



# NATIONAL GUIDE TO STATE ENERGY RESEARCH CENTERS

2016–2017



U.S. DEPARTMENT OF  
**ENERGY**

**ASERTTI**



**ERC**  
ENERGY RESOURCES CENTER

THE  
UNIVERSITY OF  
ILLINOIS  
AT  
CHICAGO  
ENGINEERING

# TABLE OF CONTENTS

**9–11 Disclaimer, Introduction, Icon Glossary**

**12–15 Foreward, Stats and Data**

**16–17 Alabama (2 centers)**

Center for Advanced Vehicle Technologies (CAVT)

Center for Bioenergy and Bioproducts

**18–22 Alaska (4 centers)**

Cold Climate Housing Research Center

Petroleum Development Laboratory (PDL)

Water and Environmental Research Center

Alaska Center for Energy and Power

*Case Study: Alaska Center for Microgrid Technologies Commercialization*

**23–29 Arizona (5 centers)**

SRC Engineering Research Center (ERC) for Environmentally Benign Semiconductor Manufacturing

Center for Bio-Inspired Solar Fuel Production (BISfuel)

Arizona Center for Algae Technology and Innovation (AzCATI)

*Case Study: Algal Biomass*

Quantum Energy and Sustainable Solar Technology (QESST)

The Center for Bioenergy and Photosynthesis

**30–32 Arkansas (3 centers)**

National Center for Reliable Electric Power Transmission (NCREPT)

Grid-Connected Advanced Power Electronics Systems (GRAPES)

DoE Cybersecurity Center for Secure, Evolvable Energy Delivery Systems (SEEDS)

**33–46 California (12 centers)**

UC Davis Center for Water-Energy Efficiency (CWEE)

Light-Material Interaction in Energy Conversion Energy Frontier Research Center (LMI-EFRC)

Center for Gas Separations Relevant to Clean Energy Technologies (CGS)

Smart Grid Energy Research Center (SMERC)

*Case Study: UCLA WINSmartGrid™*

Center for Energy Efficient Materials (CEEM)

Energy Biosciences Institute (EBI)

Center for Energy Science and Technology Advanced Research (CESTAR)

Stanford Linear Accelerator Center (SLAC)

Center for Nanoscale Controls on Geologic CO<sub>2</sub> (NCGC)

Spins and Heat in Nanoscale Electronic Systems (SHINES)

Lawrence Berkeley National Laboratory

Lawrence Livermore National Laboratory

**47–54 Colorado (8 centers)**

Renewable and Sustainable Energy Institute (RASEI)  
Renewable Energy Materials Research Science and Engineering Center (REMRSEC)  
CSU Energy Institute  
Colorado Center for Biorefining and Bioproducts  
Center for the Advanced Control of Energy and Power Systems (ACEPS)  
Engines & Energy Conversion Lab (EECL)  
Center for Next Generation of Materials by Design: Incorporating Metastability (CNGMD)  
National Renewable Energy Laboratory (NREL)

**55 Connecticut (1 center)**

Center for Clean Energy Engineering (C2E2)

**56 District of Columbia (1 center)**

Energy Frontier Research in Extreme Environments Center (EFree)

**57–64 Delaware (6 centers)**

Center for Carbon-free Power Integration (CCPI)  
Center for Fuel Cell Research  
*Case Study: Fuel Cell Bus Program*  
Delaware Biotechnology Institute  
Institute of Energy Conversion  
Catalysis Center for Energy Innovation (CCEI)  
*Case Study: Pumping up the Biofuel Yield*  
Center for Energy Environmental Policy (CEEP)

**65–73 Florida (9 centers)**

Future Fuels Institute (FFI)  
Southeast National Marine Renewable Energy Center  
Center for Advanced Power Systems (CAPS)  
Applied Research Center (ARC)  
Florida Solar Energy Center (FSEC)  
Energy & Sustainability Center (ESC)  
Nanoscience Technology Center (NSTC)  
Advanced Materials Processing and Analysis Center (AMPAC)  
Center for Actinide Science & Technology (CAST)

**74–78 Georgia (5 centers)**

Center for Organic Photonics and Electronics (COPE)  
University Center of Excellence for Photovoltaics (UCEP)  
Brook Byers Institute for Sustainable Systems (BBISS)  
Renewable Energy and Engines Laboratory  
Center for Understanding and Control of Acid Gas-induced Evolution of Materials for Energy (UNCAGE-ME)

**79 Hawaii (1 center)**

Hawaii Natural Energy Institute (HNEI)

**80–81 Kansas (2 centers)**

Center for Environmentally Beneficial Catalysis (CEBC)  
Center for Sustainable Energy (CSE)

**82–83 Kentucky (2 centers)**

Center for Applied Energy Research (CAER)  
CONN Center for Renewable Energy Research

**84 Idaho (2 center)**

Center for Advanced Energy Studies (CAES)  
Idaho National Laboratory (INL)

**86–97 Illinois (12 centers)**

Argonne National Laboratory  
Argonne-Northwestern Solar Energy Research Center (ANSER)  
Center for Power Optimization of Electro-Thermal Systems (POETS)  
Energy Resources Center  
Gas Technology Institute (GTI)  
Integrated Bioprocessing Research Laboratory  
Micro and Nanotechnology Laboratory (MNTL)  
Illinois Sustainable Technology Center (ISTC)  
Center for Electrochemical Energy Science (CEES)  
Center for Bio-Inspired Energy Science (CBES)  
Center for Geological Storage of CO<sub>2</sub> (GSCO<sub>2</sub>)  
Fermi National Accelerator Laboratory (FNAL)

**98–102 Indiana (5 centers)**

Richard G. Lugar Center for Renewable Energy (LCRE)  
Center for Sustainable Energy at Notre Dame (ND Energy)  
Materials Science of Actinides, Energy Frontier Research Center  
The Discovery Park Energy Center  
Center for Direct Catalytic Conversion of Biomass to Biofuels (C3Bio)

**103–107 Iowa (4 centers)**

Bioeconomy Institute (BEI)  
*Case Study: Modularized Pyrolysis Biorefinery*  
Iowa Energy Center  
Center for Biorenewable Chemicals (CBiRC)  
Ames Center

**108 Louisiana (1 center)**

Energy Institute

**109–110 Maryland (2 centers)**

Nanostructures for Electrical Energy Storage (NEES)  
University of Maryland Energy Research Center (UMERC)

**111–119 Massachusetts (9 centers)**

Wind Energy Center  
Northeastern University Center for Renewable Energy Technology (NUCRET)  
eni-MIT Alliance  
Electrochemical Energy Lab (EEL)  
Solid-State Solar Thermal Energy Conversion Center  
Center for Hierarchical Manufacturing  
WPI Fuel Cell Center  
Integrated Mesoscale Architectures for Sustainable Catalysis (IMASC)  
Center for Excitonics

**120–123 Michigan (4 centers)**

Energy Institute  
Center for Solar and Thermal Energy Conversion (CSTEC)  
Clean Energy Research Center (CERC)  
National Biofuels Energy Laboratory

**124–127 Minnesota (4 centers)**

Center for Biorefining  
Center for Compact and Efficient Fluid Power (CCEFP)  
Materials Research Science and Engineering Center (MRSEC)  
Inorganometallic Catalyst Design Center (ICDC)

**128–129 Mississippi (2 centers)**

Institute for Clean Energy Technology (ICET)  
Sustainable Energy Research Center (SERC)

**130–134 Missouri (5 centers)**

Energy Research and Development Center  
Photosynthetic Antenna Research Center (PARC)  
International Center for Advanced Renewable Energy and Sustainability  
Midwest Energy Efficiency Research Consortium  
Missouri Technology Corporation (MTC)

**135– 138 Montana (4 centers)**

Energy Research Institute  
Zero Emission Research and Technology Center (ZERT)  
High Temperature Electrochemistry Center (HiTEC)  
Center for Biological Electron Transfer and Catalysis (BETCy)

**139 Nebraska (1 center)**

Nebraska Center for Energy Sciences Research

**140–143 Nevada (3 centers)**

Center for Energy Research  
*Case Study: Villa Trieste Homes*  
Renewable Energy Center  
Desert Research Institute (DRI)

**144 New Hampshire (1 center)**

Center for Ocean Renewable Energy (CORE)

**145–146 New Jersey (2 centers)**

Rutgers Energy Institute  
Princeton Plasma Physics Laboratory (PPPL)

**147–149 New Mexico (3 centers)**

Los Alamos National Laboratory  
Center for Advanced Solar Photophysics (CASP)  
Sandia National Laboratories

**150–164 New York (15 centers)**

North East Center for Chemical Energy Storage  
CUNY Energy Institute  
New York Battery and Energy Storage Technology  
Center for Sustainable Energy Systems  
Energy Materials Center at Cornell (EMC2)  
Center for Sustainable Energy  
Advanced Energy Research & Technology Center (AERTC)  
David R. Atkinson Center for a Sustainable Future (ACSF)  
Center for Sustainable Mobility (CSM)  
Energy and Environmental Technology Application Center (E2TAC)  
Building Energy and Environmental Systems Laboratory (BEESL)  
The NanoPower Research Labs (NPRL)  
Center for Mesoscale Transport Properties  
Center for Emergent Superconductivity (CES)  
Brookhaven National Laboratory

**165–169 North Carolina (3 centers)**

UNC EFRC: Center for Solar Fuels  
North Carolina Clean Energy Technology Center  
Advanced Energy  
*Case Study: SystemVision*

**170 North Dakota (1 center)**

Energy & Environmental Research Center (EERC)

**171–173 Ohio (3 centers)**

Ohio Center for Industrial Energy Efficiency (OCIEE)  
Wright Center for Photovoltaics Innovation and Commercialization (PVIC)  
Center for Performance and Design of Nuclear Waste Forms and Containers (WastePD)

- 174 Oklahoma (1 center)**  
Tulsa Institute of Alternative Energy Fuels
- 175–177 Oregon (3 centers)**  
Wallace Energy Systems & Renewables Facility (WESRF)  
Northwest National Marine Renewable Energy Center  
Solar Radiation Monitoring Laboratory
- 178–194 Pennsylvania (17 centers)**  
Energy System Engineering Institute  
Biomass Energy Center  
Radiation Science and Engineering Center (RSEC)  
Center for Combustion, Power and Propulsion  
Center for Lignocellulose Structure and Formation  
Energy Research Center (ERC)  
Center for Electric Power Engineering  
The Penn Center for Energy Innovation (PENNERGY)  
Renewable Energy Research Lab (College of Engineering)  
Institutes of Energy and the Environment (PSIEE) & Indoor Environment Center (IEC)  
Penn State Institutes of Energy and the Environment (PSIEE)  
Center for Energy  
Battery and Energy Storage Technology (BEST) Center  
Marcellus Center for Outreach and Research (MCOR)  
H2E Center  
Center for the Computational Design of Functional Layered Materials (CCDM)  
National Energy Technology Laboratory (NETL)
- 195–197 South Carolina (3 centers)**  
The NanoCenter  
Center for Hierarchical Waste Form Materials (CHWM)  
Savannah River National Laboratory (SRNL)
- 198 South Dakota (1 center)**  
Center for Bioenergy Research and Development (CBERD)
- 199–203 Tennessee (5 centers)**  
Center for Environmental Biotechnology (CEB)  
BioEnergy Science Center (BESC)  
Fluid Interface Reactions, Structures and Transport Center (FIRST)  
Energy Dissipation to Defect Evolution (EDDE)  
Oak Ridge National Laboratory
- 204–206 Texas (11 centers)**  
Center for Energy and Environmental Resources (CEER)  
Center for Electromechanics  
National Wind Institute Texas Tech University

**207–214 Texas (11 centers)**

Energy & Environmental Systems Institute (EESI)  
Center for Petroleum & Geosystems Engineering (CPGE)  
Energy Institute  
Center for Frontiers of Subsurface Energy Security (CFSES)  
Center for Nano and Molecular Science and Technology (CNM)  
Texas Engineering Experiment Station (TEES)  
MIRO Center for Space Exploration and Technology Research (cSETR)  
Texas A&M Energy Institute

**215–219 Utah (5 centers)**

Institute for Clean and Secure Energy (ICSE)  
Bingham Entrepreneurship and Energy Research Center  
Sustainable Electrified Transportation Research Center  
Materials Characterization Laboratory  
Energy and Geoscience Institute

**220 Vermont (1 center)**

Smart Grid IGERT Program

**221–224 Virginia (4 centers)**

Center for Smart Power Grids (SPG)  
Center for Catalytic Hydrocarbon Functionalization (CCHF)  
Institute for Energy and Environmental Research (IEER)  
Thomas Jefferson National Accelerator Facility

**225–230 Washington (6 centers)**

Washington State University Extension Energy Program  
Institute of Advanced Materials & Technology (i-AMT)  
Power and Energy Systems Group  
Center for Molecular Electrocatalysis (CME)  
Interfacial Dynamics in Radioactive Environments and Materials (IDREAM)  
Pacific Northwest National Laboratory (PNNL)

**231–236 Wisconsin (6 centers)**

Wisconsin Energy Institute (WEI)  
Great Lakes Bioenergy Research Center  
Center for Sustainability & the Global Environment (SAGE)  
Seventhwave  
Solar Energy Laboratory (SEL)  
Engine Research Center

**237–240 Wyoming (3 centers)**

Wind Energy Research Center  
*Case Study: Atmosphere to Grid*  
Carbon Management Institute  
Center for Photoconversion and Catalysis

## **Disclaimer/Acknowledgements**

The authors would like to thank the Energy Resources Center and the Association of State Energy Research and Technology Transfer Institutions for their support in the conduct of this effort. We would also like to thank Kate Marks of the U.S. Department of Energy's Office of Energy Policy and Systems Analysis for her insights and support in the developing this guide. The authors are grateful to the University of Illinois at Chicago's Publications Center for their patient and flexible service. We would also like to thank all of the centers for their collaboration in supplying information for the guide so that we could increase the amount of detail. Additionally, we would like to thank the National Association of State Energy Officials for their help with increasing our outreach to the individual centers.

This report was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.

This work by the Energy Resources Center at the University of Illinois at Chicago was conducted under contract with Argonne National Laboratory [Work Order # 4J-30361-0019A].

## Introduction

The energy sector is a great economic driver, yet it faces some of the greatest challenges. Shifting fuel economies, increased globalization, aging infrastructure, and a more technologically reliant society are just some of the transformations confronting this industry that must think in decades rather than just the few years ahead.

As the United States embraces new energy resources and technologies, new standards and policies are being considered to ease their integration into the energy portfolio. The transmission grid is being modernized to accommodate the increased demand by the consumer market and the non-linear electrical generation created by variable renewables. The traditional centralized power production model is being challenged by the popularity of micro-grids, forcing utilities to rethink how to distribute power. This has been accelerated thanks to new drilling and extraction technologies that are allowing natural gas to become a more dominant energy player in the market, challenging the economics of coal and nuclear power facilities and allowing for combined heat and power installations in non-utility buildings. Additionally, alternative power sources are gaining substantial market share. The cost of photovoltaic technologies is continuously dropping while advances in materials and design are allowing wind turbines to be built larger, more cheaply, and with greater generation efficiency. Public and private organizations are developing

devices to extract power from ocean tides and coastal currents, as well as refining the procedures to produce better biofuels from organic sources such as corn, algae, and wastewater.

The energy industry must also contend with the technological development of its consumer base. Manufacturing facilities are integrating 3D printing technologies and the Internet-of-Things, both of which promise to disrupt the conventional methods of manufacturing and will affect how facilities demand power. Commercial businesses are increasing their reliance on the internet through both cloud storage and social networking platforms, requiring more data centers to be built. Data storage facilities require uninterrupted power supply, a task that is plagued by both natural disaster and the potential threat of cyber-attack. The development of the energy industry is further complicated by growing and complex relationships with other important resources and industries like water and telecommunications.

Even the shifts in transportation technology aim to disrupt the energy industry. Electric vehicles have gained a significant consumer base, creating the need to develop the infrastructure required for an electric fleet. California has begun investing in hydrogen fueling stations and public transportation authorities across the country are switching to compressed natural gas fuel systems. Autonomous driving and inter-car communication abilities may help

to reduce industry fuel consumption through route optimization and traffic avoidance. These transportation technologies are moving into uncharted regulation territory, and require cooperation between all parties.

Despite the challenges, the energy industry is progressing at a rapid rate. Researchers across the nation are developing innovative technologies and creative solutions. This guide serves as a resource to highlight the efforts of the energy research centers that are advancing the capabilities of the energy industry. The research fields of each center, as well as their partnering organizations, are included to help outside entities connect with a respective center depending on needs or interests. New solutions are constantly being developed; it is these energy research centers that are overcoming the challenges faced by the industry with the states and the private sector and are pushing the boundaries of how we produce, use, and distribute energy.

## Icon Glossary

### Research Areas

- |   |  |
|---|--|
|  Advanced Electronics       |  Renewable Energy             |
|  Bioenergy and Biofuel      |  Smart Grid Distribution      |
|  Carbon Capture             |  Materials                    |
|  Climate Research           |  Transportation Technology    |
|  Economic Modelling         |  Water Use/Efficiency         |
|  Sustainable Building       |  Fusion Energy                |
|  Energy Storage/Fuel Cells |  Hydrogen                    |
|  Emissions Technology     |  Energy Conversion          |
|  Manufacturing            |  Heavy Oil Characterization |
|  Nuclear Power            |  Cybersecurity              |
|  Fossil Fuels             |  Particle Physics           |
|  Policy                   |  |

### Research Activities

- |   |
|---|
|  In-House R&D            |
|  R&D Grants/Contracts    |
|  Intellectual Property   |
|  Perform Demonstrations  |
|  Spin-off Companies      |
|  Set/Verify Standards    |
|  Equity Investments     |
|  Provide Data/Analysis |
|  Shared Facilities     |
|  Education/Training    |
|  Project Management    |
|  Access to Research    |

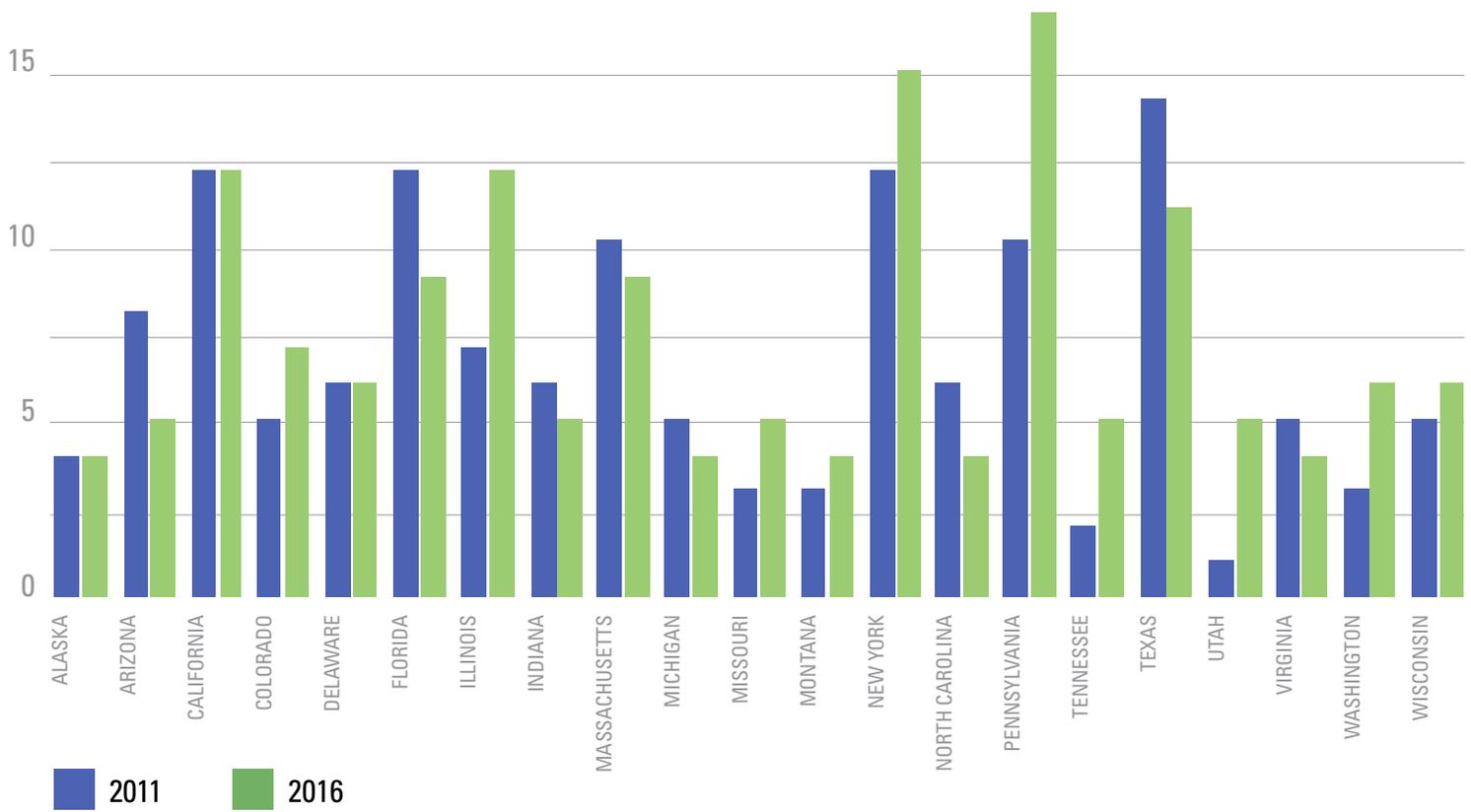
# 213 CENTERS NATIONWIDE



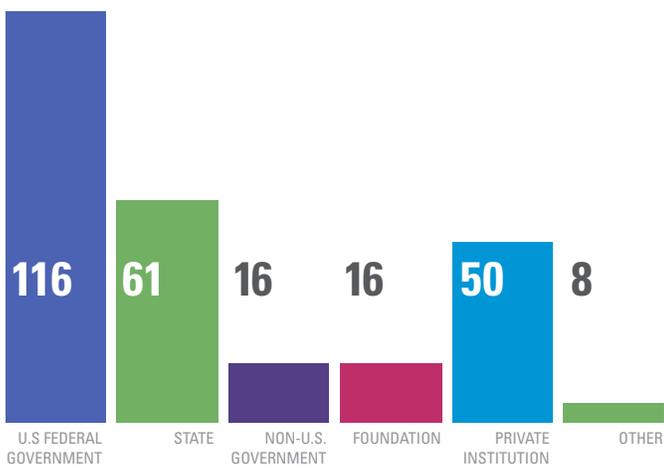
Since the release of the first version of this guide in 2012, the energy industry has grown and evolved. Nearly every state is now represented by an energy research center, and the number of research centers has grown from 130 to over 200. This guide provides a detailed description of the research activities of each center as well as contact information to aid in collaborative efforts. Individuals looking to collaborate with energy research centers are encouraged to contact both their state energy office (<http://www.naseo.org/members-states>) and the centers currently listed in this guide to learn more about the status of a specific research activity. Though we aimed to be as comprehensive as possible when including both centers and their research efforts, there may be energy research centers, or particular research efforts by a particular center, that are not included in this guide. Additionally, new centers may open after this guide has been released.

After compiling the efforts of these 213 energy centers, we are very optimistic about the future of the energy industry. Many energy research centers are collaborating together and working with private institutions to overcome the numerous obstacles that the industry faces. Though ingenuity and determination play key roles in the development of new solutions, it is the ability to work together and combine resources that ensures the continued advancement of the industry. We urge the readers of this guide to reach out to the centers listed and share ideas. Together, we can ensure that the energy industry is prepared to meet the needs of the coming century.

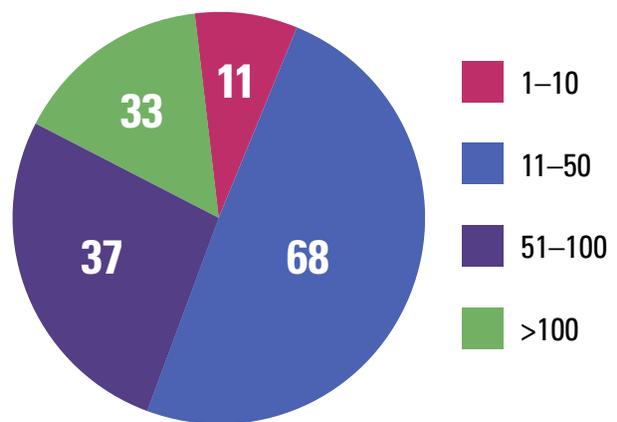
## High Volume State 5-Year Comparison



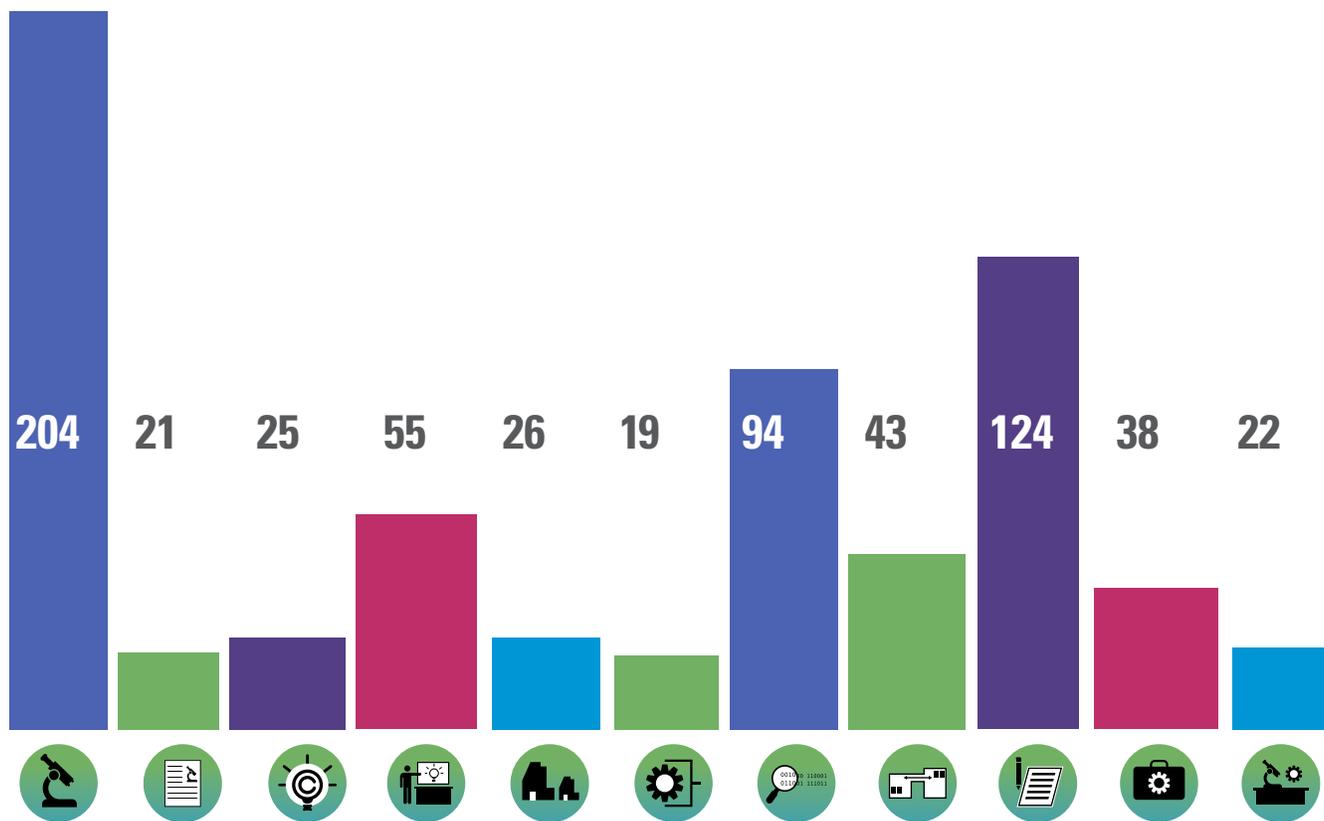
## Number of Centers per Funding Source



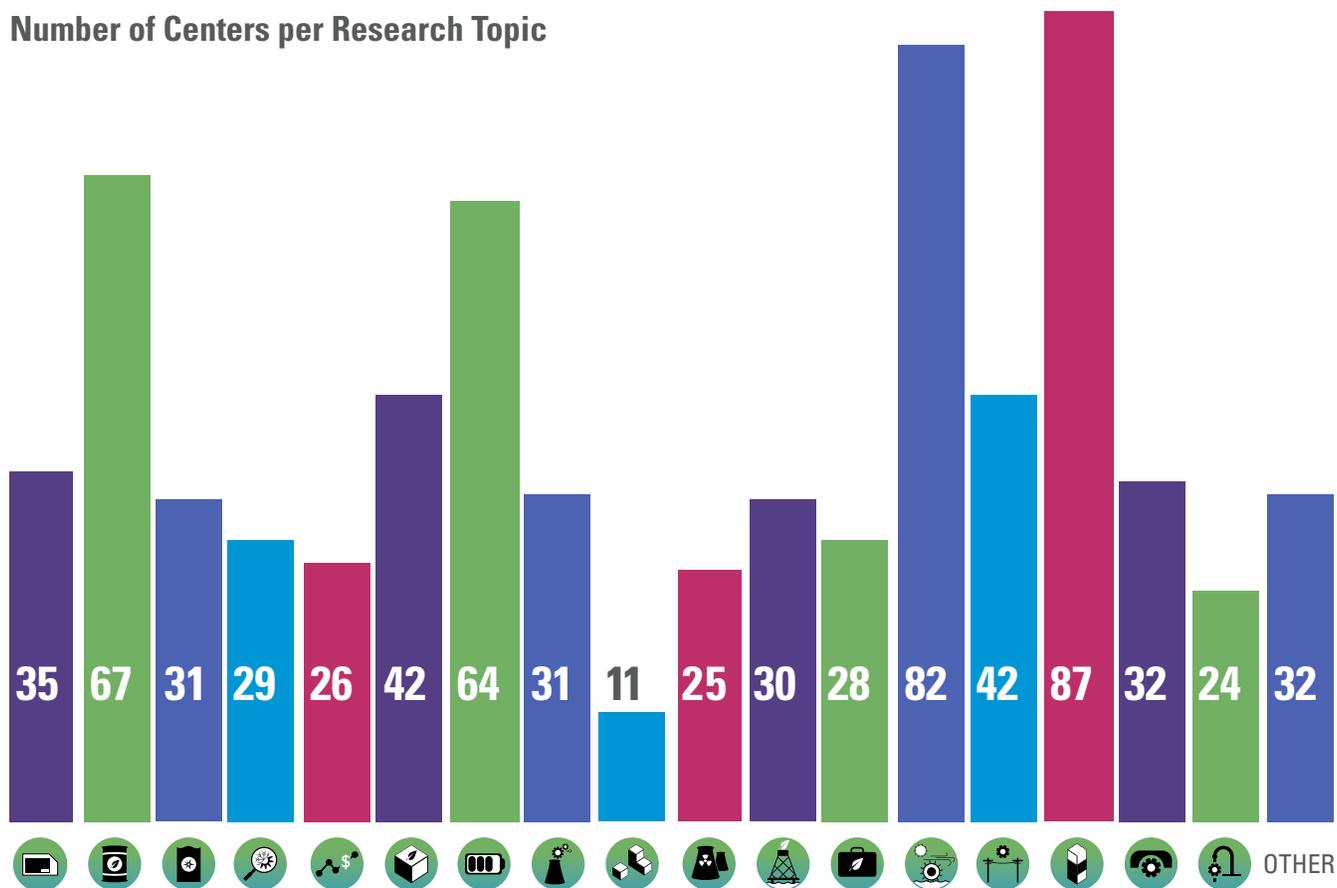
## Staffing Size



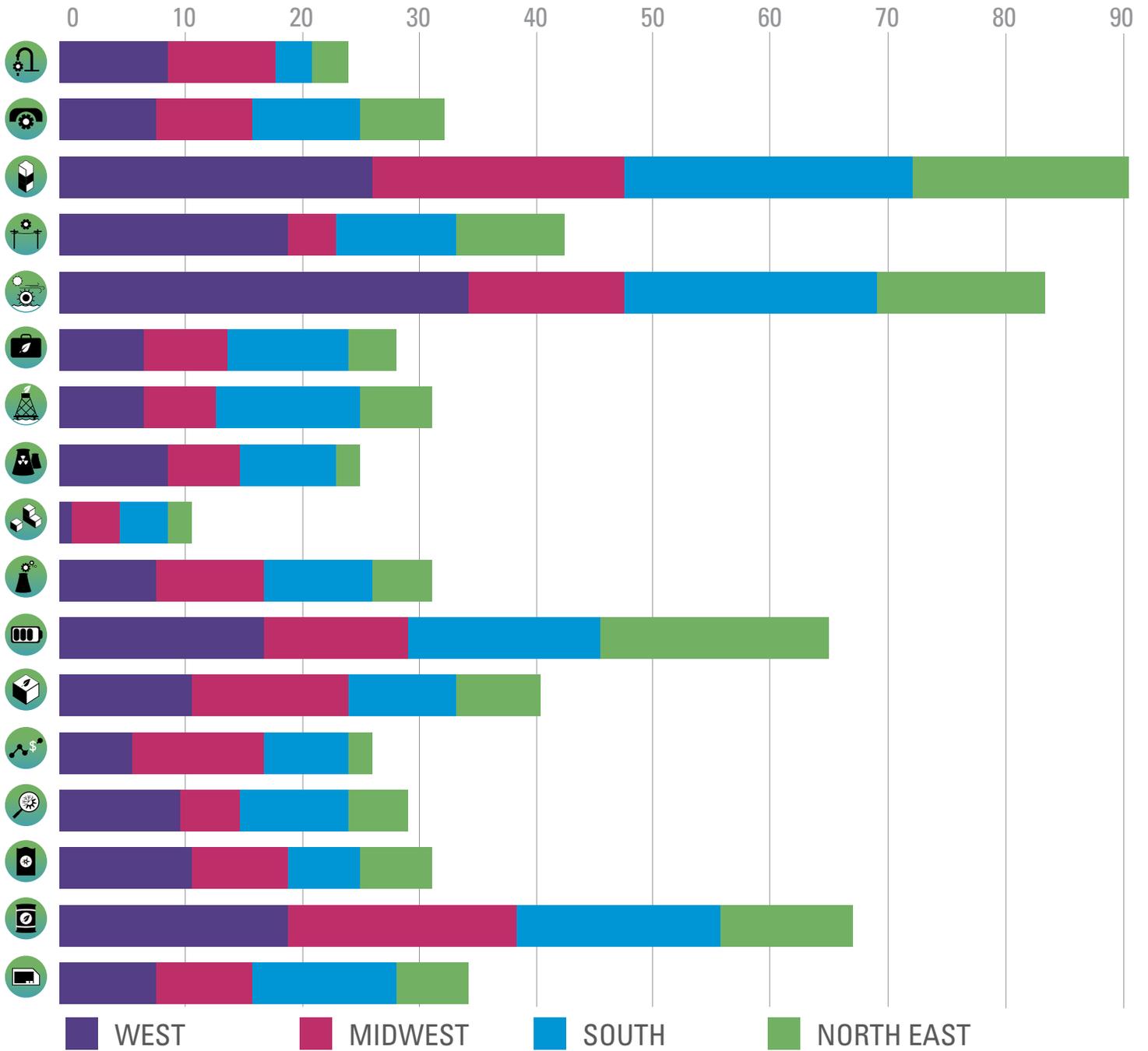
### Number of Centers per Research Activity



### Number of Centers per Research Topic



### Number of Centers per Research Topic (U.S. Regional Breakdown)



# ALABAMA

## Center for Advanced Vehicle Technologies (CAVT)

University of Alabama

### Director Contact

K. Clark Midkiff  
cmidkiff@eng.ua.edu  
(205) 348-1645

### Center Contact

<http://cavt.eng.ua.edu>

### Research Areas



### Research Activities



The Center for Advanced Vehicle Technologies (CAVT) is a University of Alabama Research Center dedicated to the advancement of vehicle technology. Based on unique, interdisciplinary research and education programs, it strives to provide the vehicular industry with novel ideas, scientific consultation, as well as new generations of engineers and scientists formed in the latest technologies in this field. Located in Tuscaloosa, Alabama, on the campus of the University of Alabama, it is at the heart of the automotive industry emergence in the United States Southeast region.

# Center for Bioenergy and Bioproducts

Auburn University

## Director Contact

Steven Taylor

taylost@auburn.edu

(334) 844-2301

## Center Contact

taylost@auburn.edu

(334) 844-3534

<http://www.eng.auburn.edu/research/centers/bioenergy>

## Research Areas



BIOENERGY  
AND BIOFUELS



POLICY



EMISSIONS  
TECHNOLOGY

## Research Activities



IN-HOUSE  
R&D



PERFORM  
DEMONSTRATIONS



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

The mission of the center is to conduct focused research & development efforts to find technologies to make bioenergy cost-competitive with traditional petroleum-based fuels; emphasize a balanced portfolio of regionally-appropriate biomass feedstocks & energy technologies; emphasize systems approaches in the solution of all problems; emphasize partnerships with industry and government agencies to speed commercialization of new technologies and their subsequent introduction to the marketplace.

Established in 2007, the Center for Bioenergy and Bioproducts houses one professor and two research staff and operates with federal, state and private funding.

The center collaborates with USDA Forest Service, US DOE, National Renewable Energy Laboratory, Alabama Forestry Commission, Alabama Power and John Deere US and is a public entity.

# ALASKA



## Cold Climate Housing Research Center

University of Alaska

### Director Contact

Jack Hebert  
Jack@cchrc.org

### Center Contact

Sandee@cchrc.org  
(907) 457-3454  
www.cchrc.org

### Research Areas



### Research Activities



The center focuses on research and testing on building science, mechanical systems, Cold Climate building design, housing needs assessments, public and industry outreach and community adaptation to climate change.

Established in 1999, the center houses approximately 17 employees; 12 research staff and five support staff and operates with approximately \$2,000,000 in annual funding from U.S. and state governments as well as from foundations.

The center collaborates with the Alaska Housing Finance Corporation, U.S. Department of Housing and Urban Development, U.S. DOE, Alaska Native Tribal Health Corporation, and the Rasmuson Foundation and is a non-profit entity.

# Petroleum Development Laboratory (PDL)

University of Alaska, Fairbanks

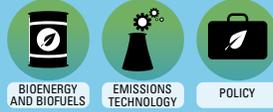
## Director Contact

Shirish L. Patil  
slpatil@alaska.edu  
(907) 474-5127

## Center Contact

<http://ine.uaf.edu/pdl/>

## Research Areas



## Research Activities



The primary function of the PDL as a research branch of the School of Mineral Engineering is to explore various aspects of enhanced oil recovery research, including the production of heavy oil through thermal recovery and miscible oil displacement. The goal is to transfer the information from the laboratory and field experiments to engineers who can apply it to problems in the oil fields. Research includes secondary recovery (waterflooding) and enhanced oil recovery processes, a comprehensive study of Alaska's oil and gas reservoirs, development of thermal recovery projects to initiate production from Ugnu and West Sak fields, and miscible flooding.

Established in 1984, the Petroleum Development Laboratory houses approximately six professors, one support staff and 25 students and operates with funding from U.S. and state governments as well as from Non-U.S. governments. The main founding contributors are the State of Alaska and private oil companies.

The center collaborates with the National energy Technology Laboratory (NETL) and is a public entity.

# Water and Environmental Research Center

University of Alaska, Fairbanks

## Director Contact

Bill Schnabel

weschnabel@alaska.edu

## Center Contact

weschnabel@alaska.edu

(907) 474-7789

<http://ine.uaf.edu/werc/>

## Research Areas



CLIMATE  
RESEARCH



TRANSPORTATION  
TECHNOLOGY



WATER  
EFFICIENCY

## Research Activities



IN-HOUSE  
R&D

WERC research aims to help improve the quality of life for arctic inhabitants while supporting careful and sustainable development of Alaska's bountiful natural resources, protecting fragile ecosystems, and seeking to better understand the role of the arctic and subarctic in the global system.

Established in 1999, the Water and Environmental Research Center operates with funding from U.S., Non-U.S. and state governments as well as from foundations and private institutions. The center is a public entity.



# Alaska Center for Energy and Power

University of Alaska, Fairbanks

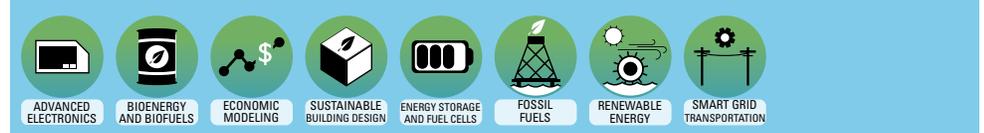
## Director Contact

Gwen Holdmann  
gwen.holdmann@alaska.edu  
(907) 888-2147

## Center Contact

ACEP.info@alaska.edu  
(907) 474-5402  
<http://acep.uaf.edu/>

## Research Areas



## Research Activities



The mission of the center is to develop and disseminate practical, cost-effective, and innovative energy solutions for Alaska and beyond.

Established in 2008 the Alaska Center for Energy and Power houses approximately 35 employees; 14 professors, nine research staff, four support staff, and eight students and operates with approximately \$4,000,000.00 in annual funding from U.S. Federal Government, state, Non-U.S. Governments, Foundations, and Private Institution. The main founding contributors are State of Alaska, Office of Naval Research, and Economic Development Administration.

The center collaborates with the University of Alaska Fairbanks, University of Alaska Anchorage, UAF Cooperative Extension Service, University of Alaska Statewide, and Various other State of Alaska organizations. Alaska Center for Energy and Power serves as a gateway to energy research for Alaska by drawing on existing expertise from across the University of Alaska system and other sources and is a non-profit entity.

# Alaska Center for Microgrid Technologies Commercialization

The U.S. Economic Development Administration selected ACEP and its partners as one of 26 winners of an i6 Challenge Award. The \$1 million, three-year award is being used to establish the Alaska Center for Microgrid Technologies Commercialization, which will operate out of ACEP's PSI Program at UAF.

ACMTC provides streamlined access to the extensive knowledge network of utilities and companies operating in more than 200 remote Alaska communities, as well as providing laboratory time for technology research and development. It also offers testing on equipment such as the solar and fault emulators, which were both funded through the i6 Challenge Award.

The focus of ACMTC is to provide technical and business assistance to industry members to bring their microgrid products or services to market.

The market includes both domestic and export opportunities, with nearest term applications in remote and/or isolated regions characterized by high energy costs, such as those in Alaska, the circumpolar North, and developing regions of the world. In

addition, there is a growing market opportunity for urban applications of microgrid technologies, due to the improved resilience they can provide in times of natural disaster and human-caused.

The first step is to document the critical issues and challenges that industry members and technology innovators can encounter in rural and isolated settings. Being able to address these issues successfully will allow developers to more effectively deploy their products and services into the Alaska microgrid market. The center will also conduct a microgrid technology demonstration competition and provide business plan and entrepreneur support.



*Power Quality Analyser*



*Utility Power Meter*

# ARIZONA



## SRC Engineering Research Center (ERC) for Environmentally Benign Semiconductor Manufacturing

University of Arizona

### Director Contact

Karen McClure

[kmcclure@erc.arizona.edu](mailto:kmcclure@erc.arizona.edu)

(520) 626-5259

### Center Contact

(520) 621-6051

<http://erc.arizona.edu>

### Research Areas



### Research Activities



The mission of the center is to develop novel strategic solutions to existing environmental, safety and health (ESH) problems in semiconductor manufacturing; create new and effective environmentally benign manufacturing processes; demonstrate the positive impact of design for environment on all aspects of semiconductor manufacturing; develop innovative education programs in which environmental factors are integral parts of the curriculum.

In 1996, the NSF/SRC Engineering Research Center (ERC) for Environmentally Benign Semiconductor Manufacturing was created as a result of a joint initiative between the University of Arizona (lead institution), the Massachusetts Institute of Technology, Stanford University, and the University of California-Berkeley with co-sponsorship from the National Science Foundation (NSF) and the Semiconductor Research Corporation (SRC). The ERC's goal was to create the science, technology, and educational methods needed to lead the semiconductor industry to a new era of environmentally benign manufacturing. When the ERC "graduated" from the NSF's Engineering Research Center program in 2006, the ERC continued under sponsorship of the SRC jointly with SEMATECH/ISMI (2006-2011). The ERC has continued its partnership with the Semiconductor Research Corporation (SRC) throughout, and continues its firm commitment to developing its goals and objectives.



# Center for Bio-Inspired Solar Fuel Production (BISfuel)

Arizona State University

## Director Contact

Devens Gust  
dgust@asu.edu  
(480) 965-4547

## Center Contact

alexander.melkozernov@asu.edu  
(480) 965-1548  
<http://solarfuel.clas.asu.edu/>

## Research Areas



## Research Activities



The Mission of the Center for Bio-Inspired Solar Fuel Production (BISfuel) is to construct a complete system for solar-powered production of fuels such as hydrogen via water splitting. Design principles will be drawn from the fundamental concepts that underlie photosynthetic energy conversion.

A major challenge facing humanity is developing a renewable source of energy to replace our reliance on fossil fuels. The ideal source will be abundant, inexpensive, environmentally clean, and widely distributed geographically. Energy from the sun meets these criteria. Unfortunately, practical, cost effective technologies for conversion of sunlight directly into useful fuels do not exist, and new basic science is required. A blueprint for storage of solar energy in fuels does exist, however, in photosynthesis. Indeed, all of the fossil-fuel-based energy we consume today derives from sunlight that was harvested by photosynthetic organisms.

Established in 2009 the Center for Bio-Inspired Solar Fuel Production houses approximately 17 professors, 11 research staff, 12 support staff, and 34 students and is a public entity.

# Arizona Center for Algae Technology and Innovation (AzCATI)

Arizona State University

## Director Contact

Peter Lammers  
peter.lammers@asu.edu  
(480) 727-1484

## Center Contact

Jamie.Rock@asu.edu  
(480) 727-1410  
www.azcati.com

## Research Areas



## Research Activities



The Arizona Center for Algae Technology and Innovation (AzCATI) serves as a national testbed for research, testing, and commercialization of algae-based products such as biofuels, pharmaceuticals, nutraceuticals, and other algae biomass co-products. AzCATI provides open test and evaluation facilities for the algae industry and research community.

Established in 2008 the Arizona Center for Algae Technology and Innovation houses approximately 30 employees; three professors, 10 research staff, seven support staff, and 10 students and operates with approximately \$2,000,000.00 in annual funding from U.S. Federal Government, State and Private Institutions. The main founding contributors are the Department of Energy, SRP, Heliae.

The center collaborates with the National Renewable Energy Laboratory, Sandia National Laboratory, Los Alamos National Laboratory, New Mexico State University, Colorado State University. AzCATI seeks collaborators with synergistic capabilities for joint grant proposal preparation. The Center tasks frequently take the form of outdoor algae cultivation, scale up of strains or process scale up beyond the proof of concept/laboratory levels. AzCATI performs outdoor testing of genetically modified algae based on existing and new permitting interactions with the U.S. Environmental Protection Agency. The center is a public entity.

# Algal Biomass

June 28, 2016

An Arizona State University research team seeks to significantly increase yields of algal biomass feedstock to ramp up production of biofuels as part of a multi-university project supported by a recently awarded \$2 million grant from the Bioenergy Technologies Office in the U.S. Department of Energy.

Peter Lammers, a research professor with Arizona Center for Algal Technology and Innovation, leads the team that will share funding from the grant with collaborators at New Mexico State University, Colorado State University and the National Renewable Energy Laboratory. AzCATI, which serves the algae industry and research community alike as a national testbed for research and commercialization of algae-based products ranging from biofuels to pharmaceuticals, is embedded within the Fulton Schools of Engineering.

Researchers will evaluate mixotrophic metabolism in algae that consume both carbon dioxide and waste sugars derived from plant cellulose. They'll use a heat-tolerant algae strain isolated from Yellowstone National Park that is perfectly adapted to growth in closed bioreactors that reduce evap-



*Peter Lammers*

orative water loss which is critical for deployment of the technology in the arid southwestern United States. Researchers see potential for multiplying algal production rates by five times over current rates. That achievement would significantly reduce the cost of enclosed algal cultivation systems and boost production particularly in the southwestern United States.

Rosa Krajmalnik-Brown, an associate professor of civil and environmental engineering in the Fulton Schools, will utilize her expertise and the facilities at ASU's Swette Center for Environmental Biotechnology to identify all microbes that are able to grow in the production system and describe the full suite of metabolic reactions occurring in the mixotrophic, waste-to-energy process.

Algal feedstock production platforms specifically designed for scale-up on land with limited water resources remain a big gap in the Bioenergy Technologies Office algae research and development portfolio.

The majority of previous algae cultivation studies utilized open-pond cultivation systems that use too much water for deployment in arid regions, but also struggle with culture stability and productivity in outdoor scale-up trials. As a result, abundant flat land in the Southwest plays little or no role in current DOE resource assessments. Still, the region offers significant potential for algal biofuels that would not compete with food production if water-scarcity challenges can be overcome.

“Water is required in large quantities to grow algae and yet water is in very short supply here,” Lammers says. “Our production systems avoid evaporation through the use of enclosed systems. These heat up in the sunlight via the greenhouse effect, so we use algae that evolved in hot springs that thrive under the conditions found in our enclosed photobioreactors,” he says. “Our work will evaluate ways to reduce the energy requirement for algae biomass cultivation beyond eliminating the cooling requirement, as we seek to reduce the energy requirements for mixing as well.”

Energy and fertilizer extraction from the algal biomass is accomplished through a process called hydrother-

mal liquefaction, which works like a pressure cooker to produce a bio-crude oil that can be upgraded to liquid transportation fuels or a natural gas substitute through a process called catalytic hydrothermal gasification.



# Quantum Energy and Sustainable Solar Technology (QESST)

Arizona State University

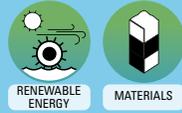
## Director Contact

Christiana Honsberg  
Christiana.Honsberg@asu.edu

## Center Contact

info@qesst.org  
(480) 965-6898  
<https://qesst.asu.edu/>

## Research Areas



## Research Activities



QESST is an Engineering Research Center (ERC) sponsored by the National Science Foundation (NSF) and the U.S. Department of Energy (DOE) that focuses on advancing photovoltaic science, technology and education in order to address one of society's greatest challenges: sustainably transforming electricity generation to meet the growing demand for energy.



# The Center for Bioenergy and Photosynthesis

Arizona State University

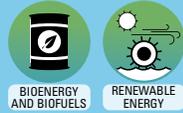
## Director Contact

Kevin Redding  
Kevin.Redding@asu.edu

## Center Contact

(480) 965-1963  
<http://bioenergy.asu.edu>

## Research Areas



## Research Activities



The ASU Center for Bioenergy & Photosynthesis (CB&P) carries out frontier multidisciplinary scientific research designed to use biological and biologically-based artificial systems to address societal energy needs in a sustainable manner, with an emphasis on solar energy conversion and bioinspired energy transformation to meet human needs.

The Center houses approximately 34 among professors and research staff and collaborates with the Biodesign Institute, Center for Bio-Inspired Solar Fuel Production, Consortium for Science, Policy & Outcomes, Department of Physics, Julie Ann Wrigley Global Institute of Sustainability. The frontier research done at the Center for Bioenergy and Photosynthesis is the result of collaborative efforts of scientists from multiple disciplines, departments, centers, institutes, and schools within ASU.

# ARKANSAS

## National Center for Reliable Electric Power Transmission (NCREPT)

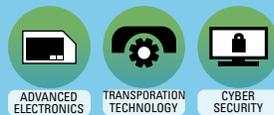
### Director Contact

Alan Mantooth  
mantooth@uark.edu  
(479) 575-4838

### Center Contact

ncrept@uark.edu  
(479) 575-4487  
<http://ncrept.uark.edu/>

### Research Areas



### Research Activities



NCREPT is a medium-voltage testing facility. It functions as a beta testing platform for power electronic, transportation and cybersecurity technologies being developed by associated researchers. In addition, NCREPT is a service center, providing testing facilities to industrial partners on a fee-bearing basis.

Established in 2007 the National Center for Reliable Electric Power Transmission houses approximately 20 employees; five professors, one research staff, two support staff, and 12 students and operates with approximately \$200,000 in annual funding from the State and testing revenues. The main founding contributor is the University of Arkansas (state funding).

The center collaborates with the University of Illinois, Urbana-Champaign, Lehigh University, Florida International University, Carnegie Mellon University, Wolfspeed and is a public non-profit entity.



# Grid-Connected Advanced Power Electronics Systems (GRAPES)

University of Arkansas

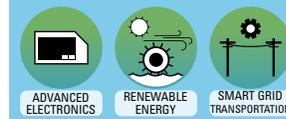
## Director Contact

Alan Mantooth  
mantooth@uark.edu  
(479) 575-4383

## Center Contact

grapes@uark.edu  
(479) 575-4487  
<https://grapes.uark.edu/>

## Research Areas



## Research Activities



GRAPES concentrates on the design, development, assessment, and effectiveness of grid-connected power electronics on both the supply and load side of power systems. Research areas include solid-state transformers, protection equipment, medium voltage converters, microgrids, and power electronic packaging for medium voltages.

Established in 2009 the Grid-Connected Advanced Power Electronics Systems houses approximately 46 employees; 11 professors, six research staff, six support staff, and 23 students and operates with approximately \$750,000 in annual funding from U.S. Federal Government. The main founding contributor is the National Science Foundation.



# DoE Cybersecurity Center for Secure, Evolvable Energy Delivery Systems (SEEDS)

University of Arkansas

## Director Contact

Alan Mantooth  
mantooth@uark.edu  
(479) 575-4383

## Center Contact

sgdavis@uark.edu  
(479) 575-6877  
<https://seedscenter.uark.edu>

## Research Areas



CYBER SECURITY

## Research Activities



IN-HOUSE R&D



INTELLECTUAL PROPERTY



PERFORM DEMONSTRATIONS



PROVIDE DATA OR ANALYSIS



ACCESS TO RESEARCH

SEEDS researchers develop innovative cybersecurity technologies, tools and methodologies that advance the energy sector’s ability to survive cyber incidents while sustaining critical functions. Center research is focused on making electrical, oil and gas delivery systems less susceptible to cyber threats and more resilient to such attacks if they occur. SEEDS has five academic and one industrial research partners as well as a membership-based Industrial Advisory Board.

Established in 2015 the DoE Cybersecurity Center for Secure, Evolvable Energy Delivery Systems houses approximately 53 employees; 17 professors, five research staff, five support staff, and 26 students and operates with approximately \$3,000,000.00 in annual funding from U.S. Federal Government and Industrial Membership. The main founding contributor is the Department of Energy.

The center collaborates with the Lehigh University, Carnegie-Mellon University, Florida International University, University of Arkansas, Little Rock, Arkansas Electric Cooperatives Corporation. The collaborating universities conduct research in cybersecurity issues related to energy delivery systems. The universities conduct laboratory research and alpha testing in testbeds located at the campuses. Once alpha testing is complete, products are beta tested by AECC to vet them for commercialization. SEEDS also collaborate with DOE and a number of industrial members to learn about the issues currently facing them and to vet our proposed projects. The Center is a public non-profit entity.

# CALIFORNIA



## UC Davis Center for Water-Energy Efficiency (CWEE)

University of California, Davis

### Director Contact

Frank Loge  
fjloge@ucdavis.edu  
(530) 754-2297

### Center Contact

(530) 752-2354  
<http://cwee.ucdavis.edu>

### Research Areas



### Research Activities



The mission of the Center is to research, develop, and disseminate efficient technologies and system-based policies for the integrated conservation of water and energy resources. It serves as a collaborative hub for universities, industrial partners, and government agencies to advance water-energy research, education, technology development, and policy assessment.

Cold Climate Housing Research Center houses approximately 13 employees; three research staff and six research staff, one support staff and three students and operates with funding from the State and Private Institutions.

# Light-Material Interaction in Energy Conversion Energy Frontier Research Center (LMI-EFRC)

Caltech

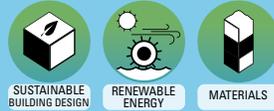
## Director Contact

Ralph G. Nuzzo  
r-nuzzo@illinois.edu  
(217) 244-0809

## Center Contact

lmi-efrc@caltech.edu  
(626) 395-3330  
<http://www.lmi.caltech.edu>

## Research Areas



## Research Activities



The Scientific Vision of the “Light-Material Interactions in Energy Conversion Energy Frontier Research Center” (LMI-EFRC) is to 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 and chemical energy with unprecedented efficiency.

Established in 2009 the Light-Material Interaction in Energy Conversion Energy Frontier Research Center houses approximately 14 professors, 12 research staff, one support staff, and 35 students and operates with \$3,000,000.00 in annual funding from the U.S. Federal Government. The main founding contributor is the Department of Energy. The Center is a non-profit entity.

## Center for Gas Separations Relevant to Clean Energy Technologies (CGS)

University of California, Berkeley

### Director Contact

Jeffrey R. Long  
jrlong@berkeley.edu  
(510) 642-0860

### Center Contact

kstangl@berkeley.edu  
(510) 664-7811  
[www.cchem.berkeley.edu/co2efrc/](http://www.cchem.berkeley.edu/co2efrc/)

### Research Areas



### Research Activities



The Center for Gas Separations conducts fundamental research that addresses the five Basic Energy Sciences Grand Challenges: how to control material processes at the level of electrons; how to design and perfect atom- and energy-efficient synthesis of revolutionary new forms of matter with tailored properties; how do remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how to control these properties; how to master energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things; how to characterize and control matter away -especially very far away- from equilibrium.

Established in 2009 the CGS houses approximately 18 professors, 21 research staff, three support staff, and 42 students and operates with approximately \$3,000,000.00 in annual funding from U.S. Federal Government. The main funding contributor is the Department of Energy.

The center collaborates with the Lawrence Berkeley National Laboratory, Texas A&M University, University of Minnesota, National Energy Technologies Laboratory, National Institute of Standards and Technology and is a public entity.

# Smart Grid Energy Research Center (SMERC)

University of California, Los Angeles

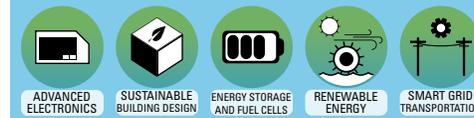
## Director Contact

Rajit Gadh  
gadh@ucla.edu  
(310) 267-4892

## Center Contact

info@smartgrid.ucla.edu  
(310) 267-4892  
<http://smartgrid.ucla.edu/>

## Research Areas



## Research Activities



The UCLA Smart Grid Energy Research Center (or SMERC) performs research, creates innovations, and demonstrates advanced wireless/communications, Internet and sense-and-control technologies to enable the development of the next generation of the electric utility grid - The Smart Grid. SMERC also provides thought leadership via partnerships between utilities, government, policy makers, technology providers, electric vehicle and electric appliance manufacturers, Department of Energy research labs and universities, so as to collectively work on envisioning, planning, and executing the smart grid of the future.

Established in 2010 the SMERC houses approximately 29 employees; nine professors, three research staff, eight support staff, and nine students and operates with approximately \$4,000,000.00 in annual funding from U.S. Federal Government, State, Non-U.S. Government and Private Institutions. The main founding contributors are the Department of Energy, California Energy Commission, LADWP.

The center collaborates with the Lawrence Berkeley National Lab, LADWP, UC San Diego. SMERC has established leadership in Smart Grid in California, with quarterly workshops, utility advisory board covering 30 million ratepayers, an industry partners group of over 20 companies. The center also has several international partners in research, including Korea and Italy, and make regular contributions to California's energy policy via comments to the California Public Utilities Commission and the California Energy Commission. SMERC is a public non-profit entity.

# UCLA WINSmartGrid™

The UCLA WINSmartGrid™ is a network platform technology that allows electricity operated appliances such as plug-in automobile, washer, dryer, or, air conditioner to be wirelessly monitored, connected and controlled via a Smart Wireless hub. The WINSmartGrid™ Technology brings together the logical components of EdgeWare, Middleware and Centralware to create a flexible Smart Grid architecture.

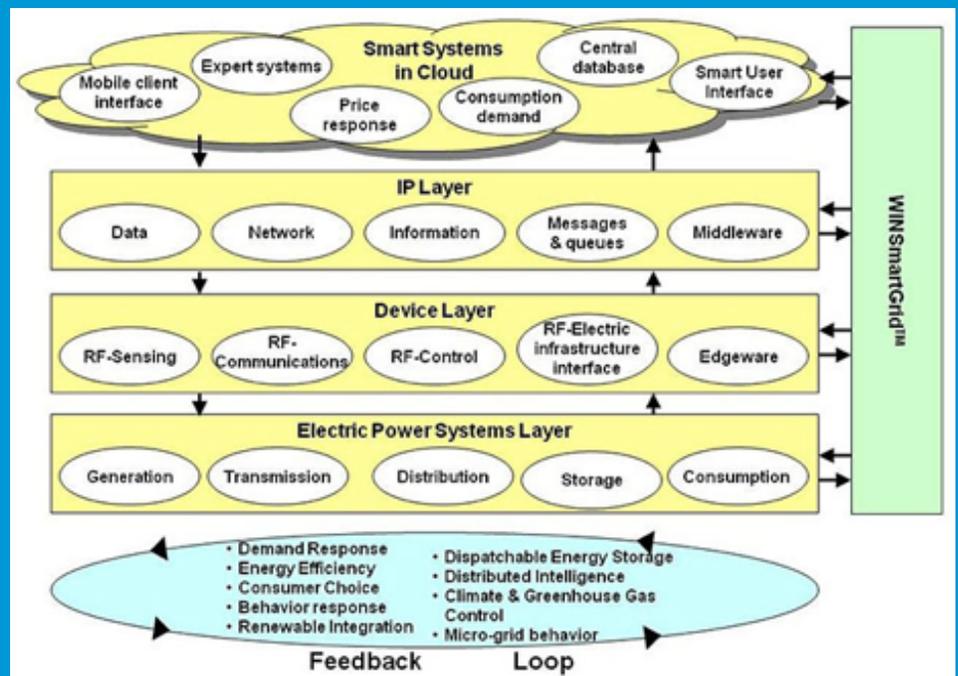
The Edgware is a combination of software and firmware that connects to and controls devices such as the temperature monitors, humidity RFID tags, motion detectors or X10 controllers on refrigerators. A variety of monitors/sensors are supported within WINSmartGrid™ including temperature, humidity, current, voltage, power, shock, motion, chemicals, etc. The Edgware controls and utilizes the wireless networks that connect to the WINSmartGrid™ hub. The WINSmartGrid™ hub supports wireless protocols such as Zigbee, Bluetooth, WiFi, GPRS and RFID, however, it appears that the 802.15.4-based low-power protocols such as Zigbee appear to hold the maximum promise. Other protocols such as WiMax and Rubee are being added. The Edge-

ware allows the creation, setup, management, control and utilization of a two-way hierarchical and low-power network.

The Middleware sits between the Edgware and the Decision making web service or Centralware. The Middleware provides functionality such as data filtration, aggregation and messaging on the raw data from the Edgware, extract meaningful infor-

mation, and route it appropriately to the correct destination / web service.

The Centralware receives real-time price feeds and other data from the utilities, has a basic set of knowledge-based rules on control decisions, and makes the control decisions that need to be executed. The WINSmartGrid™ Centralware also has the capability to connect to other Intelligent Web services to



collaborate on decision making about the control decisions – currently it is a structural interface, with a basic set of rules only. This structural web service will eventually be connected to the external intelligent services as they come on-line. Once the Centralware makes the decisions, the Middleware is informed about the control decisions via actions, which then maps and routes these control decisions to the Edgware, which in turn converts those decisions to low-level control signals for the appropriate controller (e.g. X10 controller connected to a Plug-In car).

Characteristics of the technology include:

- ▶ Low Power technology
- ▶ Standards based hardware adapted to fit the problem resulting in lower overall cost
- ▶ Wireless infrastructure for monitoring
- ▶ Wireless infrastructure for control
- ▶ Service architecture with three layers – Edgware, Middleware and Centralware
- ▶ Open architecture for easy integration
- ▶ Plug-and-Play approach to the network installation.
- ▶ Reconfigurability – The capability of the technology to be reconfigurable allows OTA (over the air) upgrade of the firmware to be able to handle different and devices, applications, sensors, controllers, thermostats, etc.



CENTER *for* ENERGY  
EFFICIENT MATERIALS

## Center for Energy Efficient Materials (CEEM)

University of California Santa

### Director Contact

John Bowers  
bowers@ece.ucsb.edu

### Center Contact

(805) 893-8447  
<http://ceem.ucsb.edu/>

### Research Areas



MATERIALS

### Research Activities



IN-HOUSE  
R&D

CEEM focuses on fundamental research in the three key areas of photovoltaics, thermoelectrics, and solid-state lighting. These technologies are strongly inter-related, not only through the materials they employ and physical principles upon which they operate, but also in the synergies resulting from operating these techniques in combination. The assembled team is uniquely positioned to pursue the proposed work based on proven expertise in these areas. While the world's growing energy needs cannot be fully addressed by any one center, the successful outcome of the proposed research will provide a critically important part to the full solution.

Established in 2009, CEEM houses approximately 25 among professors and research staff and 3 support staff and operates with funding from the Department of Energy. The center collaborates with NREL, LANL, Purdue University.



# Energy Biosciences Institute (EBI)

University of California, Berkeley

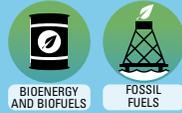
## Director Contact

Chris Somerville  
crs@berkeley.edu

## Center Contact

EBIadmin@berkeley.edu  
(510) 643-6302  
www.energybiosciencesinstitute.org/

## Research Areas



## Research Activities



The EBI is an academic, multidisciplinary research institution established to apply advanced knowledge of biology to the field of bioenergy research. Its mission is to help develop advanced biofuels that are green, sustainable, and created from non-food sources.

The Energy Biosciences Institute was formed, following an international competition invited by the global energy company BP, in late 2007 and was funded for 10 years and \$500 million (\$350 million for the public institutions).

EBI is a collaboration between four research partners: the University of California, Berkeley; the Lawrence Berkeley National Laboratory; the University of Illinois at Urbana-Champaign; British Petroleum. The institute is a public entity.



## Center for Energy Science and Technology Advanced Research (CESTAR)

University of California, Los Angeles

### Director Contact

Mohamed Abdou  
abdou@fusion.ucla.edu

### Center Contact

(310) 206-0501  
<http://www.cestar.ucla.edu/>

### Research Areas



### Research Activities



The Center for Energy Science and Technology Advanced Research (CESTAR) is an interdepartmental research center whose mission is to provide a common focal point for collaboration and synergism among researchers at UCLA involved in energy related research. CESTAR helps enable energy research at UCLA to become larger than the sum of its parts, promoting researcher teaming, expertise and equipment sharing, information exchange, invited energy research seminars. CESTAR also provides a point of contact for people outside UCLA who are interested to find information on what energy-related research is being conducted at UCLA.



# Stanford Linear Accelerator Center (SLAC)

Stanford University

## Director Contact

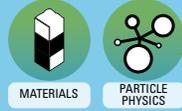
Chi-Chang Kao

## Center Contact

(650) 926-3300

[www6.slac.stanford.edu/](http://www6.slac.stanford.edu/)

## Research Areas



MATERIALS

PARTICLE PHYSICS

## Research Activities



IN-HOUSE R&D

Established in 1962, SLAC research explores the structure and dynamics of matter and the properties of energy, space and time at the smallest and largest scales, in the fastest processes and at the highest energies. These studies address questions of major scientific and technological interest to society.

The lab's longstanding collaboration with CERN in Geneva, Switzerland provided an important spark in the formative years of the World Wide Web and led to SLAC's launch of the first Web server in the United States. SLAC is also playing an important role in the ATLAS experiment at CERN's Large Hadron Collider, an international endeavor to explore the tiniest components of matter, where the elusive Higgs particle was discovered recently.



# Center for Nanoscale Controls on Geologic CO<sub>2</sub> (NCGC)

## Director Contact

Donald DePaolo  
DJDePaolo@lbl.gov  
(510) 486-7560

## Center Contact

EMAIL: DJDePaolo@lbl.gov  
(510) 486-7560  
[esd1.lbl.gov/research/facilities/ncgc/](http://esd1.lbl.gov/research/facilities/ncgc/)

## Research Areas



CARBON  
CAPTURE



MATERIALS

## Research Activities



IN-HOUSE  
R&D

To enhance the performance and predictability of subsurface storage systems by understanding the molecular and nanoscale origins of CO<sub>2</sub> trapping processes, and developing computational tools to translate to larger-scale systems.

Established in 2009 the center collaborates with the Lawrence Berkeley National Laboratory, Ohio State University, Oak Ridge, National Laboratory, Princeton University, and Purdue University.

# Spins and Heat in Nanoscale Electronic Systems (SHINES)

## Director Contact

Jing Shi  
jing.shi@ucr.edu  
TEL: (951) 827-1059

## Center Contact

glenda.barraza@ucr.edu  
(951) 827-5358  
<http://efrcshines.ucr.edu/>

## Research Areas



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The mission of SHINES is to explore the interplay of spin, charge, and heat and to control the transport of spin and energy for achieving significantly higher energy efficiencies in nanoscale electronic devices.

Established in 2014, SHINES collaborates with Arizona State University , Colorado State University, Johns Hopkins University , University of California Irvine , University of California Los Angeles , University of California Riverside, University of Texas at Austin.

# Lawrence Livermore National Laboratory

University of California

## Director Contact

William H. Goldstein  
goldstein3@llnl.gov  
(925) 423-1231

## Center Contact

(925) 422-1100  
<https://www.llnl.gov/>

## Research Areas



## Research Activities



The mission of the laboratory in the energy area is to advance the nation's security through the production, development and deployment of energy resources and technology while understanding and reducing their environmental impacts.

Established in 1952, Lawrence Livermore National Laboratory has a workforce of approximately 6,300 employees and manages an annual operating budget of approximately \$1.5 billion.



# Lawrence Berkely National Laboratory

University of California

## Director Contact

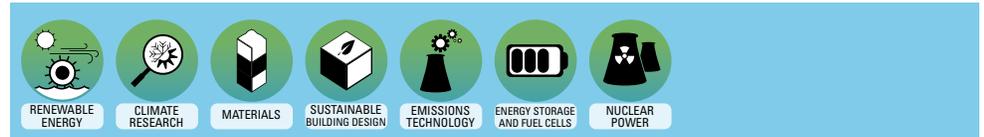
Micheal Witherell

## Center Contact

(510) 486-4000

<http://www.lbl.gov/>

## Research Areas



## Research Activities



The primary mission of the laboratory is to deliver breakthrough science and technology in the areas of Renewable energy, Energy Efficiency, Climate Change and Environmental Science, Chemistry and Physics of Matter and Force in the Universe, Computational Science and Advanced Networking and Biological Sciences for Human Health and Energy Research.

Established in 1931, the laboratory employs approximately 3,232 scientists, engineers and support staff. The Lab's total costs for FY 2015 were \$811 million.

Berkeley Lab is a member of the national laboratory system supported by the U.S. Department of Energy through its Office of Science and it is managed by the University of California (UC).

# COLORADO



## Renewable and Sustainable Energy Institute (RASEI)

University of Colorado Boulder

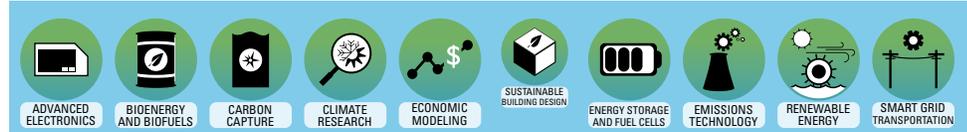
### Director Contact

Robert McGrath  
robert.mcgrath@colorado.edu  
(303) 492-8530

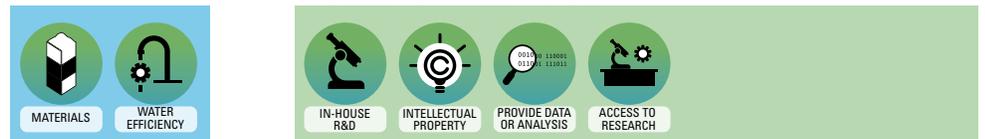
### Center Contact

inforasei@colorado.edu  
(303) 492-0284  
colorado.edu/rasei

### Research Areas



### Research Activities



RASEI (pronounced RAY-see) is a joint institute between the University of Colorado Boulder (CU Boulder) and the National Renewable Energy Laboratory (NREL) addressing important, complex problems in energy that require a multidisciplinary, multi-institutional approach. Its mission is to expedite solutions that transform energy by advancing renewable energy science, engineering, and analysis through research, education, and industry partnerships.

Established in 2009 the RASEI houses approximately eight professors, 25 research staff, seven support staff, and 20 students and operates with funding from U.S. Federal Government, State, Non-U.S. Government, Foundations. The institute is a public non-profit entity.



# Renewable Energy Materials Research Science and Engineering Center (REMRSEC)

Colorado School of Mines

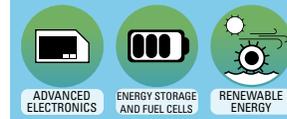
## Director Contact

Ryan Richards  
rrichard@mines.edu  
(303) 273-3612

## Center Contact

pbjohnso@mines.edu  
(303) 384-2382  
remrsec.mines.edu/

## Research Areas



## Research Activities



REMRSEC, with participation of researchers at the National Renewable Energy Laboratory, is focused on improving transformative materials to advance renewable energy technology. Research includes next-generation photovoltaics; advanced membrane technologies, essential to conversion, utilization, storage of energy and energy storage of hydrogen or methane.

Established in 2008 the REMRSEC houses approximately 44 employees; 20 professors, one research staff, three support staff, and 20 students and operates with approximately \$3,000,000.00 in annual funding from U.S. Federal Government, State, non-U.S. Government.

The center is a public non-profit entity and collaborates with the National Renewable Energy Laboratory, Carnegie Institution of Washington, Los Alamos National Laboratory on shared research projects. In some cases the partners provide samples, in other cases they characterize samples supplied by others.

## CSU Energy Institute

Colorado State University

### Director Contact

Mac McGoldrick

[mac.mcgoldrick@colostate.edu](mailto:mac.mcgoldrick@colostate.edu)

(970) 491-4793

### Center Contact

<http://energy.colostate.edu>

### Research Areas



BIOENERGY  
AND BIOFUELS



RENEWABLE  
ENERGY



SMART GRID  
TRANSPORTATION



WATER  
EFFICIENCY

### Research Activities



IN-HOUSE  
R&D

The Energy Institute serves as a nucleus of research, education, and outreach for the faculty, staff, and students of Colorado State University.

Established in 2013 CSU Energy Institute is a public entity and operates with approximately \$2,000,000.00 in annual funding from U.S. Federal Government, State, non-U.S. Government, Foundations, Private Institutions and other contributors.

# Colorado Center for Biorefining and Bioproducts

## Director Contact

Alan Weimer  
alan.weimer@colorado.edu

## Center Contact

c2b2@colorado.edu  
(303) 492.7736  
<http://www.c2b2web.org/>

## Research Areas

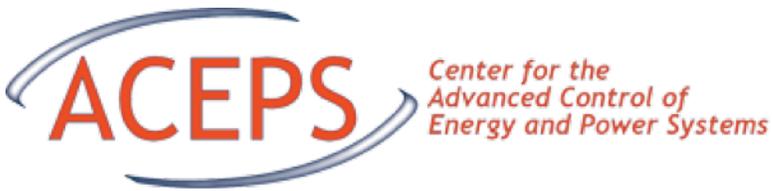


## Research Activities



Colorado Center for Biorefining and Bioproducts seeks to develop new understandings of biorefining and biofuel methodologies that are focused on the integration of renewable sources of materials and energy into the chemical industry. They strive to provide relevant training for students (BS, MS, and PhD) and industrial scientists focused on researching and developing new biorefining and biofuel applications. They work to create a vertically and horizontally integrated research and training environment, uniquely situated among three closely located universities and NREL, where academia, industry, and national labs collaborate in the development of biorefining and biofuels technologies for future commercialization.

The Colorado Center for Biorefining and Biofuels is a distinct alliance of scientific and educational dexterity. C2B2 consists of an ideal conglomeration of partner institutions which have combined resources to further the Center's objectives. The joint efforts of C2B2's four partner institutions endeavor to broaden vital knowledge of sustainable bioenergy.



## Center for the Advanced Control of Energy and Power Systems (ACEPS)

Colorado School of Mines

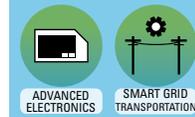
### Director Contact

Marcelo Godoy Simões  
msimoes@mines.edu  
(303) 384-2350

### Center Contact

<http://aceps.mines.edu/>

### Research Areas



### Research Activities



Center for Advanced Control of Energy and Power Systems (ACEPS) at Colorado School of Mines focuses on intelligent control systems for power systems and power electronics, real-time monitoring and advanced diagnostic systems, artificial intelligence, advanced acoustic, optical and electromechanical sensors, pollution reduction, transformers and breakers monitoring, smart substations, power quality, nondestructive evaluation, advanced power electronics, remote sensing, security, control and integration of renewable and alternative energy sources into the grid.

The center houses approximately 18 employees; eight among professors and research staff and 10 students. ACEPS is synergistically engaging efforts with other energy related centers within CSM campus such as CARDI (Center for Automation, Robotics, and Distributed Intelligence), CREW (Center for Research and Education in Wind), SolarTAC (Solar Technology Acceleration Center), ESIC (Energy Systems Integration Center) and PSERC (Power Systems Engineering Research Center).



# Engines & Energy Conversion Lab (EECL)

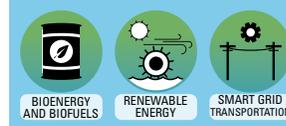
## Director Contact

Anthony Marchese  
Anthony.Marchese@colostate.edu  
(970) 491-4796

## Center Contact

Mac.McGoldrick@colostate.edu  
(970) 491-4793  
[www.eecl.colostate.edu/](http://www.eecl.colostate.edu/)

## Research Areas



## Research Activities



The EECL is now entering its second decade of delivering significant, meaningful solutions to meet the global energy challenges and opportunities of the 21st Century, providing our students and researchers the experience and tools for a lifetime of contribution. With a focus towards market driven solutions, products developed at the EECL in partnership with our Industrial Sponsors have reduced pollution in the atmosphere by millions of tons and have saved over 14 billion cubic feet of natural gas.

Established in an abandoned power plant in 1992 the laboratory houses approximately 20 among faculty and staff and 12 students and collaborates with several partners including Czero, VanDyne SuperTurbo, Inc., Envirofit, Solix and Spirae.



## Center for Next Generation of Materials by Design: Incorporating Metastability (CNGMD)

### Director Contact

William Tumas  
Bill.Tumas@nrel.gov  
(303) 384-7955

### Center Contact

<http://www.cngmd-efrc.org/>

### Research Areas



### Research Activities



The mission of the center is to dramatically transform the discovery of functional energy materials through multiple-property search, incorporation of metastable materials into predictive design, and the development of theory to guide materials synthesis.

Established in 2014 CNGMD houses 17 principal investigators and collaborates with Colorado School of Mines, Harvard University, Lawrence Berkeley National Laboratory, Massachusetts Institute of Technology, National Renewable Energy Laboratory, Oregon State University, SLAC National Accelerator Laboratory.



## National Renewable Energy Laboratory (NREL)

### Director Contact

Martin Keller  
Martin.Keller@nrel.gov  
(303) 275-3011

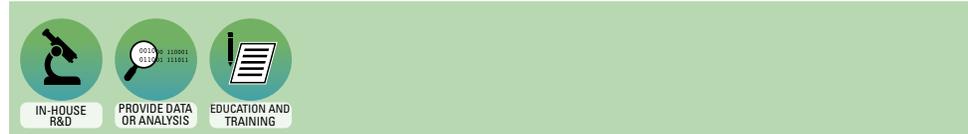
### Center Contact

(303) 275-3000  
<http://www.nrel.gov/>

### Research Areas



### Research Activities



NREL was designated a national laboratory on September 16, 1991. The laboratory advances the science and engineering of energy efficiency, sustainable transportation, and renewable power technologies and provides the knowledge to integrate and optimize energy systems.

The laboratory has more than 600 active partnership agreements including with small and large businesses, non-profits and educational institutes, as well as local, state, and federal government.

# CONNECTICUT



## Center for Clean Energy Engineering (C2E2)

University of Connecticut

### Director Contact

Prabhakar Singh  
singh@engr.uconn.edu  
(860) 486-8379

### Center Contact

(860) 486-9204  
<http://www.energy.uconn.edu/>

### Research Areas



MATERIALS

### Research Activities



IN-HOUSE  
R&D

The center's Mission is to become a leader in transforming science to systems; bridging the gap from fossil fuels to hydrogen economy; enabling industries and organizations in the development of cost effective and timely solutions for critical technical issues; and providing guidance and leadership in solving global societal issues ranging from sustainable energy to the environment.

The Center for Clean Energy Engineering houses 12 Resident Faculty, 15 Affiliated Faculty & Research Specialist, six Postdoctoral Fellows, 52 Graduate & Masters Students, seven Administrative & Laboratory Support Staff.

As a public-private partnership, the C2E2 collaborates with a broad range of national and international partners in the pursuit of excellence in education, training, innovation, research and development, systems engineering and demonstration. Among our recent partners are: United Technologies Corporation Center, Praxair, United State Department of Energy (DOE), Oak Ridge National Laboratory.

# DISTRICT OF COLUMBIA



## Energy Frontier Research in Extreme Environments Center (EFree)

Carnegie Institution of Washington

### Director Contact

Russell J. Hemley  
rhemley@ciw.edu  
(202) 478-8951

### Center Contact

<https://efree.carnegiescience.edu/>

### Research Areas



### Research Activities



The mission of the center is to accelerate the discovery and synthesis of new energy materials using extreme conditions. Established in 2009, EFree operates with federal funding and its main contributor is the U.S. Department of Energy.

The center collaborates with Penn State, Lehigh University, Colorado School of Mines, Caltech, and Cornell University.

# DELAWARE



## Center for Carbon-free Power Integration (CCPI)

University of Delaware

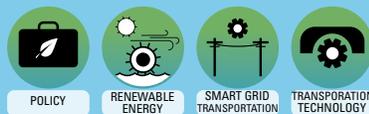
### Director Contact

Jeremy Firestone  
jf@udel.edu  
(302) 831-0228

### Center Contact

[www.carbonfree.udel.edu](http://www.carbonfree.udel.edu)

### Research Areas



### Research Activities



The Center for Carbon-free Power Integration (CCPI) at the University of Delaware (UD) fosters interdisciplinary and collaborative scientific research; engages decision makers, industry and civil society and acts as an “honest broker” among them; and enhances the education of the present generation of students with the goal of facilitating the transition to power generation using carbon-free geophysical flows.

Established in 2008, the CCPI houses approximately 16 professors, three research staff and 10-30 students and operates with funding from U.S. Federal Government, State, Private Institution and other contributors. The Center is a private non-profit entity.

# Center for Fuel Cell Research

University of Delaware

## Director Contact

Ajay K. Prasad  
prasad@udel.edu  
(302) 831-2960

## Center Contact

<http://cfcr.udel.edu/>

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS



MATERIALS

## Research Activities



IN-HOUSE  
R&D



INTELLECTUAL  
PROPERTY



PERFORM  
DEMONSTRATIONS



SPIN-OFF  
COMPANIES



PROVIDE DATA  
OR ANALYSIS



ACCESS TO  
RESEARCH

The mission of the center is to promote basic and applied research to improve fundamental understanding of fuel cells, and address critical barriers to commercialization; provide students with the opportunity to participate in fuel cell research and demonstration projects; support companies engaged in the development of fuel cells, as well as hydrogen production, storage and distribution; create an opportunity for national and international recognition and a platform for economic growth in Delaware.

Established in 2009 the center houses approximately 15 professors, two research staff, and 40 students and operates with funding from U.S. Federal Government and from Industry. The main contributors are the Federal Transit Administration and the Department of Energy.

The center collaborates with Los Alamos National Laboratory and Argonne National Laboratory. These partners provide materials for testing, conduct simulations and jointly analyze and interpret experimental data.

# Fuel Cell Bus Program



When the bus is turned on, electricity flows from the batteries to the traction motor, powering the final drive which turns the rear wheels. During operation, if the battery state-of-charge drops below 60%, the fuel cell turns on and provides electricity to the system, to help power the bus and/or recharge the batteries. The bus is equipped with regenerative braking so that when the brakes are applied, the kinetic energy of the bus is converted back to electricity by the traction motor and stored in the batteries.

Our Fuel Cell Bus Program commenced in 2005 with funding from the Federal Transit Administration. Our goal is to develop, build, and deploy a fleet of fuel cell/battery hybrid buses and hydrogen refueling stations within the state of Delaware. The long term goal is to demonstrate that fuel cell transit buses are safe, reliable, non-polluting, and cost-effective. Our fleet currently consists of three fuel cell/battery hybrid buses. Bus 1 (22-ft) has been in opera-

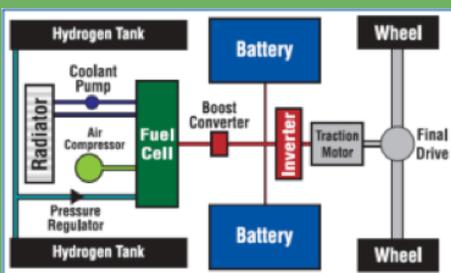
tion since 2007, and Bus 2 (also 22-ft) since 2009; hundreds of students are transported by them every day across our campus. A third “standard” size 40-ft bus was added in 2015.

### How the Fuel Cell Hybrid System Works

This is a completely electric vehicle, meaning no combustion takes place and no harmful emissions are generated. This is a battery-heavy hybrid in that the batteries are used as the primary source of electric power for the drive motor, while the fuel cell stack is used to slowly recharge the batteries. Therefore, the fuel cell acts a range extender.

### What Makes This Bus Different?

This bus emits zero greenhouse gases, is significantly quieter than a typical diesel transit bus, and gets better gas mileage (15 mpgge for the fuel cell bus, compared to approximately 5.5 mpg for a typical diesel transit bus). Also, by using a smaller fuel cell stack than similar sized fleet fuel cell buses, the overall cost is greatly reduced. This makes the bus more affordable for transit agencies wishing to incorporate new fuel cell technology into their program.





# Delaware Biotechnology Institute

University of Delaware

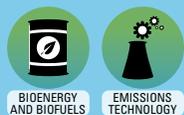
## Director Contact

Kelvin H. Lee  
(302) 831-0344

## Center Contact

biotech@udel.edu  
(302) 831.4888  
<http://www.dbi.udel.edu/>

## Research Areas



## Research Activities



Delaware Biotechnology Institute scientists use molecular and cellular methods to address important problems related to energy and the environment. Innovative work that programs microorganisms to produce next generation fuels and commonly used chemical from renewable resources leads to a more sustainable future. The institute is also exploring how microbes function in the environment and in biogeochemical cycles and is discovering some of the spectacular biology and chemistry that viruses perform in the planet's oceans in addition to helping monitor changes in ocean temperatures. Many of these efforts rely on the latest technologies for genome sequencing as well as on the expertise of computer scientists.

The Delaware Biotechnology Institute houses approximately 17 resident faculty, over 50 affiliated faculty and 22 staff, which includes administrative and building staff, as well as technical staff in research core facilities.

The institute collaborates among the others with Christiana Care Health System, Delaware Bio, Delaware Economic Development Office (DEDO), Delaware State University, Delaware Technical Community College.



# Institute of Energy Conversion

University of Delaware

## Director Contact

Robert W. Birkmire  
rwb@udel.edu  
(302) 831-6220

## Center Contact

iec-solar@udel.edu  
(302) 831-6200  
<http://www1.udel.edu/iec/>

## Research Areas



## Research Activities



The mission of the Institute of Energy Conversion is to develop the fundamental science and engineering base required to improve photovoltaic device performance and processing technologies, then effectively transfer these laboratory results to large-scale manufacturing.

Established in 1972 IEC houses approximately 11 faculty and research staff, one support staff, 11 affiliated faculty and 14 students and is affiliated with the Integrated Graduate Education and Research Training Program (IGERT) and Solar Economy Integrative Graduate Education and Research Training (SEIGERT)



# Catalysis Center for Energy Innovation (CCEI)

University of Delaware

## Director Contact

Dion Vlachos  
vlachos@udel.edu  
(302) 831-2830

## Center Contact

efrc-info@udel.edu  
(302) 831-1628  
<http://www.efrc.udel.edu/index.html>

## Research Areas

- BIDENERGY AND BIOPUELS
- ECONOMIC MODELING
- MATERIALS
- ENERGY STORAGE AND FUEL CELLS

## Research Activities

- IN-HOUSE R&D
- PERFORM DEMONSTRATIONS
- INTELLECTUAL PROPERTY
- SPIN-OFF COMPANIES
- PROVIDE DATA OR ANALYSIS
- SHARED FACILITIES
- EDUCATION AND TRAINING

The mission of the center is to develop the enabling science for viable operation of biorefineries from various ligno-cellulosic biomass feedstocks using heterogeneous catalysis; educate the workforce needed to implement these new technologies; facilitate technology transfer strategically via joint ventures with industrial partners.

Established in 2009, CCEI is a non-profit entity and houses 22 professors, 21 research staff, two support staff and 62 students and operates with approximately \$3,200,000 in annual funding from U.S. Federal Governments and from the Industry; the main founding contributors are DOE, NSF, ARL.

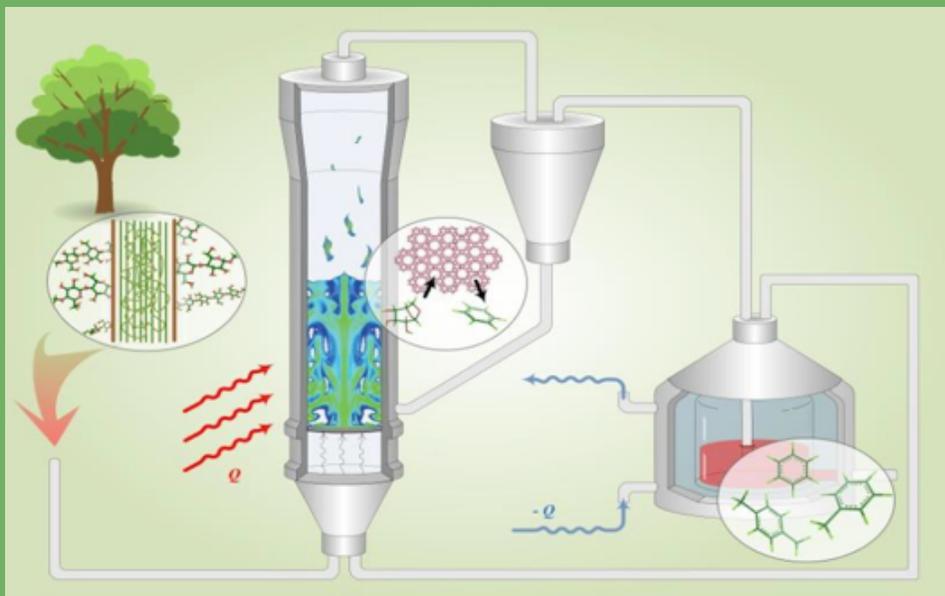
The center collaborates with Columbia University, University of Minnesota, California Institute of Technology, University of Massachusetts, University of Pennsylvania. Its collaborative approach is multiscale in nature as the center pass information from one scale to another and in reverse with scales being researched by various groups. CCEI work synergistically by creating enabling technologies in material synthesis, characterization, and computations, and sharing those with the catalysis and technology groups which in turn define new scientific frontiers for the enabling research groups.

# Pumping up the Biofuel Yield

Researchers combine an advanced catalyst with a next-generation biofuel process to significantly improve the yield of biofuels.

Reaction engineers from the Catalysis Center for Energy Innovation at the University of Massachusetts have invented a catalytic process that significantly improves the yield of biofuel from biomass. The research team led by Professors Wei Fan and George Huber can take wood or other biomass sources and feed them directly into their process, Catalytic Fast Pyrolysis (CFP). Within the reactor, particles of biomass are rapidly heated within seconds to 900 °F, and the wood breaks down to small molecules which evaporate. In the second step within the reactor, the volatile molecules are catalytically reacted to produce higher value products such as benzene, toluene, and xylenes (key components of fuels such as gasoline). The team has discovered that the introduction of a gallium-zeolite (Ga/ZSM-5) significantly increases the yield of aromatics and reduces the amount of wasted biomass which is converted to char. Using this catalyst, the overall aromatics yield increases to 23%, which is a 40% improvement over the use of previous

catalysts within CFP. This advance can get closer to the goal of catalytic fast pyrolysis being economically viable. This process is rapidly moving from the research laboratory and into the development stage. The team's catalytic fast pyrolysis technology has already been licensed to Anellotech, Inc. Development of a full-scale CFP process could contribute to a petrochemicals industry valued at an estimated \$400 billion annually.



*Schematic of catalytic fast pyrolysis*



# Center for Energy Environmental Policy (CEEP)

University of Delaware

## Director Contact

John Byrne

[jsseo@udel.edu](mailto:jsseo@udel.edu)

## Center Contact

(302) 831-3098

<http://ceep.udel.edu/>

## Research Areas



POLICY

## Research Activities



IN-HOUSE  
R&D



EDUCATION AND  
TRAINING

Established in 1980 the Center is a leading institution for interdisciplinary graduate education, research, and advocacy in energy and environmental policy that operates with funding from organizations around the world; the main founding contributors are W. Alton Jones Foundation/Blue Moon Fund, United Nations Development Program (UNDP), United Nations Environment Program (UNEP).

CEEP collaborates on research projects with partners around the world. The center works with the Australia Conservation Foundation (Australia), Environment and Planning, Royal Melbourne Institute of Technology (Australia), Center for Technology and Society, University of Toronto (Canada), Institute of Policy and Management, Chinese Academy of Science (China), Center for Environmental Science, Peking University (China).

# FLORIDA



## Future Fuels Institute (FFI)

Florida State University

### Director Contact

[rodgers@magnet.fsu.edu](mailto:rodgers@magnet.fsu.edu)

(850) 644-2398

### Center Contact

[www.research.fsu.edu/  
research-offices/future-fuels-  
institute/](http://www.research.fsu.edu/research-offices/future-fuels-institute/)

### Research Areas



BIOENERGY  
AND BIOFUELS



FOSSIL  
FUELS



HEAVY OIL  
CHARACTERIZATION

### Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS

The Future Fuels Institute (FFI) was established to serve as a global center of excellence for fuels research and development derived from biological and fossil resources. The knowledge gained will be used to better understand the science of fuels at the molecular level and the advancement of state-of-the-art technology as related to fuel generation and usage. The institute will also serve as a center of education and training for future professionals to serve the fuel-related science and technology communities.

The Future Fuels Institute employs five research staff and is supported by sponsoring companies and collaborative entities (instrument companies, universities and research institutes) to develop advance and novel techniques for research applications and problem solving. The institute also serves for the communities as a training center for fuel related science and technology and is a non-profit entity.

# Southeast National Marine Renewable Energy Center

Florida Atlantic University

## Director Contact

Gabriel Alsenas  
galsenas@fau.edu

## Center Contact

snmrec@fau.edu  
(561) 297-0956  
<http://snmrec.fau.edu/>

## Research Areas



## Research Activities



The Southeast National Marine Renewable Energy Center at Florida Atlantic University seeks to advance the science and technology of recovering energy from the oceans' renewable resources, with special emphasis on those resources available to the southeastern US: initially focusing on ocean currents and offshore thermal resources. By playing a leadership role, the SNMREC helps promote economic development and energy independence for the nation.

The Southeast National Marine renewable Energy Center is a non-profit entity that employs over five full-time staff and offers numerous opportunities for students.

The main funding sources are the Department of Energy, State of Florida, and private organizations. The center receives support from institutions such as the Coastal Studies Institute in North Carolina, Embry-Riddle Aeronautical University, Virginia Tech, Florida Keys Community College, and other private-industry organizations.

# Center for Advanced Power Systems (CAPS)

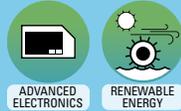
## Director Contact

Dr. Roger D. McGinnis Sr.  
mcginnis@caps.fsu.edu  
(850) 645-1183

## Center Contact

webmaster@caps.fsu.edu  
(850) 644-1035  
<http://www.caps.fsu.edu/>

## Research Areas



## Research Activities



The Center for Advanced Power Systems (CAPS) is a multidisciplinary research center organized to perform basic and applied research to advance the field of power systems technology. CAPS emphasis is on application to electric utility, defense, and transportation, as well as, developing an education program to train the next generation of power systems engineers. The research focuses on electric power systems modeling and simulation, power electronics and machines, control systems, thermal management, cyber-security for power systems, high temperature superconductor characterization and electrical insulation research.

The center houses approximately eight faculty, 20 research staff, five support staff, and approximately 35 students and operates with around \$8 million in annual funds from organizations such as the U.S. Navy, Office of Naval Research and the Department of Energy. CAPS also collaborates with the Center for Electro Mechanics, University of South Carolina, Purdue University, Massachusetts Institute of Technology, and Virginia Tech and is a non-profit entity.

# Applied Research Center (ARC)

Florida International University

## Director Contact

Dr. Inés Triay

## Center Contact

aguirrec@fiu.edu

(305) 348-4238

<http://www.arc.fiu.edu/contact-us/>

## Research Areas



## Research Activities



The Applied Research Center (ARC) has been performing R&D and technology development for the environmental cleanup of the US Dept. of Energy Nuclear Weapons Complex sites across the USA since 1995. ARC engineers, scientists and students apply specialized knowledge and skills in state-of-the-art research facilities to understand the underlying science and develop and deploy technology solutions to complex environmental challenges while training the environmental workforce of tomorrow. For energy research ARC collaborates with FIU's College of Arts, Sciences, and Education to develop R&D and support the growth of the PhD Radiochemistry track and Health Physics Specialty under the BS in Physics. Energy research areas at ARC are: nuclear power; clean coal and green and sustainable technologies.

The Applied Research Center houses approximately 28 research and support staff and 10 Interns/Assistants/Fellows.

The Center has numerous clients and collaborative ventures across the public and private sectors. Many of the federal partners include the national labs, Department of Energy, Department of Defense, National Aeronautics and Space Administration, and the U.S. Army Research Office.



# Florida Solar Energy Center (FSEC)

University of Central Florida

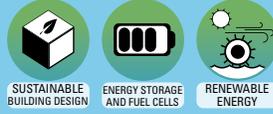
## Director Contact

Dr. James Fenton  
jfenton@fsec.ucf.edu  
(321) 638-1002

## Center Contact

(321) 638-1000  
<http://www.fsec.ucf.edu/en/>

## Research Areas



## Research Activities



The mission of the center is to research and develop energy technologies that enhance Florida's and the nation's economy and environment and to educate the public, students and practitioners on the results of the research.

Established in 1975 to serve as the state's energy research institute, The Florida Solar Energy Center houses approximately 100 employees, intermixes with faculty, support staff, and research staff.

# Energy & Sustainability Center (ESC)

Florida State University

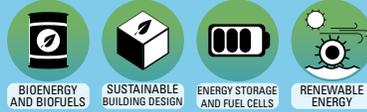
## Director Contact

Dr. Anjaneyulu Krothapalli  
kroth@eng.fsu.edu  
(850) 644-5885

## Center Contact

<http://esc.fsu.edu/kroth.html>

## Research Areas



## Research Activities



The Energy and Sustainability Center (formerly Sustainable Energy Science and Engineering Center) addresses challenging alternative energy issues through innovative solutions for consumers and industry. The need for energy systems that have lower emissions of CO<sub>2</sub> and other greenhouse materials is of paramount importance. The center houses approximately 10 employees; four faculty, one support staff, and five students.

# Nanoscience Technology Center (NSTC)

University of Central Florida

## Director Contact

Dr. Sudipta Seal  
Sudipta.Seal@ucf.edu  
(407) 823-5277

## Center Contact

nano@ucf.edu  
(407) 882-1578  
<http://nanoscience.ucf.edu/>

## Research Areas



MATERIALS

## Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

The goal and purpose of the centers is to strongly promote interdisciplinary research. Research opportunities in areas as diverse as Green Energy, In Vitro Test Systems, Functional Nanomaterials, Computer/Mathematical Simulations, Assistive Robotics, Quantum Dynamics, Bioimaging, NanoElectronics & NanoPhysics, Integrated Device Development and Advanced Materials have been explored. The work of the center intersects with research areas including biology, medicine, energy, microelectronics, and nanotechnology. The expectations are to further these applications, initiate advances in biomaterials and continue collaborative work in energy, optics and other fields. NSTC has already surpassed expectations in the field of Nanotechnology and has attained academic and research distinction in its own right.

Established in 2005, the Nanoscience Technology Center is a non-profit entity that employs over 24 employees; 14 research staff, 10 support staff, as well as many students and a large faculty group committed to the organization.

The Center collaborates with the Advanced Materials Processing and Analysis Center (AMPAC) and has many federal partners, including the National Institutes of Health, National Science Foundation, National Aeronautics and Space Administration, Defense Advanced Research Projects Agency, the Army Research Laboratory, and the U.S. Department of Energy.

# Advanced Materials Processing and Analysis Center (AMPAC)

University of Central Florida

## Director Contact

Dr. Sudipta Seal  
Sudipta.Seal@ucf.edu  
(407) 823-5277

## Center Contact

[ampac.research.ucf.edu/index.php](http://ampac.research.ucf.edu/index.php)

## Research Areas



MATERIALS

## Research Activities



IN-HOUSE  
R&D



EDUCATION AND  
TRAINING

The overall mission of the Center is to achieve excellence in materials research and education through combining resources of UCF and local industries in order to provide comprehensive solutions to complex technical challenges. AMPAC strives to excel in the development, processing and characterization of advanced materials, including structural, electronic, optical, and nanomaterials and to achieve national prominence in targeted research areas that include energy, biotechnology, microelectronics, laser materials, and nanotechnology.

Established in 1998, AMPAC houses 10 faculty members, 48 graduate students, eight undergraduate students, four technical personnel, and four administrative staff members, with an additional 17 affiliated faculty members.

Using an interdisciplinary team approach, AMPAC provides resources to industry, government, and university partners to find comprehensive solutions to complex, multi-faceted problems.

# Center for Actinide Science & Technology (CAST)

Florida State University

## Director Contact

Thomas Albrecht-Schmitt  
albrecht-schmitt@chem.fsu.edu  
(850) 841.9525

## Center Contact

[science.energy.gov/~media/bes/efrc/pdf/technical-summaries/Florida\\_State\\_Albrecht-Schmitt\\_technical\\_2016-08.pdf](http://science.energy.gov/~media/bes/efrc/pdf/technical-summaries/Florida_State_Albrecht-Schmitt_technical_2016-08.pdf)

## Research Areas



## Research Activities



The mission of the center is to unite materials chemists, separations scientists, condensed matter physicists, and theoreticians into a cohesive research unit with the common goal of solving long standing problems associated with the nuclear legacy of the Cold War.

Established in 2016, the center collaborates with Florida State University, Florida International University, National High Magnetic Field Laboratory, Lawrence Berkeley National Laboratory, Purdue University, Los Alamos National Laboratory, University of Pennsylvania.

# GEORGIA



## Center for Organic Photonics and Electronics (COPE)

Georgia Institute of Technology

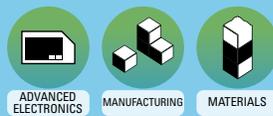
### Director Contact

Bernard Kippelen  
kippelen@gatech.edu

### Center Contact

nano@ucf.edu  
(404) 894-4040  
<http://www.cope.gatech.edu/>

### Research Areas



### Research Activities



The Georgia Tech Center for Organic Photonics and Electronics (COPE) is a premier national research and educational resource center that creates flexible organic photonic and electronic materials and devices that serve the information technology, telecommunications, energy, and defense sectors. COPE creates the opportunity for disruptive technologies by developing new materials with emergent properties and by providing new paradigms for device design and fabrication.

COPE is a non-profit entity that houses 36 faculty from several different schools within the university and operates with funding from federal organizations such as Department of Energy, Department of Defense, and National Science Foundation.

The center has partnered with industry leaders, such as Solvay and collaborated with international organizations such as the Imperial College London, Chinese Academy of Sciences, and Korean Advanced Institute of Science and Technology.



# University Center of Excellence for Photovoltaics (UCEP)

Georgia Institute of Technology

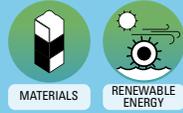
## Director Contact

Dr. Ajeet Rohatgi  
(404) 894-7692  
ajeet.rohatgi@ece.gatech.edu

## Center Contact

[www2.ece.gatech.edu/research/  
UCEP/](http://www2.ece.gatech.edu/research/UCEP/)

## Research Areas



MATERIALS

RENEWABLE  
ENERGY

## Research Activities



IN-HOUSE  
R&D

PROVIDE DATA  
OR ANALYSIS

EDUCATION AND  
TRAINING

PERFORM  
DEMONSTRATIONS

The mission of the Center is to improve the fundamental understanding of the science and technology of advanced PV devices, to fabricate record high efficiency solar cells, to provide training and enrich the educational experience of students in this field, and to give the U.S. a competitive edge by providing guidelines to industry and DOE for achieving cost-effective and high-efficiency PV devices.

UCEP houses 10 faculty and support staff, 10 graduate students, and numerous undergraduates. The center also receives assistance from a large group of faculty and researchers to further support their research.

# Brook Byers Institute for Sustainable Systems (BBISS)

Georgia Institute of Technology

## Director Contact

John Crittenden

[john.crittenden@ce.gatech.edu](mailto:john.crittenden@ce.gatech.edu)

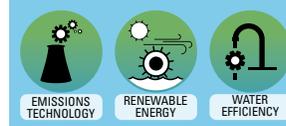
## Center Contact

[susan.ryan@sustain.gatech.edu](mailto:susan.ryan@sustain.gatech.edu)

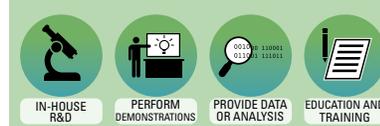
(404) 894-7895

<http://sustainable.gatech.edu/>

## Research Areas



## Research Activities



The Brook Byers Institute for Sustainable Systems conducts and facilitates research that integrates science, technology, social science, policy, planning, design, and business to improve environmental, social, and economic outcomes. While its interests span across a wide range of research problems, the BBISS is particularly focused on the emerging science of Gigatechnology. Gigatechnologies are the largest engineered systems that humans create: infrastructure, such as transportation networks, energy grids, water, sewer, and storm water systems, and food production and distribution systems. Gigatech is more than just the designing, building, and operating of big systems however. More importantly, it is about the properties that emerge as a result of big systems interacting with each other, and with social, economic, and natural systems. The BBISS specializes in a Team Science approach that enables large and diverse research teams to compete for grants and partner with other organizations to understand how these massive and complex systems function, and to develop means for managing them.

BBISS houses three faculty, nine support staff, and a large group of visiting scholars, affiliated faculty, and visiting students and is a non-profit entity.

# Renewable Energy and Engines Laboratory

Georgia Southern University

## Director Contact

Dr. Valentin Soloiu  
vsoloiu@georgiasouthern.edu  
(912) 478-2293

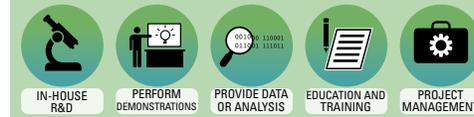
## Center Contact

[ceit.georgiasouthern.edu/engine/](http://ceit.georgiasouthern.edu/engine/)

## Research Areas



## Research Activities



The research team at the Renewable Energy and Engines Center identifies renewable sources of energy and design and evaluate products to capture the energy in a useable form for commercial or residential use in the region. The research team also assists industries in energy consumption analysis, appropriate strategies for conservation of energy, and preservation of our environments. In addition to creating a regional repository of technology that showcases energy application, these activities will help advance the State of Georgia and the region through the benefits of higher education.

Established in 2008 the Renewable Energy and Engines Laboratory houses one professor and 28 students and operates with funding from U.S. federal governments. The main founding contributors are NSF, DOE, EPA.

The center is a public entity and collaborates with the Wayne State University and UGA providing experimental data and simulation analysis.

# Center for Understanding and Control of Acid Gas-induced Evolution of Materials for Energy (UNCAGE-ME)

Georgia Institute of Technology

## Director Contact

Krista S. Walton

(404) 894-5254

krista.walton@chbe.gatech.edu

## Center Contact

<http://efrc.gatech.edu/>

## Research Areas



CARBON  
CAPTURE



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The mission of the center is to develop a deep knowledge base in the characterization, prediction, and control of acid-gas interactions with a broad class of materials to accelerate materials discovery for large-scale energy applications.

Established in 2014 the center is one of the new Energy Frontier Research Centers (EFRCs) financed with a four-year \$11.2 million grant from the U.S. Department of Energy and houses around 72 among direction, management team, research staff and students.

The center collaborates with Georgia Institute of Technology, Lehigh University, Oak Ridge National Laboratory, Pennsylvania State University, University of Alabama, University of Wisconsin, Washington University in St. Louis.

# HAWAII



## Hawaii Natural Energy Institute (HNEI)

University of Hawaii at Manoa

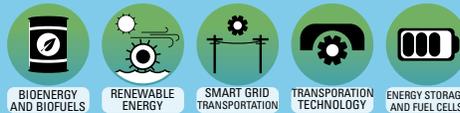
### Director Contact

Richard E. Rocheleau  
(808) 956-8346  
rochelea@hawaii.edu

### Center Contact

hnei@hawaii.edu  
(808) 956-8890  
<http://www.hnei.hawaii.edu/>

### Research Areas



### Research Activities



The Hawaii Natural Energy Institute (HNEI), a research unit of the School of Ocean and Earth Science and Technology (SOEST), University of Hawaii at Manoa (UHM), conducts research of state and national importance to develop, test and evaluate novel renewable energy technologies. The Institute leverages its in-house work with public-private partnerships to demonstrate real-world operations and enable integration of emerging technologies into the energy mix. Founded in 1974, HNEI was established in statute in 2007 to address critical State energy needs.

Established in 1974, HNEI houses approximately 71 among faculty, research and administration staff, and engineers and is a non-profit entity.

# KANSAS



## Center for Environmentally Beneficial Catalysis (CEBC)

University of Kansas

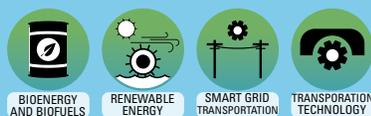
### Director Contact

Dr. Bala Subramaniam  
(785) 864-2903  
bsubramaniam@ku.edu

### Center Contact

cebc@ku.edu  
(785) 864-6050

### Research Areas



### Research Activities



The mission of the center is to invent cleaner, safer, energy-efficient technologies that protect the planet and human health. Researchers at KU's Center for Environmentally Beneficial Catalysis are developing cost-competitive chemical manufacturing processes that prevent waste and conserve natural resources. CEBC's internationally recognized faculty members offer a novel mix of expertise in developing catalytic processes. The industry-focused approach of the center helps push research discoveries toward commercialization and provides unique training opportunities for students.

CEBC is a non-profit entity that houses approximately 18 faculty and leadership staff, eight research and support staff, and 11 students.

The center has many industry partners and allows many to participate in a membership program to that strengthens the relationship between the center and its collaborators.

# Center for Sustainable Energy (CSE)

Kansas State University

## Director Contact

Mary Rezac  
rezac@ksu.edu  
(785) 532-4317

## Center Contact

energy@ksu.edu  
(785) 532-2029  
<http://cse.ksu.edu/>

## Research Areas



BIOENERGY  
AND BIOPUELS



RENEWABLE  
ENERGY

## Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

The Kansas State University Center for Sustainable Energy, through research and educational efforts, seeks to provide sustainable, renewable energy while maintaining the environment and providing an adequate food supply.

CSE is a non-profit entity that houses approximately 16 faculty and 15 Students in their Integrative Graduate Education and research Traineeship Program. Current sponsors of the include Phillips 66 and the National Science Foundation.

# KENTUCKY



## Center for Applied Energy Research (CAER)

University of Kentucky

### Director Contact

Rodney Andrews  
(859) 257-0265  
rodney.andrews@uky.edu

### Center Contact

caer-info@uky.edu  
(859) 257-0200  
<http://www.caer.uky.edu/>

### Research Areas



### Research Activities



The University of Kentucky Center for Applied Energy (CAER) investigates energy technologies to improve the environment. Researchers contribute to technically-sound policies related to fossil and renewable energy.

CAER houses a multidisciplinary staff composed of 12 faculty, 81 research staff, 15 support staff, and 24 students and operates with annual research funding of around \$15 million.

The center collaborates with groups such as the Department of Energy, Department of Defense, National Science Foundation, as well as electric utility companies and petrochemical companies and is a non-profit company.

# CONN Center for Renewable Energy Research

University of Louisville

## Director Contact

Mahendra Sunkara  
mahendra@louisville.edu  
(502) 852-8574

## Center Contact

conn.center@louisville.edu  
(502) 852-8597  
<http://conncenter.org/>

## Research Areas



## Research Activities



The mission of the Conn Center for Renewable Energy Research is to conduct and facilitate R&D on potentially commercializable renewable energy and energy efficiency technologies.

The Conn Center partners with universities, utilities, and businesses while actively pursuing federal grants, state government funds, industry partnerships, and private benefaction.

Established in 2009, CONN houses 28 professors, 16 research staff, three support staff, and 45 students and operates with approximately \$5,000,000 in annual funding from U.S. Federal Government and from private benefactors. The main contributors are the University of Louisville and the National Science Foundation.

CONN collaborates with University of Kentucky, Louisville Gas & Electric, Integro Earth Fuels, LLC, Pyrochem, Advanced Energy Materials, LLC and is a non-profit entity.

# IDAHO



## Center for Advanced Energy Studies (CAES)

Idaho State University

### Director Contact

Dr. Steven Aumeier  
steven.aumeier@inl.gov  
(208) 526-6997

### Center Contact

(208) 526-1784  
<https://caesenergy.org/>

### Research Areas



### Research Activities



CAES is a public research center focused on collaboration that inspires innovation, fueling energy transitions and economic growth for the future.

The center houses 25 staff, not-including partner organizations, which includes administration, research, and support personnel.

CAES is part of a consortium that includes Boise State University, Idaho National Laboratory, Idaho State University, University of Idaho, and the University of Wyoming and is a public entity.



# Idaho National Laboratory (INL)

Idaho State University

## Director Contact

Dr. Mark Peters

## Center Contact

(866) 495-7440

<https://www.inl.gov/>

## Research Areas



## Research Activities



The mission of the laboratory is to discover, demonstrate and secure innovative nuclear energy solutions, other clean energy options and critical infrastructure.

Established in 2005, INL is the fifth-largest employer in Idaho with 3,900 employees and more than 350 interns. In 2015, INL had a total business volume of \$917.1 million and spent \$130 million with Idaho's small businesses

INL was selected by President Barack Obama in 2015 to lead the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative. This initiative is a collaborative effort among INL, Oak Ridge National Laboratory, and Argonne National Laboratory.

# ILLINOIS



## Argonne National Laboratory

University of Chicago

### Director Contact

Peter B. Littlewood  
pblittlewood@anl.gov

### Center Contact

(630) 252-2000  
<http://www.anl.gov>

### Research Areas



### Research Activities



Argonne is a multidisciplinary science and engineering research center, where talented scientists and engineers work together to answer the biggest questions facing humanity, from how to obtain affordable clean energy to protecting ourselves and our environment. Ever since it was born out of the University of Chicago's work on the Manhattan Project in the 1940s, its goals have been to make an impact from the atomic to the human to the global scale.

Argonne National Laboratory employees 3,298 full time employees, 1,623 scientists and engineers, 315 postdoctoral scholars, 457 graduate and undergraduate students, 248 joint faculty, 7,186+ facility users.

Argonne National Labs is a federally funded research center with close ties to local nearby Universities and is a public entity.



# Argonne-Northwestern Solar Energy Research Center (ANSER)

Northwestern University

## Director Contact

Dr. Michael R. Wasielewski  
m-wasielewski@northwestern.edu  
(847) 467-1423

## Center Contact

www.anser.northwestern.edu/  
(847) 467-2519  
anser@northwestern.edu

## Research Areas



## Research Activities



The mission of the ANSER Center is to revolutionize our understanding of molecules, materials and methods necessary to create dramatically more efficient technologies for solar fuels and electricity production. ANSER will realize this vision by understanding and characterizing the basic phenomena of solar energy conversion dynamics, by designing and synthesizing new nanoscale and mesoscale architectures with extraordinary functionality, and by linking basic solar energy conversion phenomena across time and space to create emergent energy conversion systems operating with exceptional performance. Concurrently, the ANSER Center remains committed to creating and mentoring a technically excellent workforce capable of solving energy-related problems far into the future.

The Center houses 52 professors and research staff, three support staff and 48 students. In June 2014, the Department of Energy (DOE) renewed ANSER's original 2009 Energy Frontier Research Center (EFRC) grant (\$19.0 million, 5-years) for an additional \$15.2 million, 4-year term.

ANSER is the result of a collaborative effort between Argonne National Labs and Northwestern University and is a public entity.



# Center for Power Optimization of Electro-Thermal Systems (POETS)

University of Illinois at Urbana Champaign

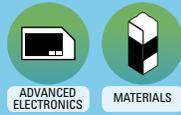
## Director Contact

Andrew Alleyne  
alleyne@illinois.edu  
(217) 244-9993

## Center Contact

<http://poets-erc.org/>

## Research Areas



## Research Activities



POETS long term goal is to increase the power density of current mobile electrified systems by 10-100 times over current state of the art systems. While ambitious, this would have profound impact on a mobile electrified infrastructure of the U.S. and beyond. On-highway vehicles could save between 100-300 million liters of fuel per year and could nearly double the range of all-electric vehicles. Off-highway vehicles could save on the order of 100 billion liters of fuel since their electrification is starting from a less mature point than current on-highway vehicles. Similarly, aircraft could see 10-30 billion liters of fuel saved as well as up to 10 million tons of CO<sub>2</sub> saved from going into the high altitude atmosphere. These economic and environmental impacts are just the beginning of the art of the possible with the achievement of the POETS vision.

The center incorporates students at the start of their curriculum to maximize their learning potential. POETS is an NSF sponsored center

The center works closely with Howard University, Stanford University, and the University of Arkansas and is a public entity



# Energy Resources Center

University of Illinois at Chicago

## Director Contact

Cliff Haefke  
Chaefk2@uic.edu  
(312) 355-3476

## Center Contact

<http://www.erc.uic.edu/>  
(312) 996-4490

## Research Areas

- BIOENERGY AND BIOFUELS
- ECONOMIC MODELING
- SUSTAINABLE BUILDING DESIGN
- FOSSIL FUELS
- POLICY
- WATER EFFICIENCY

## Research Activities

- PROVIDE DATA OR ANALYSIS
- SET/VERIFY STANDARDS
- EDUCATION AND TRAINING
- PROJECT MANAGEMENT

The Energy Resources Center at the University of Illinois at Chicago provides comprehensive and cutting edge solutions for energy and environmental challenges in the institutional, industrial, and commercial sectors.

Working in the areas of energy efficiency, distributed generation, utilities billing data management, and biofuels and bioenergy the center has made distinct progress in energy conservation and production technologies while providing cost effective solutions through its program implementation, educational outreach, modeling, and technical assistance.

The center houses approximately 25 employees and 15 students and is composed of engineers, architects, policy analysts, and economists. Annual funding is upwards of \$7 million.

The ERC is contracted under the Department of Energy, the State of Illinois' Department of Commerce and Economic Opportunity, and also works with local governments, utilities, and other private entities across the Midwest. The center is a non-profit entity.



# Gas Technology Institute (GTI)

## Director Contact

David Carroll, President and CEO

## Center Contact

<http://www.gastechnology.org/>

(847) 768-0500

[publicrelations@gastechnology.org](mailto:publicrelations@gastechnology.org)

## Research Areas

- SUSTAINABLE BUILDING DESIGN
- EMISSIONS TECHNOLOGY
- FOSSIL FUELS
- POLICY
- MATERIALS

## Research Activities

- IN-HOUSE R&D
- PERFORM DEMONSTRATIONS
- INTELLECTUAL PROPERTY
- SET/VERIFY STANDARDS
- PROVIDE DATA OR ANALYSIS
- EDUCATION AND TRAINING
- PROJECT MANAGEMENT

GTI is a research organization with “the energy to lead.” It solves important energy challenges, turning raw technology into practical solutions that create exceptional value for its customers in the global marketplace. It is driven by four primary objectives, which span the energy industry value chain. They provide both the focus and enduring opportunity for its business endeavors. These objectives are: expanding the supply of affordable natural gas and renewable energy; ensuring a safe and reliable energy delivery infrastructure; promoting the clean and efficient use of energy resources; reducing carbon emissions to the environment.

In 2015, the Institute had 300+ active projects, had 19 patents issued, and filed 17 more patent applications. The institute works with many national, state, and private partners and is a private entity.

GTI has an extensive matrix of partners, investors and clients that encompasses more than 200 organizations. It has a proud legacy of successful projects developed in partnership with, State and federal government agencies, U.S. Department of Energy, U.S. Department of Transportation, U.S. Department of Defense, California Energy Commission.

## Integrated Bioprocessing Research Laboratory

University of Illinois at Urbana-Champaign

### Director Contact

Vijay Singh

vsingh@illinois.edu

### Center Contact

<http://bioenergy.illinois.edu/>

### Research Areas



BIOENERGY AND BIOFUELS



TRANSPORTATION TECHNOLOGY



ECONOMIC MODELING

### Research Activities



IN-HOUSE R&D



PROVIDE DATA OR ANALYSIS

The mission of the Integrated Bioprocessing Research Laboratory (IBRL) is to advance research and education focused on renewable food, fuel and fiber-based processing platforms and to stimulate bio-economic development in the State of Illinois through translational scale up of developed technologies leading to commercialization. The near term strategic objective is to identify and promote the development of innovative, multi-disciplinary teams that will capitalize on recent advances at the nexus of plant and microbial genetics and bioprocessing. The building will be a new infrastructure that will be available to support team-based research and proof-of-concept activities.

IBRL is a public entity and provides a research lab and a pilot plant for innovative research to market application for commercial products for industry partners.

# Micro and Nanotechnology Laboratory (MNTL)

University of Illinois at Urbana-Champaign

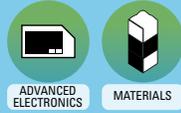
## Director Contact

Brian T. Cunningham  
bcunning@illinois.edu  
(217) 265-6291

## Center Contact

mntl@illinois.edu  
(217) 333.3097  
<http://mntl.illinois.edu/>

## Research Areas



## Research Activities



The mission of MNTL is to create, support, and sustain an environment to facilitate advanced research in photonics, microelectronics, biotechnology and nanotechnology for the benefit of the University community, the State of Illinois, and society as a whole.

The center is a public entity and has 46 general purpose labs and 16 cleanrooms. It houses personnel from across seven different departments in the University.

MNTL runs an industry affiliates program that allows for closer collaboration with private organizations.

# Illinois Sustainable Technology Center (ISTC)

University of Illinois at Urbana-Champaign

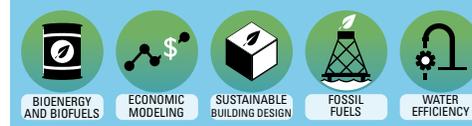
## Director Contact

Kevin O'Brien  
kcobrien@illinois.edu  
(217) 333-8940

## Center Contact

<http://www.istc.illinois.edu/>  
(217) 333-8940

## Research Areas



## Research Activities



The mission of the center is to encourage and assist citizens, businesses, and government agencies to prevent pollution, conserve natural resources, and reduce waste to protect human health and the environment of Illinois and beyond.

ISTC integrates applied research, technical assistance, and information services to advance efforts in the areas of pollution prevention; water and energy conservation; and materials recycling and beneficial reuse.

The center houses 4 administrative staff, 12 applied research staff, 8 members of their technical assistance program, and a further 8 people working on sponsored research.

ISTC collaborates with several private and public entities throughout Illinois and is a public entity.

# Center for Electrochemical Energy Science (CEES)

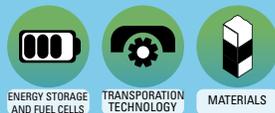
## Director Contact

Paul Fenter,  
fenter@anl.gov  
(630) 252-7053

## Center Contact

<http://www.anl.gov/cees>

## Research Areas



## Research Activities



The mission of the center is to create a robust fundamental understanding of the phenomena that control the reactivity of electrified oxide interfaces, films and materials relevant to lithium-ion battery chemistries.

Established in 2009 the center is funded by the DOE and collaborates with Argonne National Laboratory, Northwestern University, Purdue University, University of Illinois Urbana-Champaign.



# Center for Bio-Inspired Energy Science (CBES)

Northwestern University

## Director Contact

Samuel Stupp

(312) 503-0807

[s-stupp@northwestern.edu](mailto:s-stupp@northwestern.edu)

## Center Contact

[CBES@northwestern.edu](mailto:CBES@northwestern.edu)

(312) 503-6124

<http://cbes.northwestern.edu/>

## Research Areas



RENEWABLE  
ENERGY



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The mission of the center is to discover and develop bio-inspired systems that reveal new connections between energy and matter.

CBES is a public entity that houses 44 faculty, 13 research staff, one support staff, and approximately 60 students. Funding is received through federal, foundation, and private institutions.

## Center for Geological Storage of CO<sub>2</sub> (GSCO2)

University of Illinois at Urbana-Champaign

### Director Contact

Scott M. Frailey  
SFrailey@Illinois.edu

### Center Contact

<http://www.gSCO2.org/>

### Research Areas



CARBON CAPTURE



MATERIALS

### Research Activities



IN-HOUSE R&D



PERFORM DEMONSTRATIONS



PROVIDE DATA OR ANALYSIS

The mission of the center is to generate new conceptual, mathematical, and numerical models applicable to geologic storage systems in specific and strategically identified research areas, based on uncertainty and limitations observed in field pilots and CO<sub>2</sub> injection demonstration projects, laboratory experiments, and the experience of researchers in industry-sponsored applied research.

Established in 2014 the center is funded by the DOE and collaborates with National Energy Technology Laboratory, University of Notre Dame Schlumberger, SINTEF, Stiftelsen Norsar.



# Fermi National Accelerator Laboratory (FNAL)

Fermi Research Alliance, LLC

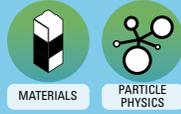
## Director Contact

Nigel Lockyer

## Center Contact

<http://www.fnal.gov/>  
(630) 840-3000

## Research Areas



MATERIALS

PARTICLE PHYSICS

## Research Activities



IN-HOUSE R&D

EDUCATION AND TRAINING

Fermilab is America’s particle physics and accelerator laboratory. Its mission is to drive discovery by building and operating world-leading accelerator and detector facilities, performing pioneering research with national and global partners and developing new technologies for science that support U.S. industrial competitiveness.

Established in 1967, Fermilab is one of the 17 DOE laboratories and houses 1,820 employees among Computing professionals, Engineers, Scientists, technical and administrative staff. It operates with approximately \$370,000,000 in annual funding from U.S. federal governments and other sources.

# INDIANA

## Richard G. Lugar Center for Renewable Energy (LCRE)

Indiana University-Purdue University Indianapolis

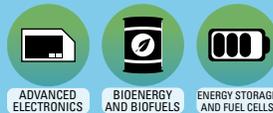
### Director Contact

Peter Schubert  
pjschube@iupui.edu

### Center Contact

<http://www.lugarenergycenter.org/>  
(317) 278-0812  
lcre@iupui.edu

### Research Areas



### Research Activities



The mission of the center is to promote research excellence in renewable energy through collaborative efforts among faculty in the disciplines of engineering, chemistry, physics, biology, and environmental affairs and public policy.

The center is a public entity that houses 44 faculty, 13 research staff, one support staff, and approximately 60 students. Funding is received through federal, foundation, and private institutions.

# Center for Sustainable Energy at Notre Dame (ND Energy)

University of Notre Dame

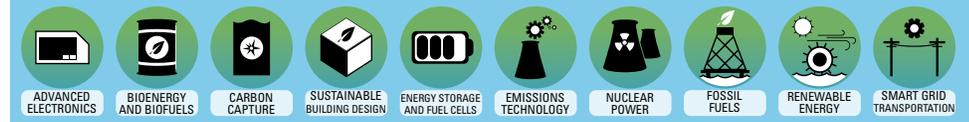
## Director Contact

Peter C. Burns  
 pburns@nd.edu  
 574-631-7852

## Center Contact

<http://energy.nd.edu/>  
 574-631-4776  
 villarosa.2@nd.edu

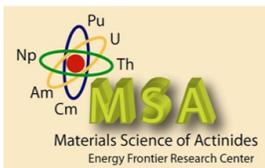
## Research Areas



## Research Activities



The Center for Sustainable Energy at Notre Dame (ND Energy) is a Public University Research Center whose mission is to foster and grow energy-related research toward sustainable and affordable energy solutions, to support energy-related education and outreach throughout the Notre Dame and surrounding communities, and to influence the national and global discussions of the most pressing energy policy issues and questions of our time.



# Materials Science of Actinides, Energy Frontier Research Center

University of Notre Dame

## Director Contact

Peter Burns  
pburns@nd.edu  
(574) 631-7852

## Center Contact

<http://www.msa-efrc.com/>  
(574) 631-6247  
gsigmon@nd.edu

## Research Areas



NUCLEAR  
POWER



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The mission of the MSA is to conduct transformative research in the actinide sciences with full integration of experimental and computational approaches, and an emphasis on research questions that are important to the energy future of the nation. Workforce development is a motivating goal of this university-based center.

The center is a public entity funded primarily by the Basic Energy Science of the Department of Energy. Annual funding is upwards of \$3 million.

# The Discovery Park Energy Center

Purdue University

## Director Contact

Maureen McCann  
mmccann@purdue.edu

## Center Contact

[purdue.edu/discoverypark/energy/](http://purdue.edu/discoverypark/energy/)  
(765) 494-1610  
energy@purdue.edu

## Research Areas



## Research Activities



The Center's mission is to grow the Purdue energy research and education enterprise. It engages researchers and students in a community that delivers new discoveries and develops disruptive technologies with national and global impact.

The Center is a public entity and collaborates with several Government Institutions, Educational Institutions, National Labs and Industry. Some of the partners are Department of the Navy, University of Minnesota, Ames Laboratory, Green Tech America, ABB.



## Center for Direct Catalytic Conversion of Biomass to Biofuels (C3Bio)

Purdue University

### Director Contact

Maureen McCann  
mmccann@purdue.edu

### Center Contact

[purdue.edu/discoverypark/c3bio/](http://purdue.edu/discoverypark/c3bio/)  
(765) 494-0497  
C3Bio@Purdue.edu

### Research Areas



BIOENERGY  
AND BIOFUELS

### Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS

The Center for Direct Catalytic Conversion of Biomass to Biofuels is focused on generating and using new knowledge of catalyst-biomass interactions driven by strong collaboration between experts in the structure, biochemistry and synthesis of biomass, in advanced imaging and analytical techniques, and in chemical engineering and catalysis. Interdisciplinary teamwork promotes a culture of creativity at the interface of physical and life sciences as biologists' knowledge of biomass chemistry and capabilities to engineer plant characteristics combine with the catalytic science and technology of engineers and chemists.

C3Bio is a public entity funded from the US Department of Energy and collaborates with Purdue University, the National Renewable Energy Laboratory, Northeastern University, and the University of Tennessee in Knoxville.

# IOWA

## Bioeconomy Institute (BEI)

Iowa State University

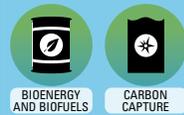
### Director Contact

Robert C. Brown  
(515)294-7934  
rcbrown3@iastate.edu

### Center Contact

[www.biorenew.iastate.edu/](http://www.biorenew.iastate.edu/)  
(515) 294-4459  
rmills@iastate.edu

### Research Areas



### Research Activities

The Bio-economy Institute (BEI) at Iowa State University seeks to advance the use of bio-renewable resources for the production of fuels, energy, chemicals, and materials. The Institute will assure Iowa's prominence in the revolution that is changing the way society obtains its essential sources of energy and carbon. This revolution will dramatically reduce our dependence on petroleum. Instead of fossil sources of carbon and energy, the bio-economy will use biomass (including lignocellulose, starches, oils and proteins) as a renewable resource to sustain economic growth and prosperity.

The institute has a large staffing: 194 affiliated professors, nine direct research staff, six direct support staff, and between 300-500 students a year. The institute operates with funding from numerous sources, primarily the United States Department of Agriculture, the Department of Energy, and the National Science Foundation. Annual funding averages \$15 million.

# Modularized Pyrolysis Biorefinery



Iowa State University, Easy Energy Systems (EES), and Stine Seeds are collaborating to demonstrate a transformative approach to processing lignocellulosic feedstocks into chemicals, fuel, power, and products. The team is pioneering a modularized pyrolysis system as one unit operation of a Modular Energy Production System (MEPSTM). The unit operations of MEPS are designed as individual modules that are mass produced and transported as standard shipping container-sized units that can be quickly integrated in the field as a fully automated, operational biorefinery.

This new approach takes advantage of the modular manufacturing and marketing experience of EES and a research team from Iowa State University's world-recognized Bioeconomy Institute, a pioneer in new approaches to thermochemical processing of biomass. The demonstration deploys three key innovations that address the historic intractability of lignocellulose:

Passivation of naturally-occurring alkali and alkaline earth metals, particularly potassium, in

biomass so these materials cannot catalyze thermal decomposition of cellulose to form light oxygenated compounds and thereby reduce yields of the desired fermentable sugars;

- ▶ Autothermal pyrolysis, a process that simplifies and intensifies the pyrolysis process and makes the modular approach viable by eliminating requirements for heat exchangers and other large ancillary equipment, while increasing feedstock throughput by as much as five fold without degrading product yield or quality;
- ▶ Bio-oil recovery from fast pyrolysis as distinct fractions, including a sugar-rich fraction (US Patent 8476480), a lignin-derived coal substitute (Lignocol™), and acetic acid.

## The Market

EES has exclusive or co-exclusive license to these technologies and will manufacture and market these systems in conjunction with other proprietary third-party technologies it has already modularized, such as proprietary sugar-to-N butanol technology. Units will be sold to companies and municipalities that have waste streams or distributed feedstocks

with high levels of cellulose, such as waste management companies, food processors, and farmers who annually leave tons of unexploited low bulk density crop residues in their fields. These customers will have a financially attractive means to convert their distributed and waste biomass into a valuable portfolio of fuels, power and chemicals. While valorizing their waste streams, customers will also be contributing to the goal of reducing carbon emissions.

## For More Information

Bioeconomy Institute  
Iowa State University

1140 Biorenewables Research Laboratory  
617 Bissell Rd.  
Ames, IA  
50011-3270

[www.biorenew.iastate.edu](http://www.biorenew.iastate.edu)  
Twitter: @Bioeconomyinst



# Iowa Energy Center

Iowa State University

## Director Contact

Mufit Akinc

(515) 294-0111

makinc@iastate.edu

## Center Contact

[www.iowaenergycenter.org/](http://www.iowaenergycenter.org/)

(515) 294-8819

iec@iastate.edu

## Research Areas



BIOENERGY  
AND BIOFUELS



SUSTAINABLE  
BUILDING DESIGN

## Research Activities



IN-HOUSE  
R&D



R&D GRANTS/  
CONTRACTS



SHARED  
FACILITIES



EDUCATION AND  
TRAINING

The Iowa Energy Center supports economic development, environmental sustainability, and social well-being in Iowa through energy innovation, education, and entrepreneurship. We provide Iowans with reliable, objective information on energy and efficiency options.

Iowa Energy Center was created by the Iowa General Assembly and signed into law in 1990, and is administered through Iowa State University. The Energy Center's goal is to serve Iowans through reliable, objective tools, and information. Whether you are a homeowner, student, architect, researcher, engineer, building operation and manufacturing professional or business owner, we provide resources to serve your needs as energy consumers and innovators.

The center houses five research staff, 10 support staff, and four students and operates with around \$4.5 million in annual funding from federal, state, and private sources.

The center collaborates with Iowa State University and is a public entity.

# Center for Biorenewable Chemicals (CBiRC)

Iowa State University

## Director Contact

Brent Shanks

(515) 294-1895

bshanks@iastate.edu

## Center Contact

[www.cbirc.iastate.edu/](http://www.cbirc.iastate.edu/)

(515) 294-8354

cbirc-info@iastate.edu

## Research Areas



BIDENERGY  
AND BIOFUELS



ECONOMIC  
MODELING

## Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS

The NSF Engineering Research Center for Biorenewable Chemicals (CBiRC) will develop the fundamental knowledge and technology and the academic and industrial partnerships needed to provide a foundation for industrial chemical production to be transformed from a petroleum-based industry to a renewable resource-based industry.

The overarching goal of CBiRC is to enable the transformation of the chemical industry through the optimized coupling of two catalyst types such that a biocatalyst will convert glucose to an intermediate chemical that can be readily converted by a chemical catalyst to the desired chemical product. It will educate a workforce capable of enabling this transformation.

CBiRC is a public entity and it is organized around research disciplines. Each research discipline has researchers from multiple institutions. To accomplish its goals, CBiRC forms partnerships among outstanding faculty from these universities who have complementary expertise. Three criteria were used to assemble the faculty participants: (1) renowned engineers and scientists with cutting-edge research programs in CBiRC-related biorenewables areas; (2) evidence of pre-existing collaborative relationships with other Center faculty members; and (3) commitment to collaborative research as the key to advancing the goals of CBiRC. While much of the Center leadership team resides at ISU, two of the three research thrusts are led by faculty from partner institutions. The education efforts for the Center will be led from ISU.

## Ames Center

Iowa State University

### Director Contact

Adam Schwartz  
director@ameslab.gov  
(515) 294-2770

### Center Contact

osra@ameslab.gov  
(515)294-6486  
www.ameslab.gov

### Research Areas



MATERIALS

### Research Activities



IN-HOUSE  
R&D



INTELLECTUAL  
PROPERTY



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

Ames Laboratory creates materials, inspires minds to solve problems, and addresses global challenges.

We tightly couple theory, computation and experiments to design new materials; synthesis and fabrication of those materials with innovative AMES developed techniques; and characterization and testing at our new Sensitive Instrument Facility with world-class characterization equipment. AMES culture of interdisciplinary science allows us to seamlessly design, synthesize, and characterize new materials.

Established in 1947, Ames Laboratory houses approximately 260 research staff, 100 support staff and 100 students and operates with approximately \$50,000,000 in annual funding from U.S. federal governments as well as from Private Institutions. The main founding contributor is DOE.

As a DOE National Laboratory, it can perform work for others where the unique capabilities of the Laboratory are needed. It performs work for its Strategic Partners on a best effort basis and with full cost recovery. Its Materials Preparation Center (MPC) provides research quantities of ultra-pure materials worldwide. The laboratory is a public entity and is also home of the Critical Materials Institute and the Caloricool Consortium, who welcome industrial participation to help define their research objectives.

# LOUISIANA



## Energy Institute

University of Louisiana at Lafayette

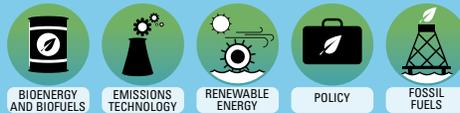
### Director Contact

Mark Zappi / Dr. Rafael Hernandez  
zappi@louisiana.edu  
(337) 482-6686

### Center Contact

mche.louisiana.edu/  
research-innovation/research-  
centers/energy-institute

### Research Areas



### Research Activities



The Energy Institute (EI) is the university's comprehensive research unit for all matters regarding energy development, usage, policy, and its impact on the ecological and human condition. The EI is one of five R&D flagship centers selected by UL Lafayette to lead the institution's primary research emphasis areas. The goal of the Louisiana Energy Institute is to provide the State of Louisiana with a World-Class energy advocate that focuses on energy industry developments from technical, ecological, and humanistic perspectives.

The institute houses around 20 faculty, 25 students, and five staff members and operates with approximately \$5 million in annual funding from federal, state, and private sources.

# MARYLAND



## Nanostructures for Electrical Energy Storage (NEES)

University of Maryland

### Director Contact

Gary W. Rubloff  
(301) 405-3011  
rubloff@isr.umd.edu

### Center Contact

[www.efrc.umd.edu](http://www.efrc.umd.edu)

### Research Areas



ENERGY STORAGE  
AND FUEL CELLS



MATERIALS

### Research Activities



IN-HOUSE  
R&D



INTELLECTUAL  
PROPERTY



SPIN-OFF  
COMPANIES

To reveal scientific insights and design principles that enable a next-generation electrical energy storage technology based on dense mesoscale architectures of multifunctional nanostructures.

The center is a public entity that houses 16 faculty, four research staff, and one support staff, and operates with around \$2.8 million in annual funding.

# University of Maryland Energy Research Center (UMERC)

University of Maryland, College Park

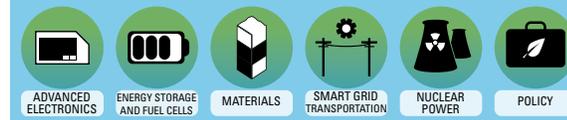
## Director Contact

Eric D. Wachsman  
(301) 405-8193  
ewach@umd.edu

## Center Contact

www.energy.umd.edu  
(301) 405-4799  
info\_energy@umd.edu

## Research Areas



## Research Activities



The mission of the center is to develop energy efficient and environmentally sustainable technologies and practices. Educate the public about energy and environmental technologies. Inform the larger policy debate on urgent, global issues of sustainable energy and environment. Improve U.S. energy security by developing indigenous and environmentally sustainable energy resources while promoting energy policies that have a positive impact on the environment.

The center collaborates with the Army Research Laboratory and the National Institute of Standards and Technology and is a public entity.

# MASSACHUSETTS



## Wind Energy Center

### Director Contact

James F. Manwell  
manwell@ecs.umass.edu

### Center Contact

wec@umass.edu  
(413) 545-4359  
<http://www.umass.edu/windenergy/>

### Research Areas



### Research Activities



The University of Massachusetts Wind Energy Center is a leading public institution in wind energy engineering nationally and internationally. Since 1972 the Center has worked diligently to maintain and enhance its important wind energy education programs and research activities.



## Northeastern University Center for Renewable Energy Technology (NUCRET)

Northeastern University

### Director Contact

Sanjeev Mukerjee  
s.mukerjee@northeastern.edu  
(617) 373-2382

### Center Contact

nucret@northeastern.edu  
(617) 373-8949  
www.northeastern.edu/nucret

### Research Areas



ENERGY STORAGE AND FUEL CELLS



MATERIALS

### Research Activities



IN-HOUSE R&D



INTELLECTUAL PROPERTY



SHARED FACILITIES



EDUCATION AND TRAINING



ACCESS TO RESEARCH

The mission of the center is to enhance the materials science and engineering of electrochemical technologies including fuel cell, electrolyzers and batteries, educate the next generation of scientists in this arena and provide outreach to policy makers and lay people on the pros and cons of various energy related initiatives or the lack thereof.

The center collaborates with Plamen Atanassov, Scott Calabrese Barton, Thomas Zawodzinski, Shawn Lister, and Piotr Zelenay and does joint research projects using federal support, and joint programs sponsored by companies.

The center collaborates with Plamen Atanassov, Scott Calabrese Barton, Thomas Zawodzinski, Shawn Lister, and Piotr Zelenay and does joint research projects using federal support, and joint programs sponsored by companies.

# eni-MIT Alliance

Massachusetts Institute of Technology

## Director Contact

Bob Armstrong  
rca@MIT.EDU

## Center Contact

<http://enimitalliance.mit.edu>

## Research Areas



BIOENERGY AND BIOFUELS    POLICY    RENEWABLE ENERGY    MATERIALS

## Research Activities



IN-HOUSE R&D    PROVIDE DATA OR ANALYSIS

The eni-MIT Alliance is a strategic partnership dating back to 2008 when eni became a Founding Member of the MIT Energy Initiative (MITEI). As a member of MITEI – and its largest energy research sponsor – eni is part of a broad consortium of industry, foundation, and government supporters that participates through specific research projects. eni’s research portfolio spans the entire energy spectrum, from solar energy to traditional and unconventional hydrocarbons. Our goal is to develop innovative, powerful tools, technologies and solutions to address global energy needs and challenges in a sustainable way.



# Electrochemical Energy Lab (EEL)

Massachusetts Institute of Technology

## Director Contact

Yang Shao-Horn  
shaohorn@mit.edu  
(617) 253-2259

## Center Contact

areynol2@mit.edu  
(617) 253-7449  
<http://web.mit.edu/eel/>

## Research Areas



## Research Activities



The research programs of the laboratory are centered on understanding the electronic structures of surfaces, with emphasis on metal oxides, searching for descriptors of catalytic activity, surface/interface reactivity and ion transport, and applying fundamental understanding to design materials for oxygen electrocatalysis, CO<sub>2</sub> reduction, ion intercalation and ion conductors, in electrochemical/photoelectrochemical energy conversion and storage, including lithium-ion, flow and metal-air batteries, proton exchange membrane and solid oxide fuel cells.

The laboratory is a public entity and houses one faculty, 12 postdoc, 17 students.



# Solid-State Solar Thermal Energy Conversion Center

Massachusetts Institute of Technology

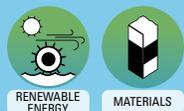
## Director Contact

Gang Chen  
gchen2@mit.edu  
(617) 253-0006

## Center Contact

(617) 253-7413  
<http://s3tec.mit.edu/>

## Research Areas



## Research Activities



The S3TEC Center aims at advancing fundamental science and developing materials to harness heat from the sun and convert this heat into electricity via thermoelectric, thermogalvanic and thermophotovoltaic technologies. Center's achieved technological advances are enabled through fundamental studies on the transport of electrons, phonons, photons, ions and spins and their interactions, leading to improved materials performance. These fundamental processes are studied through combined theoretical/computational and experimental approaches, including first-principles and mesoscale transport simulations, phonon/neutron/electron spectroscopies, material synthesis and system integration/testing. S3TEC aims at addressing grand challenges, connecting nanoscale to gigawatts by advancing the basic science underpinning direct energy conversion technologies and by discovering materials meeting the needs for application in performance, cost, and reliability and for fundamental understanding.

Ames Laboratory is a public entity that houses approximately 16 investigators, 63 research staff, seven advisors and one support staff.



# Center for Hierarchical Manufacturing

University of Massachusetts Amherst

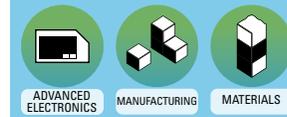
## Director Contact

Dr. James J. Watkins  
watkins@polysci.umass.edu  
(413) 545-2569

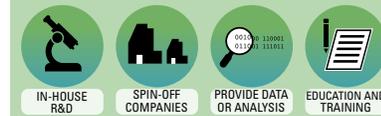
## Center Contact

chm@research.umass.edu  
(413) 545-1334  
<http://chm.pse.umass.edu/>

## Research Areas



## Research Activities



The Center for Hierarchical Manufacturing is an NSF Nanoscale Science and Engineering Center (NSEC). The mission of The Center for Hierarchical Manufacturing (CHM) at the University of Massachusetts is to be a leading research and education center for the development of efficient, cost effective process platforms and versatile tools for the two and three dimensional integration of components and systems across multiple length scales. The approach integrates nanofabrication processes for sub-30 nm elements based on directed self-assembly, additive-driven assembly, nanoimprint lithography, high fidelity 3-D polymer template replication, and conformal deposition at the nanoscale with Si wafer technologies or high-rate roll-to-roll (R2R) based production tools to yield materials and devices with unprecedented performance for computing, energy conversion and human health. The CHM effort is made comprehensive by research on device design, modeling and prototype testing in functional architectures that takes advantage of the specific hierarchical nanomanufacturing capabilities developed by the Center.

CHM is a public entity that houses approximately 11 research staff, 30 supported Investigators, 14 affiliated Collaborators, 16 investigators, five support staff and facilitates the National Nanomanufacturing Network (NNN).



# WPI Fuel Cell Center

Worcester Polytechnic Institute

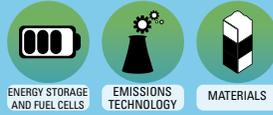
## Center Contact

chemeng@wpi.edu

(508) 831-5250

[www.wpi.edu/academics/che/FCC](http://www.wpi.edu/academics/che/FCC)

## Research Areas



## Research Activities



The WPI Fuel Cell Center is an industry-university public alliance for furthering fuel cell technology through undergraduate and graduate education and through research and development of fuel cells, fuel reformers, and related components for mobile and stationary applications. The Center currently performs research in modeling, development of higher temperature and CO tolerant proton-exchange membrane fuel cells, catalytic reformer design, nonpyrophoric reforming and water-gas shift catalysts, preferential CO oxidation catalysts, low temperature shift catalysts, palladium and other inorganic membranes, and molten-carbonate fuel cells.



## Integrated Mesoscale Architectures for Sustainable Catalysis (IMASC)

Harvard University

### Director Contact

Cynthia M. Friend  
friend@fas.harvard.edu  
(617) 495-4052

### Center Contact

defrancesco@chemistry.harvard.edu  
(617) 497-4747  
<http://efrc.harvard.edu/>

### Research Areas



MATERIALS

### Research Activities



IN-HOUSE  
R&D

The mission of the center is to drive and conduct transformative research in mesoscale science for sustainable catalysis, with full integration of multi-scale experimental, theoretical and computational approaches.

Established in 2014 IMASC houses approximately 48 among team directory, research staff, collaborators and administration and operates with funding from the DOE.

IMASC collaborates with Harvard University, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Tufts University.



# Center for Excitonics

Massachusetts Institute of Technology

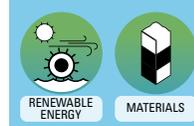
## Director Contact

Marc A. Baldo  
(617) 452.5132  
baldo@mit.edu

## Center Contact

cmbourg@mit.edu  
(617) 253-0085  
[www.rle.mit.edu/excitonics/](http://www.rle.mit.edu/excitonics/)

## Research Areas



## Research Activities



The mission of the center is to supersede traditional electronics with devices that use excitonics to mediate the flow of energy.

Established in 2009 the Center houses approximately 32 faculty and investigators, two support staff, 21 post docs and 35 students and operates with funding from the U.S. Department of Energy.

The center collaborates with Brookhaven National Laboratory, Harvard University, Lincoln Laboratory, Massachusetts Institute of Technology.

# MICHIGAN



**ENERGY INSTITUTE**  
UNIVERSITY OF MICHIGAN

## Energy Institute

University of Michigan

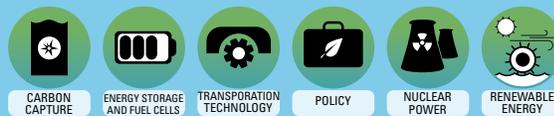
### Director Contact

Mark Barteau  
barteau@umich.edu  
(734) 615-9521

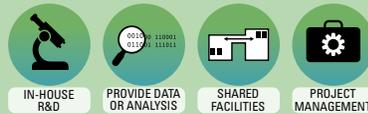
### Center Contact

amymast@umich.edu  
(734) 615-5678  
<http://energy.umich.edu/>

### Research Areas



### Research Activities



The demand for economically and environmentally sound energy solutions is urgent and global. At the Energy Institute, we build on the University of Michigan's strong energy research heritage at the heart of the nation's automotive and manufacturing industries to develop and integrate science, technology and policy solutions to pressing energy challenges.

Established in 2006 the Energy Institute houses 12 employees; four professors, one research staff and seven support staff and operates with approximately \$3,000,000 in annual funding from the State and other contributors. The main founding contributors are University of Michigan, Michigan Economic Development Corporation, Ford Motor Co.

The center is a public, non-profit entity and collaborates with Ford Motor Co. and Argonne National Laboratory. Ford has partnered to establish a Battery Fabrication and Characterization User Facility in the Energy Institute. Argonne is the lead for the Joint Center for Energy Storage Research, in which the University of Michigan is one of five academic partners.



# Center for Solar and Thermal Energy Conversion (CSTEC)

University of Michigan

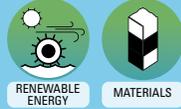
## Director Contact

Prof. Peter F. Green  
pfgreen@umich.edu  
(734) 763-2445

## Center Contact

<http://cstec.engin.umich.edu/>

## Research Areas



RENEWABLE  
ENERGY

MATERIALS

## Research Activities



IN-HOUSE  
R&D

PROVIDE DATA  
OR ANALYSIS

The vision of the Center for Solar and Thermal Energy Conversion (CSTEC) is to design and to synthesize new materials for high efficiency photovoltaic (PV) and thermoelectric (TE) devices, predicated on new fundamental insights into equilibrium and non-equilibrium processes, including quantum phenomena, that occur in materials over various spatial and temporal scales.

# Clean Energy Research Center (CERC)

Oakland University

## Director Contact

Jim Leidel

leidel@oakland.edu

(248) 648-4805

## Center Contact

<http://ucmcms.oakland.edu/cerc>

## Research Areas



PERFORM DEMONSTRATIONS



SPIN-OFF COMPANIES



PROVIDE DATA OR ANALYSIS



EDUCATION AND TRAINING

## Research Activities



BIOENERGY AND BIOFUELS



SUSTAINABLE BUILDING DESIGN



RENEWABLE ENERGY

Clean Energy Research Center (CERC) scientists, engineers and collaborators are conducting and demonstrating applied research and facilitating private sector investment to achieve a 40% energy reduction in existing industrial, commercial and institutional buildings in the Southeast Michigan tri-county region. The CERC effort will deliver energy efficiency solutions, innovation and new clean energy jobs today while providing significant natural resource, environmental and economic impact by 2020.

# National Biofuels Energy Laboratory

Wayne State University

## Director Contact

Professor K.Y. Simon Ng  
sng@wayne.edu  
(313) 577-3805

## Center Contact

NBEL@wayne.edu  
(313) 832-2643  
[www.eng.wayne.edu/page.php?id=4765](http://www.eng.wayne.edu/page.php?id=4765)

## Research Areas



BIOENERGY  
AND BIOFUELS

## Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

Biomass is a renewable resource and can serve as the nation's sustainable source of energy. The main technical barriers for widespread use of biomass-based fuel are, first, the conversion efficiency of biomass to biofuel, and second, a good understanding of the relationship between fuel properties and engine performance necessary to allow the development of fuel quality standards. The National Biofuels Energy Laboratory (NBEL) at NextEnergy, funded by DOE, was created to address the synthesis, characterization, and performance evaluation of biodiesel and biodiesel blends.

# MINNESOTA

## Center for Biorefining

University of Minnesota

### Director Contact

Roger Ruan

ruanx001@umn.edu

(612) 625-1710

### Center Contact

chenx088@umn.edu

(612) 625-7721

<http://biorefining.cfans.umn.edu/>

### Research Areas



BIOENERGY  
AND BIOFUELS



CARBON  
CAPTURE



ECONOMIC  
MODELING



EMISSIONS  
TECHNOLOGY



MATERIALS



WATER  
EFFICIENCY

### Research Activities



IN-HOUSE  
R&D



PERFORM  
DEMONSTRATIONS



SHARED  
FACILITIES



EDUCATION AND  
TRAINING

The mission of Center for Biorefining is to coordinate the University efforts and resources to conduct exploratory fundamental and applied research; provide education on bioenergy, biochemicals and biomaterials; stimulate collaboration among the University researchers, other public sector investigators, and private investigators involved in biobased production technology development; promote technology transfer to industries; and foster economic development in rural areas.

Established in 2003 the Center houses three professors, five research staff and eight students and operates with approximately \$2,000,000 in annual funding from the State and from the U.S. Federal Government. The main founding contributors are USDA, DO and MN State.

The Center collaborates on grant seeking and research and development activities with Washington State U, South Dakota State U, Metropolitan Council Environment Services, Kansas State University, Cornell University.



# Center for Compact and Efficient Fluid Power (CCEFP)

University of Minnesota

## Director Contact

Kim Stelson  
kstelson@umn.edu  
(612) 626-7168

## Center Contact

alyssa@umn.edu  
(612) 624-4991  
www.ccefp.org

## Research Areas



## Research Activities



CCEFP’s mission is to make fluid power the technology of choice for power generation, transmission, storage and motion control by changing the way fluid power is researched, taught and applied.

Established in 2006 the center houses approximately 29 Professors, four research staff, three support staff and 177 students and operates with approximately \$8,000,000 in annual funding from the U.S. Federal Government, Foundations and Private Institutions. The main founding contributors are National Science Foundation, Pascal Society and National Fluid Power Association.

CCEFP supports work at partner universities using funds from government and pooled funds for pre-competitive research from industry. The main research partners are Purdue University, Georgia Institute of Technology, Vanderbilt University, University of Illinois, Milwaukee School of Engineering.



# Materials Research Science and Engineering Center (MRSEC)

University of Minnesota

## Director Contact

Tim Lodge  
(612) 625-0877  
lodge@umn.edu

## Center Contact

(612) 626-0713  
www.mrsec.org/

## Research Areas



MATERIALS

## Research Activities



IN-HOUSE  
R&D

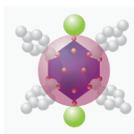


EDUCATION AND  
TRAINING

The University of Minnesota Materials Research Science and Engineering Center (MRSEC) enables important areas of future technology, ranging from biomedicine, separations, and plastic electronics to security, renewable energy, and information technology. The UMN MRSEC manages an extensive program in education and career development. Center research activities are integrated with educational programs, providing interdisciplinary training of students and postdocs.

MRSC houses 39 Senior Investigators, 10 postdoctoral researchers, 58 students and seven support staff and operates with funding from the National Science Foundation.

The center is bolstered by a broad complement of over 35 companies that contribute directly to IRG research through intellectual, technological, and financial support. International research collaborations and student exchanges are pursued with leading research labs in Asia and Europe.



# Inorganometallic Catalyst Design Center (ICDC)

University of Minnesota

## Director Contact

Laura Gagliardi  
(612) 625-8299  
gagliard@umn.edu

## Center Contact

kapla193@umn.edu  
(612)625-2636  
www1.chem.umn.edu/icdc/

## Research Areas



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The mission of the Inorganometallic Catalyst Design Center (ICDC) is to computationally guide the discovery of a new class of energy-science-relevant catalytic materials and understand the underlying structure-function relationships that lead to further catalyst discovery.

ICDC participants aim to utilize quantum simulations and predictions to aid with synthesis, characterization, and catalysis of new catalytic materials.

The center houses 21 Senior Investigators, three senior scientists, 21 postdoctoral researchers, 14 students and three support staff. The Inorganometallic Catalyst Design Center (ICDC) is an Energy Frontier Research Center funded by the United States Department of Energy.

Some of the partner institutions are Argonne National Laboratory, Clemson University, Dow Chemical Company, Northwestern University, NuMAT.

# MISSISSIPPI

**ICET** INSTITUTE FOR CLEAN  
ENERGY TECHNOLOGY  
MISSISSIPPI STATE UNIVERSITY

## Institute for Clean Energy Technology (ICET)

Mississippi State University

### Director Contact

Glenn Steele  
steele@me.msstate.edu

### Center Contact

(662) 325-2105  
<http://www.icet.msstate.edu/>

### Research Areas



CARBON  
CAPTURE



MATERIALS

### Research Activities



PERFORM  
DEMONSTRATIONS



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

Since its inception, ICET has created a tradition of excellence in diagnostic research by improving effectiveness and competitiveness while minimizing environmental impact. With over 50 professional and support staff members, ICET is made up of four different areas of research or thrusts: Diagnostic and Sensing Technologies (DST), Engineering Scale Testing (EST), Environmental Impact of Energy Production and Use (IEP) and Nuclear and Defense Measurement Technologies (NDMT). ICET has not only helped with environmental projects inside the state of Mississippi but also the Westinghouse Savannah River Project, the Western Energy Technology Office operated by MSE in Butte, Montana, the Environmental Systems Engineering facility at Clemson University, and the Vitreous State Laboratory at Catholic University in Washington, D.C.. The Institute for Clean Energy Technology is a public entity.



# Sustainable Energy Research Center (SERC)

Mississippi State University

## Director Contact

Dr. Johnathan Pote  
jpote@abe.msstate.edu  
(662) 325-2107

## Center Contact

manderson@abe.msstate.edu  
[www.serc.msstate.edu/contact](http://www.serc.msstate.edu/contact)

## Research Areas



BIOENERGY  
AND BIOFUELS



POLICY

## Research Activities



PROVIDE DATA  
OR ANALYSIS



PROJECT  
MANAGEMENT

The Sustainable Energy Research Center (SERC) was established in January 2006 at Mississippi State University (MSU) through funding from the U.S. Department of Energy (DOE). SERC was formed to create an infrastructure for coordinated interdisciplinary collaboration at MSU in the development of environmentally and economically sustainable energy sources specific to the Southeastern United States. SERC serves as a conduit for the development of integrated research and educational programs at MSU. The Center is a public entity and is also a catalyst for forging partnerships between academia, business, and the U.S. government.

# MISSOURI

## Energy Research and Development Center

Missouri University of Science and Technology

### Director Contact

Joseph D. Smith  
smithjose@mst.edu  
(573) 341-4294

### Center Contact

frieda@mst.edu  
(573) 341-4193  
<http://energy.mst.edu/>

### Research Areas



### Research Activities



The Energy Research and Development Center (ERDC) serves as a focal point for Research, Development, and Deployment activities related to energy-related technologies and energy security.

Established in 2007, ERDC houses 64 professors, five research staff, two support staff and 115 students and operates with approximately \$4,000,000 in annual funding from the State and from U.S. and Non-U.S. Government. The main founding contributors are DOE and NSF.

The center fosters close collaboration between Missouri S&T and other research centers in industry, national labs, and other universities. Work conducted through the ERDC is aimed at benefitting the university, the state of Missouri and the nation. The center is a public entity.



# Photosynthetic Antenna Research Center (PARC)

Washington University in St. Louis

## Director Contact

Robert E Blankenship  
blankenship@wustl.edu  
(314) 935.7971

## Center Contact

parc-efrc@wustl.edu  
(314) 935.3168  
<https://parc.wustl.edu/>

## Research Areas



## Research Activities



PARC brings together a core group of WUSTL researchers along with several other select scientists from academia, private research institutes, and national laboratories to produce an international interdisciplinary team. PARC aspires to maximize photosynthetic antenna efficiency in living organisms and to fabricate robust micron-scale biohybrid light-harvesting systems to drive chemical processes or generate photocurrent. This vision will be achieved through transformational research to optimize antenna size and composition for natural photosynthetic function and to develop versatile synthetic macromolecular solar-collectors that can be tailored for specific applications. PARC's research and educational activities will build a legacy of intellectual and technical capacity for harvesting solar energy for the future.

PARC is a public entity and houses around 78 research and support staff and 47 students. The main founding contributors is DOE.



# International Center for Advanced Renewable Energy and Sustainability

Washington University in St. Louis

## Director Contact

Himadri Pakrasi

## Center Contact

[icares@wustl.edu](mailto:icares@wustl.edu)

(314) 935-9541

<http://icares.wustl.edu/>

## Research Areas



## Research Activities



Many of the grand challenges of the 21st century are related to energy, the environment and sustainability. The International Center for Advanced Renewable Energy and Sustainability (I-CARES) at Washington University in St. Louis is focused on seeking solutions for such challenges. Launched in June 2007, I-CARES is a public entity and catalyzes university wide and external collaborative research and educational activities in these focal areas. The umbrella of I-CARES includes six signature initiatives; a robust internal funding program; a growing cadre of interdisciplinary researchers; a named lecture series to engage the broader university community; and a growing curriculum support focus that has helped engage new instructors, develop new courses and provide experiential opportunities for students.



# Midwest Energy Efficiency Research Consortium

University of Missouri

## Director Contact

Robert Reed  
573-884-6162  
ReedRE@missouri.edu

## Center Contact

<http://meerc.org/>

## Research Areas



## Research Activities



The Midwest Energy Efficiency Research Consortium (MEERC) located at the University of Missouri-Columbia in partnership with regional industry partners and government agencies, is focused on developing academic courses and training programs, advancing development and applications of energy efficient technologies and disseminating information on the value of energy efficiency.

The consortium's annual budget is \$150,000. Six consortium partner centers are part of MEERC, Lighting Research Center, High Performance Building Center, Energy Solutions and Service Center, Agricultural Energy Efficiency Center, Low Energy Heating and Cooling Center, and Energy Efficiency in Water and Wastewater Center.

# Missouri Technology Corporation (MTC)

## Director Contact

Bill Anderson

## Center Contact

daniel.kaemmerer@ded.mo.gov

(573) 526-0470

[www.MissouriTechnology.com](http://www.MissouriTechnology.com)

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS



BIOENERGY  
AND BIOFUELS



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The Missouri Technology Corporation (“MTC”) is a public-private partnership created by the Missouri General Assembly to promote entrepreneurship and foster the growth of new and emerging high-tech companies. MTC focuses on 21st Century bioscience industries that build on Missouri’s rich history in agriculture and technology.

MTC funds several programs across the state of Missouri that support the growth of innovative businesses, including companies developing energy efficiency technologies. One of MTC’s programs, the Missouri IDEA (Innovation, Development, and Entrepreneurship Advancement) Fund, would be particularly applicable to energy efficiency research as it promotes the formation and growth of businesses that engage in the transfer of science and technology into job creation.

# MONTANA

## Energy Research Institute

Montana State University

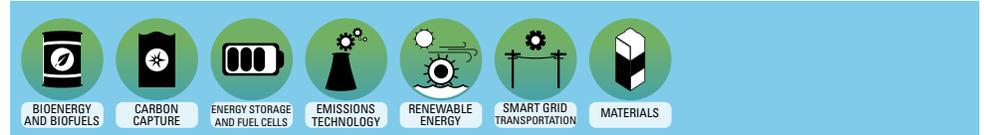
### Director Contact

Lee Spangler  
spangler@montana.edu  
(406) 994-399

### Center Contact

energy@montana.edu  
(406) 994-1658  
www.montana.edu/energy

### Research Areas



### Research Activities



The Energy Research Institute's mission is to perform basic and applied research as well as technology development for a balanced energy portfolio. The Institute studies four areas: fuel cell research, focused on making viable solid oxide fuel cells; carbon sequestration research; wind research, enabling future wind-generated electricity; and biofuel research, or replacing fossil fuels with cleaner, more efficient biofuels.

Established in 2004 the Energy Research Institute houses 38 professors, 50 research staff, 10 support staff and 140 students and operates with approximately \$13,000,000 in annual funding from the State, from U.S. and Non-U.S. Government, from Private Foundations and others. The main founding contributor is DOE.

The center collaborates with Lawrence Berkeley National Lab, Los Alamos National Lab, National Energy Technology Lab, National Renewable Energy Lab, and Schlumberger. They assemble teams of researchers, both internal and external, with appropriate expertise to address energy challenges.



# Zero Emission Research and Technology Center (ZERT)

Montana State University

## Director Contact

Dr. Lee Spangler  
spangler@montana.edu  
(406) 994-2891

## Center Contact

zert@montana.edu  
(406) 994-1658  
<http://www.montana.edu/zert/>

## Research Areas



## Research Activities



The mission of the center is to work in the public's interest to develop the basic science and technology relevant to geologic sequestration of carbon dioxide (CO<sub>2</sub>) from fossil fuels and other point sources.

In order to understand all possible fates of injected CO<sub>2</sub>, center's team members are performing laboratory experiments to understand CO<sub>2</sub> physical and chemical interaction with geologic formation mineral and fluids. They are utilizing, refining, and validating software tools that can both model geophysical and geochemical processes at the molecular level and determine transport phenomena effects up to the reservoir level. They are developing monitoring and verification techniques to determine the behavior of the underground CO<sub>2</sub>, and underground storage capacity for different geologic formations. Mitigation strategies and techniques are being developed for all potential seepage pathways. They are performing risk assessments needed to ensure public safety and health and to provide sound scientific and technological input to the decision making process. Finally, they will participate in public education about energy choices, greenhouse gas mitigation, and sequestration.

ZERT is a partnership involving DOE laboratories (Los Alamos National Laboratory, Lawrence Berkeley National Laboratory, National Energy Technology Laboratory, Lawrence Livermore National Laboratory, and Pacific Northwest National Laboratory) as well as universities (Montana State University and West Virginia University) and is a public entity.



# High Temperature Electrochemistry Center (HiTEC)

Montana State University

## Director Contact

Dr. Lee Spangler  
spangler@montana.edu  
(406) 994-2891

## Center Contact

energy@montana.edu  
(406) 994-1658  
www.montana.edu/hitec/

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS



MATERIALS

## Research Activities



IN-HOUSE  
R&D

HiTEC's goal is to understand what limits the performance of high-temperature electrochemical systems. When understood, such systems could be used in applications such as fossil energy conversion, reversible fuel cells, gas separation and purification, electrolysis, emissions reduction, and low-cost materials manufacturing technologies. The center hopes to develop these and other new energy technologies.

The Center houses a staff of 10 investigators and is a multidisciplinary research collaboration funded by the U.S. Department of Energy. It is a public entity managed by the National Energy Technology Laboratory and is based at Pacific Northwest National Laboratory in Richland, Washington.



# Center for Biological Electron Transfer and Catalysis (BETCy)

Montana State University

## Director Contact

John Peters

[john.peters@chemistry.montana.edu](mailto:john.peters@chemistry.montana.edu)

[www.chemistry.montana.edu/peters/](http://www.chemistry.montana.edu/peters/)

## Center Contact

(406) 994-7039

[heather.rauser@montana.edu](mailto:heather.rauser@montana.edu)

<http://betcy-efrc.org/>

## Research Areas



## Research Activities



The mission of the center is to investigate electron bifurcation, electron-ion coupling, and redox catalysis in model enzymes to provide a detailed understanding of mechanisms of electron transfer reactions involved in the efficient conversion of electrochemical potential into chemical bond energy.

Established in 2014 MRSC is an Energy Frontier Research Center funded by the United States Department of Energy and it houses 61 among directors, professors, affiliates and advisory board, 11 students and five support staff.

The Center collaborates with Arizona State University, Duke University, Montana State University, National Renewable Energy Laboratory, University of Georgia, University of Kentucky, University of Washington, Utah State University.

# NEBRASKA

## Nebraska Center for Energy Sciences Research

University of Nebraska - Lincoln

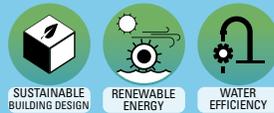
### Director Contact

Dr. Mike Nastasi  
mnastasi2@unl.edu  
(402) 472-3852

### Center Contact

lmoon1@unl.edu  
(402) 472-6082  
<http://ncesr.unl.edu/>

### Research Areas



### Research Activities



The mission of the Energy Center is to conduct energy research that produces new technologies, processes and systems that provide new or significantly enhanced renewable energy sources and improves the quality of life and economic opportunity for all Nebraskans.

Established in April 2006 the Nebraska Center for Energy Sciences Research is a collaboration between the Nebraska Public Power District (NPPD) and the University of Nebraska-Lincoln (UNL).

# NEVADA

## Center for Energy Research

University of Nevada Las Vegas

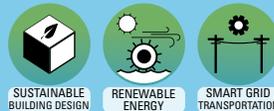
### Director Contact

Robert F. Boehm  
bob.boehm@unlv.edu  
(702) 89-4160

### Center Contact

tasha.ramos@unlv.edu  
(702) 895-0429  
<https://www.unlv.edu/cer>

### Research Areas



### Research Activities



The center serves as a generator and catalyst for ideas, a stimulus for interdisciplinary cooperation, and a facilitator for commercialization. It provides a base to bring together people from many disciplines to work on specific problems of interest.

The Center houses five professors, two research staff, one support staff and around 10 students and operates with approximately \$1,000,000 in annual funding from the State, from U.S. Federal Government and from private individuals (Robert Boehm, Yitung Chen, Yahia Baghzouz).

The Center is a public entity and collaborates with various Chinese Universities.

# Villa Trieste Homes

The Center for Energy Research performed a pilot project for the U.S. Department of Energy with NV Energy and Pulte Homes as sub-contractors investigating ways of decreasing peak electrical demand in an area of single family houses in Las Vegas known as the Villa Trieste community of homes.

The project involved 185 new homes designed specifically for this project known as the Villa Trieste community of homes. The goal was to decrease the peak electrical demand by 65% over code-minimum building designs of the same size.

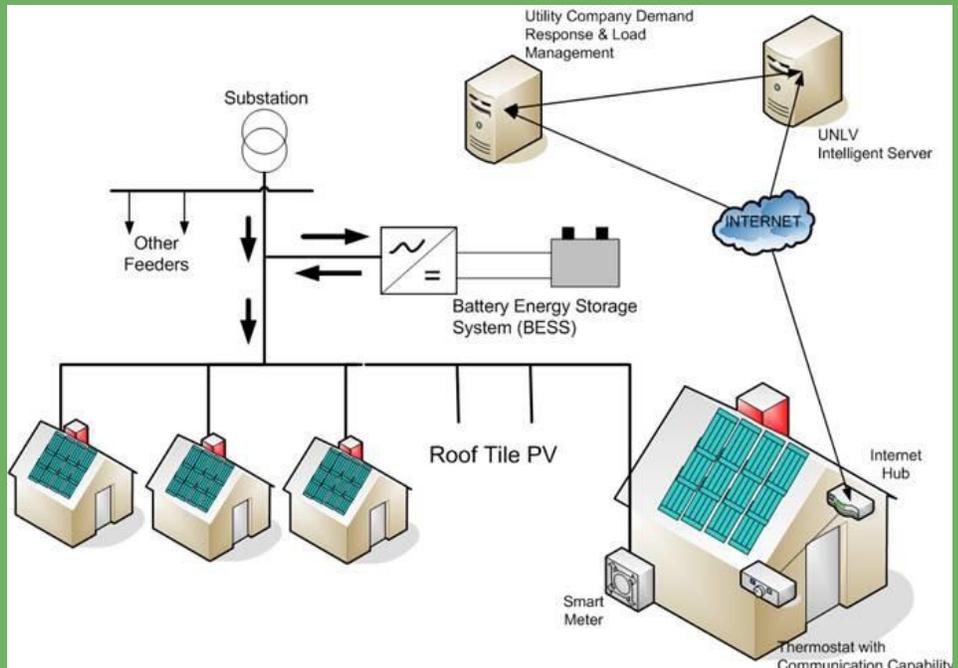
The project focused on:

- ▶ Building energy conservation
- ▶ Photovoltaic units for solar energy on the roofs of the homes
- ▶ A system that allows the home owner to select the degree of energy savings desired while working in harmony with the utility's need for peak load control
- ▶ Application of peak-shifting storage batteries.

The pilot proved to be successful without the use of battery storage, but performance was higher when battery storage was included.



*Villa Trieste Homes*



*Design details*

# Renewable Energy Center

University of Nevada, Reno

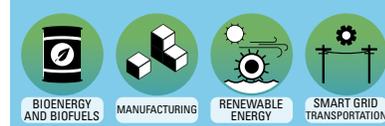
## Director Contact

Ghassan Jabbour  
ghassan.jabbour@unr.edu

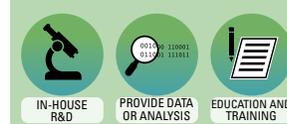
## Center Contact

Info.REC@unr.edu  
(775) 784-1603  
<http://www.unr.edu/energy/>

## Research Areas



## Research Activities



The University of Nevada, Reno focuses its renewable energy research efforts under the Renewable Energy Center that will coordinate efforts and develop programs for competitive research with plans to increase Nevada's national stature in the renewable energy field. The University has conducted renewable energy research for more than 10 years, including geothermal, biomass, hydrogen energy and solar, and in 2007, we formed the Renewable Energy Center to develop interdisciplinary, competitive research projects with an aim toward economic diversification and workforce development in the state of Nevada.

# Desert Research Institute (DRI)

University of Nevada

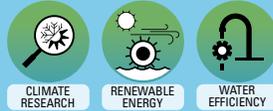
## Director Contact

Dr. Robert B. Gagosian  
Robert.Gagosian@dri.edu  
775) 673-7311

## Center Contact

(775) 673-7300  
<https://www.dri.edu/>

## Research Areas



## Research Activities



The Desert Research Institute (DRI) is the environmental research arm of the Nevada System of Higher Education. DRI conducts cutting-edge applied research in air, land and life, and water quality across Nevada, the United States and on every continent. We excel in basic and applied research and the application of technologies to improve people's lives throughout Nevada and the world. We implement this mission by fostering scientific and engineering talent. We apply scientific understanding to the effective management of natural resources while meeting Nevada's needs for economic diversification and science-based educational opportunities.

DRI houses 560 employees and has two main campuses in Reno and Las Vegas, Nevada. It operates with \$30 million in annual revenue from research grants and contracts, state support and private-sector research and development.

# NEW HAMPSHIRE



**CORE: Center for Ocean Renewable Energy**  
College of Engineering and Physical Sciences

## Center for Ocean Renewable Energy (CORE)

University of New Hampshire

### Director Contact

Ken Baldwin  
kcb@cisunix.unh.edu  
(603) 862-1898

### Center Contact

<http://www.unh.edu/core/>

### Research Areas



RENEWABLE  
ENERGY

### Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING

CORE, the UNH Center for Ocean Renewable Energy, founded in January 2008, provides multiple-scale research, technology development and evaluation, education, and outreach for issues related to Ocean Renewable Energy systems. CORE is a synergistic, interdisciplinary center for research, development and evaluation for Ocean Renewable Energy systems, and a place for training the next generation of engineers, scientists and policy makers for advancing this new industry. CORE provides innovation and commercialization support for commercial developers as they evolve from terrestrial-based energy systems to tidal, ocean wave and ocean current systems – collectively known as “hydrokinetic” energy systems.

# NEW JERSEY

## Rutgers Energy Institute

Rutgers University

### Director Contact

Paul G. Falkowski  
falko@marine.rutgers.edu  
(848) 932-3426

### Center Contact

<http://rei.rutgers.edu/>

### Research Areas



BIOENERGY AND BIOFUELS



CARBON CAPTURE



SUSTAINABLE BUILDING DESIGN



ENERGY STORAGE AND FUEL CELLS



RENEWABLE ENERGY

### Research Activities



IN-HOUSE R&D



PROVIDE DATA OR ANALYSIS

The Rutgers Energy Institute is engaged in four principal areas of activity: education of undergraduate and graduate students; pioneering research; outreach to the community to share information and engage the public; and policy advice to government, business, and civic leaders who require current knowledge about energy use, alternatives, and innovations to guide decision-making and public planning. Each of these four areas is critical to the overall mission of the institute: to foster both fundamental and applied scientific research and policy research to develop sustainable energy production compatible with economic growth and environmental vitality.

The institute is a public entity.



# Princeton Plasma Physics Laboratory

Princeton University

## Director Contact

Dr. Terrence K. Brog  
tbrog@pppl.gov  
(609) 243-3555

## Center Contact

PPPL\_OOC@pppl.gov  
(609) 243-2000  
<http://www.pppl.gov/>

## Research Areas



FUSION ENERGY

## Research Activities



IN-HOUSE R&D



EDUCATION AND TRAINING

The U.S. Department of Energy's Princeton Plasma Physics Laboratory is dedicated to developing fusion as a clean and abundant source of energy and to advancing the frontiers of plasma science. The Laboratory pursues these goals through experiments and computer simulations of the behavior of plasma, the hot electrically charged gas that fuels fusion reactions and has a wide range of practical applications

Established in 1961, PPPL houses 500 top researchers, engineers and support staff and operates with an annual budget of \$100 million.

The transfer of technology to private industry, academic institutions, and other federal laboratories is one of the missions of the Princeton Plasma Physics Laboratory (PPPL). As a technology resource, PPPL seeks to provide its unique expertise to solutions of industrial problems. PPPL has also endeavored to enhance its contact with area small businesses and to provide technological help and guidance where possible. In addition, PPPL participates in the U.S. Department of Energy Technology Partnership Ombuds Initiative.

# NEW MEXICO



## Los Alamos National Laboratory

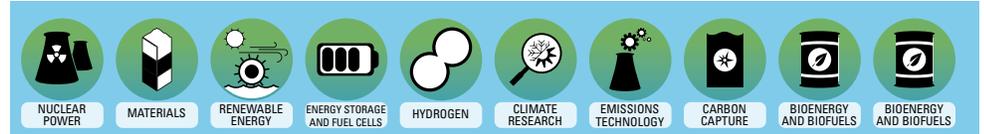
### Director Contact

Lawrence Joseph Simmons  
simmons@lanl.gov  
(505) 665 5874

### Center Contact

<http://www.lanl.gov/index.php>  
(505) 667-5061

### Research Areas



### Research Activities



Established in 1943, Los Alamos National Lab uses its world-class scientific capabilities to enhance national energy security. The laboratory has three main areas of focus in energy security: safe and sustainable nuclear energy, materials and concepts for clean energy, mitigating impacts of global energy demand growth.

# Center for Advanced Solar Photophysics (CASp)

Los Alamos National Laboratory

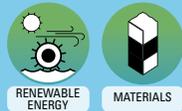
## Director Contact

Victor Klimov  
klimov@lanl.gov

## Center Contact

<http://casp.lanl.gov/index.shtml>

## Research Areas



## Research Activities



The mission of the center is to exploit fundamental interactions between nanomaterials and light with the goal of producing disruptive advances in the efficiency of solar energy conversion.

Established in 2009 CASp is an Energy Frontier Research Center funded by the United States Department of Energy and collaborates with George Mason University, Los Alamos National Laboratory, National Renewable Energy Laboratory, University of California Irvine, University of Chicago, University of Minnesota, University of Pennsylvania.



# Sandia National Laboratories

### Director Contact

Jill M. Hruby  
(505)284-2000

### Center Contact

<http://www.sandia.gov/index.html>

### Research Areas

- RENEWABLE ENERGY
- FOSSIL FUELS
- ENERGY STORAGE AND FUEL CELLS
- NUCLEAR POWER
- SMART GRID TRANSPORTATION
- CLIMATE RESEARCH
- CARBON CAPTURE
- WATER EFFICIENCY
- BIOENERGY AND BIOFUELS
- ENERGY CONVERSION

### Research Activities

- IN-HOUSE R&D
- INTELLECTUAL PROPERTY
- PERFORM DEMONSTRATIONS
- EDUCATION AND TRAINING

The mission of the Sandia National Laboratories in the energy’s area is to enhance the nation’s security and prosperity through sustainable, transformative approaches to the most challenging energy, climate, and infrastructure problems.

# NEW YORK



## North East Center for Chemical Energy Storage

Binghamton University

### Director Contact

M. Stanley Whittingham  
stanwhit@binghamton.edu  
(907) 457-3454

### Center Contact

necces@binghamton.edu  
(607) 777-4675  
www.binghamton.edu/necces/

### Research Areas



ENERGY STORAGE  
AND FUEL CELLS

### Research Activities



IN-HOUSE  
R&D

NECCES seeks to develop new characterization and theoretical tools to identify and design novel battery systems and key atomic- scale processes, which govern electrode function in rechargeable batteries. Researchers focus on developing characterization tools and methodologies with increased spatial, energy, and temporal resolution in order to gain full understanding of various properties of materials and systems.

Established in 2009, NorthEast Center for Chemical Energy Storage houses approximately 16 professors, six research staff, two support staff, and 50 students and operates with approximately \$3,500,000 in annual funding from U.S. and State Government. The main founding contributors are DOE-BES and NYS.

# CUNY Energy Institute

City College of New York

## Director Contact

Sanjoy Banerjee  
banerjee@ccny.cuny.edu  
(212) 650-5728

## Center Contact

[www.cuny.edu/site/energy.html](http://www.cuny.edu/site/energy.html)  
(212) 650-8149  
energy@che.ccny.cuny.edu

## Research Areas



## Research Activities



The CUNY Energy Institute seeks to enable utilization of renewable energy sources by improving the efficiency of electric, electrochemical, and thermal energy storage. The lack of energy storage to support intermittent renewable sources currently presents a major hurdle to their widespread use. Technologies being developed at the Energy Institute are necessary to expand solar and wind capacity. The grid-scale batteries and Metacapacitors™ that the institute is developing can improve the reliability of the national electric grid by providing back-up energy during hours of peak demand. The flexibility and commercial applicability of our energy storage products are their greatest assets. In addition, the scientists working at the CUNY Energy Institute are cleaning up traditional sources of energy to reduce our carbon footprint and reliance on foreign oil. It is possible to improve the production and utilization of domestic gas and heavy oil resources through liquid separation techniques discovered in our labs. As nuclear power provides the vast majority of domestic, carbon-free energy, the institute is working to enhance the safety and performance of the nation's 104 commercial reactors through advanced simulation research.

Established in 2008, CUNY Energy Institute is a non-profit entity that houses five professors, five research staff, two support staff, and five students and operates with funding from U.S Federal Government, NY State, non-U.S. Government, and private institutions. The main funding contributors are the DOE-ARPA-E, NYSERDA, and Con Edison.

# New York Battery and Energy Storage Technology

## Director Contact

Bill Acker

acker@ny-best.org

www.ny-best.org/page/contact-us

## Center Contact

info@ny-best.org

(518) 694-8474

https://www.ny-best.org

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS



POLICY

## Research Activities



PROVIDE DATA  
OR ANALYSIS



EDUCATION AND  
TRAINING



PROJECT  
MANAGEMENT

The mission of the consortium is to catalyze and grow the energy storage industry and establish New York State as a global leader by:

1. Acting as an authoritative resource on energy storage, proactively communicating energy storage related news and information, and facilitating connections amongst stakeholders;
2. Advancing and accelerating the commercialization process for energy storage technologies, from research and development, to products and widespread deployment;
3. Educating policymakers and stakeholders about energy storage and advocating on behalf of the energy storage industry; and
4. Promoting New York's world-class intellectual and manufacturing capabilities and providing access to markets to grow the energy storage industry in New York.

Established in 2010, NY-BEST is a non-profit entity and currently has more than 150 members. The Consortium's membership is diverse and includes manufacturers, academic institutions, utilities, technology and materials developers, start-ups, government entities, engineering firms, systems integrators, and end-users. The majority of its members are New York State based entities.

# Center for Sustainable Energy Systems

Clarkson University

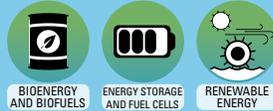
## Director Contact

Dr. Kenneth Visser  
visser@clarkson.edu  
(315) 268-7687

## Center Contact

[www.clarkson.edu/cses](http://www.clarkson.edu/cses)

## Research Areas



## Research Activities



Clarkson University has been engaged in energy research and education for over 35 years and our faculty's wide range of interests and activities span disciplines from Engineering to Business. The Center provides a vehicle to bring these efforts together, exchange ideas with each other and generate new concepts for innovative, sustainable, collaborative projects at local, national and international levels.

The center is a public entity and supports the current efforts of the Institute for a Sustainable Environment (ISE) and the Center for Advanced Materials Processing (CAMP) and is closely linked to the Shipley Center for Innovation.

# Energy Materials Center at Cornell (EMC2)

Cornell University

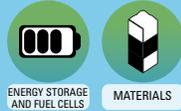
## Director Contact

Héctor D. Abruña  
hda1@cornell.edu

## Center Contact

emc2info@cornell.edu  
(607) 255-6083  
<http://www.emc2.cornell.edu/>

## Research Areas



## Research Activities



Many of today’s energy challenges are rooted in materials limitations. EMC2 focuses on advancing the science and technology of energy conversion and storage, with a focus on materials discovery and characterization, to overcome these challenges. Of particular interest are active materials and their interfaces, and finding materials based-solutions that are scalable for facile incorporation in advanced energy technologies. Researchers follow an integrated materials by design approach (theory, synthesis, analysis) with particular focus on supercapacitors, batteries, fuel cells and other electrochemical energy conversion and storage devices.

Established in 2009, EMC2 is a public entity that houses 18 professors, three research staff, two support staff, and 12 students and operates with approximately \$3,500,000 in annual funding.

The main research partners are General Motors, Primet Precision Materials, and Ford Motor Company.

# Center for Sustainable Energy

The City University of New York

## Director Contact

Aaron M Socha  
aaron.socha@bcc.cuny.edu  
(718) 933-1607

## Center Contact

cse@bcc.cuny.edu  
(718) 933-1605  
<http://www.csebcc.org/>

## Research Areas



BIOENERGY  
AND BIOFUELS

## Research Activities



IN-HOUSE  
R&D

The Center for Sustainable Energy (CSE) uses experiential education to build an urban community on the tenets of renewable energy, informed political engagement and the emerging green economy. Full-time faculty, adjunct professors, staff and students are dedicated to developing novel curriculum for grid-tied and off-grid solar/photovoltaics and green organic chemistry. The mission is to promote and implement the use of sustainable and efficient energy technologies in urban communities through education, training, workforce development, and research and project facilitation. The Center for Sustainable Energy supports clean energy development and energy conservation as the means to protect the environment, enhance public health and position New York City to capture emerging economic development opportunities in the energy sector.

The Center was established in 2003, is a public entity and houses the director, four affiliated faculty, six instructor, one office manager and one college assistant.

Some center's partners are Joint BioEnergy Institute (JBEI), Tri-State Biodiesel, GRID Alternatives New York Tri-State, CedarCreek P&T, FYT Fuels LLC.

# Advanced Energy Research & Technology Center (AERTC)

Stony Brook University

## Director Contact

Robert Catell

## Center Contact

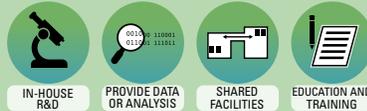
[jim.smith@stonybrook.edu](mailto:jim.smith@stonybrook.edu)

<http://www.aertc.org>

## Research Areas



## Research Activities



The Center's mission is innovative energy research, education and technology deployment with a focus on efficiency, conservation, and renewable energy and nanotechnology applications for new and novel sources of energy.

The Advanced Energy Center (AERTC) is located in the Research & Development Park at Stony Brook University and is a true partnership of academic institutions, research institutions, energy providers and industrial corporations.



# David R. Atkinson Center for a Sustainable Future (ACSF)

Cornell University

## Director Contact

David M Lodge

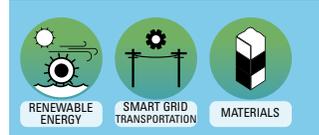
## Center Contact

[acsf@cornell.edu](mailto:acsf@cornell.edu)

(607) 255-7535

<http://www.acsf.cornell.edu/>

## Research Areas



## Research Activities



The Atkinson Center is working toward a future where the world's needs for reliable energy, a resilient environment, and responsible economic development can flourish, not as competing demands, but as complementary spokes on the wheel of prosperity. The mission is to discover and implement sustainable solutions to world needs for reliable energy, a resilient environment, and responsible economic development.

David R. Atkinson Center for a Sustainable Future has nearly 500 faculty fellows and 80-plus research fellows (post-docs and students). Center was founded by a generous gift from David and Pat Atkinson.

The Atkinson Center connects researchers to external partners with on-the-ground capacity to help identify, test, and implement research-proven strategies that work. Current collaborations are CARE, Environmental Defense Fund, the Nature Conservancy, Oxfam, Smithsonian Conservation Biology Institute.

# Center for Sustainable Mobility (CSM)

Rochester Institute of Technology

## Director Contact

Thomas A Trabold

[www.rit.edu/gis/csm/csm-staff.php](http://www.rit.edu/gis/csm/csm-staff.php)

## Center Contact

[info@sustainability.rit.edu](mailto:info@sustainability.rit.edu)

(585) 475-5385

<http://www.rit.edu/gis/csm/>

## Research Areas



TRANSPORTATION  
TECHNOLOGY

## Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS

Rochester Institute of Technology is helping shape the future of energy technologies applied to transportation. Leading this effort is the Center for Sustainable Mobility, begun in 2006 with a \$4M grant from the U.S. Department of Transportation to assess the environmental and economic impact of different alternative fuel and propulsion technologies on the U.S. public transportation system. Today, the institute also examines emerging fuel technologies and their applications – biodiesel, ethanol, fuel cells, hydrogen and combinations of these – to determine their impacts on existing systems and forecast requirements for sustainable future transportation systems and infrastructure. In addition, it develops technologies for optimal life-cycle design, management, and modernization of large equipment systems by maximizing the value of existing systems and designing advanced capabilities in new systems while managing life-cycle costs.

Established in 2006 CSM collaborates with industry, local and state governments, and the Department of Defense to conduct comprehensive research, applied development, testing, and field implementation. RIT's goal is to become a regional center for sustainable transportation and systems modernization, becoming the preferred choice for organizations seeking assistance in these areas.

# Energy and Environmental Technology Application Center (E2TAC)

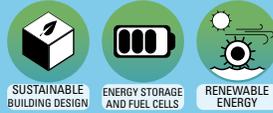
## Director Contact

Pradeep Haldar  
phaldar@sunypoly.edu

## Center Contact

www.e2tac.org

## Research Areas



## Research Activities



The Energy and Environmental Technology Applications Center (E2TAC) was created as an active expansion of the Colleges of Nanoscale Science and Engineering (CNSE) to work with companies in the rapidly emerging energy and environmental industries. E2TAC offers a critical platform for CNSE to leverage its intellectual power base and state-of-the-art infrastructure to provide an applications-targeted technology development, leading to the integration of nanoelectronics and nanotechnology in advanced energy and environmental applications.

The Energy and Environmental Technology Applications Center (E2TAC) was created in 1998. The Center has a synergistic blend of industry experience and academic credentials, with an emphasis on research, innovation and entrepreneurship (internal staff of 13 employees and five students) and is a public entity.

# Building Energy and Environmental Systems Laboratory (BEESL)

Syracuse University

## Director Contact

Dr Jianshun Zhang

## Center Contact

[bguo@syr.edu](mailto:bguo@syr.edu)

<http://beesl.syr.edu/>

## Research Areas



SUSTAINABLE  
BUILDING DESIGN

## Research Activities



IN-HOUSE  
R&D



SET/VERIFY  
STANDARDS



PROVIDE DATA  
OR ANALYSIS

The mission of BEESL is to advance the science and develop innovative technologies in the areas of indoor environmental quality (IEQ), building energy efficiency (BEE) and building protections by conducting leading edge academic and industrial research; enhance scholarly learning and professional training for graduate and undergraduate students via integration between research and teaching; help relevant industries in product development and innovation by providing objective and unbiased product testing and evaluation services.

# The NanoPower Research Labs (NPRL)

Rochester Institute of Technology

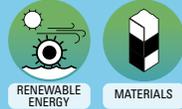
## Director Contact

Seth Hubbard  
smhsps@rit.edu  
(585) 475-4214

## Center Contact

[www.rit.edu/gis/research-centers/nanopower/](http://www.rit.edu/gis/research-centers/nanopower/)

## Research Areas



## Research Activities



The NanoPower Research Labs (NPRL) are a key component of the Center for Sustainable Energy Systems at RIT's Golisano Institute for Sustainability (GIS). Research is focused on the development of new materials and devices for power generation and storage for microelectronic components and micro-electromechanical systems (MEMS). Targeted technologies include: carbon nanotubes for high-density storage in lithium ion batteries and wires; triple junction II-V photovoltaics; and polymer photovoltaics.

The Center was established in 2001. The sponsors are US Government, Air Force Research Laboratories (AFRL), Office of Naval Research (ONR).

# Center for Mesoscale Transport Properties

Stony Brook University

## Director Contact

Esther Takeuch

[esther.takeuchi@stonybrook.edu](mailto:esther.takeuchi@stonybrook.edu)

(631) 632-7922

## Center Contact

[deborah.murphy@stonybrook.edu](mailto:deborah.murphy@stonybrook.edu)

(631) 216-7539

[www.stonybrook.edu/m2m](http://www.stonybrook.edu/m2m)

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS

## Research Activities



IN-HOUSE  
R&D

The mission of the center is to understand and to ultimately control transport properties in complex battery systems with respect to multiple length scales, from molecular to mesoscale (m2m); to minimize heat and maximize work of electrical energy storage devices.

Established in 2014 NorthEast Center for Chemical Energy Storage houses approximately 16 professors, six research staff, two support staff, and 50 students and operates with approximately \$2,500,000 in annual funding from DOE, NYTAR, and NYSERDA.

The center collaborates with Brookhaven National Laboratory, Columbia University, Georgia Institute of Technology, Oak Ridge, National Laboratory, Renselaer Polytechnic and is a public entity.

# Center for Emergent Superconductivity (CES)

Brookhaven National Laboratory

## Director Contact

J. C. Séamus Davis  
(607) 254-8965  
jcseamusdavis@gmail.com

## Center Contact

[www.bnl.gov/energy/ces/default](http://www.bnl.gov/energy/ces/default)

## Research Areas



MATERIALS

## Research Activities



IN-HOUSE  
R&D

To discover new high-temperature superconductors and improve the performance of known superconductors by understanding the fundamental physics of superconductivity.

Established in 2009 the center houses 16 principal investigators and is an Energy Frontier Research Center funded by the United States Department of Energy.

The Center collaborates with Argonne National Laboratory, Brookhaven National Laboratory, Florida State University, Los Alamos National Laboratory, Rutgers University, and University of Illinois Urbana-Champaign.



# Brookhaven National Laboratory

## Director Contact

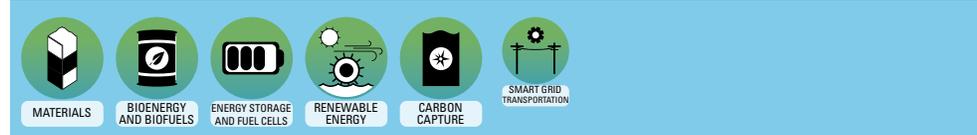
Doon Gibbs

## Center Contact

(631) 344-8000

<https://www.bnl.gov/world/>

## Research Areas



## Research Activities



The Lab advances fundamental research in nuclear and particle physics to gain a deeper understanding of matter, energy, space, and time; apply photon sciences and nanomaterials research to energy challenges of critical importance to the nation; and perform cross-disciplinary research on climate change, sustainable energy, and Earth's ecosystems.

Established in 1947 Brookhaven National Laboratory is one of the 17 DOE laboratories and houses around 3,000 scientists, engineers, and support staff and is joined each year by more than 4,000 visiting researchers from around the world. It operates with approximately \$600,000,000 in annual funding from U.S. federal governments and other sources.

The lab cultivates positive and longstanding partnerships with researchers, academic institutions, industry, students, teachers and neighbors in its community.

# NORTH CAROLINA



## UNC EFRC: Center for Solar Fuels

University of North Carolina at Chapel Hill

### Director Contact

Thomas J. Meyer  
tjmeyer@unc.edu  
(919) 843-8312

### Center Contact

serc@unc.edu  
(919) 962-5518  
www.efrc.unc.edu

### Research Areas



ENERGY STORAGE  
AND FUEL CELLS

### Research Activities



IN-HOUSE  
R&D



EDUCATION AND  
TRAINING

The Center for Solar Fuels conducts research on the dye sensitized photoelectrosynthesis cell (DSPEC) for water splitting and tandem cells for the reduction of carbon dioxide to carbon-based solar fuels.

Center for Solar Fuels houses approximately 16 professors, two research staff, three support staff, and 18 students. The Center was established in 2009. They receive approximately \$28,300,000 in annual funding from the U.S. Federal Government. The main funding source is the Department of Energy: Basic Energy Sciences. The center collaborates with University of Texas at San Antonio, Georgia Institute of Technology, and Brookhaven National Laboratory. It is a public organization.



**NC CLEAN ENERGY**  
TECHNOLOGY CENTER

# North Carolina Clean Energy Technology Center

NC State University

## Director Contact

Steve Kalland  
sskallan@ncsu.edu  
(919) 513-1896

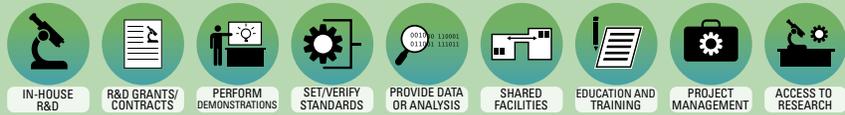
## Center Contact

nccleantech@ncsu.edu  
(919) 515-3480  
www.nccleantech.ncsu.edu

## Research Areas



## Research Activities



The mission of the NC Clean Energy Technology Center (NCCETC) is to advance clean energy for a sustainable economy by educating, demonstrating and providing support for clean energy technologies, practices, and policies.

The Center provides services to the businesses and citizens of North Carolina and beyond relating to the development and adoption of clean energy technologies. Through its programs and activities, the Center seeks to promote the development and use of clean energy while reducing dependence on foreign sources of energy, and mitigating the environmental impacts of fossil fuel use.

North Carolina Clean Energy Technology Center houses approximately 21 research staff, three support staff, and eight students. The Center was established in 1987. They receive approximately \$4,500,000 in annual funding from the U.S. Federal Government, State of NC, Non-U.S. governments, foundations, private institutions, and others. The main funding sources are US DOE, State of NC and, fees. The center collaborates with the Savannah River National Laboratory, Oak Ridge National Laboratory, PowerAmerica, Advanced Energy, and industry. It is a public organization.

## Advanced Energy

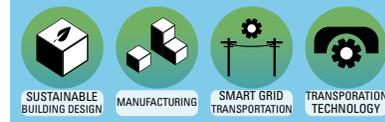
### Director Contact

Robert Koger  
bkoger@advancedenergy.org

### Center Contact

info@advancedenergy.org  
(919) 857-9000  
www.advancedenergy.org

### Research Areas



### Research Activities



Advanced Energy was founded in 1980 by the North Carolina Utilities Commission to investigate and implement technologies for distributed generation, load management and energy efficiency. Today, the non-profit organization offers research, testing, training, consulting and program services to clients nationally and internationally. Areas of expertise include residential, commercial, industrial, electric transportation, renewables and motors and drives. The organization also runs multiple programs, including NC GreenPower, SystemVision and Plug-in NC.

Advanced Energy houses approximately 44 research staff and is a non-profit organization. The Center was established in 1980. They receive funding from NC Electric Utilities. The main funding source is the State of NC.

# SystemVision

SystemVision, Advanced Energy's (AE) affordable housing program and the only guaranteed energy and comfort program for affordable housing in the nation, took a big step last year. For the first time in 15 years, SystemVision will scale to existing homes. The program is expanding its mission to give low-income families, such as those receiving less than 80% of an area's median income, a chance to have a better home that is safe, healthy, and affordable.

Since 2001, the new homes program has completed, certified, and guaranteed over 4,500 homes in North Carolina. The North Carolina Housing Finance Agency (NCHFA) is a major partner in SystemVision, providing the program with access to more than one third of the affordable units built in the state. And more importantly, NCHFA committed to providing the financial incentive needed by builders and developers to participate. Statewide, more than 60 affordable housing developers in North Carolina participate in SystemVision, including Habitat for Humanity affiliates, local governments, community development corporations, and a host of nonprofit organizations. An analysis of energy billing data in 2008 showed



*from the SystemVision website*

that the average savings per home was approximately 15% of the total bill or about 30% of the heating and cooling bill. "We want the home to be affordable not only to buy but also to live in for the long-term," says Maria Mauceri, SystemVision Program Director.

Low-income homeowners are not the only ones benefiting from the program's expansion. This new initiative gives non-profit builders the ability to take advantage of funds from the NCHFA to retrofit older homes. The AE team works with eligible builders to conduct an assessment and determine what retrofitting measures will be installed in the home. After the work is completed, all homes are

visually inspected, and they receive specific performance tests to verify compliance with the standards.

Mauceri says, "Our experience so far has been great. Builders are eager to learn the standards and process, resulting in completed homes that meet high standards for energy efficiency, comfort, durability, health, and safety."

Innovation also involves collaborating to improve the work both organizations are doing. NCHFA works intimately with affordable housing developers across the state, providing financing and support that makes it possible to increase the number and quality of affordable homes in the state. The key to implementing this

successfully is making cost-effectiveness the priority.

“System Vision for Existing Homes is a model that recognizes the nuances of an existing home structure while putting energy efficiency measures in place with the highest return on investment,” Gene Brown, President & Executive Director at Community Housing Solutions, explains, “The result ... providing beautifully renovated homes for first time home buyers with low energy costs and preserving the life of the home for many years to come.”

Even though SystemVision depends on volunteer labor, novice contractors, and limited budgets, these homes continue to outperform code-built homes while using readily available construction products and technologies.

AE has expertise in building science, training, and program management. The tools and techniques needed to implement high-quality energy-efficiency measures in existing homes is built into SystemVision’s training and inspection process. A whole-house standard resonates with the program partners. Together, we can reach a large community of homeowners.

Looking ahead, SystemVision hopes to translate an energy-efficiency philosophy to multi-family, commercial, and supportive housing. “What you need [to encourage awareness of energy efficiency in the community] are market drivers in affordable housing, NCHFA, or other organizations provide funding. In the open market, homeowners may pay more upfront, but they receive ongoing benefits for the life of the home, such as increased property values, lower energy bills, and a more comfortable, durable home,” says Mauceri.

# NORTH DAKOTA



## Energy & Environmental Research Center (EERC)

University of North Dakota

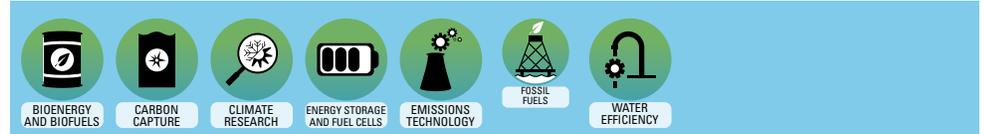
### Director Contact

Thomas A. Erickson  
terickson@undeerc.org  
(701) 777-5130

### Center Contact

info@undeerc.org  
(701) 777-5174  
www.undeerc.org

### Research Areas



### Research Activities



The EERC is a unique organization dedicated to providing practical, pioneering solutions to the world's energy and environmental challenges. The center houses approximately 124 research staff, 64 support staff, and 22 students. The Center was established in 1951. They receive approximately \$29,000,000 in annual funding. Funding sources include: U.S. Federal Government, the State of North Dakota, Non-U.S. Governments, and Private Institutions. It is a public organization.

# OHIO



## Ohio Center for Industrial Energy Efficiency (OCIEE)

### Director Contact

Lawrence Boyd  
lcb26@hotmail.com  
(216) 323-1898

### Center Contact

<http://ohiociee.org>

### Research Areas

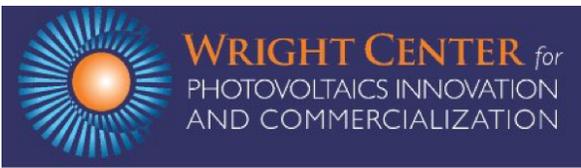


### Research Activities



OCIEE's mission as directed by the ODSA is to foster the adoption of energy efficient practices and technologies by Ohio manufacturers. This is accomplished by providing Best Practice training; facilitating and conducting facility energy assessments; assisting in the implementation/auditing of ISO 50001 and Superior Energy Performance management systems; and supporting the ODSA's Energy Efficiency Program for Manufacturers. OCIEE's overall goal is to improve the competitiveness of Ohio industry through increased energy efficiency, reduced operating costs and improved environmental performance.

OCIEE houses one support staff. The Center was established in 2010 and is a public organization. They receive approximately \$150,000 in annual funding from the State of Ohio.



# Wright Center for Photovoltaics Innovation and Commercialization (PVIC)

University of Toledo

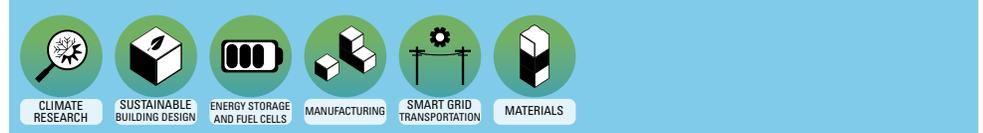
## Director Contact

Robert W. Collins, Ph.D.  
rcollins@physics.utoledo.edu  
(419) 530-3843

## Center Contact

[www.utoledo.edu/research/pvic/](http://www.utoledo.edu/research/pvic/)  
(419) 530-3905

## Research Areas



## Research Activities



The Center was funded as a means of strengthening the photovoltaics research and manufacturing base in Ohio. Activities revolve around eliminating market barriers currently facing companies in the photovoltaics sector. Companies active in the photovoltaics industry, from those researching advanced materials development to those deploying energy producing devices, advise and coordinate experts in PVIC membership.

PVIC houses approximately 14 professors, three research staff, three support staff, and 18 students. The Center was established in 2007. They receive funding from US federal government, the state of Ohio, foundations, private institutions and fees. The main funding contributor to the center is the Ohio Department of Development. The center collaborates with Bowling Green State University, Ohio State University, SSOE Inc., Edison Materials Technology Center, and Green Energy of Ohio. It is a public organization.

# Center for Performance and Design of Nuclear Waste Forms and Containers (WastePD)

## Director Contact

Gerald Frankel  
(614) 688-4128  
frankel.10@osu.edu

## Center Contact

efrc.osu.edu/

## Research Areas



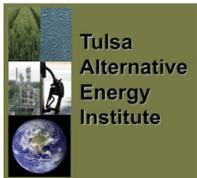
## Research Activities



The Center for Performance and Design of Nuclear Waste Forms and Containers seeks to understand the fundamental mechanisms of waste form performance and apply that understanding to design new waste forms with improved performance.

The Center houses 10 professors and it was established in 2016. The Center for Performance and Design of Nuclear Waste Forms and Containers is an Energy Frontier Research Center funded by the United States Department of Energy. Partnering institutions include the Commissariat à l’Energie in France, Louisiana State University, Ohio State University, Pacific Northwest National Laboratory, Pennsylvania State University, QuesTek Innovations, Rensselaer Polytechnic Institute, University of North Texas, and the University of Virginia.

# OKLAHOMA



## Tulsa Institute of Alternative Energy Fuels

University of Tulsa

### Director Contact

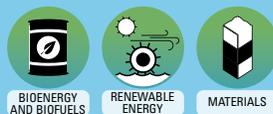
Daniel Crunkleton  
daniel-crunkleton@utulsa.edu

### Center Contact

daniel-crunkleton@utulsa.edu  
(918) 631-2644

[www.orgs.utulsa.edu/altenergy/Site/Welcome.html](http://www.orgs.utulsa.edu/altenergy/Site/Welcome.html)

### Research Areas



### Research Activities



The Center for Solar Fuels conducts research on the dye sensitized photoelectrosynthesis cell (DSPEC) for water splitting and tandem cells for the reduction of carbon dioxide to carbon-based solar fuels. UNC EFRC houses approximately 15 professors, 15 research staff, one support staff, and 10 students. The Center was established in 2007. The institute is a private organization.

# OREGON



## Wallace Energy Systems & Renewables Facility (WESRF)

Oregon State University

### Director Contact

Ted Brekken

[brekken@eecs.oregonstate.edu](mailto:brekken@eecs.oregonstate.edu)

(541) 737-2995

### Center Contact

<http://eecs.oregonstate.edu/wesrf>

### Research Areas



CLIMATE RESEARCH



ENERGY STORAGE AND FUEL CELLS



RENEWABLE ENERGY



SMART GRID TRANSPORTATION



WATER EFFICIENCY

### Research Activities



IN-HOUSE R&D



R&D GRANTS/ CONTRACTS



PERFORM DEMONSTRATIONS



SHARED FACILITIES



EDUCATION AND TRAINING



PROJECT MANAGEMENT

The WESRF at OSU provides research, testing and consulting services related to motors, generators, adjustable speed drives, power electronics, power supplies, power quality, industrial process equipment, power systems and renewables. By using state-of-the-art facilities and the expertise of internationally recognized personnel, we are able to meet the most stringent of industry and utility requirements and testing standards.

WESRF was established in 1993. They receive funding from U.S. Federal Government, State of Oregon, Non-U.S. governments, and private institutions. The main contributors are US DOE, Electric Power Research Institute, and Pacific Gas & Electric. Research partners include the Columbia Power Technologies and the US Navy. WESRF is a public organization.



# Northwest National Marine Renewable Energy Center

Oregon State University

## Director Contact

Belinda Batten

Belinda.Batten@oregonstate.edu

(541) 737-9492

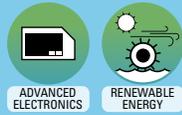
## Center Contact

samantha.quinn@oregonstate.edu

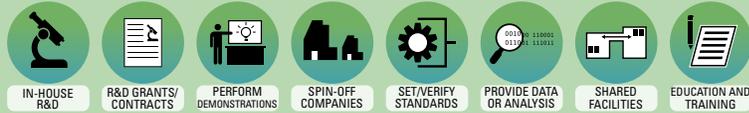
(541) 737-6138

nnmrec.oregonstate.edu/

## Research Areas



## Research Activities



Our mission is to facilitate commercialization of marine energy technology, inform regulatory and policy decisions, and close key gaps in scientific understanding with a focus on student growth and development.

Northwest National Marine Renewable Energy Center houses approximately 20 professors, six research staff, two support staff, and 30 students. The Center was established in 2008. They receive approximately \$4,000,000 in annual funding from US Department of Energy, US Department of Defense, and the National Science Foundation. The center engages with their partners in collaborative research projects. Partners include: Pacific Northwest National Laboratory, National Renewable Energy Laboratory, Sandia National Laboratories, and the University of Hawai'i. The center is a public organization.

# Solar Radiation Monitoring Laboratory

University of Oregon

## Center Contact

fev@uoregon.edu

(541) 346-4745

<http://solardat.uoregon.edu/>

## Research Areas



## Research Activities



The mission of the NC Clean Energy Technology Center (NCCETC) is to advance clean energy for a sustainable economy by educating, demonstrating and providing support for clean energy technologies, practices, and policies. The Center provides services to the businesses and citizens of North Carolina and beyond relating to the development and adoption of clean energy technologies. Through its programs and activities, the Center seeks to promote the development and use of clean energy while reducing dependence on foreign sources of energy, and mitigating the environmental impacts of fossil fuel use.

Solar Radiation Monitoring Laboratory houses one professor, one research staff, and three students. The Center was established in 1975. They receive approximately \$140,000 in annual funding from BPA, ETO, and NREL. The Laboratory shares data collection information and writes papers with NREL, TEI Crete, and DMI.

# PENNSYLVANIA

ENERGY SYSTEMS  
ENGINEERING INSTITUTE

## Energy System Engineering Institute

Lehigh University

### Director Contact

Ramesh Shankar  
(610) 758-3529  
rudys.shankar@lehigh.edu

### Center Contact

lehigh.edu/esei  
(610) 758-3650  
waa3@lehigh.edu

### Research Areas



### Research Activities



Satisfying society's energy demands while protecting our environment requires unprecedented collaboration among scientists, engineers, policymakers, economists, and leaders of industry. Lehigh's Energy Systems Engineering Institute (ESEI) represents a novel partnership among students, industry sponsors and academic faculty, serving as a center of excellence that promotes research, education and technology transfer in energy systems.

The institute has four faculty, one support staff, and maintains around 15-20 students. The center is funded through industry donations and funding from the student tuition, receiving approximately \$1 million annually. The institute works across the university to partner with the PC Rossin College of Engineering and Applied Science. It is a public organization.

# bio**mass** energy center

## Biomass Energy Center

Pennsylvania State University

### Director Contact

Tom L. Richard  
trichard@psu.edu

### Center Contact

<http://www.bioenergy.psu.edu>  
(814) 863-0291

### Research Areas



BIOENERGY AND BIOFUELS



POLICY

### Research Activities



IN-HOUSE R&D



R&D GRANTS/ CONTRACTS



INTELLECTUAL PROPERTY



PERFORM DEMONSTRATIONS



SPIN-OFF COMPANIES



SHARED FACILITIES



EDUCATION AND TRAINING



ACCESS TO RESEARCH

The mission of the Biomass Energy Center is to coordinate and facilitate research and outreach across the university, building teams to address the complete value chain of biomass energy systems.

The center has 65 affiliated faculty, 15 research staff, one support staff, and around 75 students. Funding is primarily received from the Department of Energy, United States Department of Agriculture, and the National Science Foundation. The center receives around \$12-14 million annually and is a public organization. The Biomass Energy Center works with partners such as Dartmouth, Cornell University, and some of the national labs.

# Radiation Science and Engineering Center (RSEC)

Pennsylvania State University

## Director Contact

Kenan Unlu  
(814) 865-6351  
k-unlu@psu.edu

## Center Contact

<http://www.rsec.psu.edu/>  
cxp7@psu.edu

## Research Areas



NUCLEAR  
POWER

## Research Activities



IN-HOUSE  
R&D



PERFORM  
DEMONSTRATIONS



SHARED  
FACILITIES



EDUCATION AND  
TRAINING

The RSEC is the home of the Penn State Breazeale Reactor. The RSEC provides neutron and gamma-ray sources and nuclear techniques for interdisciplinary research, education, and applications of radiation. The RSEC is utilized by students, faculty, and staff at PSU, as well as to scientists in universities, governments, and industries worldwide. The Radiation Science and Engineering Center was established in 1990 as a public organization and it is funded by U.S. Federal Government and Private Institutions.

# Center for Combustion, Power and Propulsion

Pennsylvania State University

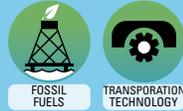
## Director Contact

Daniel Haworth  
(814) 863-6269  
trichard@psu.edu

## Center Contact

[sites.psu.edu/ccpp/](http://sites.psu.edu/ccpp/)

## Research Areas



## Research Activities



For more than 50 years, Penn State researchers have made important contributions to the field of combustion, both in terms of improved understanding of combustion fundamentals and the application of combustion science to the development of advanced combustion technology. CCpp's mission is to address the technological challenges of the 21st century through nationally and internationally recognized research and education programs, strong industry-government-university relationships and active engagement of researchers across the university.

The center works with large industry partners such as the Volvo Group under an Academic Preferred Partnership, as well as with other institutions such as Trinity College. The center has 15 affiliated faculty, 15 support staff, and 36 students. It is a public organization.



# Center for Lignocellulose Structure and Formation

Pennsylvania State University

## Director Contact

Daniel Cosgrove

(814) 863-3892

[dcosgrove@psu.edu](mailto:dcosgrove@psu.edu)

## Center Contact

[lug11@psu.edu](mailto:lug11@psu.edu)

(814) 867-4132

[www.lignocellulose.org](http://www.lignocellulose.org)

## Research Areas



BIOENERGY  
AND BIOFUELS



MATERIALS

## Research Activities



IN-HOUSE  
R&D



SHARED  
FACILITIES



EDUCATION AND  
TRAINING

The CLSF investigates how land plants can convert soluble sugar into high-strength crystalline cellulose and combine it with other polymers to make cell walls with diverse physical properties. By conducting transdisciplinary research on lignocellulose structure, CLSF aims to provide improved scientific-based methods of converting biomass for diverse economic applications.

The center works with several other universities and labs in a highly collaborative, transdisciplinary partnership. Partners include: Massachusetts Institute of Technology, North Carolina State University, Oak Ridge National Laboratory, University of Virginia, and University of Rhode Island. The center has 16 affiliated faculty, 22 research staff, one support staff, and 20 students. It is a public organization.

# Energy Research Center (ERC)

Lehigh University

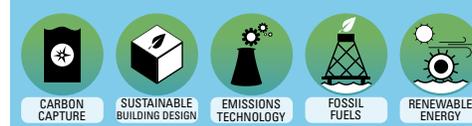
## Director Contact

Carlos E. Romero  
(610) 758-4092  
cerj@lehigh.edu

## Center Contact

cam915@lehigh.edu  
(610) 758-4544  
www.lehigh.edu/energy

## Research Areas

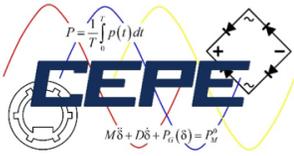


## Research Activities



The mission of the Energy Research Center is to find solutions to national and global energy and energy-related problems by collaborating with federal, state and local agencies, energy businesses, technology developers and suppliers, the research community and academic institutions.

The Energy Research Center accomplishes this mission through its innovative research and development, while recognizing the important link between energy and the environment. The Center brings together faculty and staff within Lehigh University to conduct research, foster partnerships between government and industry, provide research opportunities for students. The center is comprised of eight faculty, four research staff, one support staff, and seven students. Funding is brought in from federal and non-governmental grants. The center is a non-profit organization.



# Center for Electric Power Engineering

Drexel University

## Director Contact

Chika Nwankpa

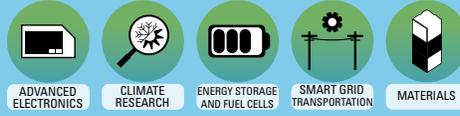
(215) 895-2218

nwankpa@ece.drexel.edu

## Center Contact

<http://power.ece.drexel.edu>

## Research Areas



## Research Activities



The mission of the Center for Electric Power Engineering is to advance and apply scientific and engineering knowledge associated with the generation, transmission, distribution, use, and conservation of electric power. At the same time, the CEPE supports the instructional program of Drexel University in academic areas associated with electric power. In pursuing these goals, the CEPE works with electric utilities, state and federal agencies, private industries, nonprofit organizations and other universities on a wide spectrum of projects.

Affiliated institutions include several international groups such as the Institute for Energy & Environment at the University of Strathclyde, the Institute of Power Systems and Power Economics at Aachen University, the Electrical Energy Technology and Systems Laboratory at the University of Hong Kong, King Monkut's University of technology Thonburi, Nigde university in Turkey, the power Systems and High Voltage Laboratories at the Swiss Federal Institute of Technology, and the Distributed Electrical Systems Laboratory at the Swiss Federal Institute of Technology Lausanne. The center houses 10 faculty and 10 student researchers. It is funded by U.S., State and Non-U.S. Government and by Private Institutions, and is a public organization.

# The Penn Center for Energy Innovation (PENNERGY)

University of Pennsylvania

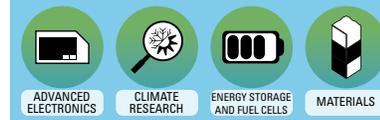
## Director Contact

Cherie R. Kagan / Andrew Jackson  
215-573-4384  
kagan@seas.upenn.edu

## Center Contact

Pennergy@seas.upenn.edu  
<http://www.energy.upenn.edu>

## Research Areas



## Research Activities



PENNERGY's mission is to bring together world-class researchers to solve scientific and technological problems enabling the efficient use of current energy sources, the practical use of more sustainable energy, and the facile conversion of energy to different forms.

The Penn Center for Energy Innovation was launched in September, 2009 under the sponsorship of the University of Pennsylvania's Schools of Engineering and Applied Science (SEAS) and Arts and Sciences (SAS) and from Penn's Office of the Vice Provost of Research. The Center unites faculty and students from SEAS and SAS as well as from other Penn schools, and from neighboring Drexel and Temple Universities. It is a public organization.

# Renewable Energy Research Lab (College of Engineering)

Temple University

## Director Contact

Svetlana Neretina  
(215) 204-6326  
NERETINA@TEMPLE.EDU

## Center Contact

engineering.temple.edu/  
research-center/renewable-  
energy-lab

## Research Areas



ADVANCED  
ELECTRONICS



MATERIALS

## Research Activities



IN-HOUSE  
R&D



PERFORM  
DEMONSTRATIONS

Our vision is one where the photonic surfaces needed to realize these functionalities will best be achieved through a multidisciplinary approach which combines the solution-based techniques typically practiced by chemists with the substrate-based fabrication techniques which are the cornerstone of the digital revolution. It is a public organization.



# Institutes of Energy and the Environment (PSIEE) & Indoor Environment Center (IEC)

Pennsylvania State University

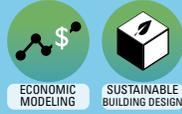
## Director Contact

William P. Bahnfleth, Ph.D., P.E.  
(814) 863-2076  
wbahnfleth@psu.edu

## Center Contact

[www.engr.psu.edu/iec/](http://www.engr.psu.edu/iec/)

## Research Areas



## Research Activities



The Indoor Environment Center (IEC) conducts interdisciplinary research, knowledge transfer and outreach activities to support the development of indoor environments that are more safe, more thermally, visually and acoustically comfortable, and that minimize the use of energy and other resources. The IEC is housed in the Department of Architectural Engineering, but affiliated faculty and staff come from a variety of Penn State campuses, colleges and departments. The IEC is affiliated with and supported by the College of Engineering Environmental Institute and the Penn State Institutes for Energy and the Environment. IEC houses around 18 professors and 13 students and it is funded by the State. It is a public organization.



# Penn State Institutes of Energy and the Environment (PSIEE)

Pennsylvania State University

## Director Contact

Tom L. Richard

(814) 863-0291

[trichard@psu.edu](mailto:trichard@psu.edu)

## Center Contact

<http://psiee.psu.edu/>

## Research Areas



BIOENERGY  
AND BIOFUELS



CLIMATE  
RESEARCH



WATER  
EFFICIENCY

## Research Activities



IN-HOUSE  
R&D



PERFORM  
DEMONSTRATIONS



EDUCATION AND  
TRAINING



PROJECT  
MANAGEMENT

The mission of the Biomass Energy Center is to coordinate and facilitate research and outreach across the university, building teams to address the complete value chain of biomass energy systems. PSIEE is funded from U.S. and State Government. The Center has a staff of 14 employees and is a public organization.



# Center for Energy

University of Pittsburgh

## Director Contact

Gregory Reed  
(412) 383-9862  
reed5@pitt.edu

## Center Contact

[www.engineering.pitt.edu/cfe/](http://www.engineering.pitt.edu/cfe/)

## Research Areas

Three circular icons representing research areas: a leaf for Bioenergy and Biofuels, a star for Carbon Capture, and a sun for Climate Research.

BIOENERGY AND BIOFUELS    CARBON CAPTURE    CLIMATE RESEARCH

## Research Activities

A circular icon representing in-house research, featuring a microscope.

IN-HOUSE R&D

The Center for Energy, housed in the Swanson School of Engineering, is dedicated to improving energy technology development and sustainability, including energy efficiency, advanced materials for demanding energy technologies, carbon management, and energy diversification. The Center for Energy has assembled a team of more than 70 faculty members and receives funding from the State and from Private Institutions. It is a public organization.

# Battery and Energy Storage Technology (BEST) Center

Pennsylvania State University

## Director Contact

Chris Rahn

(814) 865-6237

cdrahn@psu.edu

## Center Contact

www.best.psu.edu

## Research Areas



## Research Activities



The BEST Center was formed to bring together the campus-wide expertise in energy storage, foster collaboration, and provide a focal point for research and education activities. The expertise of Penn State researchers within the BEST Center spans from materials to cells to systems. BEST researchers are making significant and pioneering contributions to the most important aspects of energy storage technology.

The center is manned by 12 faculty, 8 research staff, two support staff, and upwards of 60 students. Annual funding is \$1.2 million and is obtained through grants from the Department of Energy, National Science Foundation, the Department of Defense, and others. It is a public organization.

# Marcellus Center for Outreach and Research (MCOR)

Pennsylvania State University

## Director Contact

Thomas B. Murphy  
(814) 865-6237  
cdrahn@psu.edu

## Center Contact

marcellus@psu.edu  
(814) 865-1587  
<http://www.marcellus.psu.edu/>

## Research Areas



EMISSIONS  
TECHNOLOGY



FOSIL  
FUELS

## Research Activities



IN-HOUSE  
R&D



PERFORM  
DEMONSTRATIONS



EDUCATION AND  
TRAINING

MCOR connects a holistic view of the shale energy development lifecycle which considers energy needs, best available technologies, environmental protection, economic impacts, regulatory frameworks, public policy, utilization, and social license globally. The Center was established in 2010 and receives founding from State, U.S. Government and Industry.

# H2E Center

Pennsylvania State University

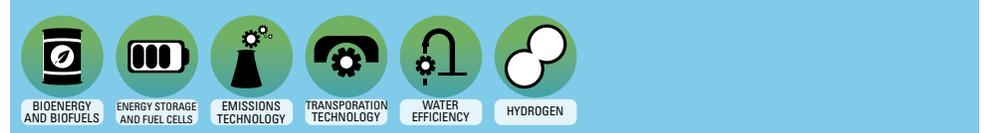
## Director Contact

Bruce E. Logan  
(814) 863-7908  
blogan@psu.edu

## Center Contact

<http://www.engr.psu.edu/h2e>

## Research Areas



## Research Activities



The H2E Center is the focal point at Penn State for multi-investigator activities at Penn State around all types of hydrogen-based production and combustion technologies with a particular focus on fuel cell technologies for conversion of biomass energy sources and advancement of hydrogen storage technologies. The center was established in 2000 and receives founding from State, U.S. and Non-U.S. Government. It is a public organization.



## Center for the Computational Design of Functional Layered Materials (CCDM)

Temple University

### Director Contact

John Perdew

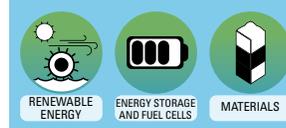
(215) 204-1407

[perdew@temple.edu](mailto:perdew@temple.edu)

### Center Contact

<http://efrc.cst.temple.edu/>

### Research Areas



### Research Activities



CCDM's mission is to design new or defect-engineered functional layered materials on the computer, for applications such as solar cells, batteries, and catalysts to generate hydrogen fuel or to convert carbon dioxide to methanol.

The Center houses 67 among leadership, research staff and students and it was established in 2014. Center for the Computational Design of Functional Layered Materials is an Energy Frontier Research Center funded by the United States Department of Energy.

Partner institutions include Brookhaven National Laboratory, Drexel University, Duke University, North Carolina State University, Northeastern University, Princeton University, Rice University, Temple University, University of Pennsylvania, and the University of Texas at El Paso.



# National Energy Technology Laboratory (NETL)

Temple University

## Director Contact

Grace M. Bochenek

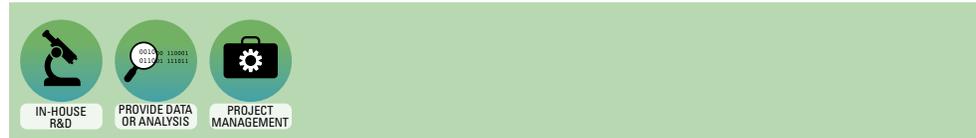
## Center Contact

<http://www.netl.doe.gov/>  
(412) 386-4984

## Research Areas



## Research Activities



NETL’s current mission is to discover, integrate, and mature technology solutions to enhance the nation’s energy foundation and protect the environment for future generations. Through forward-looking research and technology development, our team of talented and diverse experts provides technology solutions for today and options for tomorrow.

Over the past century, fossil energy research and technology development has been advanced by NETL and its predecessor facilities as the energy needs of the Nation have grown and evolved. Across three sites, NETL has nearly 1,400 employees who provide the laboratory with wide-ranging competencies, from computational science to chemical engineering to business, finance, and acquisition.

In addition to research conducted onsite, NETL’s project portfolio includes R&D conducted through partnerships, cooperative research and development agreements, financial assistance, and contractual arrangements with universities and the private sector.

# SOUTH CAROLINA

**NANOCENTER**  
AT THE UNIVERSITY OF SOUTH CAROLINA

## The NanoCenter

University of South Carolina

### Director Contact

Tom Vogt  
(803) 777-1151  
tvogt@mailbox.sc.edu

### Center Contact

(803) 777-9927  
<http://www.nano.sc.edu/>

### Research Areas



### Research Activities



The NanoCenter is the University's focal point for science and engineering studies of nanometer-scale structures, their unique properties, and their integration into functional units. It fosters multidisciplinary research and education efforts involving faculty whose combined expertise spans the disciplines of a comprehensive research university, including the arts and sciences, engineering, and medicine, as well as other professional schools. The NanoCenter is a public organization.

# Center for Hierarchical Waste Form Materials (CHWM)

University of South Carolina

## Director Contact

Hans-Conrad zur Loye

## Center Contact

<http://chwm.sc.edu/>

## Research Areas



NUCLEAR  
POWER

## Research Activities



IN-HOUSE  
R&D

The Center for Hierarchical Waste Form Materials combines experiment and modeling to develop the chemistry and structure motifs needed to create hierarchical materials that effectively immobilize nuclear waste in persistent architectures.

The Center was established in 2014. Center for the Computational Design of Functional Layered Materials is an Energy Frontier Research Center funded by the United States Department of Energy. Partner institutions include Alfred University, Brookhaven National Laboratory, Clemson University Commissariat à l'Énergie, France, Savannah River National Laboratory, Pacific Northwest Laboratory University of Florida, and the University of South Carolina.



## Savannah River National Laboratory (SRNL)

### Director Contact

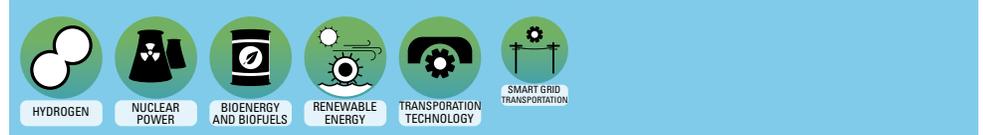
Terry Michalske

### Center Contact

(803) 725.6211

<http://srnl.doe.gov/index.html>

### Research Areas



### Research Activities



NETL's current mission is to discover, integrate, and mature technology solutions to enhance the nation's energy foundation and protect the environment for future generations. Through forward-looking research and technology development, our team of talented and diverse experts provides technology solutions for today and options for tomorrow.

Over the past century, fossil energy research and technology development has been advanced by NETL and its predecessor facilities as the energy needs of the Nation have grown and evolved. Across three sites, NETL has nearly 1,400 employees who provide the laboratory with wide-ranging competencies, from computational science to chemical engineering to business, finance, and acquisition.

In addition to research conducted onsite, NETL's project portfolio includes R&D conducted through partnerships, cooperative research and development agreements, financial assistance, and contractual arrangements with universities and the private sector.

# SOUTH DAKOTA



## Center for Bioenergy Research and Development (CBERD)

North Carolina State University

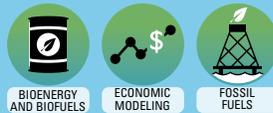
### Director Contact

Dr. Steve Peretti  
peretti@ncsu.edu  
(919) 515-6397

### Center Contact

[bioenergy.sdsmt.edu/Default.htm](http://bioenergy.sdsmt.edu/Default.htm)

### Research Areas



### Research Activities



CBERD's mission is to conduct collaborative research focused on delivering technology solutions that enable widespread commercialization of biofuels and bi-products and to assist government and industry in achieving the National priority goal of augmenting our petroleum-based economy with renewable energy, chemicals and biomaterials. The Center was established in 2011 and is funded from the State.

The center is a public organization comprised of four universities (South Dakota School of Mines and Technology, University of Hawai'i at Manoa, State University of New York Stony Brook, North Carolina State University).

# TENNESSEE

## Center for Environmental Biotechnology (CEB)

University of Tennessee

### Director Contact

Frank Loeffler  
frank.loeffler@utk.edu  
(865) 974-4933

### Center Contact

CEBweb@utk.edu  
(865) 974-8080  
<http://www.ceb.utk.edu/>

### Research Areas



### Research Activities



The Center for Environmental Biotechnology (CEB)'s mission is to strengthen UT's research infrastructure by providing access to state-of-the-art instrumentation, laboratory space, and expertise that enables researchers to make breakthrough discoveries. The CEB includes over 50 among faculty, research scientists, technicians, graduate students, and undergraduate students.

CEB collaborates with the National Science Foundation, University of Nebraska Medical Center, University of South Carolina, Columbia, South Carolina, Colorado School of Mines, University of South Carolina, New England Bio Labs, Vanderbilt University, Northern Illinois University, and the Bigelow Laboratory for Ocean Sciences. It is a public organization.



# BioEnergy Science Center (BESC)

Oak Ridge National Laboratory

## Director Contact

Paul Gilna  
gilnap@ornl.gov

## Center Contact

besc@ornl.gov  
(865) 576-0567  
<http://bioenergycenter.org>

## Research Areas



BIOENERGY  
AND BIOFUELS

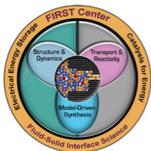
## Research Activities



IN-HOUSE  
R&D

The BioEnergy Science Center enables the emergence of a sustainable cellulosic biofuels industry by leading advances in science and science-based innovation resulting in removal of recalcitrance as an economic barrier to cost-effective production of biofuels.

The BioEnergy Science Center (BESC) is a non-profit, multi-institutional (18 partners), Department of Energy-funded research organization. The center collaborates with Oak Ridge National Laboratory, University of Georgia (UGA), National Renewable Energy Laboratory (NREL), University of Tennessee (UT), and Dartmouth College.



# Fluid Interface Reactions, Structures and Transport Center (FIRST)

Oak Ridge National Laboratory

## Director Contact

David J. Wesolowski

(865) 574-6903

wesolowskid@ornl.gov

## Center Contact

[web.ornl.gov/sci/first/index.shtml](http://web.ornl.gov/sci/first/index.shtml)

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS



MATERIALS

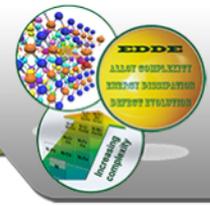
## Research Activities



IN-HOUSE  
R&D

FIRST's mission is to 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.

The Center houses 23 research staff and is an Energy Frontier Research Center funded by the United States Department of Energy. FIRST collaborates with Argonne National Laboratory, Drexel University, Oak Ridge National Laboratory, Pennsylvania State University, University of California Davis, University of California Riverside, University of Delaware, University of Minnesota, and Vanderbilt University.



# Energy Dissipation to Defect Evolution (EDDE)

Oak Ridge National Laboratory

## Director Contact

<http://edde.ornl.gov/>

## Center Contact

Yanwen Zhang  
(865) 574-8518  
[zhangy1@ornl.gov](mailto:zhangy1@ornl.gov)

## Research Areas



NUCLEAR  
POWER



MATERIALS

## Research Activities



IN-HOUSE  
R&D

The laboratory's mission is to develop a fundamental understanding of energy dissipation mechanisms in tunable concentrated solid-solution alloys, and ultimately control defect evolution at the early stage in a radiation environment; and to yield new design principles and accelerate science-based material discovery of radiation-tolerant structural alloys for energy applications.

The laboratory was established in 2014 and it houses around 40 among leadership team, investigators, students and support staff. EDDE is an Energy Frontier Research Center funded by the United States Department of Energy.

The laboratory collaborates with the Lawrence Livermore National Laboratory, Oak Ridge National Laboratory, University of Michigan, University of Tennessee, University of Wisconsin, University of Wyoming, and Virginia Tech.

## Oak Ridge National Laboratory

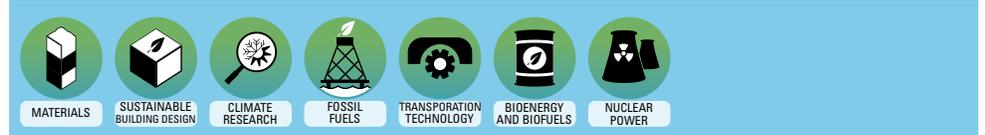
### Director Contact

Thomas E. Mason  
(865) 576-2900  
masont@ornl.gov

### Center Contact

(865) 576-7658  
<https://www.ornl.gov/>

### Research Areas



### Research Activities



Oak Ridge National Laboratory is the largest US Department of Energy science and energy laboratory, conducting basic and applied research to deliver transformative solutions to compelling problems in energy and security.

Established in 1943 the laboratory houses around 4,559 employees, including scientists and engineers in more than 100 disciplines and operates with approximately \$1.3 billion in annual funding from U.S. federal governments and other sources.

ORNL works with industry to move research to the marketplace and collaborates with other research institutions, universities, and the state of Tennessee to expand its capabilities, increase the availability of its facilities and expertise, and create research and educational opportunities for students and teachers.

# TEXAS



## Center for Energy and Environmental Resources (CEER)

University of Texas at Austin

### Director Contact

David T. Allen  
allen@che.utexas.edu  
(512) 475-7842

### Center Contact

vmtorres@mail.utexas.edu  
(512) 471-5803  
[www.utexas.edu/research/ceer](http://www.utexas.edu/research/ceer)

### Research Areas



### Research Activities



The Center for Energy and Environmental Resources (CEER) serves as the central liaison for energy and environmental research, education, and public service at the University of Texas at Austin. Its mission is to focus on efficient and economical use of energy and on ensuring a cleaner environment by developing, in cooperation with industry, processes and technologies that minimize waste and conserve natural resources.

The Center houses approximately 16 professors, nine research staff, 40 students and 12 support staff. The Center was established in 1974. They receive approximately \$10,000,000 in annual funding. CEER research projects are funded from a variety of state, federal, and private sources, including the Texas Advanced Research and Technology Programs, National Science Foundation, US Department of Energy, US Environmental Protection Agency, Texas Governor's Energy Office, several national associations, and more than 40 private and public corporations.

The center collaborates with NCAR, TEES, cSEND, NOAA, the Energy Institute, the Texas Commission on Environmental Quality (TCEQ), URS, and Aerodyne Research. It is a public organization.

# Center for Electromechanics

University of Texas at Austin

## Director Contact

Robert Hebner  
r.hebner@cem.utexas.edu  
(512) 232-1628

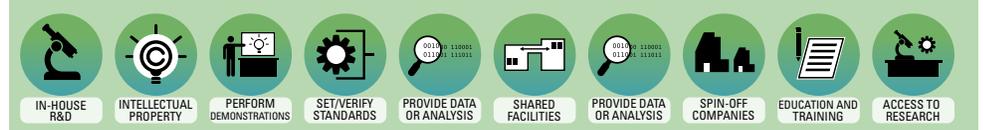
## Center Contact

s.brahm@cem.utexas.edu  
(512) 232-1624  
<http://www.cem.utexas.edu/>

## Research Areas



## Research Activities



The center's mission is to perform leading edge basic and applied research in electrical and mechanical engineering, with a special emphasis on applied engineering leading to prototype development in electromechanical devices and systems with high specific power, force, and/or energy storage or other unique attributes. Embedded in this mission is educating and developing students and CEM staff members into engineering leaders of tomorrow.

The Center houses approximately 33 research staff, three students and 10 support staff. The Center was established in 1973. They receive approximately \$8,000,000 in annual funding. Research projects are funded from a variety of state, federal, and non-profit groups like Office of Naval Research, Center for Transportation and the Environment, Department of Energy. The center is a non-profit organization.

# National Wind Institute Texas Tech University

## Director Contact

Daan Liang  
daan.liang@ttu.edu  
(806) 834-0383

## Center Contact

elizabeth.paulk@ttu.edu  
(806) 742-3476  
[www.depts.ttu.edu/nwi/](http://www.depts.ttu.edu/nwi/)

## Research Areas



## Research Activities



The National Wind Institute's mission is to serve as Texas Tech University's intellectual hub for interdisciplinary and transdisciplinary education, research, and commercialization related to wind science, wind energy, wind engineering and wind hazard mitigation. The institute will support Texas Tech faculty, students, and external partners involved in these activities and in other related areas of interest.

The institute includes 65 among professors, research staff, technicians and support staff. Research projects are funded from a variety of state, federal, and non-profit groups like Office of Naval Research, Center for Transportation and the Environment, Department of Energy. The institute collaborates with the U.S. Department of Energy and is a public organization.



# Energy & Environmental Systems Institute (EESI)

Rice University

## Director Contact

Walter G. Chapman, Ph.D.  
wgchap@rice.edu  
(713) 348-4900

## Center Contact

<http://www.chbe.rice.edu/>

## Research Areas



## Research Activities



The institute's mission is to successfully translate scientific advances into new cost-effective products and processes, the chemical and biomolecular engineer of the future will need a broad education that combines: solid grounding on science and engineering fundamentals; knowledge of advanced computational and experimental techniques; and interdisciplinary skills that extend from chemistry, biology and materials science to computer science, systems modeling and environmental engineering.

The institute houses approximately 40 professors, eight research staff, 13 students and five support staff. The Center was established in 1921. Research projects are funded by the state. The institute is a public organization.



# Center for Petroleum & Geosystems Engineering (CPGE)

University of Texas at Austin

## Director Contact

Gary A. Pope  
gpope@mail.utexas.edu  
(512) 471-3235

## Center Contact

dianeh@mail.utexas.edu  
<http://www.cpge.utexas.edu/>

## Research Areas



## Research Activities



CPGE’s vision is to be the premier academic research organization in all facets of oil and gas exploration and production. Through leadership and technology innovation, CPGE will enable energy security that balances environmental impact and affordable resources.

The Center houses approximately 24 professors, two research staff, eight students and 31 support staff. Research projects are funded by the state. The center is a public organization.



## Energy Institute

University of Texas at Austin

### Director Contact

Thomas F. Edgar

[tedgar@energy.utexas.edu](mailto:tedgar@energy.utexas.edu)

### Center Contact

(512) 475-8447

<http://energy.utexas.edu/>

### Research Areas



POLICY

### Research Activities



IN-HOUSE  
R&D



SHARED  
FACILITIES



EDUCATION AND  
TRAINING

The institute's mission is to foster interdisciplinary interactions among colleges and schools across campus, while serving as a portal for external audiences interested in learning more about energy research carried out at The University of Texas at Austin. The Institute leverages the expertise of faculty to study critical energy policy questions, and is dedicated to broadening the educational experience of students by creating a community of scholars around energy issues of importance to Texas, the nation and the world.

The institute includes 16 among professors, research staff, and support staff. Funding for research, student training, and outreach comes from a variety of private and public sources, including federal, state, regional and local governmental agencies, non-profit foundations, and private industry organizations. The institute is a public organization.



# Center for Frontiers of Subsurface Energy Security (CFSES)

University of Texas at Austin

## Director Contact

Larry Lake

[larry\\_lake@mail.utexas.edu](mailto:larry_lake@mail.utexas.edu)

(512) 471-8233

## Center Contact

<http://www.utcfeses.org>

## Research Areas



CARBON CAPTURE



ENERGY STORAGE AND FUEL CELLS

## Research Activities



IN-HOUSE R&D



EDUCATION AND TRAINING

The center's mission is to pursue scientific understanding of multiscale, multiphysics processes to ensure safe and economically feasible storage of carbon dioxide and other byproducts of energy production without harming the environment.

The Center houses approximately 10 professors, 15 research staff, 19 students and two support staff. Research projects are funded from a variety of state and federal sources. CFSES collaborates with the U.S. Department of Energy and is a public organization.

## Center for Nano and Molecular Science and Technology (CNM)

University of Texas at Austin

### Center Contact

[cnm@cm.utexas.edu](mailto:cnm@cm.utexas.edu)

(512) 232-4020

<http://www.nano.utexas.edu/>

### Research Areas



MATERIALS

### Research Activities



IN-HOUSE  
R&D



SHARED  
FACILITIES



EDUCATION AND  
TRAINING

The CNM has several missions: to educate students, faculty and others in nanoscience and nanotechnology research by providing focused learning opportunities; to facilitate training of students, faculty and others in their science efforts by serving as UT-Austin's organized research unit for nanoscience and nanotechnology research, providing necessary infrastructure and specialized instrumentation; to guide groundbreaking, targeted research initiatives and programs in nanoscience and nanotechnology by fostering and supporting both internal and external collaborations for the pursuit of funding from federal and private sources.

The Center houses approximately 33 research staff, three students and 10 support staff. The Center was established in 2000. Research projects are funded from a variety of state, federal, foundations and private institutions.

The center collaborates with the National Science Foundation, U.S. Department of Energy, Sandia National Laboratories, and is considered a public organization.



# Texas Engineering Experiment Station (TEES)

Texas A & M University

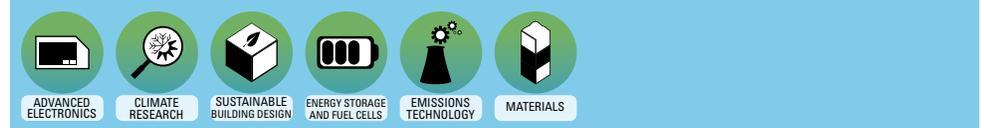
## Director Contact

Dr. M. Katherine Banks  
k-banks@tamu.edu  
(979) 845-1321

## Center Contact

(979) 458-7643  
<http://tees.tamu.edu/>

## Research Areas



## Research Activities



The station’s mission is to conduct relevant research and provide practical answers to critical state and national needs. TEES partners with industry, communities, and academic institutions to solve problems to help improve the quality of life, promote economic development and enhance the educational systems of Texas. TEES also promotes new technology education and investigates problems in both health and the environment. The station serves as a catalyst for collaborations that position Texas to be especially competitive for federal dollars and play a major role in strengthening research leadership across the state.

TEES houses approximately 10 professors. Research projects are funded from a variety of state, federal, and national foundation funds. TEES is a public organization.



# MIRO Center for Space Exploration and Technology Research (cSETR)

University of Texas at El Paso

## Director Contact

Ahsan R. Choudhuri, Ph.D

ahsan@utep.edu

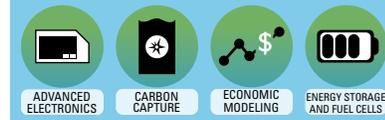
(915)747-6906

## Center Contact

csetr@utep.edu

(915)747-8252

## Research Areas



## Research Activities



The center's mission is to conduct a wide range of analytical, experimental and computational research in energy and propulsion engineering with a particular interest in green propulsion, in-situ resource utilizations, space structures, clean power generation, solar energy and carbon dioxide sequestrations.

The center houses approximately 10 professors, 43 students and six support staff. Research projects are funded from a variety of state and federal funds. The center is a public organization.

# Texas A&M Energy Institute

Texas A&M University

## Director Contact

Stratos Pistikopoulos

stratos@tamu.edu

(979) 458-0259

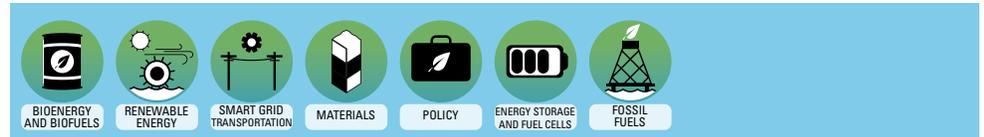
## Center Contact

tamuenergy@tamu.edu

(979) 458-1644

<http://energy.tamu.edu/>

## Research Areas



## Research Activities



The Texas A&M Energy Institute interdisciplinary research program focuses on the interacting themes of: Fossil and Non-Fossil based Technologies for Energy; Materials, Catalysis, and Separations for Energy; Multi-scale Energy Systems Engineering; and Energy Economics, Law, Policy, and Societal Impact. The four interconnected themes are further classified into (10) research areas, and (65) research topics. To enhance the synergy among different disciplines, the Texas A&M Energy Institute introduces annual multi-PI proposal calls and provides seed and matching funds for competitively selected group projects.

The Texas A&M Energy Institute External Partnerships program focuses on establishing a vibrant interactive environment that brings together academia, government, and industry to discuss, address, and provide transformative solutions to energy challenges. The Center houses eight employees. Research projects are funded from a variety of state and federal funds.

# UTAH



**Institute for Clean and Secure Energy**  
THE UNIVERSITY OF UTAH

## Institute for Clean and Secure Energy (ICSE)

University of Utah

### Director Contact

Phillip J. Smith  
Phillip.Smith@utah.edu  
(801) 585-3129

### Center Contact

icse@utah.edu  
(801) 585-1233  
<http://www.icse.utah.edu/>

### Research Areas



BIOENERGY  
AND BIOFUELS



CARBON  
CAPTURE



ECONOMIC  
MODELING



FOSSIL  
FUELS



SMART GRID  
TRANSPORTATION

### Research Activities



IN-HOUSE  
R&D



EDUCATION AND  
TRAINING

The mission of ICSE is education through interdisciplinary research on high-temperature fuel utilization processes for energy generation, and associated environmental, health, policy, and performance issues.

The center houses approximately 41 among faculty, technicians and support staff and 20 students.

Research projects are funded from a variety of state and federal funds and from private institutions. The center is a public organization.

# Bingham Entrepreneurship and Energy Research Center

Utah State University

## Director Contact

Seth Lyman

[seth.lyman@usu.edu](mailto:seth.lyman@usu.edu)

(435) 722-1740

## Center Contact

<http://rd.usu.edu/>

## Research Areas



## Research Activities



Utah State University's 75,000-square-foot Bingham Entrepreneurship and Energy Research Center is a state-of-the-art, high-tech educational facility in Vernal, Utah, where students are trained in business, entrepreneurship, accounting, education, engineering, wildlife science, water management, social work, natural resources, environmental policy, and other fields at the undergraduate and graduate levels. The Bingham Center brings together USU scientists and researchers, county leaders, state and federal authorities, and industry partners to create innovative best practices in education, resource development, economic growth, and environmental stewardship.

Bingham Entrepreneurship and Energy Research Center houses approximately 10 employees. 2 professors, three research staff, three support staff and two students. The Center was established in 2010. They receive approximately \$1,000,000 in annual funding from U.S. and State governments and from Private Institution. The main founding contributors are State of Utah, Uintah Impact Mitigation Special Service District, and the U.S. Department of Energy. The center is a public organization.

# Sustainable Electrified Transportation Research Center

Utah State University

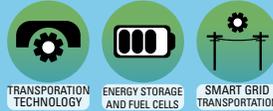
## Director Contact

Regan Zane  
regan.zane@usu.edu  
(435) 797-4949

## Center Contact

<http://select.usu.edu/>

## Research Areas



## Research Activities



The mission of the center is to champion sustainable holistic solutions for grand challenges, eliminate range anxiety and cost barriers associated with newer car technologies, support national initiatives and standards in electrified roadways, perform full-scale system technology demonstrations and pilot projects, create a viable path to reduce air pollution in cities, advance safety and resiliency, and to provide interoperability of charging Infrastructure from light to heavy duty vehicles. The Center includes 23 faculty.

# Materials Characterization Laboratory

University of Utah

## Director Contact

Taylor D. Sparks  
taylor.sparks@utah.edu

## Center Contact

sem lab@eng.utah.edu  
(801) 581-5303  
characterizationlab.mse.utah.edu/

## Research Areas



MATERIALS

## Research Activities



PROJECT  
MANAGEMENT

The Materials Characterization Lab offers a broad range of characterization services not limited to microscopy, diffractometry, and physical testing. The MCL is run by the Materials Science and Engineering Department at the University of Utah and staffed with well-trained student technicians.



# Energy and Geoscience Institute

University of Utah

## Director Contact

Raymond Levey  
(801) 585-3826  
rlevey@egi.utah.edu

## Center Contact

(801) 581-5126  
<https://egi.utah.edu/>

## Research Areas



## Research Activities



Home to leading experts in the fields of geology, geophysics, geochemistry, and engineering, the Energy & Geoscience Institute (EGI) at the University of Utah is the world's largest University based industry cost-shared upstream E&P research program of its kind, with 65+ Corporate Associate members representing 20 countries.

The institute is uniquely positioned to engage high caliber, innovative, and creative geoscience and engineering professionals to expand the body of scientific research and knowledge in the hydrocarbon and geothermal fields for both industry and government projects. Over 100 scientists and dedicated staff are part of EGI with an additional 100 affiliated scientist worldwide.

# VERMONT

## Smart Grid IGERT Program

University of Vermont

### Director Contact

Jeffrey Marshall  
jmarsha1@uvm.edu  
(802) 656-3826

### Center Contact

<http://www.uvm.edu/smartgrid/>

### Research Areas



### Research Activities



The center's vision is to create a new generation of multidisciplinary scientists who are capable of analyzing the entire smart grid system – integrating technology, human behavior, and policy – to understand the complex dynamics of the next generation of electric power systems.

Smart Grid IGERT Program houses 18 professors, one support staff and 16 students. The Center was established in 2012. They receive approximately \$800,000 in annual funding from U.S. and state governments. The main founding contributors are NSF and University of Vermont.

The center works with the Sandia National Laboratories, NREL, Green Mountain Power, Los Alamos National Laboratory, and is a public, non-profit organization.

# VIRGINIA



## Center for Smart Power Grids (SPG)

George Mason University

### Director Contact

Dr. Alex Brodsky

[brodsky@gmu.edu](mailto:brodsky@gmu.edu)

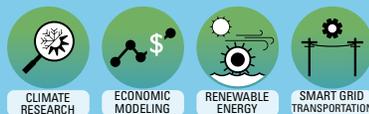
(703) 993-1529

### Center Contact

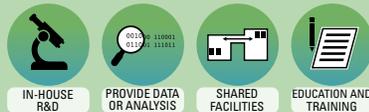
[spg@gmu.edu](mailto:spg@gmu.edu)

<http://spg.gmu.edu/>

### Research Areas

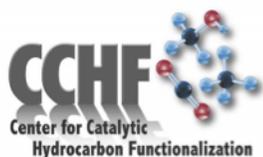


### Research Activities



The mission of the Center for Smart Power Grids (SPG) is to advance the knowledge frontiers of decision guidance systems, economic and market models, and public policy strategies to bring the nation's power grid to the 21 century. SPG subscribes to the philosophy of exploiting synergistic interactions among diverse disciplines of information technology, mathematics, electrical engineering, economics and public policy. SPG aspires to contribute as a scholarly research institution of excellence, discovery, and invention, and functioning as an active, cutting-edge leader in the effort to raise the nation's power infrastructure to the highest standards necessary for being the backbone of the American economy. SPG seeks opportunities for developing collaborative scientific relations with other centers, as well as with individual scholars dedicated to the advancement of the smart power grid.

SPG works toward establishing partnerships with industrial partners in the areas of power generation, transportation and distribution; power equipment and control/SCADA systems; and IT companies that support the Electric Power industry. The center houses around 25 professors.



# Center for Catalytic Hydrocarbon Functionalization (CCHF)

University of Virginia

## Director Contact

T. Brent Gunnoe  
tbg7h@virginia.edu  
(434) 982-2692

## Center Contact

[artsandsciences.virginia.edu/cchf/](http://artsandsciences.virginia.edu/cchf/)

## Research Areas



## Research Activities



The mission of the Center for Catalytic Hydrocarbon Functionalization is to develop, validate, and optimize new methods to rearrange the bonds of hydrocarbons, implement enzymatic strategies into synthetic systems, and design optimal environments for catalysts that can be used to functionalize hydrocarbons, especially for more efficient use of natural gas, including low temperature conversion to liquid fuels.

The Center houses approximately 11 professors, 15 research staff and 19 students. Research projects are funded from federal funds like U.S. Department of Energy. The center currently collaborates with Brigham Young University, California Institute of Technology, Colorado School of Mines, Princeton University, and the Scripps Research Institute. It is a public organization.

# Institute for Energy and Environmental Research (IEER)

James Madison University

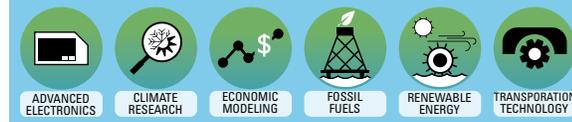
## Director Contact

Kenneth Newbold  
newboldk@jmu.edu  
(574) 535-7550

## Center Contact

<http://www.jmu.edu/ieer/>

## Research Areas



## Research Activities



The Institute for Energy and Environmental Research at James Madison University builds on JMU’s recognized leadership in the Commonwealth of Virginia for developing and implementing innovative alternative energy solutions and applied environmental research programs. In addition to working with faculty, staff, and students at JMU, the Institute for Energy and Environmental Research (IEER), housed within the Office of Research and Scholarship, facilitates strategic alliances with external partners to advance the university’s research and service projects. The institute strives to provide educational and technical opportunities, support, and resources to foster the advancement of sustainable energy in Virginia.

Research projects are funded from a variety of state, federal, and non-profit groups like National Science Foundation and other private institutions. The institute is a public organization.

# Thomas Jefferson National Accelerator Facility

Southeastern Universities Research Association

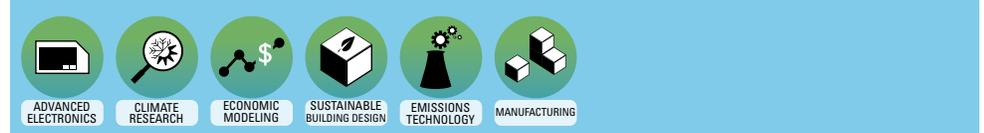
## Director Contact

Hugh E. Montgomery  
mmaier@jlab.org  
(757) 269-7100

## Center Contact

<https://www.jlab.org/>

## Research Areas



## Research Activities



The lab's primary mission is to conduct basic research of the atom's nucleus using the lab's unique particle accelerator, known as the Continuous Electron Beam Accelerator Facility (CEBAF). Jefferson Lab also conducts a variety of research using its Free-Electron Laser, which is based on the same electron-accelerating technology used in CEBAF.

The Center houses approximately six research staff, and 1 support staff. Research projects are funded from federal funds like U.S. Department of Energy. The center is a private organization.

# WASHINGTON



## Washington State University Extension Energy Program

Washington State University

### Center Contact

Info@energy.wsu.edu  
(360) 956-2000  
<http://www.energy.wsu.edu/>

### Research Areas



### Research Activities



Operating similar to a consulting firm, the Washington State University (WSU) Energy Program is a self-supported department within the university. Center staffing consists of energy engineers, energy specialists, technical experts, software developers, and energy research librarians. The center's team provides unmatched energy services, products, education and information – all with a focus on advancing the environmental and economic well-being of our customers.

Since 1990, the center has designed and operated energy-related information and technical assistance clearing-houses for the Bonneville Power Administration, Western Area Power Administration, U.S. Department of Energy, and various state and regional organizations.



# Institute of Advanced Materials & Technology (i-AMT)

University of Washington

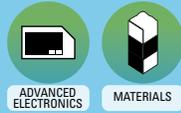
## Director Contact

<http://depts.washington.edu/iamt/>

## Center Contact

Alex Jen  
ajen@uw.edu  
(206) 543-2626

## Research Areas



## Research Activities



The i-AMT Center aims to provide leadership in the Northwest region to foster excellence in materials research by facilitating the work of researchers so as to achieve sustainable solutions to major problems facing society. The Institute focuses on selected research areas including photonics, electronics, and magnetic materials; materials for energy generation and storage; biomaterials for the bio-nano interface; and multifunctional composites

# Power and Energy Systems Group

University of Washington

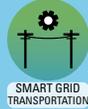
## Director Contact

Daniel Kirschen  
kirschen@uw.edu  
(206) 543-2174

## Center Contact

wp.ee.washington.edu/  
energy-group/

## Research Areas



## Research Activities



The Center's research focuses on how to build a smart grid that will maximize the amount of energy produced from renewable energy sources at a reasonable cost while maintaining the reliability of the electricity supply at the level to which we have grown accustomed. The center is a public organization.



# Center for Molecular Electrocatalysis (CME)

Pacific Northwest National Laboratory

## Director Contact

R Morris Bullock  
(509) 372-6589

## Center Contact

<http://efrc.pnnl.gov/>

## Research Areas



NUCLEAR  
POWER



MATERIALS



ENERGY STORAGE  
AND FUEL CELLS

## Research Activities



IN-HOUSE  
R&D

The center's mission is to understand and design molecular electrocatalysts for conversions between electrical energy and chemical energy.

CME was established in 2009 and it houses around 30 among leadership team and research staff. CME is an Energy Frontier Research Center funded by the United States Department of Energy, and currently collaborates with the Pacific Northwest National Laboratory, University of Illinois Urbana-Champaign, University of Wisconsin, and Yale University.

# Interfacial Dynamics in Radioactive Environments and Materials (IDREAM)

Pacific Northwest National Laboratory

## Center Contact

[science.energy.gov/bes/efrc/centers/idream/](http://science.energy.gov/bes/efrc/centers/idream/)

## Research Areas



## Research Activities



IDREAM's mission is to master molecular to mesoscale chemical and physical phenomena at interfaces in complex environments characterized by extremes in alkalinity and low-water activity, and driven far from equilibrium by ionizing ( $\gamma, \beta$ ) radiation.

The Center was established in 2016. IDREAM is an Energy Frontier Research Center funded by the United States Department of Energy, and currently collaborates with the Georgia Institute of Technology, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, University of Notre Dame, and the University of Washington, Washington State University.

# Pacific Northwest National Laboratory (PNNL)

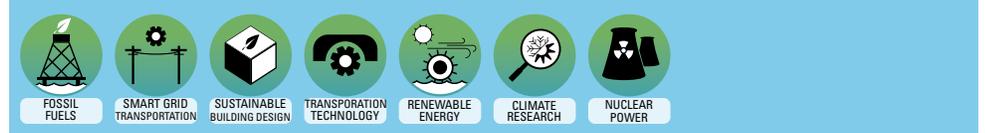
## Director Contact

Steven Ashby  
(509) 375-4550

## Center Contact

(509) 375-2121  
<http://www.pnnl.gov/>

## Research Areas



## Research Activities



PNNL is one of ten Office of Science Laboratories and is a multi-program laboratory with a primary mission on delivering breakthrough science and technology in the areas of Energy and Environment, Fundamental and Computational Science and National Security.

Established in 1965, the laboratory houses more than 4400 scientists, engineers, and professionals and operates with approximately \$870,000,000 in annual funding from U.S. federal governments and other sources.

# WISCONSIN

## Wisconsin Energy Institute (WEI)

University of Wisconsin – Madison

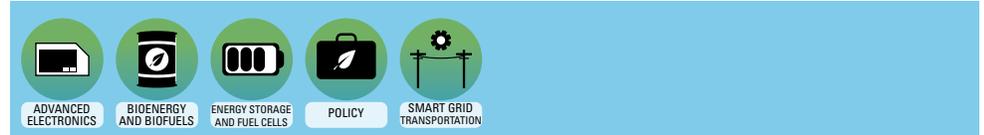
### Director Contact

Mary Blanchard  
mary.blanchard@wisc.edu

### Center Contact

communications@wei.wisc.edu  
(608) 890-3828  
<http://energy.wisc.edu/>

### Research Areas



### Research Activities



The Wisconsin Energy Institute vision is to increase Wisconsin's national leadership in identifying strategies for clean, efficient, and cost-effective energy; to advance economic growth for the state and the nation; and to continue UW-Madison's legacy of solving large-scale societal challenges.

The Wisconsin Energy Institute houses 60 professors, 92 research staff, 35 support staff and 252 students and it was established in 2006. The center procures approximately \$3 million in annual funding from groups such as the Wisconsin Alumni Research Foundation, the Department of Energy, and the National Science Foundation.

The institute works with several industry and university partners, including Johnson Controls, the Mid-West Energy Research Consortium, Michigan State University, Oak Ridge National Laboratory, and Purdue University. The center is a public organization.

# Great Lakes Bioenergy Research Center

University of Wisconsin – Madison

## Director Contact

Timothy Donohue  
tdonohue@bact.wisc.edu

## Center Contact

communications@glbrc.wisc.edu  
(608) 262-4663  
<https://www.glbrc.org>

## Research Areas



BIOENERGY AND BIOFUELS    ECONOMIC MODELING    EMISSIONS TECHNOLOGY

## Research Activities



IN-HOUSE R&D    R&D GRANTS/ CONTRACTS    EDUCATION AND TRAINING

The mission of the Great Lakes Bioenergy Research Center is to perform the basic research that generates technology to convert cellulosic biomass to ethanol and other advanced biofuels.

GLBRC houses 78 professors, 121 research staff, 37 support staff and 261 students and it was established in 2007. Annual funding is around \$25,000,000 with the Department of Energy as a main contributor. GLBRC collaborates with Michigan State University, Illinois State University, Pacific Northwest National Lab, Texas A&M University, and the University of British Columbia.

The center subcontracts with several other universities, including Michigan State University, Illinois State University, Pacific Northwest National Lab, Texas A&M University, and University of British Columbia.

Researchers and staff work with collaboratively at several subcontractor institutions.

The center is a public organization.



# Center for Sustainability & the Global Environment (SAGE)

University of Wisconsin

## Director Contact

mjsternitzky@wisc.edu  
(608) 265-0572  
<http://nelson.wisc.edu/sage/>

## Center Contact

Dr. Carol Barford  
(608) 262-9334

## Research Areas

A horizontal bar with a light blue background containing six circular icons. Each icon is in a green circle and has a white label below it. The icons represent: 1. Climate Research (sun and leaf), 2. Economic Modeling (dollar sign and line graph), 3. Energy Storage and Fuel Cells (battery), 4. Emissions Technology (flask with bubbles), 5. Policy (briefcase), 6. Water Efficiency (water tap with drop).

- CLIMATE RESEARCH
- ECONOMIC MODELING
- ENERGY STORAGE AND FUEL CELLS
- EMISSIONS TECHNOLOGY
- POLICY
- WATER EFFICIENCY

## Research Activities

A horizontal bar with a light green background containing three circular icons. Each icon is in a green circle and has a white label below it. The icons represent: 1. In-house R&D (microscope), 2. R&D Grants/Contracts (document with dollar sign), 3. Education and Training (document with pencil).

- IN-HOUSE R&D
- R&D GRANTS/CONTRACTS
- EDUCATION AND TRAINING

The Center for Sustainability and the Global Environment (SAGE) examines the connections between natural resources, technology, policy, human health, security, and changes in the global environment. The center conducts cutting-edge research on these critical problems and disseminates that knowledge through innovative teaching and outreach at the University of Wisconsin-Madison.

SAGE houses about 50 faculty, scientists, students, and staff. The Center is supported by government research grants, corporate gifts, and private funds. The center is a public organization.



# Seventhwave

University of Wisconsin

## Director Contact

Doug Ahl

(608) 210-7116

dahl@seventhwave.org

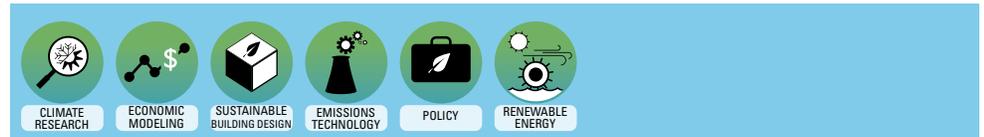
## Center Contact

mjsternitzky@wisc.edu

(608) 210-7100

<http://www.seventhwave.org/>

## Research Areas



## Research Activities



Seventhwave delivers trusted expertise for bold energy leadership and advances powerful strategies for real energy impacts through engineering, education, and research. The center conducts research into energy markets, behavioral impacts on energy use, and policy.

Seventhwave houses 41 research staff and three support staff. Annual funding is approximately \$2.1 million from U.S. Federal Government, Midwest states, Foundations, Private Institutions and others. Seventhwave works closely with the utility and energy sectors. It is a non-profit organization.



# Solar Energy Laboratory (SEL)

University of Wisconsin

## Director Contact

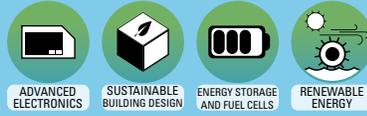
S. A. Klein

[klein@engr.wisc.edu](mailto:klein@engr.wisc.edu)

## Center Contact

<https://sel.me.wisc.edu/>

## Research Areas



## Research Activities



SEL emphasizes the application of engineering concepts to energy problems, including solar heating,  $CO_2$  cycles, PV, desiccant and absorption cooling, and HVAC and air quality. SEL is an innovator of energy simulation methods, developing software such as TRNSYS and FCHART to aid the energy industry in development and design.

The Center houses four professors, two research staff, one support staff and 16 students and it was established in 1954. They receive approximately \$500,000 in annual funding from the Department of Energy and from the Industry. SEL collaborates with the NREL and with Sandia National Laboratories. It is a public organization.

# Engine Research Center

University of Wisconsin - Madison

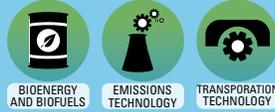
## Director Contact

Christopher J. Rutland  
rutland@engr.wisc.edu  
(608) 262-5853

## Center Contact

rutland@engr.wisc.edu  
<https://www.erc.wisc.edu/>

## Research Areas



## Research Activities



The center looks to provide cutting-edge research to help the U.S. meet national goals of reduced emissions and fuel consumption, help the military meet goals of higher power density and reduced fuel consumption, as well as providing outstanding graduate students and a technically diverse faculty to serve as a national resource for information on combustion engine science and technology

The Engine Research Center houses six professors, four research staff, one support staff and 50 students. The Center was established in 1946. They receive approximately \$3,000,000 in annual funding from U.S. and state governments and from corporations. The main founding contributors are US Department of Energy, General Motors, and the U.S. Office of Naval Research.

The center works with the University of Michigan and Penn State. Partners provide data for simulation validation. Compare simulation results with other partners. It is a public organization.

# WYOMING



Wind Energy  
Research Center

## Wind Energy Research Center

University of Wyoming

### Director Contact

Jonathan Naughton  
naughton@uwyo.edu

### Center Contact

(307) 766-6284  
<http://www.uwyo.edu/werc/>

### Research Areas



CLIMATE  
RESEARCH



ECONOMIC  
MODELING



RENEWABLE  
ENERGY



SMART GRID  
TRANSPORTATION

### Research Activities



IN-HOUSE  
R&D



PROVIDE DATA  
OR ANALYSIS

The Wind Energy Research Center at the University of Wyoming provides experimental and computational capabilities as well as intellectual resources to carry out internationally unique research that aids in the nation's goal of enhancing energy security while reducing energy-related environmental impact. No single institution can address all areas of wind energy research, so the center strategically partners with other academic institutions, federal laboratories, and companies with complementary capabilities. Coupled with this research mission is the commitment to produce part of the workforce necessary to the large-scale penetration of wind.

The Center houses 10 professors, one research staff, one support staff and 20 students and it was established in 2007. They receive approximately \$1.5 million in annual funding from the U.S. Federal Government, Private Institution and Industry. The main contributors are the Department of Energy and the University of Wyoming.

The Center collaborates with Montana Tech, Sandia National Laboratory, National Renewable Energy Laboratory, Power Company of Wyoming, University of Western Ontario. It is a public organization.

# Atmosphere to Grid

## Addressing Barriers to Energy Conversion and Delivery



A DOE funded effort, “Atmosphere to Grid: Addressing Barriers to Energy Conversion and Delivery,” involves faculty from several departments at the University of Wyoming and Montana Tech. Collaborators on the project include groups from national labs, industry, and other academic institutions.

The work has 3 focuses: modeling and optimization of wind plant performance, development of measurement-based transmission grid modeling capability, and development of fully integrated economic models for more diverse and variable energy generation and transmission scenarios.

With a team of experts in areas ranging from atmospheric science to energy economics, the project will leverage unique computational, laboratory, and field resources. Aiming to lower the cost of energy, this project will develop high performing computing tools capable of simulating wind farms under different conditions, use measurements from geographically-dispersed synchrophasors to assess power grid reliability issues, and consider the economic effects of wind and other renewable energy generation on grid operations. Dagle commented that the University of Wyoming’s approach goes “well beyond the present state-of-the-art.”

This project is funded by DOE’s Experimental Program to Stimulate Competitive Research at \$4.25 million over the course of three years. After that timeframe, the project may be renewed for an additional three years.

## Carbon Management Institute

University of Wyoming

### Director Contact

Kipp A. Coddington  
kcoddington@uwyo.edu

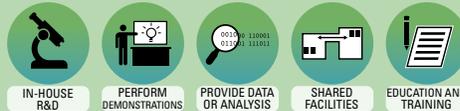
### Center Contact

(307) 766-6731  
<http://www.uwyo.edu/cmi/>

### Research Areas



### Research Activities



The center supports the University of Wyoming's land-grant mission by: 1) providing the University with a balanced and experienced applied geologic and geophysics research branch focused on energy studies; 2) building upon the Institute's international expertise in the geologic storage of CO<sub>2</sub>; 3) striving to become a world-class center of techno-economic and policy carbon management solutions, including CO<sub>2</sub> capture technologies, for the benefit of Wyoming's energy resources; 4) assessing how carbon management laws and policies may be leveraged to the benefit of Wyoming's citizens and all of Wyoming's resources; and 5) educating students in the same.

The Carbon Management Institute houses eight research staff, one support staff and varies students. The Center was established in 2009. They receive funding from U.S. and state governments, and is a non-profit, public organization.

# Center for Photoconversion and Catalysis

University of Wyoming

## Director Contact

Dr. Bruce Alan Parkinson

bparkin1@uwyo.edu

307-766-9891

## Center Contact

(307) 766-9891

<http://www.uwyo.edu/cpac/>

## Research Areas



ENERGY STORAGE  
AND FUEL CELLS



RENEWABLE  
ENERGY



MATERIALS



BIOENERGY  
AND BIOFUELS

## Research Activities



IN-HOUSE  
R&D



ACCESS TO  
RESEARCH

The Center for Photoconversion and Catalysis (CPAC)'s mission is to promote and support photoconversion and catalysis research at the University of Wyoming, as well as to create and support educational opportunities with renewable energy-related content. CPAC-affiliated faculty are a resource to provide information for the public and for public officials with regard to solar energy, fuel conversion, and fuel cell technologies.

The Center houses 12 professors and 15 students and it was established in 1999. They receive approximately \$75,000 in annual funding from the State of Wyoming. The Center is a public organization.