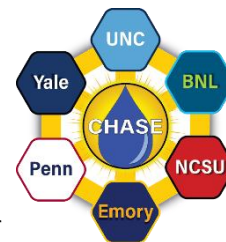


Job Opportunity: Postdoctoral Researcher in Solar Fuel Research and Simulation with Profs. Rene Lopez and Jim Cahoon, UNC Chapel Hill

The Center for Hybrid Approaches in Solar Energy to Liquid Fuels (CHASE) led by University of North Carolina at Chapel Hill is a pioneering DOE research hub committed to advancing sustainable energy technologies by combining semiconductor photoelectrodes with molecular catalysts. Our collaborative team is dedicated to developing innovative solutions for clean energy generation and environmental stewardship. We are seeking a driven and innovative Postdoctoral Researcher to contribute to revolutionary research in the design of systems for cascade catalysis using CHASE photoelectrodes. This role focuses both on developing multiscale computational modeling and performing supportive experimental validation (either directly or via collaboration) for cascade catalyst architectures, where pairs of catalysts collaborate to convert CO₂ into complex products. Join us at CHASE to use state-of-the-art laboratory facilities and computational resources for transformative research in cascade catalysis that drives advancements in sustainable energy conversion.



We will work with the postdoctoral scholar to achieve the following targets:

- Develop advanced COMSOL Multiphysics simulations and/or analytical models to simulate interfacial photoelectrochemical processes and cascade catalysis in systems that CHASE can test experimentally.
- Integrate various physical models (semiconductor device physics, electrochemistry, reaction kinetics, etc.) under non-equilibrium conditions to create unified, predictive models.
- Collaborate closely with experimental researchers to validate simulation outcomes and provide insights for experimental design.
- Address the intricate challenges associated with two-catalyst cascade systems, including light absorption, interfacial charge transfer, kinetics, and intermediate chemistry.
- Optimize cascade systems by iteratively adjusting parameters and configurations based on simulation results.
- Analyze simulation data to uncover the design principles that govern kinetics and energy conversion efficiency.
- Publish and present results in leading journals and conferences.

Qualifications (candidates expected to meet some but not necessarily all qualifications):

- Ph.D. in Chemical Engineering, Chemistry, Materials Science, or a related field.
- Experience in computational modeling and simulation (e.g. COMSOL Multiphysics).
- Strong background in one or more of the following: catalysis, reaction engineering, kinetics, semiconductor device physics, electrochemistry.
- Proficiency in programming languages relevant to scientific research.
- Proven track record of publishing research outcomes in reputable scientific journals.
- Exceptional problem-solving skills and the ability to work both independently and collaboratively.
- Effective communication skills to convey results and collaborate across interdisciplinary teams.

Application Process:

Interested candidates should email the following documents to Profs. Rene Lopez (rln@email.unc.edu) and Jim Cahoon (jfcahoon@unc.edu) with the email subject line "CHASE postdoc applicant":

1. Up-to-date CV highlighting academic and research accomplishments.
2. Cover letter outlining relevant research experience and motivation for the position.
3. Contact information for two professional references.

More information:

CHASE Center: <https://chaseliquidfuels.org/>

Lopez group: <https://research.physics.unc.edu/rln/>

Cahoon group: <http://cahoon.chem.unc.edu/>