



## 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.

## CHEMICAL AND NANO ENGINEERING

### 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

### 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

## PHYSICS

### Oleg Shpyrko

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

## CHEMISTRY AND BIOCHEMISTRY

### Kent Griffith

Synthesis–structure–function relationships in complex energy-related materials

### 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

### Alicia Kim

Multiscale and multiphysics optimization of materials

### 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

### Minh Nguyen

Solid oxide fuel cells, reversible fuel cells, hydrogen

### Antonio Tong

Senior Development Engineer

## PARTNER BENEFITS

- » A seat on the Sustainable Power and Energy Center's Board of Advisers for discussion of Center priorities
- » Opportunities to engage Center faculty through research-oriented meetings
- » Opportunities to engage graduate students affiliated with the Center regarding jobs, internships, and co-ops
- » Invitations to annual research reviews, workshops, and seminars

### Director

#### Ping Liu

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### Industry Partnerships

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