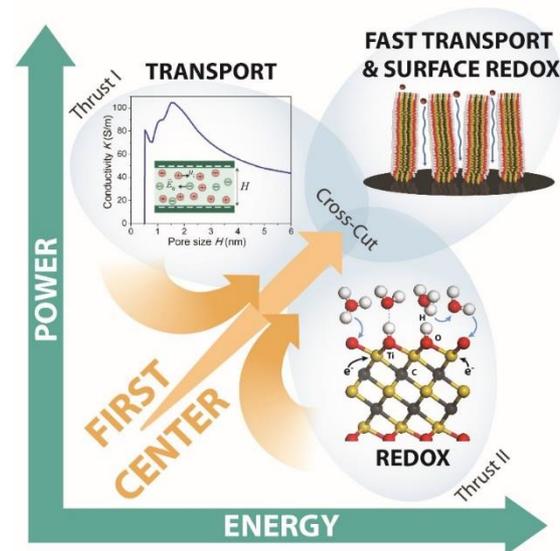


Fluid Interface Reactions, Structures and Transport (FIRST)

Sheng Dai (Oak Ridge National Laboratory); Class: 2009-2022

MISSION: To achieve fundamental understanding and validated, predictive models of the atomistic origins of electrolyte and coupled electron transport under nanoconfinement that will enable transformative advances in capacitive electrical energy storage and other energy-relevant interfacial systems.



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RESEARCH PLAN:

Thrust I integrates novel experimental and computational approaches to determine how electrolyte *transport* is affected by composition, nanoconfinement and surface chemistry/charge. Thrust II considers how fast surface *redox* reactions proceed in pseudocapacitive electrode/electrolyte systems. The Cross-Cutting Theme uses these fundamental insights to achieve *simultaneous* high power and energy density.