy to study the dynamics of nanostructured catalyst, which bridges the atomic scale mechanisms with reaction and transformation in chemistry. His expertise also includes advancing and applying four-dimensional electron microscopy at heterogeneous interfaces in functional oxide materials. Gao's work has been recognized by numerous awards, including the Racheff-Intel Award for Graduate Research from the Univ. of Illinois, the 2012 Eric Samuel Award from the Microscopy Society of America, an Award of an Invited Student Talk at the 2013 Argonne National Laboratory Annual User Meeting, the Racheff/Burnett Teaching Fellowship at Univ. of Illinois, Urbana-Champaign, the MSA Postdoctoral Award of 2019, and the Albert Crewe Award of 2021 from Microscopy Society of America.

Research Interest and Topics of Presentation:

Gao's research focuses on understanding chemical reactions and materials transformation process at the atomic scale using in-situ imaging techniques in Scanning/Transmission Electron Microscopy. His group also develops techniques to automate and improve big data analysis in four-dimensional electron microscopy on functional materials including semiconductors and oxides. In the presentation, recent development in in-situ imaging enabled by the coupling of environmental TEM stages, new electron detectors, with aberration corrected STEM will be discussed, with a focus on the application of visualizing chemical processes and correlating in-situ results with the design of new materials.