

## 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.

### Collaborate with us.

BATTERY RECYCLING

DATA ANALYTICS AND MACHINE LEARNING

THEORY AND COMPUTATION

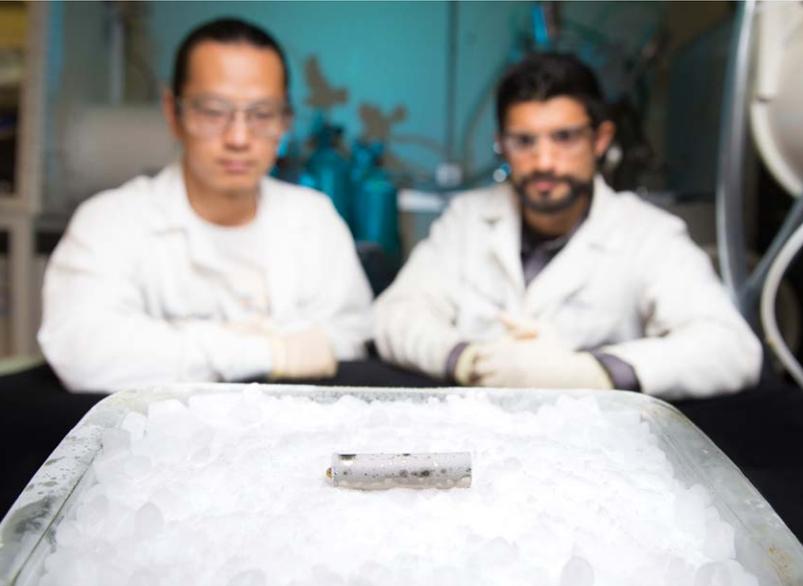
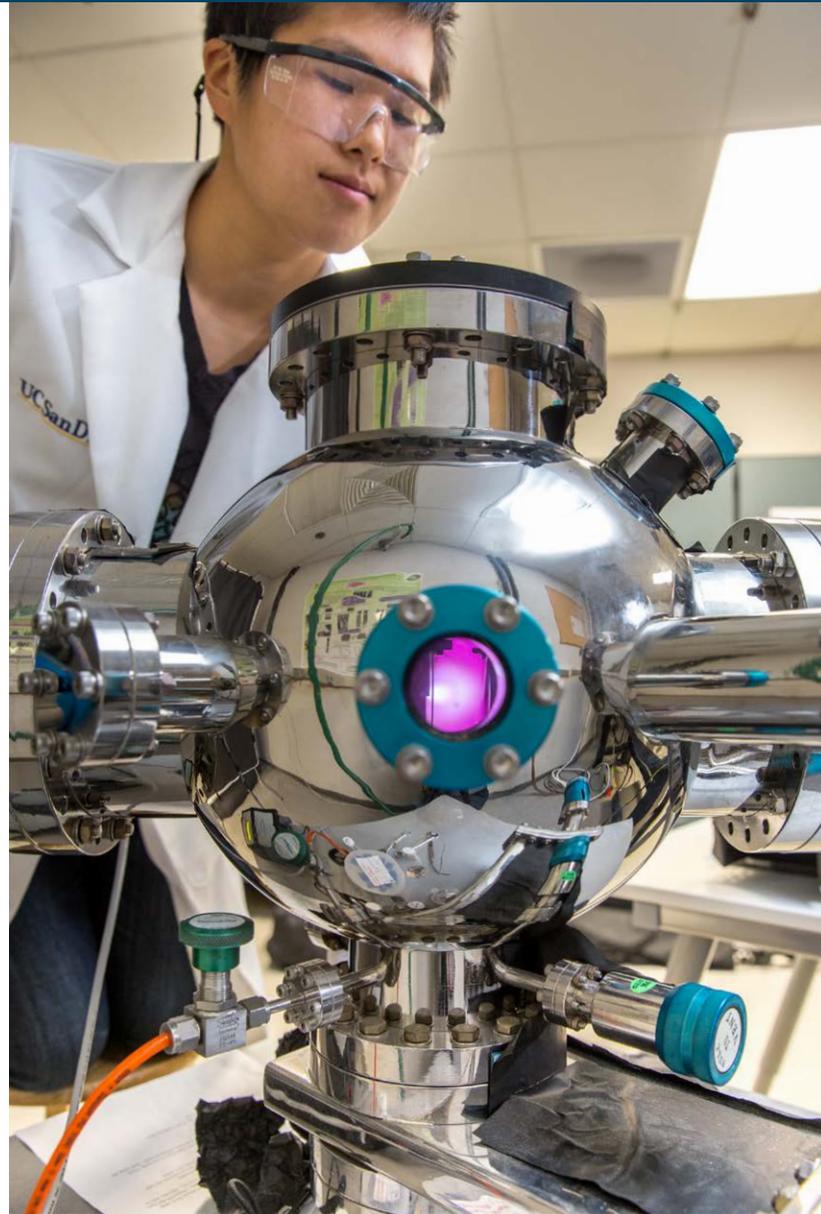
SYNTHESIS AND FABRICATION

CHARACTERIZATION AND DIAGNOSIS

PROTOTYPING AND INTEGRATION

MICROGRID TESTING

ECONOMIC EVALUATION



## 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.

"As most of the world continues to transition from an industrial to an information-driven society, the technological, sociological, and environmental requirements placed upon our energy infrastructure have become increasingly demanding.

Renewable energy, distributed energy, portable power, and smart energy systems are reshaping a future that will be more complex and potentially more volatile than the fossil fuel-based systems currently in place. Nonetheless, this future may bring with it far lower energy prices and improved sustainability."

— Y. Shirley Meng, Ph.D. Sustainable Power and Energy Center Director



## 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

### 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

## 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

### Antoni Tong

Senior Development Engineer

## JOIN US

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

## Director

### Y. Shirley Meng

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