Department of Energy, Office of Science
FY 2014 Energy Frontier Research Centers (EFRCs)

Lead Institution	State	EFRC Name	EFRC Director	EFRC Objective
California Institute of Technology	CA	Light-Material Interactions in Energy Conversion (LMI)	Atwater, Harry	Tailor the morphology, complex dielectric structure, and electronic properties of matter so as to sculpt the flow of sunlight and heat, enabling light conversion to electrical energy with unprecedented efficiency.
Lawrence Berkeley National Laboratory	CA	Center for Nanoscale Controls on Geologic CO_2 (NCGC)	DePaolo, Donald	Produce robust predictive models that will greatly improve confidence in subsurface carbon dioxide storage systems by characterizing and understanding carbon dioxide trapping processes at the nano, meso, and macro scales.
University of California, Berkeley	CA	Center for Gas Separations Relevant to Clean Energy Technologies (CGS)	Long, Jeffrey	Create new synthesis strategies, combined with novel characterization and computational methods, for tailoring materials for the efficient separation of gases, such as natural gas, hydrocarbons, and carbon dioxide.
University of California, Riverside	CA	Spins and Heat in Nanoscale Electronic Systems (SHINES)	Shi, Jing	Explore the interplay of spin, charge, and heat to control the transport of spin and energy to achieve much higher energy efficiencies in nanoscale electronic devices.
National Renewable Energy Laboratory	CO	Center for Next Generation of Materials by Design: Incorporating Metastability (CNGMD)	Tumas, William	Transform the design and synthesis of materials for solar energy conversion and solid state lighting using high throughput computation and data mining.
Carnegie Institution of Washington	DC	Energy Frontier Research in Extreme Environments (Efree II)	Hemley, Russell	Accelerate the discovery and synthesis of kinetically stabilized energy-relevant materials using extreme pressures.
University of Delaware	DE	Catalysis Center for Energy Innovation (CCEI)	Vlachos, Dionisios	Understand catalytic processes that will enable the viable, economic operation of biorefineries with lignocellulosic biomass feedstocks converted to a range of fuels and chemicals.
Georgia Tech	GA	Center for Understanding and Control of Acid Gas-induced Evolution of Materials for Energy (UNCAGE-ME)	Walton, Krista	Develop fundamental understanding of acid gas interactions with sorbent, catalyst, and membrane materials to enable rational design of acid gas-tolerant materials with improved catalytic and separations properties.

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Argonne National Laboratory	IL	Center for Electrochemical Energy Science (CEES-II)	Fenter, Paul	Understand electrochemically-driven reactivity in electrified oxide materials, films and interfaces using lithium ion battery chemistry.
Northwestern University	IL	Center for Bio-Inspired Energy Science (CBES)	Stupp, Samuel	Develop artificial materials, inspired by biological systems, that can change the way we convert and use energy.
Northwestern University	IL	Argonne-Northwestern Solar Energy Research (ANSER) Center	Wasielewski, Michael	Revolutionize our understanding of the molecules, materials, and physical phenomena necessary to create dramatically more efficient technologies for solar fuels and electricity production.
University of Illinois, Urbana-Champaign	IL	Center for Geologic Storage of CO_2	Finley, Robert	Discover new basic science solutions that address uncertainties in current technology at field carbon dioxide storage demonstration projects.
Purdue University	IN	Center for Direct Catalytic Conversion of Biomass to Biofuels (C3Bio)	McCann, Maureen	Use chemical catalysis and fast pyrolysis to transform the main components of non-food lignocellulosic biomass directly to liquid hydrocarbons and other high-value chemicals.
University of Notre Dame	IN	Materials Science of Actinides (MSA)	Burns, Peter	Understand and control ceramic, metallic, hybrid, and nanoscale actinide materials to lay the scientific foundation for advanced nuclear energy systems.
Harvard University	MA	Integrated Mesoscale Architectures for Sustainable Catalysis (IMASC)	Friend, Cynthia	Understand chemical reactivity of complex structures to enable the design of highly selective catalysts for some of the most energy-consuming industrial chemical processes.
Massachusetts Institute of Technology	MA	Center for Excitonics (CE)	Baldo, Marc	Develop new materials and structures that use excitons to increase the efficiency of solar photovolatic cells and high brightness solid state lighting devices.
Massachusetts Institute of Technology	MA	Solid-State Solar-Thermal Energy Conversion Center (S3TEC)	Chen, Gang	Design materials for efficient direct heat-to electricity energy conversion technologies.
University of Maryland, College Park	MD	Nanostructures for Electrical Energy Storage (NEES II)	Rubloff, Gary	Provide the scientific insights and design principles needed to realize a new generation of powerful and long lasting batteries based on nanostructures.

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University of Minnesota	MN	Inorganometallic Catalyst Design Center (ICDC)	Gagliardi, Laura	Advance the knowledge of catalytic transformations through new theoretical, computational, and experimental approaches in order to design materials and processes for energy- and atom-efficient conversion of shale-gas components.
Washington University, St. Louis	MO	Photosynthetic Antenna Research Center (PARC)	Blankenship, Robert	Understand the principles of light harvesting and energy funneling in photosynthetic systems.
Montana State University	MT	Center for Biological Electron Transfer and Catalysis (BETCy)	Peters, John	Investigate the mechanisms and structural basis controlling electron transfer in model enzymes to develop modular biochemical conversions for the production of hydrocarbon and hydrogen biofuels.
The University of North Carolina at Chapel Hill	NC	Center for Solar Fuels (UNC)	Meyer, Thomas	Develop the scientific basis for solar-driven molecular catalysis of solar fuel reactions.
Los Alamos National Laboratory	NM	Center for Advanced Solar Photophysics (CASP)	Klimov, Victor	Harness the unique properties of quantum-confined semiconductors to realize the next generation of low-cost, high-efficiency solar photoconversion systems.
Brookhaven National Laboratory	NY	Center for Emergent Superconductivity (CES)	Johnson, Peter	Explore the quantum mechanical underpinnings of high temperature superconductivity (HTS) and develop novel ways of using computational predictive design to tailor new HTS materials for energy applications.
SUNY Binghamton	NY	NorthEast Center for Chemical Energy Storage (NECCES)	Whittingham, M. Stanley	Understand the transformations that occur in an electrode composite structure throughout the lifetime of the functioning battery in order to achieve close to theoretical capacities in intercalation systems and enable new battery chemistries.
SUNY Stony Brook	NY	Center for Mesoscale Transport Properties (m2M)	Takeuchi, Esther	Understand ion and electron transport and electron transfer properties over multiple length scales and across interfaces to enable the design of higher performing, longer life, and safer energy storage systems.

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Temple University	PA	Center for the Computational Design of Functional Layered Materials (CDFLM)	Perdew, John	Employ computation and theory to design modified layered materials with desired functionalities, to grow and experimentally characterize them, and to test their efficacy for clean-energy applications.
The Pennsylvania State University	PA	Center for Lignocellulose Structure and Formation (CLSF)	Cosgrove, Daniel	Develop a detailed nano- to meso-scale understanding of plant cell wall structure and its mechanism of assembly to provide a basis for improved methods of converting biomass into fuels.
Oak Ridge National Laboratory	TN	Fluid Interface Reactions, Structures and Transport (FIRST) Center	Wesolowski, David	Develop fundamental understanding and validated, predictive models of the unique nanoscale environment at fluid-solid interfaces that will enable transformative advances in electrical energy storage and electrocatalysis.
Oak Ridge National Laboratory	TN	Energy Dissipation to Defect Evolution (EDDE)	Zhang, Yanwen	Develop a fundamental understanding of energy dissipation mechanisms to control defect evolution in structural alloys in a radiation environment.
The University of Texas at Austin	TX	Center for Frontiers of Subsurface Energy Security (CFSES)	Lake, Larry	Understand and control emergent behavior arising from coupled physics and chemistry in heterogeneous geomaterials, particularly during the time and length scales for geologic carbon dioxide storage.
Pacific Northwest National Laboratory	WA	Center for Molecular Electrocatalysis (CME)	Bullock, R. Morris	Develop a fundamental understanding of proton transfer reactions that will lead to transformational changes in our ability to design molecular electrocatalysts for interconversion of electricity and fuels.