Sustainable Power and Energy Center

UC San Diego
JACOBS SCHOOL OF ENGINEERING

FROM ATOMS TO SYSTEMS, WE INNOVATE.

YOUR RESEARCH PARTNER

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.

Visiting Industrial Fellows are welcomed.

Come collaborate with us.

FACILITIES AND CAPABILITIES

Battery fabrication
2 Ah pouch cell by MTI-UCSD Battery Fabrication Lab

Battery testing
High precision testing at Arbin-UCSD Battery Testing Lab

Materials synthesis
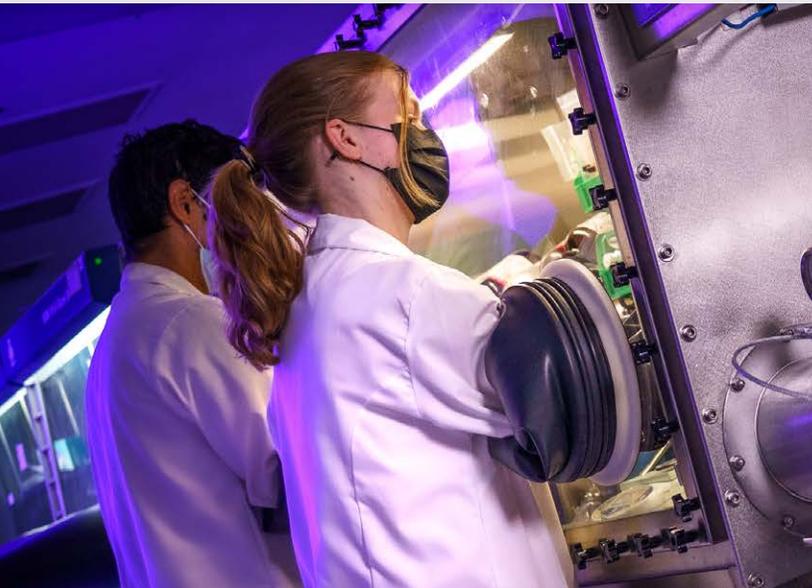ALD, PLD, E-Beam, Sputtering, sol-gel, electrodeposition

Materials characterization
XPS, XRD, SEM, UV, IR, GC-MS, AFM

Microgrid testing

Theory and computation

Data analytics and machine learning

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.

SUSTAINABLE POWER AND ENERGY CENTER

"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

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

Hanh-Phuc Le
Efficient power electronics

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

Minh Nguyen
Solid oxide fuel cells, reversible fuel cells, hydrogen

v.2408

Director

Ping Liu

Dept. of NanoEngineering

piliu@eng.ucsd.edu

Associate-Director

Shyue Ping Ong

Dept. of NanoEngineering

ongsp@eng.ucsd.edu

Industry Partnerships

Cindy Hanson

**Director
Corporate Research Partnerships**

cahanson@ucsd.edu

+1 (858) 822-1033