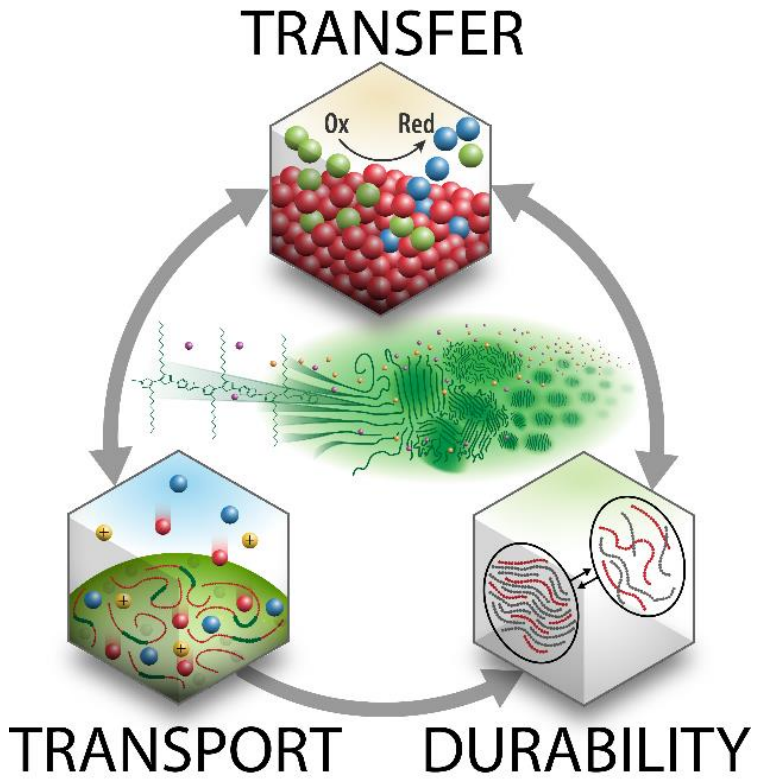
# Center for Soft PhotoElectroChemical Systems (SPECS)

## Neal Armstrong (University of Arizona); Class: 2022-2026

**MISSION:** SPECS understands the factors controlling charge and matter transport processes in inexpensive, scalable, and durable π-conjugated polymer (plastic) materials. We explore the factors across spatiotemporal scales that underpin emerging energy conversion technologies to influence the formation of fuels, such as $H_2$, from sunlight and develop new approaches to energy storage.

**RESEARCH PLAN:** SPECS is organized around 3 interconnected thrusts that focus on energy conversion and storage systems. **Thrust *1: Hybrid Electrical-Ionic Charge Transport*** understands and controls the complex polymer/electrolyte structures that control ion and charge transport. ***Thrust 2: Charge Transfer and Energy Cascades*** understands and optimizes polymer photocathodes for efficient charge transfers to drive fuel-forming reactions, such as formation of $H_2$. ***Thrust 3: Durability*** focuses on creation of a molecular and material scale understanding, leading to robust design guidelines.




https://specs.arizona.edu

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