



Energy Transition with Economic Justice

CONFERENCE PROGRAM

June 21-24 2022 | Albuquerque, NM

Co-organized with the 50th Anniversary of NMSEA

ases.org/conference



National Solar Conference
Co-organized with the
50th Anniversary of NMSEA

June 21-24, 2022
Albuquerque, NM
#SOLAR2022NM



EVENTS*

Tuesday, June 21

Chapter Caucus | 9:00am - 12:00pm
Technical Divisions Caucus | 1:00pm - 4:00pm
SOLAR 2022 Opening Reception | 6:00pm - 9:00pm

Wednesday, June 22

Young Professional Forum | 10:30am - 11:45am
Networking Luncheon | 12:00pm - 2:00pm
Community Solar Forum: Energy Sovereignty - From
Community ed & Owned Community Solar to Public
Power | 2:15pm - 3:30pm
Fellows Reception | 6:00pm - 6:30pm
ASES Annual Awards Banquet | 6:30pm - 9:30pm

Thursday, June 23

Women in Solar Energy (WISE) Forum | 11:00am - 12:15pm
Women in Solar Energy (WISE) Luncheon
12:30pm - 2:00pm
NREL and the Midwest Tribal Energy Resources
Association (MTERA) Forum & Networking Session
2:15pm - 3:30pm
Industry Roundtable | 2:15pm - 3:30pm
Spirit and Sustainability Forum | 4:00pm - 5:15pm
NMSEA 50th Anniversary Celebration Dinner
6:00pm - 9:00pm

Friday, June 24

Solar Fiesta | 9:00am - 3:00pm
Annual Membership Meeting | 12:30pm - 2:00pm
Sandia National Labs Tour | 2:00pm - 5:30pm

Saturday, June 25

CFV Labs & Atrisco Heritage Site (OE Solar) Tours
9:00am - 12:00pm

WORKSHOP/COURSE*

Thursday, June 23

NABCEP Course: Energy Storage Intensive
2:00pm - 4:00pm
NABCEP Course: Energy Storage and the NEC
4:00pm - 6:00pm
Energy Storage, PV & NEC Workshop (NABCEP Registered)
2:30pm - 4:30pm

Thursday, June 23

NABCEP Workshop: PV Systems and the 2020 NEC
9:00am - 5:00pm
Solar Energy 101: Learn the Basics of Solar
1:00pm - 3:00pm

* Mountain Time

FROM THE CONFERENCE CHAIR

We are living in a world where the impact of climate change is felt in our everyday life with ever increasing extreme weather events. What used to be 100 year weather events will soon become annual occurrences unless we can aggressively address the climate crisis. The American Solar Energy Society (ASES) believes that with the right policies, education and other activities, we can reach a 100% renewable energy society and avert adverse climate induced weather events.

ASES is meeting climate challenge issues through various activities including organizing the SOLAR 2022 conference to bring in key stakeholders to the conversation in order to explore interests of shared values, identifying issues in the energy transition towards 100% renewable energy. The organization and its programs are working on finding solutions to make a positive difference in communities around the world. The event will be co-organized with the 50th anniversary of the New Mexico Solar Energy Association (NMSEA). NMSEA is a local chapter of ASES, a nonprofit association, dedicated to advancing solar and related arts, sciences, and technologies with special attention to the ecological, social and economic fabric of New Mexico.

To elevate public, institutional, and governmental awareness of the important role the energy transition is playing in the U.S., a large number of bills dealing with an energy transition were passed during the most recent legislative sessions. The challenge everyone faces is how well the energy transition will happen with inclusive engagement with those who were often left out during the crucial planning stages.

ASES is optimistic that participants will have a fulfilling time networking and sharing ideas during the four days of the conference. SOLAR 2022 will allow positive steps towards empowering each other in our common aspiration of serving all stakeholders judiciously according to their needs. ASES is looking for oral and poster presentations, as well as submissions for outdoor displays and hands-on workshops related to sustainability and renewable energy.



Ashok Kumar Ghosh

Ashok Kumar Ghosh, Ph.D., PE
2022 National Solar Conference Chair

SOLAR 2022 NATIONAL ORGANIZING COMMITTEE

Carly Rixham, ASES Executive Director
Dara Bortman, ASES Board Secretary
Andrew Stone, ASES/NMSEA Board Member
Abraham Ellis, ASES Vice Chair
Ashok Ghosh, NMSEA President, Conference Chair
Robert Foster, Board Chair
Paulette Middleton, Panorama Pathways
Carly Cipolla

SOLAR 2022 LOCAL ORGANIZING COMMITTEE

Andrew Stone, NMSEA Board
Athena Christodoulou, NMSEA Board
Stefi Weisburd, NMSEA Board
Lois Fuller, NMSEA Board
Sherrick Roahhorse, NMSEA Board
Gabriel Maestas, NMSEA Board
Isaac Flores, NMSEA Board
Bruce Winchell, NMSEA Board
Quentin Wilson, NMSEA Board
Michael Lipkan, NMSEA Member
Ben Luce, NMSEA Member
Troy McGee, NMSEA Member
Walter Gerstle, NMSEA Board Member
Xubi Wilson, NMSEA Board Member
Julie Stephens, NMSEA Member
Marlene Brown, NMSEA Member
Tom Solomon, NMSEA Board Member
Ashok Ghosh, NMSEA Board Member

ASES STAFF

Carly Rixham, Executive Director
Sarah Townes, Chief Financial Officer
Lauren Reddington, National Solar Tour Director
Anna Bybee, Operations Assistant
Ella Nielsen, Membership and Engagement Manager
Kat Friedrich, Editor in Chief, Solar Today
Sunshine Urbaniak, Creative Director
Terri Steele, Tour Development
Phil Arndt, Development
Remi Akinwonmi, Technical Volunteer
Brynne O'Connor, Conference Intern

VOLUNTEERS

Heidi Applegate
Muriel Carpenter
Eric Featherstone
Walter Gerstle
Jasper Hardesty
Christopher Jewsbury
Frank Kelly
Jimm Palmer
Pete Parsons
Aaron Wheeler
Charles Wohlenberg
Robert Youngberg

REGISTRATION:

University of New Mexico
Albuquerque

Student Union Building Ballroom

Tuesday: 4pm - 8pm

Wednesday & Thursday: 8am - 7pm

Friday: 8am - 1:30pm

Note: All times are Mountain Time

- Keynote
- Session
- Special Event
- Workshop/Course
- Networking Break

Tuesday, June 21

| | | |
|------------------|---|----------------------|
| 9:00am - 12:00pm | SOLAR 2022 Chapter Caucus <i>(Invite only)</i> | Santa Ana A & B/Zoom |
| 1:00pm - 4:00pm | Technical Divisions Caucus | Santa Ana A & B/Zoom |
| 6:00pm - 9:00pm | SOLAR 2022 Opening Reception | Ballroom C |

Wednesday, June 22

| | | |
|-------------------|---|---------------|
| 8:30am - 10:00am | Keynote: Governments' Role in the Renewable Energy Transformation | Ballroom C |
| 10:30am - 10:45am | Networking Break | Navajo Lounge |
| 10:30am - 11:45am | Young Professionals Forum | Ballroom C |
| 10:30am - 11:45am | Grid & PV Track: Grid Integration & Energy Storage | Ballroom B |
| 10:45am - 11:45am | Economic Justice Track: Community Partnership | Ballroom A |
| 12:00pm - 2:00pm | Networking Luncheon | Navajo Lounge |
| 2:15pm - 3:30pm | Policy Track: Regional Policy Design for Solar and Other Advanced Energy Technologies | Ballroom C |
| 2:15pm - 3:30pm | Grid & PV Track: Material Design and Advancing PV Tech | Ballroom B |
| 2:15pm - 3:30pm | Community Solar Forum: Energy Sovereignty - From Community Led & Owned Community Solar to Public Power | Ballroom A |
| 3:30pm - 4:00pm | Networking Break | Navajo Lounge |
| 4:00pm - 5:15pm | Poster Session | Ballroom C |
| 4:00pm - 5:15pm | Energy Transformation Track: Drivers/Innovation | Ballroom B |
| 4:00pm - 5:15pm | Economic Justice Track: Equity in Financing and Investment | Ballroom A |
| 6:00pm - 6:30pm | Fellows Reception <i>(Invite only)</i> | Ballroom C |
| 6:30pm - 9:30pm | ASES Annual Awards Banquet | Ballroom C |

Thursday, June 23

| | | |
|--------------------|--|---------------|
| 9:00am - 10:30am | Keynote: Ensuring a Just & Equitable Transformation | Ballroom C |
| 10:30am - 11:00am | Networking Break | Navajo Lounge |
| 11:00am - 12:15 pm | Women in Solar Energy (WISE) Forum | Ballroom C |

Thursday, June 23 *(continued)*

| | | |
|--------------------|--|-----------------|
| 11:00am - 12:15 pm | Education Track: Education and Inspiration | Ballroom B |
| 11:00am - 12:15 pm | ~switch Session | Ballroom A |
| 11:00am - 12:15 pm | Renewable Energy Deployment with Equity and Justice | Santa Ana A & B |
| 12:30pm - 2:00pm | Women in Solar Energy (WISE) Luncheon | Ballroom C |
| 12:30pm - 2:00pm | Education Track: Real Estate Solar Valuation Luncheon | Ballroom B |
| 2:00pm - 4:00pm | NABCEP Course: Energy Storage Intensive | Santa Ana A & B |
| 2:15pm - 3:30pm | NREL and the Midwest Tribal Energy Resources Association (MTERA) Forum & Networking Session | Ballroom A |
| 2:15pm - 3:30pm | Industry Roundtable | Ballroom C |
| 2:15pm - 3:30pm | Education Track: Workforce Education | Ballroom B |
| 3:30pm - 4:00pm | Networking Break | Navajo Lounge |
| 4:00pm - 5:15pm | Buildings Track: Commercial Building Innovations – Beyond | Ballroom C |
| 4:00pm - 5:15pm | Energy Transformation Track: Community Solar – Grassroots Efforts | Ballroom B |
| 4:00pm - 5:15pm | Spirit and Sustainability Forum | Ballroom A |
| 4:00pm - 6:00pm | NABCEP Course: Energy Storage and the NEC | Santa Ana A & B |
| 6:00pm - 9:00pm | NMSEA 50th Anniversary Celebration Dinner | Ballroom C |

Friday, June 24

| | | |
|-------------------|--|---------------------------|
| 7:45am - 8:45am | ASES Technical Divisions Breakout Breakfast (All In-Person Welcome) | Navajo Lounge |
| 9:00am - 10:30am | Keynote: Solar Design, Architecture and the Future of Solar Education | Ballroom C |
| 9:00am - 3:00pm | Solar Fiesta | Cornell Mall Outside Area |
| 9:00am - 5:00pm | NABCEP Workshop: PV Systems and the 2020 NEC | Santa Ana A & B |
| 11:00am - 12:15pm | Buildings Track: It's More than Just Photovoltaics | Ballroom C |
| 11:00am - 12:15pm | Energy Transformation Track: Adoption Support for Acceleration | Ballroom B |
| 11:00am - 12:15pm | Clean Transportation Session | Ballroom A |
| 12:30pm - 2:00pm | Annual Membership Meeting | Ballroom C |
| 1:00pm - 3:00pm | Solar Energy 101: Learn the Basics of Solar | Ballroom B |
| 1:00pm - 5:30pm | Sandia National Labs Tour | Off Campus |
| 2:15pm - 3:30pm | Energy Transformation Track: Rooftop Solar Efforts | Ballroom C |

Saturday, June 25

| | | |
|------------------|--|------------|
| 9:00am - 12:00pm | CFV Labs and Atrisco Heritage Site (OE Solar) Tours | Off Campus |
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MONDAY, JUNE 13

Women's Hands-On PV Workshop (June 13-17)

7:00am - 4:00pm

This is a WOMEN'S ONLY workshop! Join us the week before the conference for a women's-only PV workshop. The workshop will include water, snacks and lunches everyday. Attendees will be responsible for their own accommodations and transportation. Learn how to design, size, and install a solar electric system.

SATURDAY, JUNE 18

ABQ Guided Hike

8:00am - 11:00am

Local Organizing Committee member, Marlene Brown, will be hosting and taking us on this adventure. Please register in advance so we have an accurate headcount and contact information. We will be in contact with more details in early June.

SUNDAY, JUNE 19

Climate Ride

7:00am - 11:30am

Join us for this 25 mile ride led by Marlene Brown, with a shorter option. We'll meet behind the Student Union at UNM (187106 US, Albuquerque, NM 87131) have a stop at the Bike In Cafe (949 Montoya St NW, Albuquerque, NM 87104) and end back at the Student Union.

TUESDAY, JUNE 21

Solar 2022 Chapter Caucus (Invite Only)

9:00am - 10:00am

Technical Divisions Caucus

1:00pm - 4:00pm

Volunteer Training (Invite Only)

4:30pm - 5:30pm

Opening Reception

6:00pm - 9:00pm | Ballroom C

Speakers: Carly Rixham, ASES; Ashok Ghosh, NMSEA; Beata Tsosie, Tewa Women United; Jimmy Santiago; Hakim Bellamy, Beyond Poetry LLC; Noam Chomsky, Massachusetts Institute of Technology

WEDNESDAY, JUNE 22

Keynote: Governments' Role in the Renewable Energy Transformation

8:30am - 10:00am | Ballroom C

Speakers: Paulette Middleton, Panorama Pathways; Michelle Lujan Grisham, Governor of New Mexico; Martin Heinrich, New Mexico Senior Senator; Dave Renné, International Solar Energy Society (ISES); Ron Darnell, PNM

A global renewable energy revolution is underway, and this revolution is intimately connected with significant societal transformations also occurring. Technology, finance, policy and public support all are coming together to make just transformations possible. The critical roles, successes and paths forward of governments at all levels – international, national, tribal, state, local – are highlighted.

Young Professional Forum

10:30am - 11:45am | Ballroom C

Speakers: Sydney Muñoz, Re-volv Solar; Taylor Ryan, National Renewable Energy Laboratory; Ellen Ross, Solar Energy International

The Young Professionals Forum will provide students and emerging professionals to gain knowledge from professionals, build networks, and obtain guidance for navigating early career challenges. This event attracts attendees from a diversity of professional backgrounds and represents the interdisciplinary nature of the renewable energy community. ASES is committed to furthering professional development of our student members and the emerging professional community through education and supportive networking.

Grid & PV Track: Grid Integration and Energy Storage

10:30am - 11:45am | allroom B

Speakers: Erick Aponte Bezares, University of Puerto Rico Mayaguez; Jamil AL-Nouman, New Mexico State University with Abdulmalek Al-Gahmi, Weber State University; Clifford Ho, Sandia National Laboratories; Marc Perez, Clean Power Research; Gautam Yadav, Urban Electric Power; Madhuri Kumari, Sandia National Laboratories

Research and development of photovoltaic technologies that improve efficiency and reliability will be covered in this session. Presentations will focus on PV cells and Perovskites development, solar thermal technology research, as well as solar panel life cycle analysis.

Economic Justice Track: Community Partnership

10:30am - 11:45am | Ballroom A

Speakers: Ashok Ghosh, NMSEA, India Appleton, UNC Asheville, Jan Gudell, Elevate, Amanda Farthing, National Renewable Energy Laboratory, Berlyn Hubler, Energy Outreach Colorado, Don Wichert, Eudai Energy, LLC with Kurt Reinhold, Legacy Solar Wisconsin Coop.

Energy transition will be sustainable when the local community will participate actively during the strategic energy planning and the implementation of solutions that address their specific challenges. Papers in this technical session will discuss initiatives that will target clean and resilient energy transitions.

Policy Track: Regional Policy Design for Solar and Other Advanced Energy Technologies

2:15pm - 3:30pm | Ballroom C

Speakers: Joseph McNamara, Sandia National Laboratories; Jim DesJardins, Renewable Energy Industry Assn-NM (REIA); Ron Celentano, Philadelphia Solar Energy Association; Ravi Malhotra, ICAST; Laura Beshilas, NREL; Liz Weber, NREL; Jake Glavin, MTREA

This session will highlight innovative policy mechanisms being used to spur the deployment of solar, energy efficiency, battery storage, electric vehicles, and related advanced energy forms across the United States. Presentations will highlight case studies at the local (e.g., New York City), regional (e.g., Tribal Lands), state (e.g., New Mexico), and national levels, with a particular focus on overcoming market barriers through government intervention. Presentations will also focus on the use of public policy to ensure equity, justice, and inclusion in renewable energy opportunities, especially for historically marginalized populations.

Grid & PV Track: Material Design and Advancing PV Tech

2:15pm - 3:30pm | Ballroom B

Speakers: Remi Akinwonmi, ASES; Joshua Stein, Sandia National Laboratories; Hendrik Laubscher, Sandia National Laboratories; Benjamin Pierce, Sandia National Labs; Natalie Click, Arizona State University

Research and development of photovoltaic technologies that improve efficiency and reliability will be covered in this session. Presentations will focus on PV cells and Perovskites development, solar thermal technology research, as well as solar panel life cycle analysis.

Community Solar Forum: Energy Sovereignty - From Community Led and Owned Community Solar to Public Power

2:15pm - 3:30pm | Ballroom C

Speakers: Bianca Sopoci-Belknap, New Energy Economy; Mariel Nanasi, New Energy Economy; Timothy DenHerd-er-Thomas, Cooperative Energy Futures; Andrew Stone, Joseph Maestas, NM Public Regulation Commission

New Mexico is finally rolling out its Community Solar program this summer. If it is to be a tool for an equitable energy transition where the solar benefits get to the subscriber, community led and community owned community solar must be pursued. Industry experts from around the nation who have successfully launched subscriber owned facilities and cooperatives will share their insights and recommendations for NM. Energy sovereignty, being much larger than community solar, includes the public power movement and we'll learn from an award-winning utility law insider about a society-wide solution to energy equity.

Poster Sessions

4:00pm - 5:45pm | Ballroom C

For a full list of poster presentations see page 14.

Energy Transformation Track: Drivers/Innovation

4:00pm - 5:15pm | Ballroom B

Speakers: James Stalker, The Enterprise Universe; Windy Dankoff, The Solar Water Pumping Handbook; Jan Pepper, Peninsula Clean Energy; Henry Red Cloud, Red Cloud Renewable; Ryan Austin, Xcel Energy; Brian DeBruine, Colorado Hydrogen Network

Energy transformation has to increase energy adoption significantly from where it is today, whether that is through new materials, designs, increased efficiency, new use cases for solar energy, even policy, collaboration, cooperation, etc. Presenters will address drivers and innovation toward increased energy adoption for energy transformation.

Economic Justice Track: Equity in Financing and Investment

4:00pm - 5:15pm | Ballroom A

Speakers: Julie Stephens, NMSEA; Kathryn Milun, University of Minnesota/MN Design Center; Martin Pochtaruk, Heliene; Flor Sandoval, Sonora Environmental Research Institute, Inc.; Nick Kerwin, New Energy Equity; Rich Stromberg, Alaska Center for Energy and Power/UAF/Equitable Solar Solutions;

Randy Ellingson, *Glass City Community Solar*; **Philip Ottinger**, *Glass City Community Solar*; **Ben McMahan**

The falling cost of key clean energy technologies offer a tremendous opportunity to energy transition using clean energy. The governmental lawmakers can play an important role by legislating measures towards development of financing and investment opportunities that gradually adjust direct and indirect subsidies. This session will highlight thoughts on various economic issues.

Annual ASES Fellows Reception

6:00pm - 6:30pm

Speakers: **Paulette Middleton**, *Panorama Pathways*; **Jill Cliburn**, *Cliburn Associates*

ASES honors persons making significant contributions to the society and generally within the field of solar and renewable energy each year. Join us for dinner and drinks as we present our annual ASES Awards and Fellows recognitions! We will host an Art and Vacation Home Auction fundraiser after the awards ceremony.

ASES Annual Awards Banquet *(Tickets available)*

6:30pm - 9:30pm

Speakers: **Larry Kazmerski**, *NREL*; **Carly Rixham**, *ASES*

Honors persons making significant contributions to the society and generally within the field of solar and renewable energy each year. Join us for dinner and drinks as we present our annual ASES Awards and Fellows recognitions! We will host an Art and Vacation Home Auction fundraiser after the awards ceremony.

THURSDAY, JUNE 23

Keynote: Ensuring a Just & Equitable Transformation

9:00am - 10:30am | Ballroom C

Speakers: **Dara Bortman**, *ASES*; **Shalanda Baker**, *Office of Economic Impact and Diversity at the Department of Energy*; **Jonathan Nez**, *President of the Navajo Nation*; **Wahleah Johns**, *Office of Indian Energy at the Department of Energy*; **Nicole Sitaraman**, *Federal Energy Regulatory Commission*

Reinforcing our conference focus on an Energy Transition with Economic Justice, our exciting panel of speakers will discuss their work to ensure that America's frontline communities not only benefit from the transition to clean energy, but have the opportunity to lead the way in enabling a transformation in the way

we think about energy, create energy, deliver energy, and consume energy. Through support, education, investment, workforce development opportunities, and inspirational legislative leadership toward total electrification, those who have historically been the most adversely affected by climate change, can show us the path forward to a more resilient, sustainable and secure future - one with access to cheaper energy, cleaner air and water, good-paying local jobs, and improved public health for all.

~switch Session

11:00am - 12:15pm | Ballroom A

Speakers: **Karen Soares**, *ASES*; **Naoise Irwin**, *Solarflux Energy Technologies, Inc.*; **Larry Schlusser**, *Sun Frost*; **Henry Vandermark**, *Solar Wave Energy, Inc.*; **Geoff Greenfield**, *Third Sun Solar, Solar For All, New Resource Solutions*; **Mark Chalom**, *Solar Design*; **Barry Butler**, *Butler Sun Solutions*; **Elizabeth Ross**, *Colorado State University*; **Kevin Cray**, *Coalition for Community Solar Access*; **Bruce Davis**, **Patrick Thompson**, *CloudBank*; **John Laitner**, *University of Arizona School of Government and Public Policy*; **Lauren Reddington**, *ASES*

These presentations are rapid fire 5 minutes – 20 slides each, with opportunities for Q&A at the end of all of the presentations. This year's fast paced, information packed session provides new insights into a wide variety of topics. Enjoy creative presentations!

Renewable Energy Deployment with Equity and Justice

11:00am - 12:15pm | Santa Ana A & B

Speakers: **Abraham Ellis**, *Sandia National Laboratories*; **Luis Reyes**, *CEO, Kit Carson Electric Cooperative*; **Stan Atcitty**, *Sandia National Laboratories*; **Jennifer Garson**, *Director of the Water Power Technology Office*

Sandia National Laboratories is hosting a panel session on the "Renewable Energy Deployment with Equity and Justice". The focus will be on the practical aspects of engaging with communities and local stakeholders on energy deployment projects, sharing examples, lessons learned, challenges, and successes. The panelists represent perspectives from national laboratories, a university, and the Kit Carson Electric Cooperative (New Mexico).

Women in Solar Energy (WISE) Forum

11:00am - 12:15pm | Ballroom C

Speakers: **Marlene Brown**, *Prep4Resilience*; **Riley Neugebauer**, *Solar for Women*; **Jill Cliburn**, *Cliburn Associates*; **Karen Paramanandam**, *Unirac, Inc.*; **Olga Lavrova**, *New Mexico State University*

The purpose of the WISE forum is to inspire women to become more technically involved in solar, not just peripheral to it. It's easy for us to talk about what we do, but this isn't a forum to just talk about our jobs, but about how we got where we are and the obstacles and barriers that we've come up against and broke through or just moved out of the way to continue on our path. this is a forum for accomplished women to share lessons learned and heartfelt stories about their lives. It is the story about the journey.

Education Track: Education and Inspiration

11:00am - 12:15pm | Ballroom B

Speakers: **Dale Miller**, *University of Colorado Boulder*; **Ruth Amundsen**, *Norfolk Solar LLC*; **Gary Brock**, *HMFH Architects*; **Steven Smiley**, *Smiley Energy Services*; **Sharon Klein**, *School of Economics, University of Maine*; **Mark Nanny**, *University of Oklahoma, School of Civil Engineering and Environmental Science, and the Institute for Energy and the Environment*

This session deals with inspiring students, teachers, and administrators with STEM-related programs and incorporating solar energy into school buildings for hands-on and leading by example education.

Women in Solar Energy (WISE) Luncheon

12:30pm - 2:00pm | Ballroom C

Speakers: **Marlene Brown**, *Prep4Resilience*; **Yuriria Morales**, *Global Ties*; **JoAnn Armenta**, *2022 ASES WISE Award Winner/Purpose Focused Alternative Learning*

Real Estate Solar Valuation Forum and Luncheon

12:30pm - 2:00pm | Ballroom B

Speakers: **Dara Bortman**, *ASES Board Member*; **Janelle McGill**, *J McGill Homes, LLC*; **Pamela Brookstein**, *Elevate, Robin LeBaron, Pearl Certification*

NABCEP Course: Energy Storage Intensive

2:00pm - 4:00pm | Santa Ana A & B

Speakers: **Sean White**, *White House Solar*

This Energy Storage Intensive Workshop will count for NABCEP Credit and will be fast paced and cover a lot of information. Topics covered include Energy Storage

Systems (ESS) vs. Storage Batteries, Lithium-Ion Chemistries, Flow Batteries, Fuel Cells, Lead-Acid Batteries, Charge Controllers, Inverters, AC and DC Coupling, Ancillary Services, Self-Consumption, Power vs. Energy Ratings, System Sizing, Residential, Commercial and Utility Scale Storage.

Industry Roundtable

2:15pm - 3:30pm | Ballroom C

Speakers: **Mary Monson**, *Sandia National Laboratories*; **Anima Bista**, *Unirac*; **Jesse Winternitz**, *S-5!*; **John Espino**, *Solar Informatics*; **Amber Naqvi**, *Solar Informatics*; **Patrick Thompson**, *U.S. Solar Coalition/CloudBank*; **Gary Oppedahl**, *Emera Technologies*; **Artem Nikulkov**, *Earth Coast*; **Kevin Borgia**, *SunVest Solar*; **Tony Smith**, *Secure Futures*; **Andre Eanes**, *Secure Futures*; **Sushil Ghimire**, *Array Technologies*; **Taiyoko Sadewic**, *Positive Energy*; **Robert Foster**, *SolAqua*

All are welcome to join Industry Round Table Luncheon where sponsors will each give a five-minute pitch for their business or offering. Join us as we flip the script!

Education Track: Workforce Education

2:15pm - 3:30pm | Ballroom B

Speakers: **Marc Perez**, *Clean Power Research/ASES Board Member*; **Gilbert Michaud**, *Loyola University Chicago*; **Sampson Hao**, *Loyola University*; **Riley Neugebauer**, *Solar for Women*; **Jeff Gilbert**, *Azimuth Solar LLC*; **Kerry Rippy**, *National Renewable Energy Laboratory*; **Patrick Thompson**, *CloudBank*

This session covers educating and training for the solar workforce by evaluation of the programs developed in communities throughout the U.S.

NREL and the Midwest Tribal Energy Resources Association Forum and Networking Session

2:15pm - 3:30pm | Ballroom A

Speakers: **Laura Beshilas**, *NREL*; **Elizabeth Weber**, *NREL*; **Jake Glavin**, *MTERA*

Join the National Renewable Energy Laboratory and the Midwest Tribal Energy Resources Association for a collaborative discussion about regulatory barriers and solutions to tribal solar deployment. Share your experiences and hear from other tribes, utilities, regulators, and funders. Sign up to receive updates and more information about the Tribal Solar Initiative.

Spirit and Sustainability Forum

4:00pm - 5:15pm | Ballroom A

Speakers: Paulette Middleton, *Panorama Pathways*; Orlo Stitt, *Stitt Education, Holistically Green Living, LLC*

Accelerating the transformation to a truly renewable energy, sustainable living world means universal commitments to 100% renewable energy across all sectors and populations; justice, equity, diversity and inclusion (JEDI) principles; circular economy (reuse, recycle, renew); environmental protection and restoration; and highest quality development standards. How do we grow the political will needed to make these commitments and successfully act on them? This forum provides SOLAR 2022 participants the opportunity to explore this question together. This informal listen and learn moderated dialogue format aims to build community and create new insights.

Buildings Track: Commercial Building Innovations - Beyond Solar Roofs

4:00pm - 5:15pm | Ballroom C

Speakers: Debbie Coleman, *Sun Plans*; Akintonde Abbas, *Energy Production and Infrastructure Center*; Ash Ragheb, *Lawrence Technological University*; Laura Combs, *Eagle Solar & Light*; William Barber III, *Rural Beacon Initiative*; Aldo Fanchiotti, *Università degli Studi Roma Tre*; Guangdong Zhu, *NREL*

Innovative building-integrated solar technologies are greatly beneficial to commercial buildings, because space heating, cooling, and lighting energy use can be reduced, and working conditions may be enhanced, which further positively affect human well-being, productivity, and health. This session provides recent studies about solar utilization and technology integration in the commercial building sector.

Energy Transformation Track: Community Solar - Grassroots Efforts

4:00pm - 5:15pm | Ballroom B

Speakers: Henry Vandermark, *Solar Wave Energy Inc.*; Kimberli Roth, *OE Solar*; David Sarkisian, *North Carolina Clean Energy Technology Center*; Jill Cliburn, *Cliburn and Associates, LLC*; James Orenstein, *Trinity River Community Solar Systems (TRCSS)*; Joan Ross, *North End Woodward Community Coalition*; Michael Fladmark, *Trinity River Community Solar Systems*

This will be a discussion of how community solar efforts are contributing to energy transformation and increased energy production.

NABCEP Course: Energy Storage and the NEC

4:01pm - 6:00pm | Santa Ana A & B

Speaker: Sean White, *White House Solar*

This workshop will be jam-packed with NEC (National Electrical Code) Energy Storage insight and interpretation. Sean White teaches Energy Storage courses around the world and has authored many technical Storage and Solar books. Sean will fill you up with as much information as possible in the time given, while entertaining you. We will primarily focus on the 2020 NEC and refer to earlier versions where there were dramatic changes.

NMSEA 50th Anniversary Celebration Dinner

6:00pm - 9:00pm | Ballroom C

Speakers: Katie Stone, *The Children's Hour*; Ashok Ghosh, *NMSEA*; Tim Keller, *Albuquerque Mayor*; Nicole Olonovich, *Athena Christodoulou, New Mexico House of Representatives*; NMSEA; Mayane Barudin, *Vote Solar*; Ben Luce, *Northern Vermont University*

FRIDAY, JUNE 24

Technical Divisions Breakfast & Breakouts

7:45am - 8:45am | In-Person Only

NABCEP Workshop: PV Systems and the 2020 NEC

8:59am - 5:00pm | Santa Ana A & B

This special workshop taught by John Wiles of NMSU will be an all day event on June 24 from 9am-5 PM MDT with lunch provided for all registrants. The course offers NABCEP credits if completed in full.

The workshop will cover the 2020 National Electrical Code (NEC) requirements for designing and installing PV systems. A basic knowledge of the NEC is required since Code basics will not be addressed. Conductor selection, ampacity calculations and overcurrent devices and disconnects will be covered. How to do it correctly and what not to do are items on the agenda. The focus will be on utility-interactive systems. 2020 NEC requirements in major areas related to PV systems will be addressed. Electricians, electrical inspectors, electrical engineers and PV installers should attend. PV installers will receive 6 hours of NABCEP (North American Board of Certified Energy Practitioners) continuing education credits for the course.

Solar Fiesta

9:00am - 3:00pm | Cornell Mall outdoors

9:00am - 1:00pm | Electric Vehicle show

Celebrate the sun and our electric future at the 2022 Solar Fiesta by NMSEA.

Thinking of going solar? Talk to solar companies all in one place. Have questions about electric cars? Ask real owners for real answers. Hands-on STEM activities for kids. Giant solar cooker. Music. Learn about careers in solar and wind. Ride the Albuquerque Electric Bus. Free Parking, Free Admission.

Keynote: Solar Design, Architecture and the Future of Solar Education

9:00am - 10:30am | Ballroom C

Speakers: Abraham Ellis, *Sandia National Laboratories*; Ed Mazria, *Architecture 2030*; Dan Arvizu, *New Mexico State University*; Sandra Begay, *Sandia National Laboratories*; Gigi Goldman, *We Share Solar*; Hal Aronson, *We Share Solar*

Buildings Track: It's More than Just Photovoltaics

11:00am - 12:15pm | Ballroom C

Speakers: Mark Chalom, *Solar Design*; Antonio Vazquez Molinary, *Texas A&M University*; Clément Gaillard, *Paris 1 University/Ecole Normale Supérieure of Paris-Saclay*; Orlo Stitt, *Stitt Education, Holistically Green Living, LLC*; M Keith Sharp, *University of Louisville*

Sustainable housing is one that makes efficient use of renewable resources and energy, such as solar, wind, ambient air temperature variations, etc., which needs specific design methodologies and considerations in terms of building geometry, room layout, envelope component, and material selection. In this session, different perspectives about passive design in residential buildings will be presented.

Energy Transformation Track: Adoption Support for Acceleration

11:00am - 12:15pm | Ballroom B

Speakers: Sydney Munoz, *RE-Volv*; Sydney Lienemann, *Camus Energy*; Nir Krakauer, *City College of New York*; Anita Ledbetter, *Build San Antonio Green*; Gary Skulnik, *Neighborhood Sun Benefit Corp*; Jack Whittier, *Enon Management, LLC*

Presenters will address facilitation (or acceleration) of the energy transformation other than what is covered in session one, particularly data analytics, utilities, collaboration (i.e., for increased energy production).

Clean Transportation Session

11:00am - 12:15pm | Ballroom A

Speakers: Birk Jones, *Sandia National Laboratories*; Daniel Pritchard, *Renewable Taos, Inc.*; Evan Eskilson, *National Science Foundation REU - Texas A&M Kingsville*; Dave Erb, *Self*; Philippe Hartley, *CleanFinancing LLC / PACEfi.com*; Timothy Haas, *Aptera Motors, Inc.*

This session will explore environmentally just approaches to sustainable, decarbonizing transportation. Topics include electric vehicle (EV) charging, electrifying school buses and agricultural machinery and equitable biking.

Annual ASES Membership Meeting

12:30pm - 2:00pm | Ballroom C

Speakers: Carly Rixham, *ASES*; Anna Bybee, *ASES*; Sarah Townes, *ASES*; Robert Foster, *ASES Chair*

The 2022 ASES Membership Meeting will include an update on the organization from the ASES staff and board. Lunch provided to all in-person attendees.

Solar Energy 101: Learn the Basics of Solar Energy (FREE to Public)

1:00pm - 3:00pm | Ballroom B

Speakers: Marlene Brown, *Central New Mexico Community College*; Quentin Wilson, *Mark Chalom, Solar Design*

One hour will be focused on solar PV and the other focused on adobe building and passive solar with time for Q&A.

Sandia National Labs Facility Tour (Pre-registered only)

1:00pm - 5:30pm | UNM

Meet at 1:00pm, bus leave at 1:30pm. This tour of PSEL and the NSTTF is scheduled to depart from UNM, and total tour time will be 4-4.5 hours. Meet at North Side of UNM Bookstore (2301 Central Ave NE, ABQ, NM 87106) on Redondo Dr. This tour is a comprehensive walking tour of the NSTTF including all facilities. Depending on the weather, visitors may observe operating concentrating systems and may also be able to access the top of the solar tower.

ASES SOLAR 2022 | PROGRAM DESCRIPTIONS

Energy Transformation Track:
Rooftop Solar Efforts

2:15pm - 3:30pm | Ballroom C

Speakers: Summer Ferreira, Sandia Labs; Jacqueline Berg, SOMAH, Center for Sustainable Energy; Andrea Almeida, Energy From Women; Tatiana Vasquez, Energy From Women; Mike Winn, DroneDeploy; David Comis, Solar, Maryland Energy Administration; Eric Peterman, GRNE Solar

Presenters will discuss how rooftop solar systems and potentially passive solar designs will contribute to the energy transformation (i.e., increased energy production or passive use).

SATURDAY, JUNE 25

CFV Labs and Atrisco Heritage Site
(OE Solar) Tours

9:00am - 12:00pm | OE Solar

We will be visiting OE Solar's newest installation at the Atrisco Heritage site as well as a short tour of CFV Labs. Water and snacks will be provided.

Tour Agenda: Meet at 8:45 AM MT, the bus will leave by 9:00 AM MT. First stop will be CFV labs for a 30 minute tour, then we will go to the Atrisco Heritage (OE Solar) site for a 1.5-2 hour tour. Shuttle Pick-up Location: UNM Shuttle stop on Redondo Dr NE by the UNM Bookstore, 2301 Central Ave NE, Albuquerque, NM 87106

ANNUAL 2022 ASES AWARDS

CHARLES GREELEY ABBOT AWARD

Ranga Pitchumani

For pioneering scientific contributions in the fields of solar engineering, energy conversion, and energy storage technologies

HOYT CLARKE HOTTEL AWARD

Steven Johnston

For significant technical contributions to the PV R&D community, and especially the development of innovative PV measurement techniques

LEADERSHIP IN SOLAR ARCHITECTURE AND DESIGN

Orlo Stitt

For leadership in "building of conscience" in the dedicated use of passive and active solar strategies and environmentally responsible materials.

LEADERSHIP IN SOLAR POLICY AND MARKET TRANSFORMATION

Amanda Bybee and the Clean Energy Cooperative Network

For cooperative and sustained action with an innovative vision in growing independent solar businesses to promote greater equity and sustainability

WOMEN IN SOLAR ENERGY (WISE)

JoAnn Armenta

For her visionary work in building authentic & powerful relationships in solar energy across Native Nations, especially guiding Native American girls and women toward solar careers

REBECCA VORIES

Drew Gillett

For his long-standing, continuous dedication to ASES through conference participation, volunteering, and active chapter representation for over 40 years

JOHN AND BARBARA YELLOTT

Aaron Wheeler

For his outstanding studies of GaAs and perovskite-on-silicon PV modules, in sharing his enthusiasm about solar energy with students and with the world.

2022 ASES FELLOWS INDUCTEES

Bruce Anderson
Barry Butler
Mario Monesterio

Trudy Forsyth
Henry Vandermark

Renewable technologies are crucial to New Mexico's energy journey. PNM is currently powering our communities with more than 30% renewables in our portfolio, and we will continue to grow towards a zero-carbon future together.

Learn more at pnmforwardtogether.com



Together for clean energy now

Posters will be on display Tuesday-Thursday in the Ballroom C and on the online platform. Poster Sessions will be held on **Wednesday, June 22 from 4:00pm - 5:45pm.**

T1 | Alexander Winn, *US DOL Partnership on Inclusive Apprenticeship*
Diversifying the solar workforce through inclusive apprenticeships

T1 | Armando Gaetaniello, *Neighborhood Sun Benefit Corp*
Community solar can power local economic justice

T1 | Ravi Malhotra, *ICAST*
Financial Hurdles to Financing Community Solar for Low Income Residents

T1 | Jennifer Braid, *Sandia National Laboratories*
Financial Optimization of Commercial-Scale Photovoltaic Systems

T1 | Sean WillChene, *Shared Solar Advisors USA*
How To Talk About Community Solar Energy

T1 | Kelsey Rader, *City of Albuquerque*
The Path to 100: Achieving 100% renewable energy use for government operations

T2 | Eduardo Rincón-Mejía, *Autonomous University of México City*
How to correctly assess the value of energy converted from solar and other renewable sources

T2 | John Bumgarner, *Mosaic*, *Everything You Need to Know About Solar Financing Options*

T3 | Brian DeBruine, *Colorado Hydrogen Network*, *Off-Grid Solar + Wind Co-location and Cogeneration for Dedicated Hydrogen Production*

T4 | Jay Warmke, *Blue Rock Station LLC*
Solar Installer Certification Programs: What's Out there and How do They Compare?

T4 | Lelia Deville, *Sandia National Laboratories*
Comparative Analysis of Photovoltaic Performance Models Based on Different Systems and Input Data

T4 | Tom Thompson, *Solaria Corporation*
The importance of enhanced aesthetics and increased efficiency in spurring solar deployment

T4 | Susan Opperman, *Olsson*
Landowner Considerations in Utility-Scale Solar Vegetation Management

T4 | Daniel Simon, *3D Solar Inc.*
Low concentrating PV-Thermal module

T4 | Patrick Thompson, *CloudBank*
A Green Hydrogen Bridge for Solar Storage?

T4 | Randy Ellingson, *The University of Toledo*
An Update on Bifacial CdTe PV Technology

T5 | Tiffany Mollohan, *Oklahoma State University - School of Architecture*
Comparative Analysis of Thermal Performance for Wall Systems with Conventional and Innovative Insulation

T5 | Ahmed Mezaïen, *Department of Architecture, Texas A&M University*
Evaluating the performance of a passive architectural element in hot-dry climate through natural ventilation and thermal impact analysis

T5 | Mithra Sankrithi, *RIC Enterprises*
Innovative Rooftop CPV Cogeneration System for Electricity, Solar Hot Water & Supplemental Building Heating

T5 | Andrew Stone, *Adobe Solar Builder*
A 40 Year Passive Solar Adobe Retrofit Retrospective

T5 | Theresa Foley, *Sonora Environmental Research Institute, Inc. (SERIERI)*
Evaluating the effectiveness of solar mini-splits

T5 | Steve Kenin, *Taos Solar Resources, Inc.*
Solar Thermal Heating of Existing Buildings

T6 | Jan-Erik Gudell, *Elevate*
Community Mobilization for Access and Equity to Sustainable Active Urban Transit

T6 | Patrick Thompson, *CloudBank*
Magic School Bus

T7 | Jesse Duroha, *University of Rhode Island - Sustainable Innovative Solutions (SIS) Lab*
Solar Installers' Risk Perception

T7 | Mindy Fox, *Solar Cookers International*
Solar Cookers: a just, clean, and sustainable cooking solution towards energy transition

T7 | Clifford Ho, *Sandia National Laboratories*
Solar Energy for Industrial Decarbonization

T7 | Ron Celentano, *Philadelphia Solar Energy Association*
Solar and its Role in Solving Climate Change: Curriculum for Middle School

T7 | Luis Moreno, *University of the Pacific*
Real-Time Display of Carbon Dioxide Contents at Local, National, and Global Levels; 2022 Progress Update on the Zero Emissions Network

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Live/Virtual Experience



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