Basic Energy Sciences (BES) Office Hour

Ask BES: Open Office Hour

July 18, 2024

U.S. DEPARTMENT OF ENERGY | Office of Science

Energy.gov/science

https://science.osti.gov/bes

U.S. DEPARTMENT OF ENERGY | Office of Science

Our Mission:

Deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic, and national security of the United States.

More than **34,000 r**esearchers supported at more than **300** institutions and **17** DOE national laboratories

Steward **10** of the 17 DOE national laboratories

More than **37,000** users of **28** Office of Science scientific user facilities

$8.1B
(FY 23 enacted)

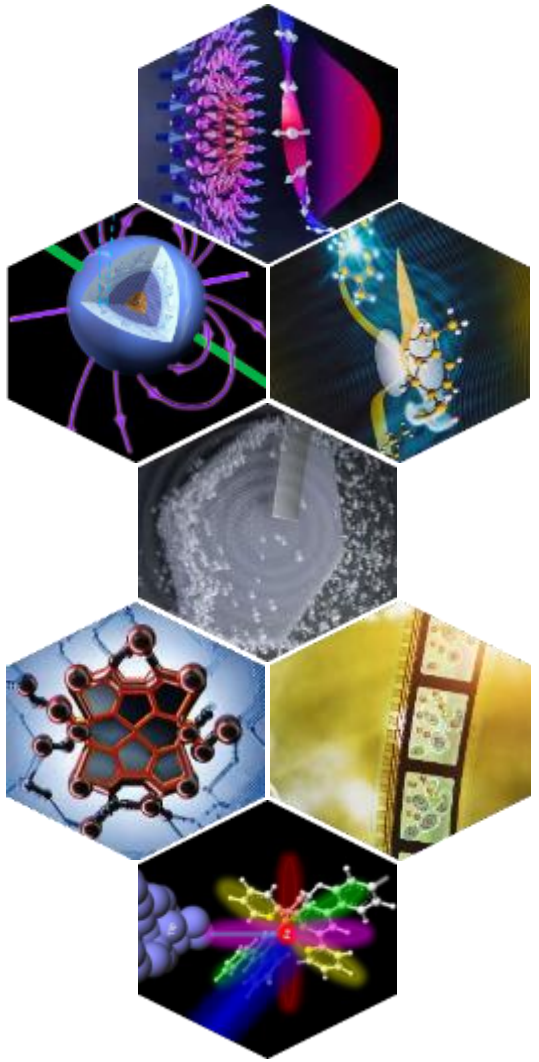
The Office of Science Research Portfolio

Advanced Scientific Computing Research	• Delivering world leading computational and networking capabilities to extend the frontiers of science and technology
★ Basic Energy Sciences	• Understanding, predicting, and ultimately controlling matter and energy flow at the electronic, atomic, and molecular levels
Biological and Environmental Research	• Understanding complex biological, earth, and environmental systems
Fusion Energy Sciences	• Supporting the development of a fusion energy source and supporting research in plasma science
High Energy Physics	• Understanding how the universe works at its most fundamental level
Nuclear Physics	• Discovering, exploring, and understanding all forms of nuclear matter
Isotope R&D and Production	• Supporting isotope research, development, production, processing and distribution to meet the needs of the Nation
Accelerator R&D and Production	• Supporting new technologies for use in SC's scientific facilities and in commercial products

Basic Energy Sciences: Understanding Matter and Energy at Electronic, Atomic, and Molecular Levels

BES fulfills its mission through:

- Supporting **basic research in Chemical Sciences, Materials Sciences, Geosciences, and Biosciences**
  - "Grand Challenge" science
  - Discovery and design of materials and chemical processes that underpin a broad range of energy technologies
- Operating **world-class scientific user facilities** in X-ray, neutron, and nanoscale science
- Managing **construction and upgrade projects** to maintain **world-leading** scientific user facilities
- Ensuring **broad participation** in the research portfolio and user communities



Office of Basic Energy Sciences

Acting Associate Director
Andrew Schwartz

BES Budget and Planning
Kara Beles, Financial Management
Donetta Herbert, Financial Management
Adam Kinney, Senior Technical Advisor)
(Vacant, Senior Technical Advisor)

BES Operations
Teresa Crockett, Program Analyst
Robin Hayes, Program Manager and Acting EFRC Co-Lead
Kerry Hochberger, Program Analyst / BESAC*
Angie Thevenot, Program Analyst
(Vacant, Senior Technical Advisor)

* Basic Energy Sciences Advisory Committee

Chemical Sciences, Geosciences, and Biosciences Division

Gail McLean, Director

Gregory Fiechtner, EFRC Team Co-Lead (A)
(Vacant)

Fundamental Interactions
Tom Settersten

- Atomic, Molecular, and Optical Sciences — Tom Settersten (A), (Vacant)
- Gas Phase Chemical Physics — Wade Sisk
- Condensed Phase and Interfacial Molecular Science — Gregory Fiechtner
- Computational and Theoretical Chemistry — Aaron Holder, Phay Ho
- Quantum Information Science — Marat Valiev

Photochemistry and Biochemistry
Gail McLean (A)

- Solar Photochemistry — Chris Fecko, Jennifer Roizen
- Photosynthetic Systems — Stephen Herbert
- Physical Biosciences — Kate Brown
- Fuels from Sunlight Energy Innovation Hub — Chris Fecko, Jennifer Roizen

Chemical Transformations
Raul Miranda

- Catalysis Science — Chris Bradley, Viviane Schwartz
- Separation Science — Amanda Haes, Vanda Glezakou
- Heavy Element Chemistry — Philip Wilk
- Geosciences — Philip Wilk (A), Eugene Ilton

Collaborative Research Division

Gail McLean, Acting Director

- Energy Frontier Research Centers
- Energy Innovation Hubs
- Energy Earthshot Research Centers
- Cross-SC Coordination (EPSCoR, RENEW, FAIR) — Tim Kidd

Materials Sciences and Engineering Division

Andrew Schwartz, Director

John Vetrano, EFRC Team Co-Lead (A)
Shawn Chen

Materials Discovery, Design, and Synthesis
Craig Henderson (A)

- Materials Chemistry — Chris Chervin, Craig Henderson
- Biomolecular Materials — Aura Gimm
- Synthesis and Processing Science — James Dorman
- Batteries and Energy Storage Hub; Technology Coordination — Craig Henderson, John Vetrano

Condensed Matter and Materials Physics
Mick Pechan

- Experimental Condensed Matter Physics — Claudia Cantoni, Tim Mewes
- Theoretical Condensed Matter Physics — Matthias Graf, Claudia Mewes
- Physical Behavior of Materials — Refik Kortan
- Mechanical Behavior and Radiation Effects — John Vetrano
- Quantum Information Science — Athena Sefat

Scattering and Instrumentation Sciences
Helen Kerch

- X-ray Scattering — Lane Wilson
- Neutron Scattering — Mike Fitzsimmons
- Electron and Scanning Probe Microscopies — Jane Zhu
- Experimental Program to Stimulate Competitive Research (DOE EPSCoR) — Tim Fitzsimmons

Scientific User Facilities Division

Andrew Schwartz, Acting Director

Rocio Meneses, Program Support Specialist

Operations

- X-ray, Neutron and Nanoscale Science User Facilities — Dava Keavney, Misha Zhernenkov, Yiping Feng, (Vacant)
- Accelerator and Detector Research — Eliane Lessner
- Facilities Coordination; Metrics; Assessment — Van Nguyen

Construction

- Linac Coherent Light Source-II/ Advanced Light Source Upgrade — Hannibal Joma
- Advanced Photon Source/ SNS Proton Power Upgrade — Ed Stevens
- Facilities Upgrades and Major Items of Equipment — Ed Stevens, Hannibal Joma, (Vacant)

LEGEND

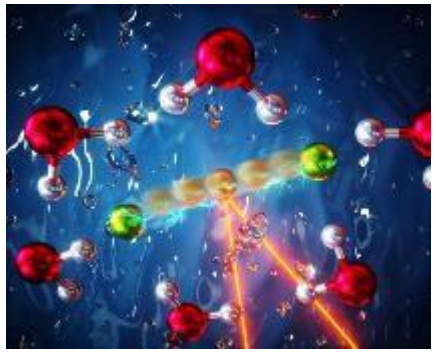
- IPA from SLAC
- (A) Acting
- Detailee (50%) from ORNL
- Detailee (50%) from ANL
- Detailee (50%) from PNNL

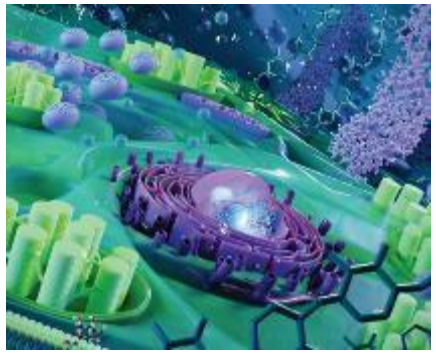
June 2024

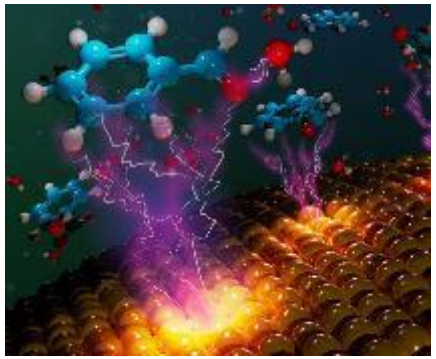
Posted : June 4, 2024

Chemical Sciences, Geosciences & Biosciences Research

Broad Portfolio of Grand Challenge and Energy Use-Inspired Fundamental Research







Fundamental Interactions

Control chemical reactivity and dynamics in gas and condensed phases and at interfaces

Photochemistry and Biochemistry

Molecular mechanisms of light energy capture and its conversion into chemical and electrical energy

Chemical Transformations

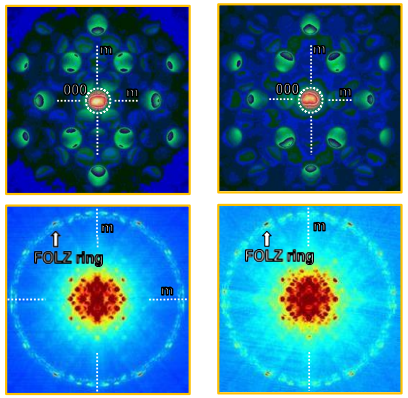
Chemical catalysis, synthesis, separation, stabilization, and transport processes, from atomic to geologic scales.

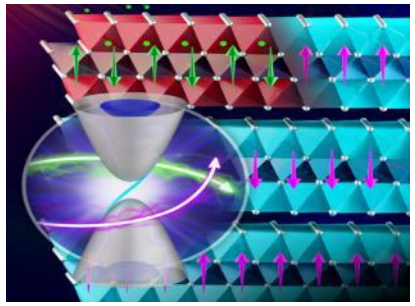
Crosscutting Research Themes:

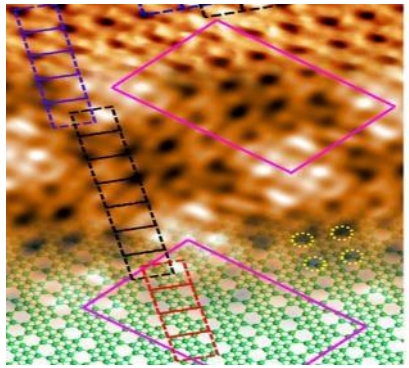
Chemical Mechanisms for Clean Energy; Ultrafast Chemistry; Chemistry at Complex Interfaces; Charge Transport and Reactivity; Reaction Pathways in Diverse Environments; Chemistry in Aqueous Environments

Materials Sciences and Engineering Research

Broad Portfolio of Grand Challenge and Energy Use-Inspired Fundamental Research







Scattering and Instrumentation Sciences

Investigation of photon, neutron, and electron interactions with matter to characterize structures, dynamics, and functionality

Condensed Matter and Materials Physics

Exploration of phenomena in condensed matter, such as quantum behavior and response to environmental stimuli

Materials Discovery, Design, and Synthesis

Understanding synthesis and dynamics to discover/design new materials via innovative physical, chemical, and bio-molecular routes

Division-wide Themes

- Clean energy materials research
- Quantum materials
- Theory, computation and data science
- Materials synthesis
- Science across length and time scales
- Non-equilibrium dynamics
- In-situ, operando, and multi-modal characterization

Breakout Rooms Are Organized by BES Research Division Teams

Fundamental Interactions – Atomic, Molecular and Optical Sciences; Gas Phase Chemical Physics; Condensed Phase and Interfacial Molecular Science; Computational and Theoretical Chemistry; Quantum Information Science

Photochemistry and Biochemistry – Solar Photochemistry; Photosynthetic Systems; Physical Biosciences

Chemical Transformations – Catalysis Science; Separation Science; Heavy Element Chemistry; Geosciences

Materials Discovery, Design, and Synthesis – Materials Chemistry; Biomolecular Materials; Synthesis and Processing Science

Condensed Matter and Materials Physics – Experimental Condensed Matter Physics, Theoretical Condensed Matter Physics, Physical Behavior of Materials, Mechanical Behavior and Radiation Effects, Quantum Information Science

Scattering and Instrumentation Sciences – X-ray Scattering; Neutron Scattering, Electron and Scanning Probe Microscopies; Established Program to Stimulate Competitive Research (DOE EPSCoR)

Thank you