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Invited Talk:
Engineering Ion Conductors to Enable New Functionalities for Next Generation Energy Efficient Computing

Abstract: A massive amount of information was generated every day by every one of us. Such a pace of data creation and data processing demands electronics that are more powerful, but uses less energy. However, the continuous miniaturization of electronics over the past 60 years is nearing an end due to physical constraints. Novel materials systems and device concepts are needed. Iontronics is a newly emerging, interdisciplinary concept that bridges electronics and ionics. An iontronic device has electronic properties or functions controlled by ionic motion and arrangement, and they can even exceed state-of-the art. In order for ion conductors to be integrated into electronics, customizations are needed. I will discuss some of my work utilizing ions to control transport in 2D materials, and engineering ion conductors for applications in next generation low-power electronics.

Biography: Dr. Ke Xu is an Assistant Professor in the School of Physics and Astronomy and in Microsystems Engineering at Rochester Institute of Technology. Previously he was a Research Assistant Professor at University of Pittsburgh and Executive Director of the Pittsburgh Quantum Institute (PQI). He received his B.S. in Optical Engineering from Zhejiang University, China, and his Ph.D. in Electrical Engineering from University of Illinois at Chicago working with Dr. Michael Stroscio and Dr. Mitra Dutta. His doctoral research focused on graphene- and DNA aptamer-based micro/nano scale electronic devices and their applications in photo-detectors and biomolecular sensing. He worked as a post-doc researcher with Dr. Susan Fullerton-Shirey and Dr. Alan Seabaugh at University of Notre Dame on the development of low-voltage and steep subthreshold swing components for beyond-CMOS electronic systems.