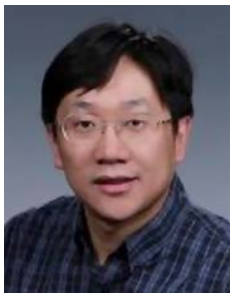

**Prof Wei Wang**

Chief Scientist
Pacific Northwest National Laboratory, USA

---

Dr Wei Wang is a cheif scientist at Pacific Northwest National Laboratory (PNNL). He is currently the thrust lead on stationary energy storage R&D with a diverse portfolio including redox flow, lithium-ion, and sodium-ion batteries, as well as hydrogen production technologies. His research spans from materials synthesis, electrochemistry, and catalysis to photovoltaics with main focus on energy conversion and storage technologies. He is interested in the investigation of the synthesis-structure-performance relationship in energy-related materials, and the understanding of the underlying material chemistry and physic principles, particularly the development of new materials and novel energy technologies. His work has been widely covered by the media, e.g., Science, Nature, R&D magazine, Scientific American, Materials Views, etc. Dr Wang joined PNNL in 2009 after received his PhD in materials science and engineering from Carnegie Mellon University.

He was honored as one of the two recipients at PNNL with Ronald L. Brodzinski Award for Early Career Exceptional Achievement in 2012 for his accomplishments in state-of-the-art stationary energy storage technologies. He was also recognized by the R&D Magazine with the R&D 100 Award in 2012 for his contribution on graphene enhances lithium-ion batteries. In 2013, he was awarded FLC Award for Excellence in Technology Transfer by the Federal Laboratory Consortium for the advanced vanadium redox flow battery technology. He was one of 41 awardees in the US Department of Energy's ARPA-E OPEN 2015 (the 3$^{rd}$ open call for proposals) for his HyFe dual mode redox flow cell concept.

His 60+ published articles on electrochemical devices, nanostructured materials, and membranes have been widely cited in the scientific community (h-index = 25, total citation = 2500+, 6 papers > 200 citations, 3 book chapters). He has been an inventor on 9 issued and 15+ pending patents. Technologies developed in his lab have been licensed to several companies including UniEnergy Technologies, Imergy Power Systems, Watt Joule Corporation, and Vorbeck Materials.

**Molecular Engineering of the Redox Flow Battery Technology**

Abstract:
Redox flow batteries (RFBs) have increasingly being recognized as a prominent candidate for large-scale energy storage due to their unique advantages of high safety, decoupling of power and energy, long lifespan, quick response, and potentially low cost. Electrolyte is de facto the most critical component in an RFB system. This presentation describes development of new electrolyte chemistries at Pacific Northwest National Laboratory. Solvation chemistry of the different electrolyte systems will be discussed, which provide a greater understanding of dynamic interactions between solvent-solvent, ion-solvent, and ion-ion at the molecular level. Such understanding is pivotal in developing new redox flow system with higher energy density and temperature stability.