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In Situ Neutron Measurements in Battery Research

Date: 28 April, 2023 (Friday)

Time: 11:30 a.m.

Venue: Room 7-34, Haking Wong Building, HKU

Speaker: Prof. Howard Wang

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USA & China

Abstract:

Large scientific research facilities such as synchrotron X-ray and neutron sources have enabled *in situ* measurements for advancing the design, synthesis, processing and applications of materials. We have carried out critical *in situ* neutron measurements on Li distribution and transport in electrodes and electrolytes during the battery operation, and gain new insights in the function and failure of battery systems. Four neutron measurement techniques, neutron depth profiling (NDP), neutron reflectivity (NR), small angle neutron scattering (SANS), and neutron imaging (NI) have been used to quantify the Li composition in real-time. Data have revealed that heterogeneities in structures and transport occur at all scales, and play a critical role in battery operation and health. We show that *in situ* neutron diagnoses offer new opportunities in revealing mechanisms affecting the performance and lifetime of secondary batteries.

Biography:

Prof. Wang obtained his Bachelor of Science in Physics from the Peking University and Ph.D. in Materials Science and Engineering from the University of Pennsylvania in 1999. After postdoc research at NIST, he was an assistant professor at Michigan Technological Univ., an associate professor at the State University of New York, Binghamton, a research professor at the University of Maryland, College Park, and the founding director of the SLDF, the first deuteration facility in China. Wang has had extensive research experience in neutron techniques for studying soft matter, nanotechnology, electronics and batteries, and authored over 100 publications and 8 patents. Wang was a member of the Bohmische Physical Society, a recipient of the NSF Career Award, an Empire-State Professor at SUNY, and a NIST-ARRA Senior Research Fellow.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. Y. Chen at 3917 7095.