From Photons to Fuels

We provide the basic research to enable a revolution in the collection and conversion of sunlight into storable solar fuels

Partner Institutions

UNC Chapel Hill

University of Texas at San Antonio

Georgia Institute of Technology

Brookhaven National Laboratory

SOLAR FUELS UNC EFRC

UNC EFRC
CENTER FOR SOLAR FUELS

Director
Thomas J. Meyer
tjmeyer@unc.edu

Co-Deputy Director
John M. Papanikolas
john_papanikolas@unc.edu

Co-Deputy Director
Gerald J. Meyer
gjmeyer@email.unc.edu

Assistant Director
Catherine M. Heyer
cmheyer@unc.edu

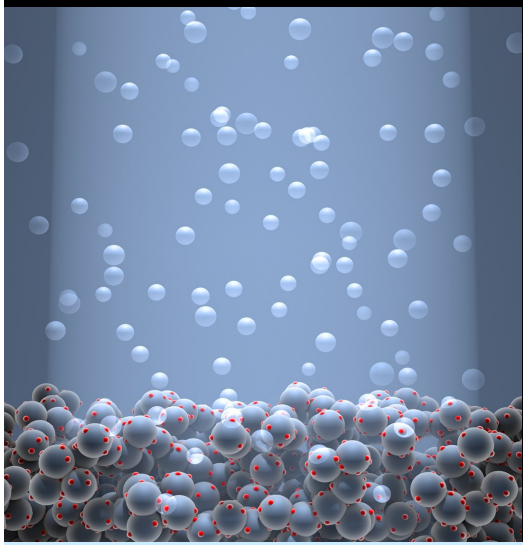
U.S. DEPARTMENT OF ENERGY | Office of Science

UNC Energy Frontier Research Center
Chemistry Department
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3290

EFRC@unc.edu
(919) 962-2304

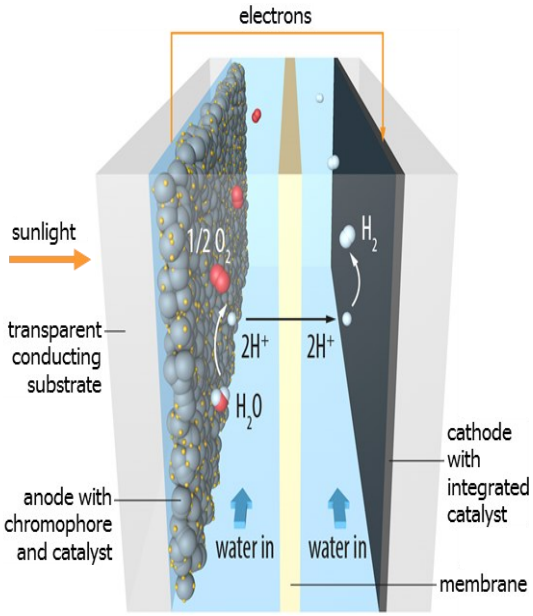
www.efrc.unc.edu

Let the Molecules Do the Work



CENTER for SOLAR FUELS

UNC ENERGY FRONTIER RESEARCH CENTER



Dye-Sensitized Photoelectrosynthesis Cell

Fuels from Sunlight

Funded by the US Department of Energy, Office of Basic Energy Sciences, the UNC EFRC Center for Solar Fuels is conducting research on capturing sunlight to drive solar fuel reactions. The Center's efforts range from basic research on fundamental processes to integrating components into sub-systems and sub-systems into prototype devices. The research utilizes a broad multidisciplinary approach in a highly collaborative setting drawing on expertise across a broad range of disciplines in chemistry, physics and materials science.

The UNC EFRC

A Collaborative, Integrated, Multi-disciplinary, Inter-Institutional, Team-Based Approach

The UNC Energy Frontier Research Center is headquartered at the University of North Carolina at Chapel Hill, one of the top five public research universities in the United States.

Multiple platforms are under investigation but the primary target is a Dye-Sensitized Photoelectrosynthesis Cell (DSPEC) for Solar Fuels production. This approach uses molecules and molecular assemblies for catalysis in photoelectrochemical configurations closely related to those used in Dye Sensitized Solar Cells (DSSC). In contrast to a DSSC where the target is creating electrical power, the target of a DSPEC is the production of a high energy fuel with oxygen as the co-product in the physically separated compartments of a photoelectrochemical cell.

The UNC EFRC uses a modular approach that focuses on maximizing component performance and integration into device prototypes.

Our integrated team-based approach in Solar Fuels is based on four research areas:

- Catalysis
- Assemblies
- Interfaces
- Device Prototypes and Evaluation

Five teams led by faculty members at four partner institutions pursue research in these areas.

World-Class Research Capabilities

- Catalysis
- Spectroscopy
- Photoelectrochemistry
- Synthesis
- Solar Fuels Analysis
- Device Fabrication and Characterization
- Surface and Materials Analysis
- Theory

Professional Research Staff

- Mentoring
- Training
- Continuity
- Research on complex problems over extended periods

We combine the best features of academic and translational research to study light/matter interactions and chemical processes for the efficient collection, transfer, and conversion of solar energy into chemical fuels

SOLAR FUELS
UNC EFRC