

Pathways to the Renewable Energy Transformation #SOLAR2018Boulder



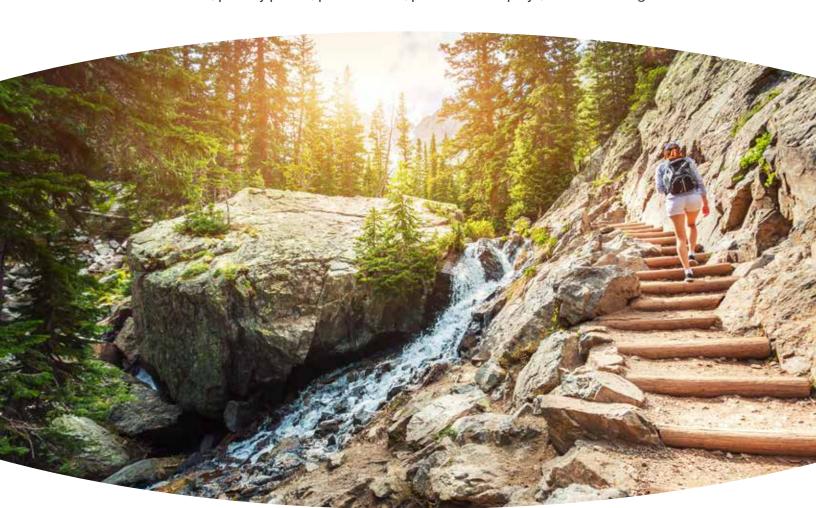
47th Annual National Solar Conference & Summit



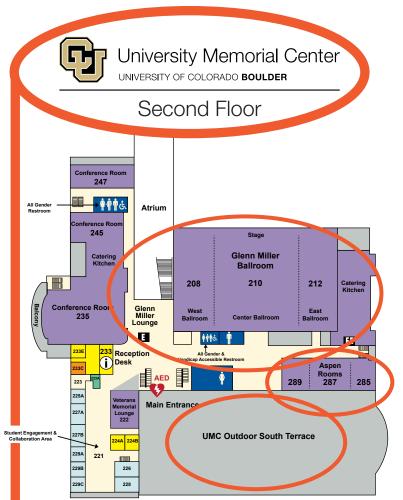
BOULDER, CO August 5-8

# **Program**

SOLAR 2018, held at the University of Colorado, Boulder is the American Solar Energy Society's 47th annual National Solar Conference. The Conference and Summit will feature technical sessions, forum discussions, plenary panels, presentations, public solar displays, and networking events.



# **O** ASES SOLAR 2018



University of Colorado, Boulder University Memorial Center (UMC) 1669 Euclid Avenue Boulder, Colorado 80302 August 5-8, 2018

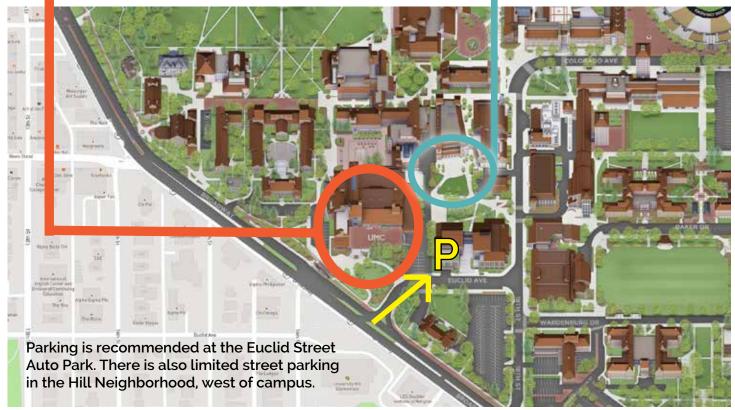
Drive, Bus, Bike, Walk to Boulder: www.colorado.edu/visit/directions-parking

Registration 289: Aspen Sunday 6:00 – 8:00 pm Monday 8:00 am – 7:00 pm Tuesday 7:30 am – 8:00 pm Wednesday 8:00 – 11:00 am

Session Rooms
208: West Ballroom
210: Center Ballroom
212: East Ballroom
285/287: Aspen
UMC Outdoor South Terrace

Exhibit Areas
Glenn Miller Lounge
VAC Courtyard (East of UMC):

Solar Cooking & other Sustainable Living Information will be on display 10am-6:30pm Monday, August 6th in the VAC Courtyard.



# Welcome

#### FROM THE PROGRAM CHAIR, JILL CLIBURN



The National Solar Conference has always reflected the times, beginning with a focus on pioneering technologies nearly 50 years ago, to creating a place for passive solar designers in the 70s and 80s, to sharing PV innovations in the 90s and increasingly promoting integrated solutions for 21st Century problems like climate change and energy grid modernization. Today, we are in caught in a maelstrom of environmental, technical and social change. These are nearly overwhelming times. And yet ASES membership nationwide has remarkable breadth, depth and power. Recognizing this, the SOLAR 2018 Conference committee decided to plan this Conference to bring cross-disciplinary interests and expertise to bear on at least a three of our most pressing energy challenges:

- Broadening access to solar, to give everyone a choice and a voice
- Innovating new energy systems, including clean electrification to maximize renewable resources and distributed energy solutions
- Resilience, preparedness and recovery from climate disruptions, using collaborative planning, solar technology and other sustainable solutions

Of course you will also find many of your favorite sessions and ASES traditions returning from previous conferences. For example, it's not too late to get a ticket for the ASES Awards Dinner, Women in Solar Energy Lunch or Solar Circus Celebration. But speaking for our Conference Committee, I want to underscore our hope that this year, more than any other, should be a year for crossing whatever you perceive as a divide. Whether that leads you to re-imagine heating, lighting and transportation options or to re-imagine your workplace, neighborhood or pro-solar organizing team, we think you will find a diversity of new friends and colleagues on your pathway to a Renewable Energy Transformation.



#### **SPECIAL CONFERENCE EVENTS:**

\*Ice Breaker Hike - NCAR northwest side Sunday, August 5th, 1:00-3:00 pm

FattE Bikes – Electric Bike Tour of Campus Sunday, August 5th, 4:30-5:30 pm and Monday, August 6, 5:30-6:30 pm

\*Opening Reception Sunday, August 5, 6:30-9:00 pm

\*Solar Cookers Display VAC Courtyard Monday, August 6th, 10:00 am-6:30 pm

Women in Solar Energy Luncheon Monday, August 6th, 12:00-2:00 pm

ASES Annual Awards Banquet Monday, August 6th, 6:30-9:00 pm

\* included with conference registration (all other tickets can be purchased separately)

\*FEATURED WORKSHOP: Solar in Your Community Challenge Workshop, Solar Energy Technology Office, U.S. Department of Energy Co-Located with SOLAR 2018, Focused on Broadening Access to Solar Tuesday, August 7th, 9:00 am-5:00 pm

Solar Circus Celebration Tuesday, August 7th, 7:00-9:00 pm

Rocky Mountain Institute (RMI) Tour Wednesday, August 8th, 12:30-3:30 pm

National Renewable Energy Laboratory (NREL) Tour (sold out) Wednesday, August 8th, 1:00-5:00 pm



# **ASES SOLAR 2018 FULL PROGRAM**

Visit <u>www.ases.org/conference/program</u> for more detailed information on speakers and sessions.

# SUNDAY, AUGUST 5, 2018

9:30am - 2:30pm

**Chapter Caucus -** Chapter Leaders Only 9:30am VAC 1B90 and 12:00pm Aspen Room

1:00pm - 3:00pm Ice Breaker Hike NCAR Trailhead Lucas Dixon

4:30pm - 5:30pm

Fatte Bikes: Electric Bike Tour of CUBoulder - Ticketed **UMC South Terrace** 

6:30pm - 9:30pm

#### Opening Reception: Networking and News from Sustainable Boulder - All Welcome!

South Terrace Tent

Jonathan Koehn, Lucas Dixon, Mario Molina, Suzanne Jones

## MONDAY, AUGUST 6, 2018

8:30am - 10:40am

#### Opening General Session: Solar 2018 Pathways to a Renewable Energy Transformation

Center Ballroom

- Welcome by Carly Rixham, ASES CEO
- Reinventing the Wheel and Other Imperatives of a Clean Energy Transformation

John A. "Skip" Laitner, Energy and Resource Economist, Economic and Human Dimensions Research Associates

- Community Powered Futures - Coreina Chan, Director, Elab LEAP and Electricity Practice, Rocky Mountain Institute

Discussion

- Planning Your Pathway Jill Cliburn, Cliburn and Associates
- From Interns to Innovators Sandra Begay, Sandia National Labs
- Broadening Access to Renewables -Rob Wallace, CEO, Power 52 Energy Solutions

10:00am - 6:30pm

Outdoor Exhibits - Electric Bikes, Solar Cookers, and more!

VAC Courtvard

Solar cookers: Doug Simmers, Patty Roberts, Joan

Electric fat tire bikes: FattE Bikes

11:00am - 12:30pm

#### More Solar, Less Cost

Aspen Room

Wyldon Fishman (moderator), Warren Schirtzinger, Janelle McGill, Orlo Sitt, Greg Elsberry, Mike Buday, Kevin Anderson

11:00am - 12:30pm

## **New Energy Systems: Clean Electrification**

West Ballroom

- Clean Electrification

John Powers (Moderator) Paul Bony, Brett KenCairn, Kelly Murphy

- Stretch Break
- Solar-Plus Solutions

Peter Leilenthal, John Powers, Diane Dandeneau

11:00am - 12:30pm

#### Broadening Access to Solar: Jobs, Careers, and **Futures**

Center Ballroom

- Jobs, Careers and Futures

Annie Lappé (Moderator), Monique Dyers, Sarah Wilder, Thalia Quinn, Jake Bobrow

- Dialog with Guest Speakers including Sandra Begay and Rob Wallace

12:30pm - 2:00pm

#### Women in Solar Luncheon & Awards - Ticketed

Center Ballroom

Richa Pandey, WISE award winner Forum: Anita Ledbetter, Laura Rigell, Diane Dandaneau, Annie Lappé

2:00pm - 3:30pm

#### New Energy Systems: High-Penetration Renewables West Ballroom

- High-Penetration Renewables

Marc Perez (Moderator), Marc Perez, Joyce Mclaren, Lori Bird, Stephanie Lenhart

- Stretch Break
- Solar and DER Integration Value Uros Simovic, Orth Sikder, Discussion

2:00pm - 3:30pm

#### Research Pathways: Solar in Buildings

Fast Ballroom

Dave Panich (moderator), Victor Olgyay, Andrew Michler, Khaled Mansy Christoph Opitz, Ganesan Visvabharathy

- Stretch Break
- Discussion

#SOLAR2018Boulder

Meet more than 100 featured presenters from community-based projects, state and local government, academia and research institutions, solar industry, non-profit organizations and local ASES Chapters nationwide.

2:00pm - 3:30pm

#### Broadening Access to Solar: Financing Solar for All

Center Ballroom

Jeff Cook (moderator), Sandhya Murali, Blake Jones, Jeff Cook, Paul Schwabe

- Stretch Break
- Discussion on Community-based Strategy Anita Ledbetter, Jeff Cook

3:45pm - 5:15pm

#### Dialogue: Spirit and Sustainability

East Ballroom

Orlo Stitt, Discussion Leader

3:45pm - 5:15pm

## **New Energy Systems: Electrifying Transportation**

West Ballroom

- Electrifying Transportation

Will Toor (moderator)

Alicia Parks, Kirsten Ardani, Nigel Zeid

- Stretch Break
- Podcars: A Solar Innovation Ron Swenson + discussion

3:45pm - 5:15pm

# Education in the Classroom and Beyond

Aspen Room

Wyldon Fishman (Moderator) Lucy Stolzenburg, Kurt Thronnings, James Ward, Heaven Campbell

- Discussion

- Climate Education and Action Athena Christodoulou, David Kline

3:45pm - 5:15pm

#### **Broadening Access to Solar: Community Solar Vision**

Center Ballroom

Marta Tomic (moderator)

Jeff Cramer, Marta Tomic, Gabe Chan, Sarah Conley,

- Stretch Break
- Cheryl Vauahn, Emily McGavisk

5:30pm - 6:30pm

Fellows Reception (Drinks & Appetizers Provided) -Invite Only

Center Ballroom

5:30pm - 6:30pm

FattE Bikes: Electric Bike Tour of CUBoulder - Ticketed

VAC Courtyard

6:30pm - 9:00pm **Annual ASES Awards Dinner (Dinner Provided & Drinks** 

Available) - Ticketed Center Ballroom

# TUESDAY, AUGUST 7, 2018

8:00am - 9:15am

Poster Breakfast (Food & Beverages Provided) Center Ballroom, see POSTERS below

## **POSTERS**

# All welcome for poster breakfast on Tuesday, August 7th, 8-9:15 A.M. in the Center Ballroom

Moderator: Paulette Middleton

- Kevin Anderson, Community scale solar water heating in Los Angeles County, SAM modeling
- Everett Barber, Long-term output deterioration of grid-tied PV systems
- Shirin Cupples, Performance and financial assessment of two-tank versus thermocline molten salt thermal energy storage system for parabolic trough power plants
- Ana Dyreson, Dry cooling for concentrating solar using PV
- Istvan Haber, City energy simulation for renewable efficiency increase
- Rahim Khoie, Renewable resources in the northern half of the United States; a pathway to total renewability?
- Fang Li, Demand-side management (DSM) application in a self-consumption residential microgrid
- Jack Martin, Built from scratch wind turbines and sustainable living at Handy Village Institute
- Stefania Mitova, Charging shared electric vehicles in San Francisco: transportation, energy & economic feasibility analysis
- Apoorv Nagpal, Risk analysis of grid-connected solar powered irrigation in India
- Tim Rehder, Opportunities for solar projects on contaminated lands
- Osiris Stevens, Enhancing the secondary grid
- Hessam Taherian, Case study of PV panels with reflector on the back side
- Amirahmad Zare, Simulated performance of a photovoltaic thermal heat pump system for single-family houses





Visit <u>www.ases.org/conference/program</u> for more detailed information on speakers and sessions.

TUESDAY, AUGUST 7, 2018 cont.

9:00am - 5:00pm Solar in Your Community Challenge (Co-Located Workshop) East Ballroom

9:15am - 10:45am

#### General Session: Solar for Resilience, Preparedness, and Recovery (RPR)

Center Ballroom

Carly Rixham, ASES Executive Director,

Announcements

Paulette Middleton (Moderator)

Keynote Panel

- Dave Renné, International Solar Energy Society,
- "Status and Trends of the Global Renewable Energy Transformation"
- David Fahey, NOAA, "Climate Change: Current and Projected Impacts on the US"
- Hunter Lovins, Co-Founder, Natural Capitalism, "A Finer Future"

11:00am - 12:30pm

#### RPR: Case Studies of Disaster Response with Renewables

West Ballroom

Lucas Dixon, (moderator)

Alison Mason, Bill Young, Anita Ledbetter,

Stretch Break

Andee Chamberlain, Tim Ohno Discussion

11:00am - 12:30pm

#### Solar Research Pathways: Generation and Storage for **New Energy Systems**

Center Ballroom

Marc Perez (moderator) Robi Robichaud, Mithra Sankrithi, Alan Weimer, Kevin Anderson

- Stretch Break

BrightLight Foundation Demonstration

Ben Bunker - (Introduction, followed by visits to the BrightLight Van, through Lunch)

11:00am - 12:30pm

#### Solar Research Pathways: Looking Ahead for Solar Thermal

Aspen Room

- Looking Ahead for Solar Thermal

Jay Burch (moderator)

Fred Milder, Hessam Taherian, Francis DeWinter, Peter Skinner

- Discussion of Solar Thermal Outlook and ASES Division

12:30pm - 2:00pm

**ASES Annual Membership Meeting** (Lunch Provided for

ASES Members)

Center Ballroom

Carly Rixham, Blake Jones, Carly Cipolla, Sarah Townes

2:00pm - 3:30pm

#### Research Pathways: Developing Solar for New Energy Systems

West Ballroom

Angela Lipanovich (Moderator)

Van Haaran, Kevin Brehm, Tim Rehder, Ujiwal Bhattacheaijee

- Stretch Break
- Blockchain, Seriously?

Jason Dispenza

2:00pm - 3:30pm

#### Solar Research Pathways: Resource/Forecasting for **New Energy Systems**

Aspen Room

Richard Perez (moderator)

Richard Perez, Aron Habte, Eric Anderson, Ian Smithpeter, Bill Marion

- Stretch Break and Discussion

2:00pm - 3:30pm

#### RPR: Policies and Preparedness Strategies 🕏

Center Ballroom

Elizabeth Doris (moderator)

Jeff Cook, Eliza Hotchkiss, Rory Johnston, Debbie Dooley

Stretch Break

Chris Robertson, John Steele

Discussion

3:45pm - 5:15pm

#### Solar Research Pathways: Modeling for New Energy **Systems**

Aspen Room

Kathleen Krah (moderator)

Yu Xie, Meghan Hoskins, Reinke, Kathleen Krah, Nate

- Stretch Break and Discussion
- SAM Tutorial Nate Blair

3:45pm - 5:15pm

#### RPR: Tiny Watts, Introducing a New Big "Tiny" Community

Center Ballroom

Douglas Simmers, Elaine Hebert, Joan Nesmith, Paulette Middleton, Wyldon Fishman

#SOLAR2018Boulder

3:45pm - 5:15pm

#### PV in the Lab and the Field

West Ballroom

David Renné (Moderator)

Sarah Toth, Fred Brooks, Hessam Taherian, Ian Carbone

7:00pm - 9:00pm

#### Solar Circus Celebration: Entertainment by Sven **Jorgensen** (Appetizers & Desserts Provided, Drinks

Available) - Ticketed Center Ballroom Sven Jorgensen

# WEDNESDAY, AUGUST 8, 2018

8:00am - 9:30am

**Breakfast** (Food & Beverages Provided)

South Terrace Tent

8:45am - 11:00am

#### General Session: Policy in Action

South Terrace Tent

Sarah Townes, ASES (moderator)

- The Solar Peoples' Choice Awards
- Jill Cliburn, ASES Program Chair - Lessons Learned from Successful Vote Solar Campaigns
- Jessica Scott, Regional Director, Vote Solar
- Panel: From California to Coal Country
- Gilbert Michaud, Rahim Khoie, David Manning, Paul Hirt, David Butler
- Final Words and Discussion

Carly Rixham, Executive Director, ASES

12:30pm - 3:00pm

#### Rocky Mountain Institute (RMI) Boulder Office Tour -

Ticketed

Aspen Room Lyft ride 12:50pm



1:00pm - 5:00pm

#### National Renewable Energy Laboratory (NREL) Tour -

Ticketed

Aspen Room Lyft ride 1:20pm 🔮



Please note that the schedule-at-a-glance and the detailed program are available online at www.ases.org/conference/program, and are subject to change.

#### The following sessions/tours are eligible for American Institute of Architects continuing education units:

Research Pathways: Solar in Buildings

EDUCAX

- Education in the Classroom and Beyond
  - Case Studies of Disaster Response with Renewables
  - Policies and Preparedness Strategies
  - Modeling for New Energy Systems
  - Rocky Mountain Institute (RMI) Boulder Office Tour
  - National Renewable Energy Laboratory (NREL) Tour





# AT-A-GLANCE: SOLAR 2018

SUNDAY, AUGUST 5				
9:30 – 2:30 pm	Chapter Caucus - Chapter Leaders & ASES Staff Only	VAC 1B90		
1:00 - 3:00 pm	Ice Breaker Hike with Lucas Dixon	NCAR Trailhead		
2:30 – 4:30 pm	Volunteer Training Session - Volunteers & ASES Staff Only	Aspen Room		
4:30 - 5:30 pm	FattE Bikes: Electric Bike Tour of CUBoulder - Ticketed	UMC South Terrace		
6:00 - 8:00 pm	Registration OPENS!	West Aspen Room		
6:30 – 9:00 pm	ASES SOLAR 2018 Opening Reception - All Welcome! (Appetizers Provided & Drinks Available)	South Terrace Tent		

8:30 – 10:40 am SOLAR 2018 Keynote Presentations Center Ballroom 10:00 - 6:30 pm Outdoor Exhibits - Electric Bikes, Solar Cookers, and more! VAC Courtyard 10:40 – 11:00 am Break (Refreshments Provided)  11:00 – 12:30 pm Broadening Access to Solar: Jobs, Careers, and Futures Center Ballroom More Solar, Less Cost Aspen Room New Energy Systems: Clean Electrification West Ballroom Panel: Solar-Plus Solutions  12:30 – 2:00 pm Women in Solar Luncheon & Awards - Ticketed  Center Ballroom Center Ballroom	MONDAY, AU	GUST 6	
10:00 - 6:30 pm  Outdoor Exhibits - Electric Bikes, Solar Cookers, and more!  10:40 − 11:00 am  Break (Refreshments Provided)  Broadening Access to Solar: Jobs, Careers, and Futures  More Solar, Less Cost  New Energy Systems: Clean Electrification  Panel: Solar-Plus Solutions  West Ballroom  West Ballroom  12:30 − 2:00 pm  Women in Solar Luncheon & Awards - Ticketed  Lunch Break (On Your Own)  2:00 − 3:30 pm  Broadening Access to Solar: Financing Solutions  New Energy Systems: High-Penetration Renewables  Research Pathways: Solar in Buildings  Broadening Access to Solar: Community Solar Vision  New Energy Systems: Electrifying Transportation  New Energy Systems: Electrifying Transportation  New Energy Systems: Electrifying Transportation  Solar Podcars: A New Vision  Dialogue: Spirit and Sustainability  Solar Education in the Classroom and Beyond  Center Ballroom  West Ballroom  West Ballroom  West Ballroom  West Ballroom  West Ballroom  West Ballroom  Aspen Room  Aspen Room  Aspen Room  Fellows Reception (Drinks & Appetizers Provided) - Invite Only  Center Ballroom  Center Ballroom	8:00am - 7:00pm	Registration Open & Available	West Aspen Room
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Solar Education in the Classroom and Beyond Aspen Room Aspen Room  5:30 - 6:30 pm FattE Bikes: Electric Bike Tour of CUBoulder - Ticketed  5:30 - 6:30 pm Fellows Reception (Drinks & Appetizers Provided) - Invite Only Center Ballroom		Solar Podcars: A New Vision	West Ballroom
Climate Education and Action  Aspen Room  5:30 - 6:30 pm  Fatte Bikes: Electric Bike Tour of CUBoulder - Ticketed  VAC Courtyard  5:30 - 6:30 pm  Fellows Reception (Drinks & Appetizers Provided) - Invite Only  Center Ballroom		Dialogue: Spirit and Sustainability	East Ballroom
5:30 - 6:30 pm FattE Bikes: Electric Bike Tour of CUBoulder - <b>Ticketed</b> VAC Courtyard 5:30 - 6:30 pm Fellows Reception (Drinks & Appetizers Provided) - <b>Invite Only</b> Center Ballroom		Solar Education in the Classroom and Beyond	Aspen Room
5:30 – 6:30 pm Fellows Reception (Drinks & Appetizers Provided) - Invite Only Center Ballroom		Climate Education and Action	Aspen Room
	5:30 - 6:30 pm	FattE Bikes: Electric Bike Tour of CUBoulder - Ticketed	VAC Courtyard
6:30 – 9pm Annual ASES Awards Dinner (Dinner & Drinks Provided) - <b>Ticketed</b> Center Ballroom	5:30 – 6:30 pm	Fellows Reception (Drinks & Appetizers Provided) - Invite Only	Center Ballroom
	6:30 – 9pm	Annual ASES Awards Dinner (Dinner & Drinks Provided) - Ticketed	Center Ballroom

TUESDAY, AUGUST 7				
7:30am - 8:00pm	Registration Open & Available	West Aspen Room		
8:00 - 9:15 am	Poster Breakfast (Food & Beverages Provided)	Center Ballroom		
9:00 - 5:00 pm	Solar in Your Community Challenge (Co-Located Workshop)	East Ballroom		
9:15 - 10:45 am	SOLAR 2018 Keynote Presentations: Solar for Resilience, Preparedness, and Recovery (RPR)	Center Ballroom		
10:45 - 11:00 am	Break (Refreshments Provided)	Center Ballroom		
11:00 - 12:30 pm	RPR: Case Studies of Disaster Response with Renewables	West Ballroom		
	Research Pathways: Looking Ahead for Solar Thermal	Aspen Room		
	Generation and Storage for New Energy Systems  Demonstration: BrightLight Foundation	Center Ballroom		
	ASES Annual Meeting (Lunch Provided if Attending)	Canter Ballroom		
12:30 - 2:00 pm	Lunch Break (On your Own)	Center Ballroom		
12:30 - 2:00 pm 2:00 - 3:30 pm	RPR: Policies and Preparedness Strategies	Options on Campus Center Ballroom		
2.00 0.00 p	Research Pathways: Developing Solar for New Energy Systems  Blockchain, Seriously?	West Ballroom		
		West Ballroom		
	Solar Research Pathways: Resource/Forecasting for New Energy Systems	Aspen Room		
3:30 - 3:45 pm	Break (Refreshments Provided)			
3:45 - 5:15 pm	RPR: Tiny Watts, Introducing a New Big "Tiny" Community	Center Ballroom		
	Solar Research Pathways: PV in the Lab and in the Field	West Ballroom		
	Solar Research Pathways: Modeling for New Energy Systems	Aspen Room		
7:00 - 9:00 pm	Solar Circus Celebration: Reception & Networking Event (Appetizers & Desserts Provided, Drinks Available) - Ticketed	Center Ballroom		

WEDNESDAY, AUGUST 8				
8:00 - 11:00 am	Registration Open & Available	West Aspen Room		
8:00 - 9:30 am	Breakfast (Food & Beverages Provided)	South Terrace Tent		
8:30 - 11:30 am	Policy in Action: The Solar People's Choice Awards	South Terrace Tent		
	Panel: Reports from Vote Solar	South Terrace Tent		
	Panel: From California to Coal Country	South Terrace Tent		
	Final Words and Discussion	South Terrace Tent		
12:30 pm	Rocky Mountain Institute (RMI) Tour - Ticketed	Aspen Room		
1:00 pm	National Renewable Energy Laboratory (NREL) Tour - Ticketed (SOLD OUT)	Aspen Room		

# ASES SOLAR 2018

#### **EVENTS/TOURS/WORKSHOPS:**

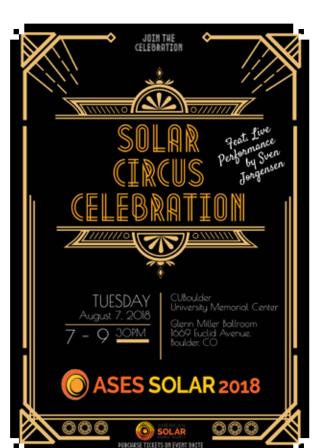


After an ebike ride with FattE Bikes, join your friends in the Volkswagon bus photo booth at the SOLAR 2018 Opening Reception.









## THANK YOU SOLAR 2018 PROGRAM LEADERS AND ASES STAFF!

Elaine Hebert, Resilience, Preparedness & Recovery (RPR) Moderator

Wyldon Fishman, Broadening Access Moderator Marc Perez, Broadening Access Moderator Angela Lipanovich, Solar for New Energy Systems Moderator Lucas Dixon, ASES Chair, Fundraising Chair David Comis, Awards Banquet Marlene Brown, WISE Luncheon Dan Powers, NREL Tour Victor Olgay, RMI Tour David Panich, AIA Certification Matthew Califano, CU Boulder Conference Services

Michael Allender, CRES Local Chapter Director

Carly Rixham, Executive Director

Jill Cliburn, Program Chair and Challenge Workshop

Paulette Middleton, RPR and Posters Moderator

#### ASES Staff:

Carly Cipolla, Director of Membership Services Sarah Townes, Finance Manager Shaun Mehr, Director of Sales and Development Sara Morell, Webmaster Tiffiny Harrower, Finance & Accounts Manager Emma Gerona, Operations Assistant Emma Laub, Partnerships and Marketing Intern Christine Lozano, Membership Intern Carly Bednarski, Tiny Watts and Solar Tour Intern Mathew Hurtado, Solar@Work and Social Media Intern Heddie Hall, Tiny Watts Intern

#### 2018 ASES AWARD WINNERS:

Ralph Knowles, Charles Greeley Abbot Award Dr. Walter Grondzik, Passive Pioneer Award William Young, Rebecca Vories Award Teresa Zhang, Hoyt Clark Hottel Award Dr. Richa Pandey, Women in Solar Energy Award Hadis Moradi. John and Barbara Yellott Award

#### 2018 ASES FELLOWS INDUCTEE:

Dr. Sarah Kurtz

#### THANK YOU SOLAR 2018 VOLUNTEERS!

Claudia Pavel

**Nathan Sloat** 

Rick Tazelaar

Karlis Viceps

Cheryl Vaughn

Lucy Stolzenburg

**Robert Youngberg** 

Orlo Stitt

Carly Bednarski Ron Bercovitz Gail Burrington Weston Carloss Kaycee Chang Athena Christodoulou Tom Cowing **Drew Gillett** Spring Hericks Mathew Hurtado

Frank Kelly Marion Kreith William Kroll Jane Lane Christine Lozano Mark Morgan Richard McCallister Max Moore Sara Morell **David Panich** 

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