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What one material can do

Junqiao Wu

Chancellor's Professor
Department of Materials Science and Engineering
University of California, Berkeley

Abstract: Vanadium dioxide undergoes a metal-insulator phase transition at 67 degree C. The two phases differ drastically in electrical and optical/dielectric properties. Using this one material and its doped phases, we have uncovered new physics in correlated electron behavior and phase transition thermodynamics, as well as developed new applications ranging from regulation of thermal radiation to simulation of neural plasticity.

Bio: Professor Junqiao Wu received a B.S. from Fudan University and a M.S. from Peking University, China. He obtained a Ph.D. degree from the University of California, Berkeley for work on semiconductors. He did postdoctoral research at Harvard University on transition metal oxides, and then began his faculty appointment in the Department of Materials Science and Engineering at the University of California. His honors include the 29th Ross N. Tucker Memorial Award, the US-NSF Career Award, the US-DOE Early Career Award, the Presidential Early Career Award for Scientists and Engineers (PECASE) from the White House, the Bakar Prize, elected Fellow of the American Physical Society (APS), and the FMD John Bardeen Award from the TMS. He is currently the Chair of the Department of Materials Science and Engineering at UC Berkeley, and he holds joint appointment at the Lawrence Berkeley National Laboratory. He also serves on the Chair Line of the Division of Materials Physics of the American Physical Society. The Wu group explores physics and applications of functional and electronic materials. For more information, please visit wu.mse.berkeley.edu.