TomKat Center 2019-2020
Year-in-Review
New Center Leadership

September 2019

Matthew Kanan
co-Director of TomKat Center for Sustainable Energy
Associate Professor of Chemistry

Jennifer Dionne
co-Director of TomKat Center for Sustainable Energy
Associate Professor of Materials Science and Engineering
2019 Research Seed Grants

University-wide funding for early-stage high-risk high-reward projects

Development and Validation of Techno-Economic Analysis Tools for Modular, Energy-Efficient Agricultural Water Treatment Systems

William Tarpeh, Chemical Engineering, Juan Santiago and Xiaolin Zheng, Mechanical Engineering

Exploring for fault-hosted geothermal systems using low temperature thermochronometry and thermo-kinematic modeling

Elizabeth Miller and Martin Grove, Geological Sciences

High Specific Power High-voltage Variable Capacitance Generator with Resonant Pulse Excitation to Enable the Next Generation of Offshore Wind Turbines

Juan Rivas-Davila, Electrical Engineering and Claudio Rivetta, SLAC

Environmental Justice Consequences of Transportation Choices

Ines Azevedo, Sally Benson, and Adam Brandt, Energy Resources Engineering
## 2019 Postdoctoral Fellowships

Two years of support for ambitious research that complements the work of Stanford faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Research Area</th>
<th>Mentor</th>
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</thead>
<tbody>
<tr>
<td>Marco Miotti</td>
<td>(MIT)</td>
<td>Combining transportation and urban studies to find synergistic ways to reduce carbon emissions.</td>
<td>Prof. Rishi Jain, Civil &amp; Environmental Engineering</td>
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<tr>
<td>Juyoung Leem</td>
<td>(University of Illinois, Urbana Champagne)</td>
<td>Exploring the production of hydrogen fuel from water split with solar energy.</td>
<td>Prof. Xiaolin Zheng, Mechanical Engineering</td>
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<tr>
<td>Jared McDonald</td>
<td>(University of Maryland)</td>
<td>Examining American public opinion and the consequences of leaders spreading misinformation about climate science.</td>
<td>Prof. Jon Krosnick, Communications</td>
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<tr>
<td>Sophia Cheng</td>
<td>(Caltech)</td>
<td>Researching solar-driven chemical reactions that will enable efficient production of solar fuels.</td>
<td>Prof. Jen Dionne, Materials Science Engineering</td>
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</tbody>
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4 Postdoctoral Fellowships Awarded
2020-2022 Graduate Student Fellowships
Provides two years of support for advanced doctoral students to move research from proof-of-concept toward impactful applications

Enabling the integration of renewable energy into the existing energy grid.

Francis Chen
Electrical Engineering

PI: Bill Dally
Project: A Novel Three Phase Multilevel Inverter for the Future Power Grid

Developing a roadmap and policy recommendations to transition to renewable energy.

Anna-Katharina von Krauland
Civil and Environmental Engineering

PI: Mark Jacobson
Project: Development and Analysis of a Socio-Technical Wind Atlas for the United States and India

Assisting the developing world leap-frog traditional energy systems to a sustainable energy infrastructure.

Nathan Ratledge
E-IPER

PI: Marshall Burke
Project: Accelerating Clean Energy and Electric Mobility Deployment in Sub Saharan Africa
2019-2020 energyCatalyst Grants

A sampling of two recent awards:

Students for Sustainable Stanford Airport Shuttle
They brought the university community environmentally sustainable and financially accessible transportation between campus and the airport. For winter break 2019, 304 students took their shuttle. This dramatically reduced the number of single passenger ride-hailing service trips made from campus (i.e., Uber and Lyft). Each rider was provided information on CO₂ emissions and travel.

Intelligent Image Analysis for Coral Reef Health
A team of three computer science undergraduates are using computer vision to take pictures of a coral reef and automatically extract bleaching levels, a key indicator of ocean health. They are building a tool to make it easy for citizen scientists to contribute to global coral monitoring and allow for environmental monitoring organizations to keep tabs on reefs and reduce the amount of energy used in the collection and analysis of this data.
TomKat 2020 Summer Interns/Fellows
Our First Ever Virtual Social

THURSDAY, MAY 28, 2020
TomKat Center Virtual Spring Social

SUCCESS

INNOVATION

VENTURE

SALES

PLAN

IDEAS

BUSINESS

TEAM

GOALS

TEAM

TECHNOLOGY

OPPORTUNITIES

TECHNOLOGY

STATEGY

SUPPORT

OUTREACH
Articles Highlighting Innovation and Impact

- LaderaTech Spotlight (July 2020)
- Chibueze Amanchukwu Postdoc Spotlight (December 2019)
- ClearFlame Spotlight (May 2020)
- Ohi Spotlight (November 2019)
- XFlow Spotlight (March 2020)
- Mawa Modular Spotlight (October 2019)
2019-2020 Innovation Transfer Grants

Past Awardee Updates:

• Awardees have gone on to raise a total of $322M in follow-on funding.
• A total of 20 revenue generating companies have spun-out of the program.
• Three teams were selected to the 2020 cohort at Activate (Cyclotron Road).
  • Aurora Solar (2013) software is used to create over 8000 solar design projects a week and is scaling up with a recent $20M investment round.
  • Cuberg (2015) demonstrated that a drone can fly 70 percent longer using its lithium-metal battery compared to a conventional lithium-ion battery.
  • XFlow Energy (2017) is field-testing a half-size prototype of its vertical-axis wind turbine.
  • Nitricity (2019) won the MIT Clean Energy Prize and BASES competition and has deployed their first fertilizer production system on a farm in Fresno, CA.
  • LaderaTech (2019) was acquired by Perimeter Solutions and their fire retardant product will be widely deployed by this fall.