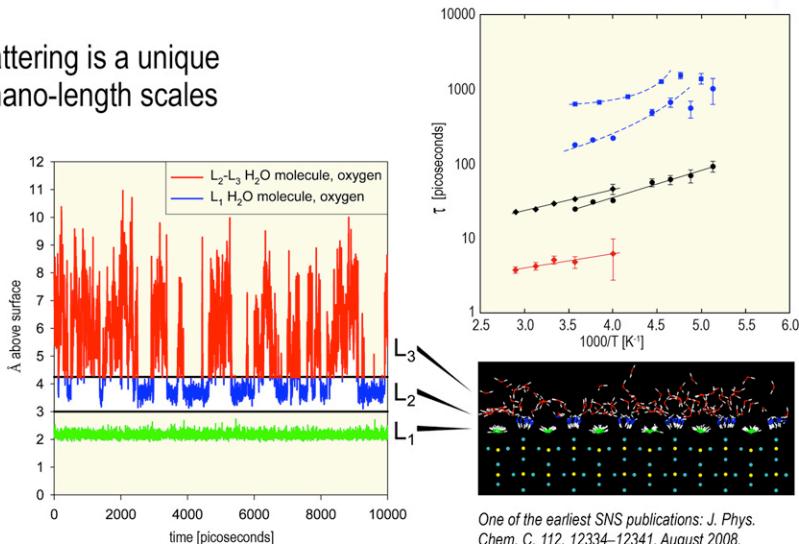


Structure and Interfacial Dynamics of Electrical Energy Storage Materials

NEUTRON SCIENCES



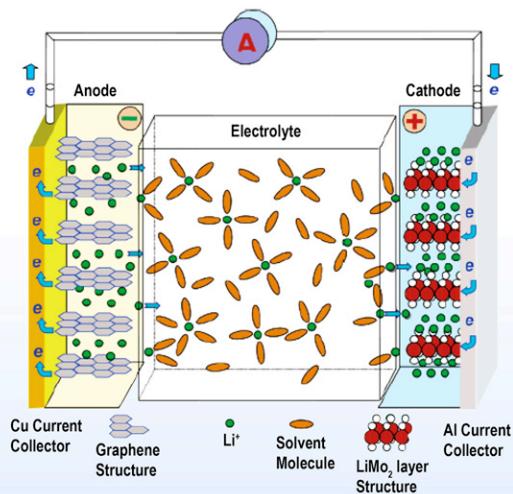
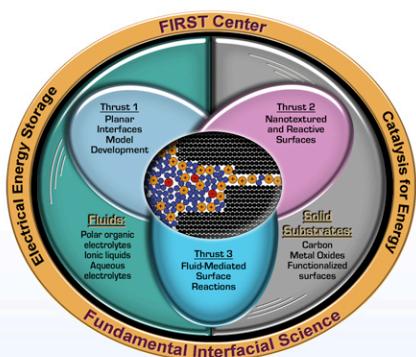
- High-resolution neutron quasielastic scattering is a unique probe of dynamics on the atomic and nano-length scales
- Initial measurements were performed on a model system of water adsorbed on a nanoparticle rutile (TiO₂) surface
- The combination of world-leading neutron instrumentation, controlled synthesis, and molecular dynamics simulations gave detailed insight into the motion of water at the oxide interface



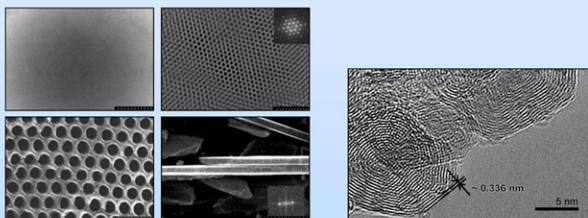
Fluid Interface Reactions, Structures and Transport (FIRST)

Battery Materials for Electrical Storage

Energy Frontier Research Center



Measurements planned for BaSiS will provide key data on diffusion at the carbon-electrolyte interface (RTILs, aprotic solvents) as part of an integrated effort to develop a quantitative and predictive capability for designing new interfacial systems for 21st Century energy needs



Dai, et al., *Angew. Chem.-Int. Edit.*, 43, 5785-5789 (2004)

Gogotsi, *Carbon*, 2007, 45: 2511

- The opposite-signed neutron scattering lengths of ⁷Li and ⁶Li provide exquisite sensitivity to local and long-range order in electrode materials
- Neutron diffraction can probe structural changes in situ during real-life operating conditions