ABSTRACT Solution-processed perovskite solar cells for efficiently and economically harvesting the solar energy have invoked extraordinary attentions in both academic and industrial sectors in the past 10 years. In this presentation, I would like to share with you how we approach high-performance solution-processed perovskite solar cells via novel materials and device engineering.

- To enhance efficiency and boost stability of perovskite solar cells, we developed novel perovskite materials incorporated with transition metal cations, rare earth cations and polymers. As a result, efficient and stable perovskite solar cells with drastically suppressed hysteresis are realized.
- To enhance and balance charge carrier properties in perovskite solar cells, for the first time, we demonstrated bulk heterojunction perovskite solar cells with enhanced efficiency and reduced photo-hysteresis.
- To facilitate the charge carrier extraction efficiency in perovskite solar cells, for the first time, we mixed magnetics nanoparticles with perovskite materials and aligned perovskite active layer by an external magnetic field, and demonstrated efficient perovskite solar cells.

BIO Dr. Xiong Gong is a Professor of Polymer Engineering in the Department of Polymer Engineering of the College of Polymer Science and Polymer Engineering at The University of Akron. Prior that, he was a manager and senior scientist at CBRITE Inc. and senior research scientist in the Center of Polymers and Organic Solids at University of California Santa Barbara. Dr. Gong received B. Sc. in Chemistry, M. Sc. in Chemistry and Ph. D. in Physics from China. He did his post-doc fellowship with Professor Alan Heeger, a Nobel Prize Laureate, at University of California Santa Barbara. Dr. has accomplished ~200 articles published in the peer reviewed journals, with a peer citation over 22,000 times. He earned an H-index of 63. He also contributed 35 granted/pending patents, and 9 book chapters. Dr. Gong received many international and national awards and honors including the world's most influential scientific minds 2014, the top 1% mostly cited researchers in the years of 2014, 2015 and 2016 by Thomson Reuters, Outstanding Research Award in The University of Akron, and National Science Foundation Career Award (2014).