

Lithium Battery Technology at PNNL: Next Generation of Energy Storage Systems

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With Guest Lecturer Dr. Ji-Guang (Jason) Zhang

Laboratory Fellow

Battery Technology – Energy & Environment Directorate
Pacific Northwest National Laboratory (PNNL)



Dr. Ji-Guang (Jason) Zhang

Large scale deployment of electrical vehicles needs to have an energy storage system which has an energy density that far exceeds those of the state of the art Li-ion batteries. Li-air batteries and Li-S batteries are two of the most promising systems which have a theoretical energy density five to ten times of those of Li-ion batteries. However, there are many barriers on the practical applications of these systems. In this presentation, our recent progresses on the effect of nano-structured materials on the performance of Li-air batteries, Li-S batteries, as well as other type of Li-metal batteries will be reported. We will demonstrate a novel mechanism which can fundamentally alter Li dendrite formation often observed in Li anode. Further development of this approach will lead to long term safe operation of rechargeable Li metal batteries.

Abridged Biography:

Dr. Ji-Guang (Jason) Zhang is a Laboratory Fellow at the Energy and Environment Directorate of the Pacific Northwest National Laboratory (PNNL) located in Richland, Washington. Currently, he is the group leader for PNNL's efforts in the area of energy storage for transportation applications. He has 23 years of experience in the development of energy storage and energy efficient devices, including lithium-ion batteries, lithium-air batteries, Lithium-metal batteries, Li-S batteries, thin-film solid-state batteries, and electrochromic devices. Dr. Zhang holds 11 patents (with another 13 patents pending) and publishes more than 100 papers in refereed professional journals. Dr. Zhang received his Ph.D. in Experimental Condensed Matter Physics from the University of Kentucky in 1990.

