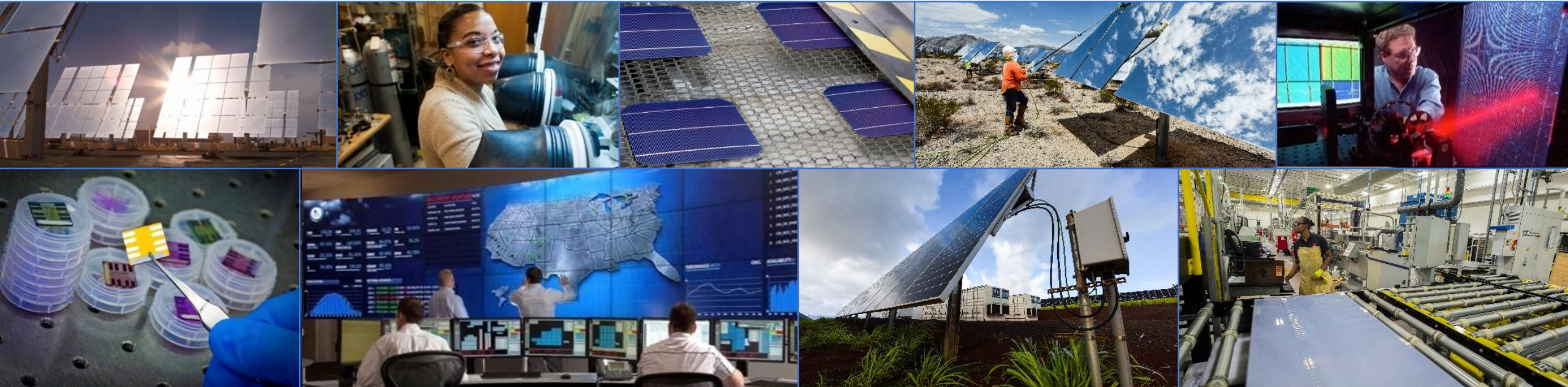


# Harnessing the Sun: Day in the Life of a SETO Fellow.

Caria Evans, PhD

November 1, 2024



# About Me

## **Center for Selective C-H Functionalization**

### **GT Summer REU-Seth Marder**

*Synthesis of Non-Fullerene Donor-Acceptor  
Semiconducting polymers*

*And*

*Thermally Activated Delayed Fluorescent Donor-  
Acceptor Material via C-H Activation.*



## **UGA Undergraduate Researcher- Jason Locklin**

*Studied antimicrobial and hydrophobicity properties of hydrophobic coating for  
lumber.*

*and*

*Development of Polyurethane biodegradable foam polymers for package.*

## **PhD Student - Elsa Reichmanis (2018-2021)**

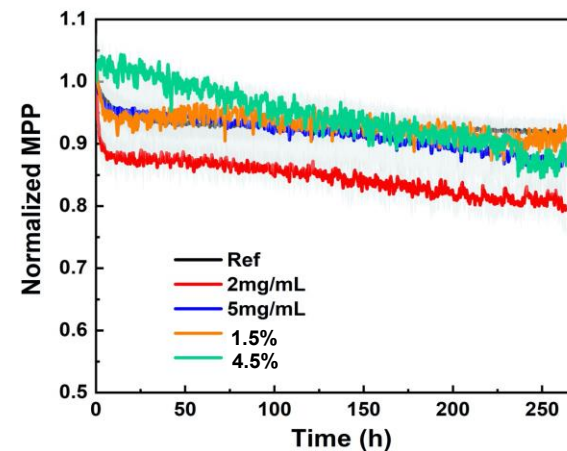
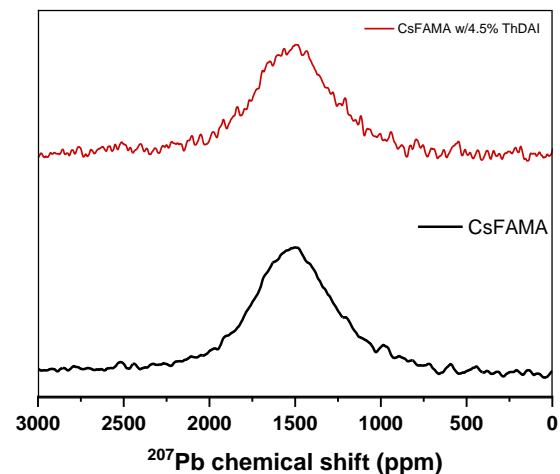
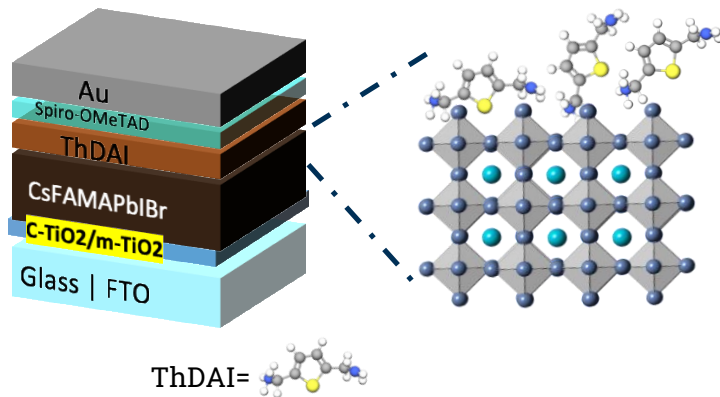
*Studied passivating mechanisms in Perovskite Solar Cells.  
And*

## **PhD Student – Stefan France (2021-2024)**

*Development of new methodology and small molecules for  
diverse applications.*

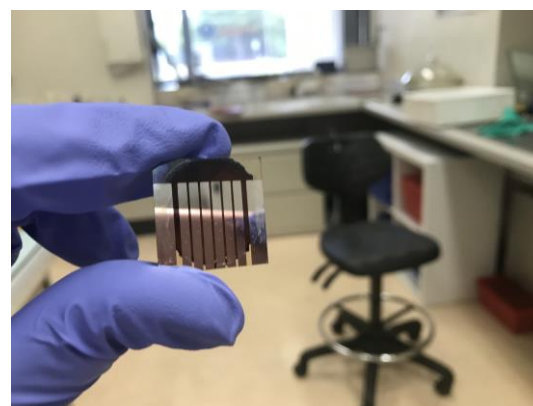
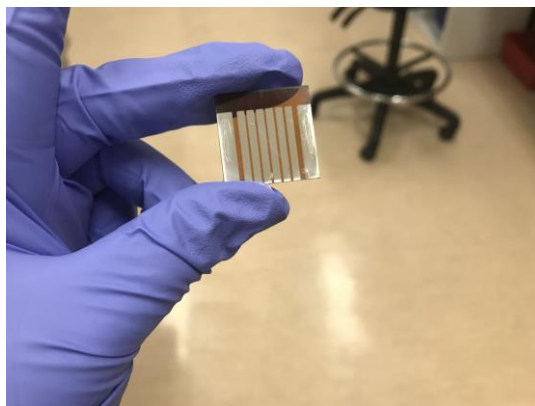


# Perovskite Research and Efforts

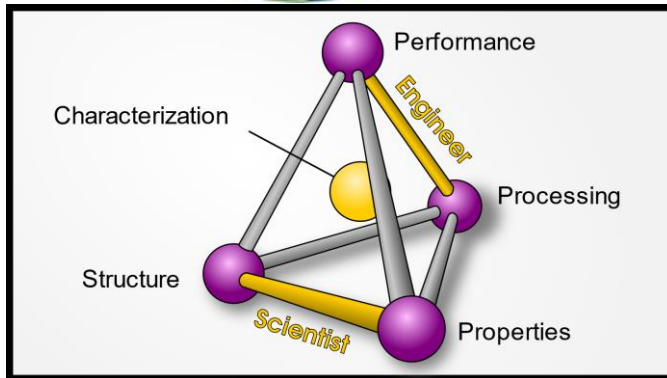
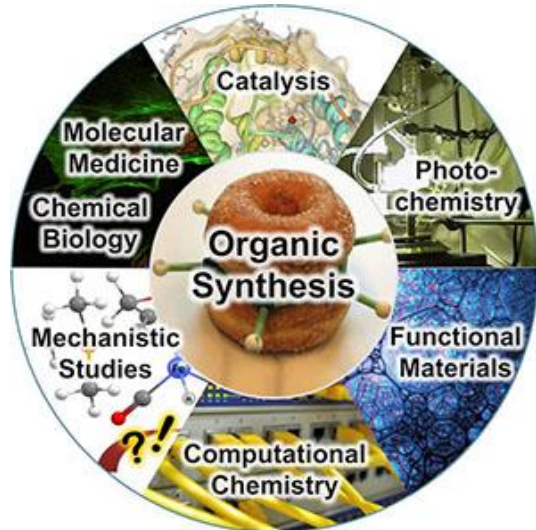


*Perovskite  
Solar Cell  
Optimization*

Worked abroad in Australia at CSIRO (National Lab) Flexible Electronic and Photovoltaic Branch



# Organic Chemistry vs Materials Chemistry

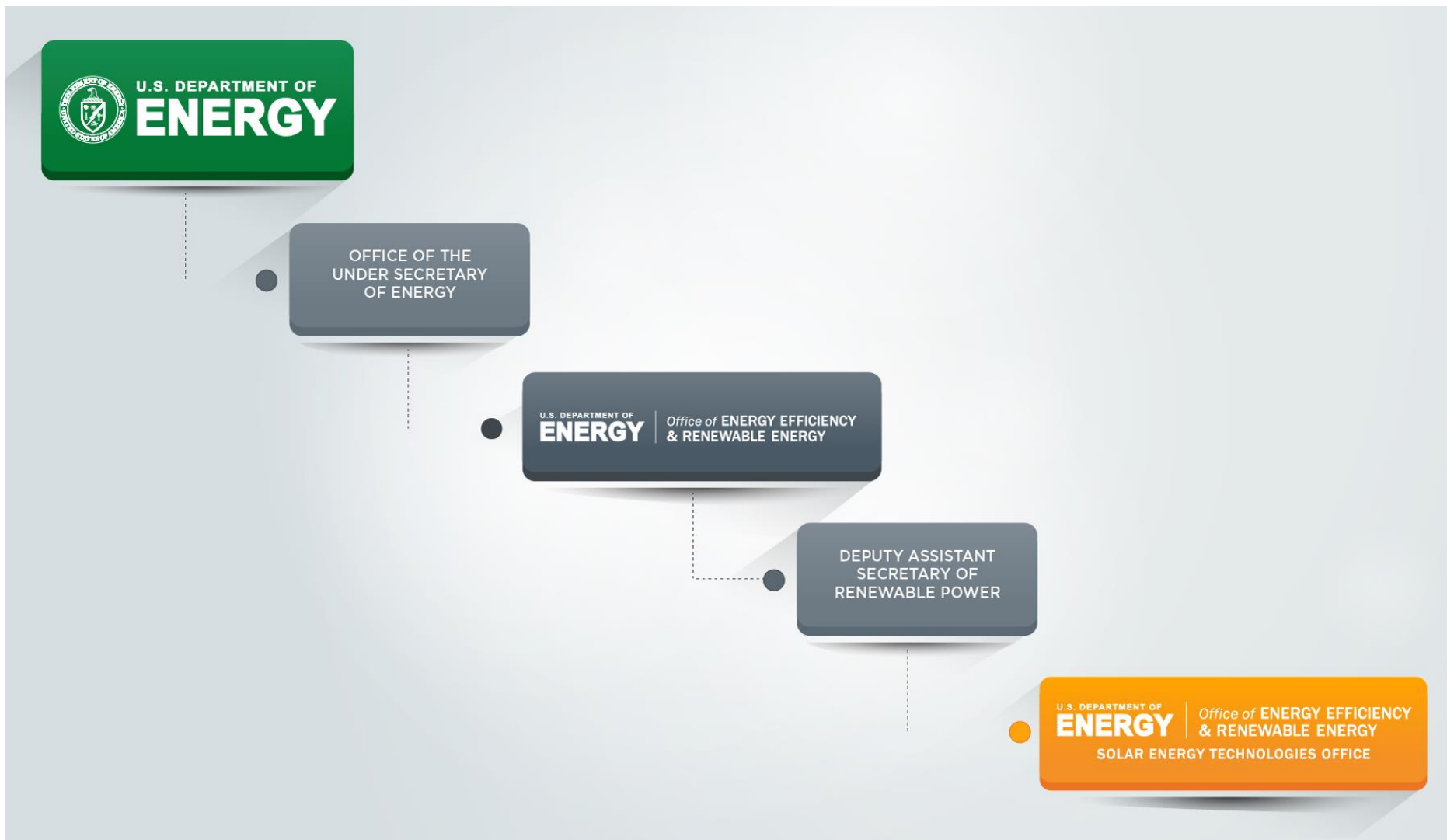


A Sprinkle of



SOLAR ENERGY  
TECHNOLOGIES OFFICE  
U.S. Department Of Energy

# Where Does SETO Fit Within the Energy Department?



# EERE Covers a Lot of Technologies

Office of Energy Efficiency & Renewable Energy

## Renewable Power



Solar



Geothermal

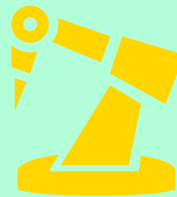


Wind



Water

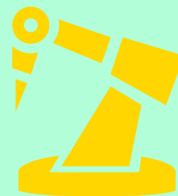
## Energy Efficiency



Advanced Manufacturing



Buildings



Industrial Decarb

## Sustainable Transportation



Hydrogen and Fuel Cells



Bioenergy



Vehicles

# Solar Energy Technologies Office (SETO) Overview

## MISSION

We accelerate the **advancement** and **deployment of solar technology** in support of an **equitable** transition to a **decarbonized economy no later than 2050**, starting with a decarbonized power sector by 2035.

## WHAT WE DO

Drive innovation in technology and soft cost reduction to make solar **affordable** and **accessible** for all Americans

Enable solar to support the **reliability, resilience, and security** of the grid

Support **job growth, manufacturing, and the circular economy** in a wide range of applications

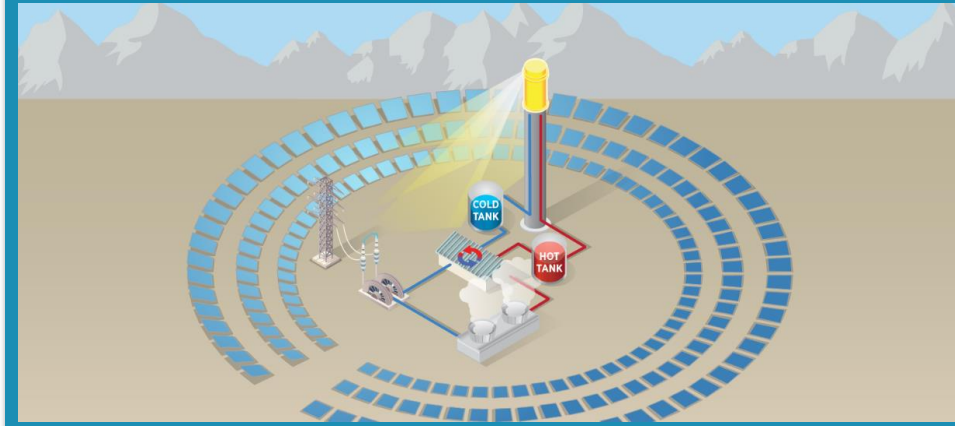


# SETO Research Areas

## PHOTOVOLTAICS



## CONCENTRATING SOLAR-THERMAL POWER



## BALANCE OF SYSTEMS/ SOFT COST REDUCTION



## SYSTEMS INTEGRATION



## MANUFACTURING AND COMPETITIVENESS





# Manufacturing and Competitiveness



# Mature Sector Technologies



PV Supply Chain &  
Manufacturing

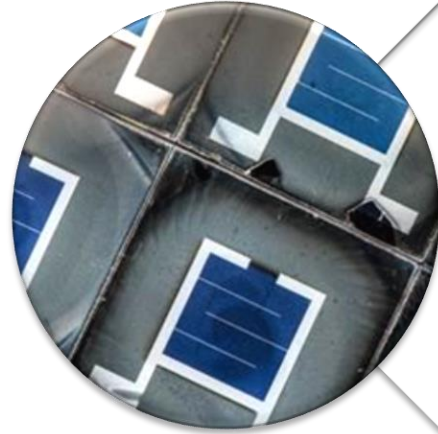


Balance of Systems



Installation  
Automation

# Emerging Sector Technologies



Perovskites &  
Hybrid Tandems



Wide Band Gap  
Power Electronics  
(SiC, GaN)

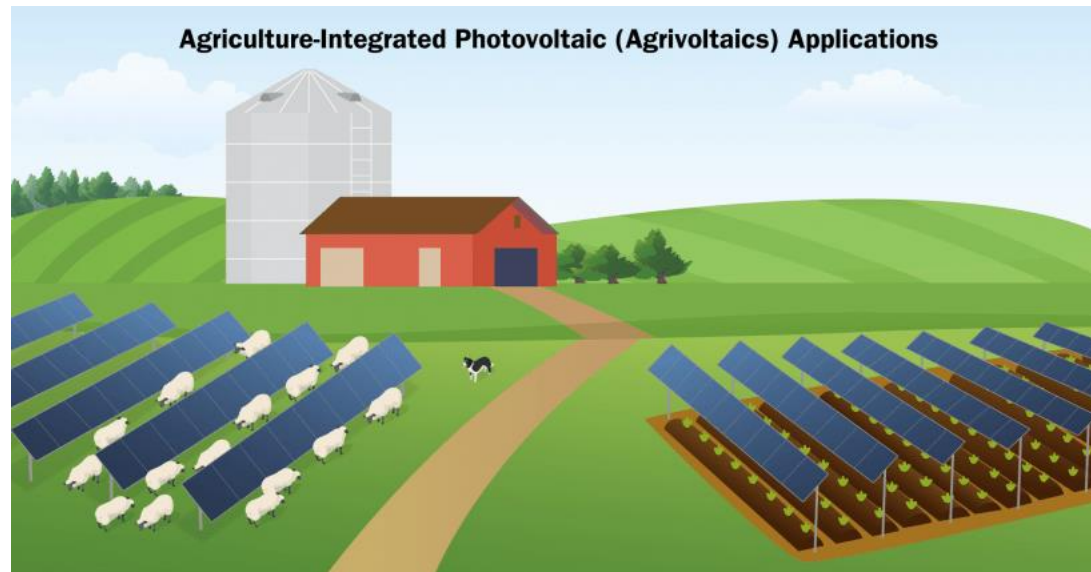
# Emerging Sector: Dual Use

## Examples of Building-Integrated and Ancillary Structure Photovoltaic Applications

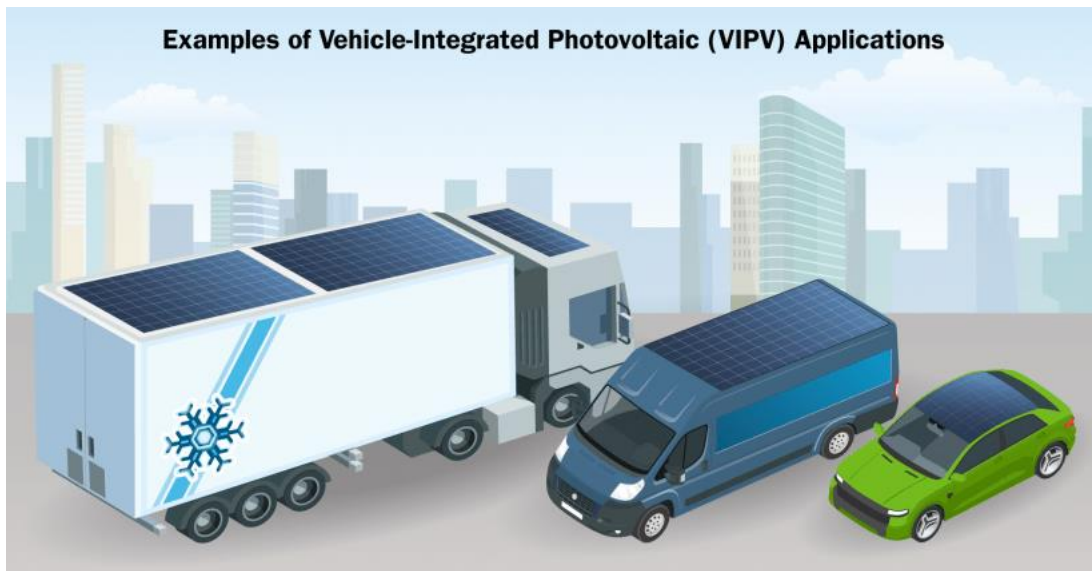
- 1 Roof
- 2 Awning
- 3 Façade
- 4 Balustrade
- 5 Window
- 6 Shade Canopy



## Agriculture-Integrated Photovoltaic (Agrivoltaics) Applications

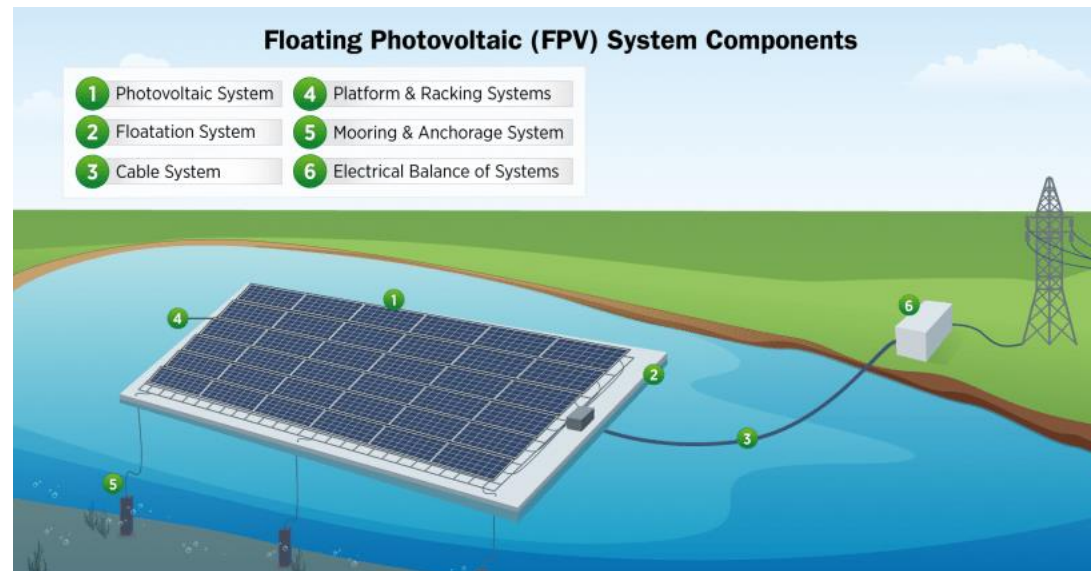


## Examples of Vehicle-Integrated Photovoltaic (VIPV) Applications



## Floating Photovoltaic (FPV) System Components

- 1 Photovoltaic System
- 2 Floatation System
- 3 Cable System
- 4 Platform & Racking Systems
- 5 Mooring & Anchorage System
- 6 Electrical Balance of Systems



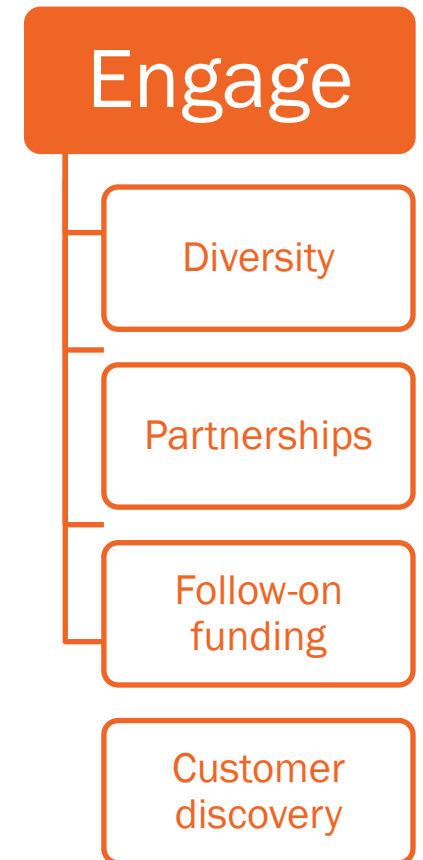
# Manufacturing and Competitiveness Project Approach

Promote activities that amplify the impact of R&D projects and enable technology transformations from prototypes to real-world, viable solutions.

Research & Development



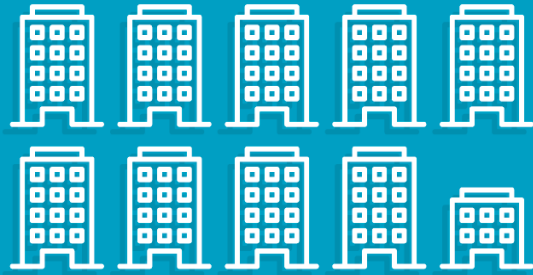
Market relevant and self-sustaining technology



# Private Sector Taking Innovation to Market (2007-2021)

228

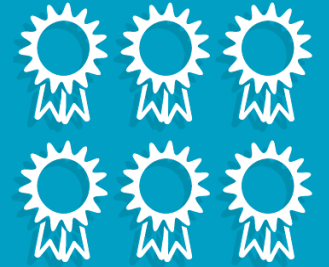
Small  
Businesses



RECEIVED

307

Awards



Over  
**\$361M**  
Invested



TURNED INTO

Nearly  
**\$11B** of  
Follow on Funding



RESULTING IN A



**29X**  
Investment  
Multiplier



# Internship, Fellowship and Job Opportunities

# SMILE Internship (Program Lead)

# SMILE

Solar Manufacturing Internship for Leaders in Energy

*Sponsored by Solar Energy Technologies Office*

## JUMP START YOUR FUTURE!

Applications  
Now Open!

Application Deadline  
12/9/2024 11:59PM Eastern Time Zone



## Provisions

- Stipend: \$850 per week
- Housing Supplement: \$150/week
- Local Transportation: \$30/week
- Inbound/Outbound Transportation Allowance: Up to \$1,200
- You may be required to travel to Washington, DC for scheduled professional development activities. You will be allocated a travel/education allowance of up to \$2,000 to cover those expenses.

All supplements and allowances are determined based on eligibility criteria. Please refer to the Zintellect posting for additional details.

If you have any questions, contact Cedricka Harris at DOE-RPP@orise.ora.gov.

## Eligibility

- Be a United States citizen, or Lawful Permanent Resident (LPR) at the time of application.
- Must be 18 years or older
- Be enrolled as a full-time undergraduate student at an eligible Minority Serving Institution (MSI).
- Have completed at least 1 year of undergraduate coursework at the time of application and be planning to enter the next year or semester/quarter of their undergraduate studies after the summer of 2025.



# ORISE Science, Technology, & Policy Fellowship

Develop leadership skills in science, technology, and policy by designing and implementing national research and development programs

## Strategic Areas:

- Photovoltaic technologies
- Concentrating solar-thermal power technologies
- Grid systems integration technologies
- Solar siting, permitting, interconnection, and market analysis
- Manufacturing and technology transfer
- Energy and environmental justice
- Access to financing, capacity building, and technical assistance
- Workforce development
- Scaling and accelerating deployment with meaningful benefits
- Communications, graphic design, and stakeholder engagement

## Eligibility:

Candidates with backgrounds including but not limited to physical and natural sciences, social science, engineering, policy, entrepreneurship, community and equity work, and others with bachelor's, master's, or doctoral degrees, as well as established professionals with relevant post-degree experience. SETO is also interested in bilingual candidates. Must be a U.S. citizen or have Permanent Resident (Green Card) status.

## Benefits:

- One-year appointment, renewable for a second year
- Competitive stipend and paid leave
- Mentorship from DOE officials
- Travel/professional development allowance
- Local transportation stipend

Applications are accepted on a rolling basis with two annual review dates: **January 15 | July 15**

**VISIT:** [bit.ly/SETO-Fellowships](https://bit.ly/SETO-Fellowships) • **EMAIL:** [DOE-RPP@orau.org](mailto:DOE-RPP@orau.org)

# GEM Fellowship

## About The GEM Fellowship Program

GEM offers MS and Ph.D. level students an outstanding opportunity and access to dozens of the top Engineering and Science firms and Universities in the nation. The GEM Fellowship was designed to focus on promoting opportunities for individuals to enter industry at the graduate level in areas such as research and development, product development, and other high level technical careers. GEM also offers exposure to a number of opportunities in academia.

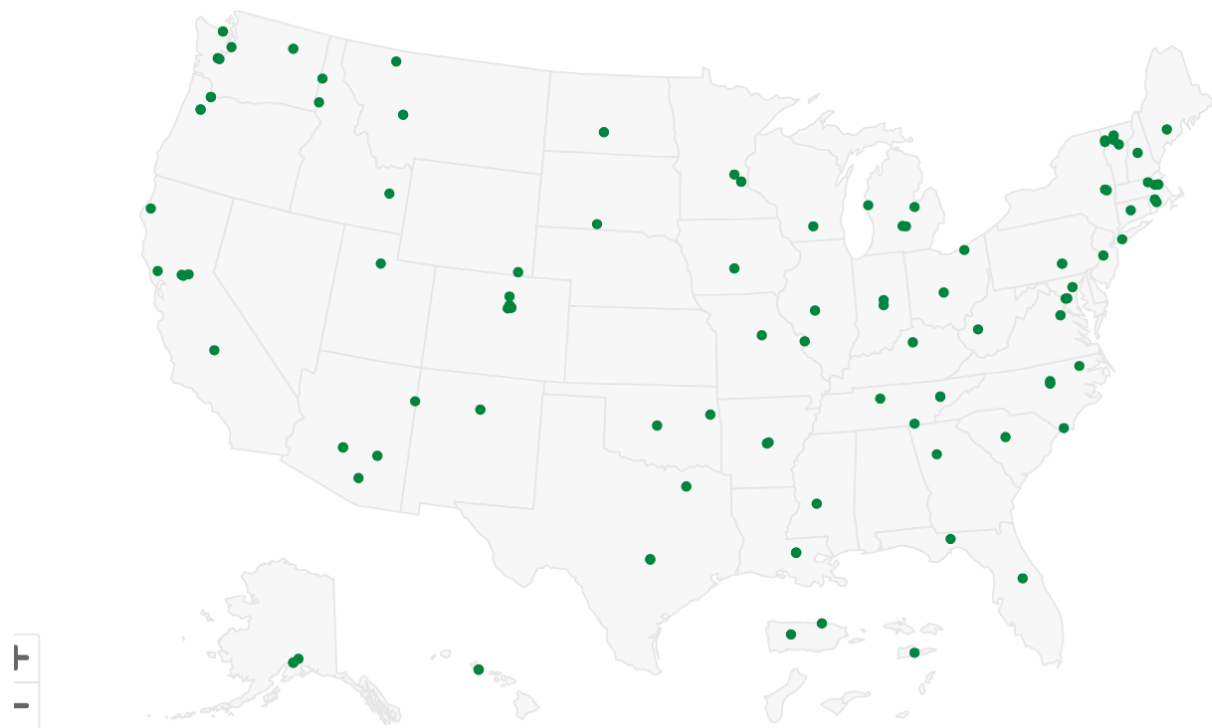
[APPLY NOW >](#)



# Clean Energy Innovator Fellowship

The Clean Energy Innovator Fellowship **funds recent graduates and energy professionals to work with critical energy organizations to advance clean energy solutions.**

All Clean Energy Innovator Fellowship Hosts, Current and Former 



© Natural Earth

# Interested in Joining Us?



Join our team. Design national R&D strategies across:



Photovoltaics



Systems Integration



Strategic Analysis  
and Institutional Support



Manufacturing and  
Competitiveness



Concentrating Solar-  
Thermal Power



Workforce and  
Equitable Access

Email [ops.solar@ee.doe.gov](mailto:ops.solar@ee.doe.gov) for more information.

# Funding Opportunities

# EnergyTech University Prize 2025 (Program Lead)

- The U.S. Department of Energy Office of Technology Transitions' American-Made EnergyTech University Prize (EnergyTech UP)! In EnergyTech UP, student teams will compete for more than \$540,000 in cash prizes for successfully identifying a promising energy technology, assessing its market potential, and creating a business plan for commercialization.



# Interested in Applying?

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Learn more: [EnergyTech University Prize | Department of Energy](#)

Join the 2025 informational webinars:

- Dec. 10, 2024 ([register to join](#))
- Jan. 23, 2025 ([register to join](#))

Sign-Up: [EnergyTech University Prize 2025 | HeroX](#)

Submission Deadline: Jan. 13, 2025, 2 p.m. PST

# Solar District Cup

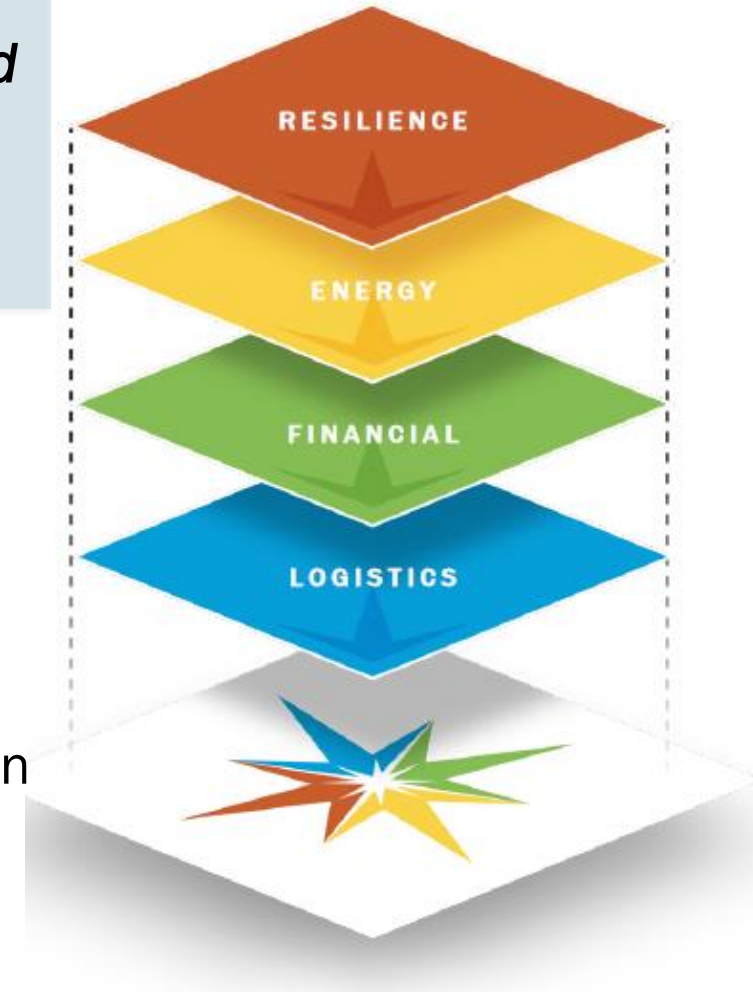


*Solar District Cup is a multidisciplinary collegiate competition that challenges student teams to DESIGN and MODEL SOLAR-PLUS-STORAGE SYSTEMS\* for multiple buildings on a local electrical distribution network—at a campus, across a development, or in a district.*

\*Winter/Spring Timeline teams design and model solar PV (only, without battery storage).

- Student teams act as renewable energy developers proposing to solar-plus-storage system requests
- Multiple divisions, each with a partner district use case of existing building energy data
- One- or two-semester project culminating in a spring 2025 competition event
- Challenge aimed at upper-level undergraduate
- Fall registration closed 9/26 **Spring registration closes 1/16/2025**

[Solar District Cup | HeroX](#)





# Learn About Upcoming Funding Opportunities

## EERE Funding Opportunity Updates

Promotes the Office of Energy Efficiency and Renewable Energy's funding programs.



SIGN UP NOW:

[energy.gov/eere/funding/  
eere-funding-opportunities](https://energy.gov/eere/funding/eere-funding-opportunities)

## SETO Newsletter

Highlights the key activities, events, funding opportunities, and publications that the solar program has funded.



SIGN UP NOW:

[energy.gov/solar-newsletter](https://energy.gov/solar-newsletter)

[Caria.evans@ee.doe.gov](mailto:Caria.evans@ee.doe.gov)



# QUESTIONS

[Caria.evans@ee.doe.gov](mailto:Caria.evans@ee.doe.gov)