

Nanoscale Surface Adsorption and Disordering in Battery Materials

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The Scientific Basis (built largely via a CAREER program during 2005-10) – Nanoscale “surface phases” with the following *distinct characteristics*:

- "equilibrium" (self-regulating) thickness;
- structures and compositions that are neither observed nor stable as bulk phases; and
- properties unattainable by bulk phases.

Objectives of the Current Project (2010-14):

- using the spontaneously-formed nanoscale “surface phases” to improve the performance of *lithium-ion battery materials*; and
- using lithium-ion battery materials as model systems to advance the fundamental interfacial science for high-T ceramic systems.

Spontaneously-formed nanoscale “surface phase” with self-regulating thickness:

- Stabilize interface
- Improve transport

