

From atoms to systems, we innovate.

We collaborate to solve key technical challenges that will unleash better distributed-energy storage and generation, and accompanying power-management systems.

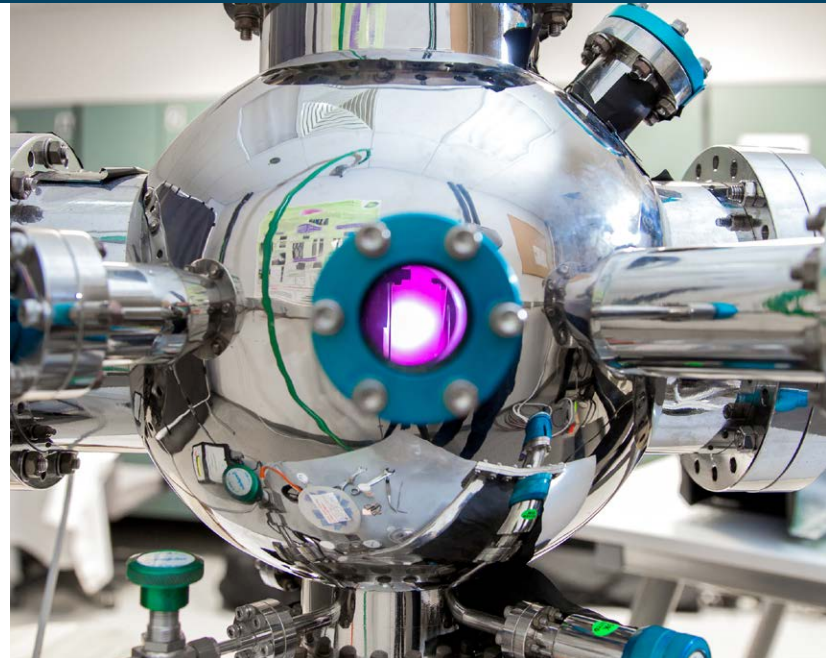
We research and develop higher-performance and lower-cost materials and devices for energy generation, storage and conversion.

We partner with innovators on electric vehicles, microgrids, photovoltaic panels, wind turbines, wearable power devices and more.

Our battery fabrication laboratory is equipped with a complete line of tools to produce high-capacity pouch cells; battery testing laboratory features a high-precision system to quickly determine battery life; materials fabrication laboratories specializing in electron beam evaporation, pulsed laser deposition, and atomic layer deposition; and materials characterization tools including X-ray diffraction, X-ray photoelectron spectroscopy, and atomic force microscopy

Visiting Industrial Fellows are welcomed.

Come collaborate with us.



DATA ANALYTICS AND MACHINE LEARNING

THEORY AND COMPUTATION

BATTERY FABRICATION

PROTOTYPING AND INTEGRATION

ATOMIC LAYER DEPOSITION

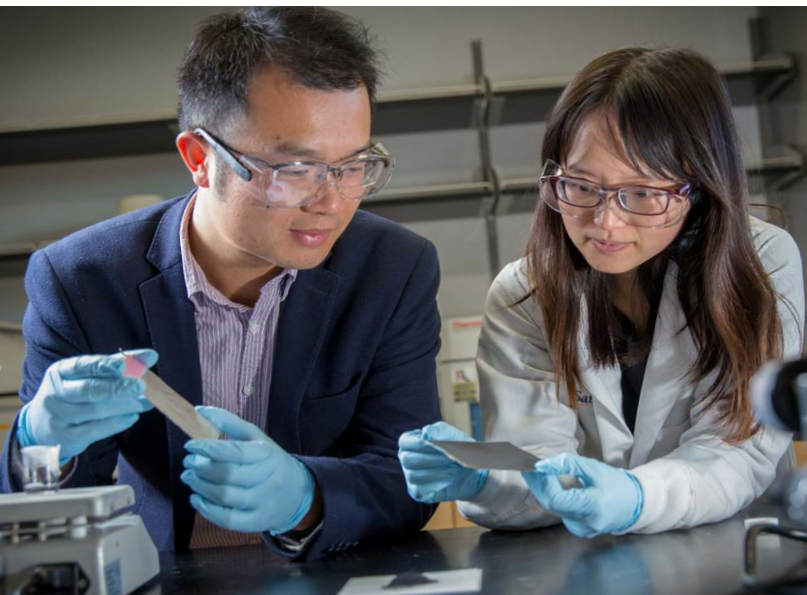
E-BEAM EVAPORATION

PULSED LASER DEPOSITION

HIGH-PRECISION BATTERY TESTING

MICROGRID TESTING

CHARACTERIZATION AND DIAGNOSIS



Your Energy Workforce

We train and mentor our students to become tomorrow's workforce for sustainable energy.

Engage and recruit students working at the cutting edge of materials genome computation and design, real-time monitoring of energy devices, scalable nanomaterials manufacturing methods, recycling and reuse of materials, and economic analysis of new and disruptive energy technologies.

"To transition to a sustainable society, we need to continue to innovate in materials and systems for the generation, storage, and transmission of electrical energy. Energy systems are complex engineering systems that require collaborative research activities."

— Ping Liu, Ph.D. Sustainable Power and Energy Center Director



JOIN US

We welcome industry partners, faculty members and researchers to join the Sustainable Power and Energy Center.

NANOENGINEERING

Jinhye Bae

Polymeric materials for energy harvesting/storage systems, flexible and printable materials and devices

Zheng Chen

Nanostructured and polymeric materials for electrochemical energy storage and conversion

David Fenning

Defect engineering for high efficiency solar cells and solar-to-fuels

Darren Lipomi

Ultra-flexible and stretchable solar cells and inexpensive, large-area graphene

Ping Liu

Materials and architectures for energy conversion and storage systems

Jian Luo

Novel materials processing methods and interfacial engineering of materials for energy-related applications

Shirley Meng

Advanced nanoscale imaging and analysis of high-performance battery materials

Shyue Ping Ong

Data-driven computational design of materials

Tod Pascal

Theory, simulations, materials physics, spectroscopy, characterization, thermodynamics

Andrea Tao

Colloidal synthesis, low dimensional materials for energy storage, plasmonic nanoparticles for photovoltaics and photocatalysis

Joseph Wang

Wearable energy harvesting devices, porous electrodes and electrocatalysis

Sheng Xu

Soft inorganic materials for energy harvesting and storage devices

PHYSICS

Oleg Shpyrko

Advanced X-ray microscopy of ionic, magnetic and electronic materials

CHEMISTRY AND BIOCHEMISTRY

Michael Sailor

Silicon nanotechnology, surface chemistry and coatings, silicon-lithium anodes, photonic crystals

Akif Tezcan

Bioinorganic and biophysical chemistry; metalloprotein structure, function and biosynthesis; biomaterials

COMPUTER SCIENCE AND ENGINEERING

Tajana Rosing

Modeling and control of distributed energy resources, Internet of Things infrastructure

ELECTRICAL AND COMPUTER ENGINEERING

Eric Fullerton

Ultra-low-energy memory, processing elements and architectures

Tse Nga 'Tina' Ng

Solution processing and printing methods, flexible electronic devices

Yuanyuan Shi

Algorithms and mechanisms for optimizing the efficiency, intelligence and sustainability of the energy system

MECHANICAL AND AEROSPACE ENGINEERING

Renkun Chen

Materials and devices for thermal energy transport and conversion

Sonia Martinez

Networked system control, distributed optimization algorithms, decision making for autonomous systems

STRUCTURAL ENGINEERING

Yu Qiao

Low-grade heat, energy harvesting, green cement, energy efficiency, thermal runaway in batteries

ECONOMICS

Graham Elliott

Market specific algorithms to construct realistic estimates of the direct economic value of the energy storage device

Richard Carson

Forecasting greenhouse gas emissions; role of economic incentives, regulation and technical change on energy systems; valuation of non-market impacts

UC SAN DIEGO MICROGRID

Antonio Tong

Senior Development Engineer

Director

Ping Liu

Dept. of NanoEngineering
piliu@eng.ucsd.edu

Associate-Director

Shyue Ping Ong

Dept. of NanoEngineering
ongsp@eng.ucsd.edu

Cody Noghera

Executive Director
Corporate Research Partnerships
cnoghera@eng.ucsd.edu
+1 (858) 246-0214