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

AMPED EFRC

ALLIANCE FOR MOLECULAR PHOTOELECTRODE DESIGN FOR SOLAR FUELS

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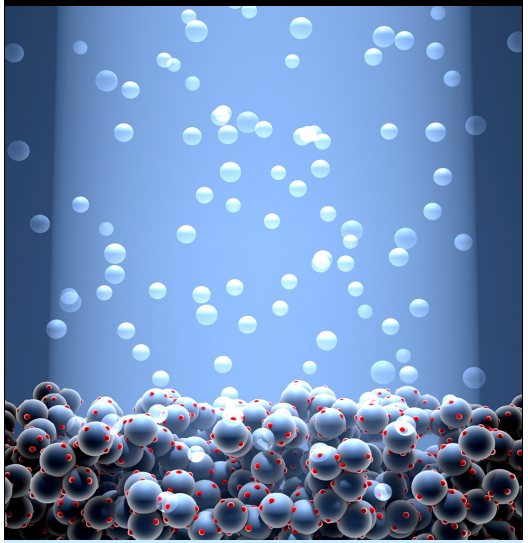
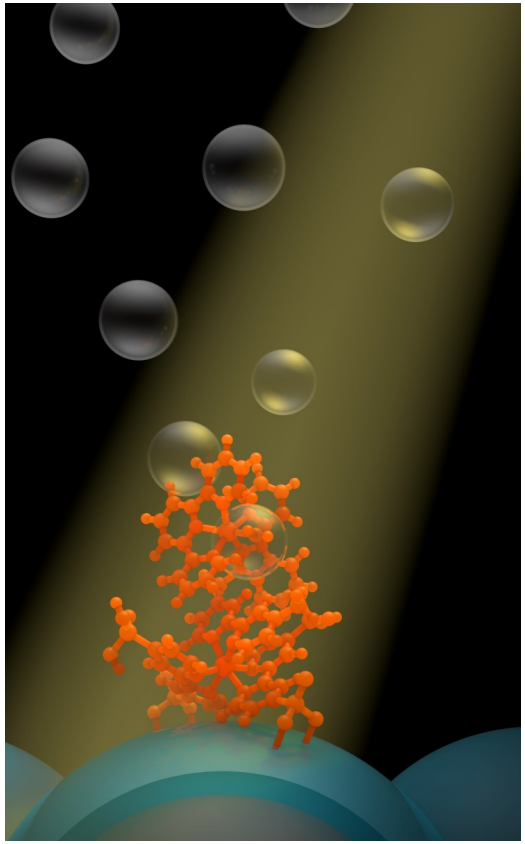
SOLAR FUELS

A Molecular Approach



ALLIANCE for MOLECULAR PHOTOELECTRODE DESIGN for SOLAR FUELS

UNC ENERGY FRONTIER RESEARCH CENTER



Fuels from Sunlight

Funded by the US Department of Energy, Office of Basic Energy Sciences, the Alliance for Molecular PhotoElectrode Design for Solar Fuels (AMPED) Energy Frontier Research Center is conducting fundamental research on capturing sunlight to drive solar fuel reactions.

The Center's efforts focus on basic research on fundamental processes, utilizing a broad multi-disciplinary approach in a highly collaborative setting drawing on expertise across a broad range of disciplines in chemistry, physics and materials science.

The AMPED EFRC

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

The Alliance for Molecular PhotoElectrode Design for Solar Fuels (AMPED) 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.

Sunlight is the one renewable natural resource that could meet all the energy demands of our growing world economy. For solar energy to reach its full potential it must be coupled to a storage method, which can be achieved by conversion of sunlight into chemical energy stored in bonds of molecules called solar fuels. Inspired by natural photosynthesis, the mission of the AMPED EFRC is to develop the fundamental molecular basis for solar-driven water oxidation and carbon dioxide reduction catalysis. This mission will be achieved by understanding how molecular catalysts and chromophores can be integrated covalently and non-covalently with oxide materials to achieve structurally well-defined photoelectrodes that efficiently couple light absorption with multi-electron fuel-forming reactions.

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

- Catalysis & Assemblies
- Materials & Interfaces

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

World-Class Research Capabilities

- Catalysis
- Spectroscopy
- Photoelectrochemistry
- Synthesis
- Solar Fuels Analysis
- Materials 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 collaborative research to study light/matter interactions, and chemical processes for the efficient collection, transfer, and conversion of solar energy into chemical fuels

AMPED SOLAR FUELS