



2022  AICHE  
ANNUAL  
MEETING

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November 13-18, 2022  
Phoenix Convention Center  
Phoenix, AZ

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SUSTAINABILITY  
USERS GUIDE

›POWERING THE FUTURE

# MEMBERSHIP VALUE PROP

AIChE's **Institute for Sustainability (IfS)** is a member-driven organization that aids in pushing the sustainability profession forward, engaging the community, and defining excellence across the field. IfS provides multidisciplinary scientific rigor and research for sustainability discussions, encourages the incorporation of sustainability concepts in engineering education, and facilitates the development of measurement tools to guide the design of more sustainable products and processes.

As a member of IfS, you will enjoy a vast array of opportunities to communicate with leading international engineers, researchers, academics and scientists. Connect for ideas, inspiration, and technical information.



An AIChE Technological Community

- **Technical Resources** - Keep apprised of new developments in the chemical engineering profession through our CEP magazine, AIChExchange and SmartBrief electronic newsletters, as well as Journals published in partnership with Wiley.
- **Exclusive Technical Content** - Access scientific and technical opportunities and research for sustainability discussions. IfS approaches sustainability from the perspectives of engineering and scientific disciplines to promote the societal, economic, and environmental benefits of sustainable and green engineering.
- **Conferences** - Get the lowest rates on future conference registrations (both virtual and in-person).
- **Education** - Build new technical knowledge and skills through live and archived webinars, credentials as well as self-paced eLearning courses.
- **Advance Your Career** - Whether you are actively searching or just researching possibilities, CareerEngineer is the leading e-recruitment source for chemical engineers at every level, in every field.
- **AIChE Engage** - Cultivate meaningful professional relationships through AIChE Engage, the mobile-friendly community discussion platform.
- **Students** - Get all the up-to-date information on grants and sponsorship opportunities to support your registration to present at any of the IfS conferences. Take part in the next dedicated Poster and Short Talk Session to network with leading professionals in your field of study.

## Join today!

[www.aiche.org/ifs/membership](http://www.aiche.org/ifs/membership)

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The **Sustainable Engineering Forum** promotes Sustainable Engineering and Sustainable Development in an inclusive forum.

This technical forum is open to all disciplines to promote technical and professional development with a focus on sustainability principles and practice.

More information at: [www.aiche.org/sef](http://www.aiche.org/sef)



IfS is governed by a Managing Board of industrial and academic leaders, which sets the course for the society.

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**David Routt Shonnard**

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**Jeffrey Seay**

**Debalina Sengupta**

**Subhas K Sikdar**

**Barbara Valentine**

**Kristina Wagstrom**

**Jeffrey Wilbur**

**Fengqi You**



# HIGHLIGHTS

## FEATURED PROGRAMMING Be sure to attend these conference highlights –

### SUNDAY, NOVEMBER 13, 2022

#### Discussing the 2022 NASEM Report: New Directions for Chemical Engineering

3:00 PM – 4:45 PM

N-124AB, Phoenix Convention Center

### MONDAY, NOVEMBER 14, 2022

#### IACChE's James Y. Oldshue Lecture

9:00 AM – 10:15 AM

North Ballroom 120D, Phoenix Convention Center

#### Nanostructured Polymers for Energy Efficient Devices and Specialty Separation Applications

David Suleiman, *University of Puerto Rico at Mayagüez*

#### Powering the Future: Panel Discussion

11:00 AM – 12:20 PM

N-124AB Phoenix Convention Center

#### 2022 P.V. Danckwerts Lecture

11:15 AM – 12:15 PM

North Ballroom 120D, Phoenix Convention Center

#### Working with CO<sub>2</sub>

Diane Hildebrandt, *University of the Witwatersrand*

### TUESDAY, NOVEMBER 15, 2022

#### Topical Plenary: Frontiers in Green Process and Product Engineering

8:00 AM – 10:30 AM

N-229AB, Phoenix Convention Center

#### 2022 Andreas Acrivos Award for Professional Progress in Chemical Engineering Lecture

11:15 AM – 12:15 PM

North Ballroom 120D, Phoenix Convention Center

#### Building Microbial Chemical Factories: Design, Assembly, and Engineering of Biological Routes to Chemical Compounds

Kristala L. J. Prather, *Massachusetts Institute of Technology*

#### Topical Plenary: Environmental Analytical Technology: Sensor Applications in Sustainability

12:30 PM – 3:00 PM

N-229AB, Phoenix Convention Center

#### Plenary Session: Waste Plastics

3:30 PM – 6:00 PM

N-124AB, Phoenix Convention Center

#### SBE's James E. Bailey Award Lecture

6:15 PM – 7:00 PM

North Ballroom 120D, Phoenix Convention Center

#### Exploiting Viruses that Kill and Killing Viruses that Exploit: Some Sweet Science

Jonathan Dordick, *Rensselaer Polytechnic Institute*

### WEDNESDAY, NOVEMBER 16, 2022

#### Sustainable Engineering Forum Plenary

8:00 AM – 10:30 AM

N-224AB, Phoenix Convention Center

#### John M. Prausnitz AIChE Institute Lecture

11:15 AM – 12:15 PM

North Ballroom 120D, Phoenix Convention Center

#### From Silicon to Plastic: It's All About Surfaces, Interfaces and Processing

Elsa Reichmanis, *Lehigh University*

#### William R. Schowalter Lecture

6:15 PM – 7:15 PM

North Ballroom 120D, Phoenix Convention Center

#### From Particles to People and Complex Organizations

John L. Anderson, *National Academy of Engineering*

# SUSTAINABILITY PROGRAM GRID

**Property Key**  
**Phoenix Convention Center = PCC**

| TIME                       | SESSION # | SESSION   | PROPERTY | ROOM                |
|----------------------------|-----------|---|----------|---------------------|
| <b>SUNDAY, NOVEMBER 13</b> |           |   |          |                     |
| 3:00 PM                    | 3         | Discussing the 2022 NASEM Report: New Directions for Chemical Engineering   | PCC      | N-124AB             |
| 3:30 PM                    | 17        | Design and Analysis of Sustainable Carbon Capture and Emissions Control Technologies*   | PCC      | N-225B              |
| 3:30 PM                    | 25        | Advances in Biofuels Production and Alternative Fuels I*  | PCC      | W-103A              |
| 3:30 PM                    | 36        | Design, Analysis, and Optimization of Sustainable Energy Systems and Supply Chains I  | PCC      | N-226C              |
| 3:30 PM                    | 37        | Reactor Engineering for Biomass Feedstocks  | PCC      | N-226B              |
| <b>MONDAY, NOVEMBER 14</b> |           |   |          |                     |
| 8:00 AM                    | 64        | Advances in Biofuels Production and Alternative Fuels II*   | PCC      | W-103A              |
| 8:00 AM                    | 65        | Developments in Electrochemical Reactors, Fuel Cells, and Electrolyzers I*  | PCC      | W-102C              |
| 8:00 AM                    | 66        | Efficient Processing of Lignin to Bioproducts and Biofuels  | PCC      | N-228B              |
| 8:00 AM                    | 86        | Big Data and Analytics for Sustainability   | PCC      | N-226A              |
| 8:00 AM                    | 87        | Design, Analysis, and Optimization of Sustainable Energy Systems and Supply Chains II   | PCC      | N-226C              |
| 8:00 AM                    | 92        | Sensors and Monitoring for Health   | PCC      | N-231A              |
| 11:00 AM                   | 93        | Powering the Future: Panel Discussion   | PCC      | N-124AB             |
| 11:15 AM                   | 94        | 2022 Danckwerts Lecture   | PCC      | North Ballroom 120D |
| 12:30 PM                   | 124       | Materials for thermochemical and electrochemical Energy Storage   | PCC      | N-228B              |
| 12:30 PM                   | 149       | Novel Approaches to CO <sub>2</sub> Utilization I   | PCC      | N-226C              |
| 12:30 PM                   | 150       | Sustainable Biorefineries Plenary Session (Invited Talks)   | PCC      | N-226B              |
| 12:30 PM                   | 151       | Sustainable Management and Uses of Post-Consumer Materials and Waste  | PCC      | N-226A              |
| 12:30 PM                   | 157       | Student Competition in Sensors (Sponsored)  | PCC      | N-231A              |
| 3:30 PM                    | 166       | Poster Session: Food and Bioprocess Engineering*  | PCC      | Exhibit Hall E      |
| 3:30 PM                    | 195       | Integrated Biorefineries: Technologies and TEA/LCA*   | PCC      | W-103A              |
| 3:30 PM                    | 196       | Ionic Liquids: Novel Separation, Catalytic reaction and Electrochemical Processes   | PCC      | N-228B              |
| 3:30 PM                    | 197       | Climate Solutions Policy Initiative (CSPI)*   | PCC      | N-127A              |
| 3:30 PM                    | 215       | Feedstock Conversion Interface Consortium – Understanding Feedstock Variability to Enable Next Generation Biorefineries (Invited Talks) | PCC      | N-226B              |
| 3:30 PM                    | 216       | Green Chemistry and Engineering-I   | PCC      | N-226A              |
| 3:30 PM                    | 217       | Novel Approaches to CO <sub>2</sub> Utilization II  | PCC      | N-226C              |
| 3:30 PM                    | 223       | Next-Gen Sensors  | PCC      | N-231A              |

This program is as of October 6, 2022. An up-to-date program is available at [aiche.org/annual](http://aiche.org/annual) and in the AIChEevents app.

# SUSTAINABILITY PROGRAM GRID

| TIME                        | SESSION # | SESSION   | PROPERTY | ROOM                |
|-----------------------------|-----------|---|----------|---------------------|
| <b>TUESDAY, NOVEMBER 15</b> |           |   |          |                     |
| 8:00 AM                     | 256       | Developments in Shale Gas and Natural Gas*  | PCC      | W-103A              |
| 8:00 AM                     | 257       | Topical Plenary: Frontiers in Green Process and Product Engineering (Invited Talks)                         | PCC      | N-229AB             |
| 8:00 AM                     | 281       | Concentrated Solar Power Generation and Chemical Processing I   | PCC      | N-226C              |
| 8:00 AM                     | 282       | Value-Added Biorefinery Co-Products   | PCC      | N-226B              |
| 8:00 AM                     | 287       | Field-Deployable Sensors  | PCC      | N-231A              |
| 8:00 AM                     | 288       | Sustainable Pathways to Clean Hydrogen and Synthetic Fuels I*   | PCC      | W-103B              |
| 11:15 AM                    | 290       | Andreas Acrivos Award for Professional Progress in Chemical Engineering Lecture                             | PCC      | North Ballroom 120D |
| 12:30 PM                    | 320       | Breakthroughs in Sustainable Chemical Production and Process  | PCC      | N-228B              |
| 12:30 PM                    | 323       | Leadership and Management of Sustainable Solutions in Industry*   | PCC      | W-102B              |
| 12:30 PM                    | 344       | Biofuels Production: Design, Simulation, and Economic Analysis  | PCC      | N-226B              |
| 12:30 PM                    | 345       | Concentrated Solar Power Generation and Chemical Processing II  | PCC      | N-226C              |
| 12:30 PM                    | 346       | The Food-Energy-Water Nexus   | PCC      | N-226A              |
| 12:30 PM                    | 352       | Topical Plenary: Environmental Analytical Technology: Sensor Applications in Sustainability (Invited Talks) | PCC      | N-229AB             |
| 12:30 PM                    | 353       | Sustainable Pathways to Clean Hydrogen and Synthetic Fuels II*  | PCC      | W-103B              |
| 3:30 PM                     | 375       | General Poster Session in Sensors   | PCC      | Exhibit Hall E      |
| 3:30 PM                     | 397       | Integrated Process Engineering and Economic Analysis*   | PCC      | N-228B              |
| 3:30 PM                     | 400       | AIChE Management Award Recipient Presentation Session: Nuclear Energy in a Sustainable World*               | PCC      | N-229AB             |
| 3:30 PM                     | 413       | Engineering Geologic Carbon Dioxide Storage Systems   | PCC      | N-226A              |
| 3:30 PM                     | 414       | Feedstock Logistics for Biorefineries   | PCC      | N-226B              |
| 3:30 PM                     | 415       | Fuel and Energy Decarbonization   | PCC      | N-226C              |
| 3:30 PM                     | 421       | Sustainable Pathways to Clean Hydrogen and Synthetic Fuels III*   | PCC      | W-103B              |
| 3:30 PM                     | 422       | Plenary Session: Waste Plastics (Invited Talks)   | PCC      | N-124AB             |
| 6:15 PM                     | 424       | SBE's James E. Bailey Award Lecture   | PCC      | North Ballroom 120D |

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| TIME                          | SESSION # | SESSION  | PROPERTY | ROOM                |
|-------------------------------|-----------|--|----------|---------------------|
| <b>WEDNESDAY, NOVEMBER 16</b> |           |  |          |                     |
| 8:00 AM                       | 445       | CO <sub>2</sub> Industrial, Engineering and R&D Approaches*                                | PCC      | N-225B              |
| 8:00 AM                       | 454       | Conversion of plastic wastes to high value products  | PCC      | N-230               |
| 8:00 AM                       | 470       | Sustainable Engineering Forum Plenary (Invited Talks)                                      | PCC      | N-224AB             |
| 8:00 AM                       | 473       | Recycling and Upcycling of Plastic Waste   | PCC      | N-121A              |
| 11:15 AM                      | 475       | John M. Prausnitz AIChE Institute Lecture  | PCC      | North Ballroom 120D |
| 12:30 PM                      | 496       | Sustainable Fuel from Renewable Resources*   | PCC      | N-225B              |
| 12:30 PM                      | 501       | Sustainable Biodegradable Polymers from Renewable & Waste Resources *                      | PCC      | N-228A              |
| 12:30 PM                      | 502       | New processes for efficient CO <sub>2</sub> capture and utilization under mild conditions* | PCC      | N-230               |
| 12:30 PM                      | 523       | Advances in Algae Cultivation, Conversion and Products                                     | PCC      | N-226B              |
| 12:30 PM                      | 524       | Advances in Clean Energy R&D (Invited Talks)   | PCC      | N-226C              |
| 12:30 PM                      | 525       | Process Design: Innovation for Sustainability  | PCC      | N-226A              |
| 12:30 PM                      | 527       | Interfacial Chemical Conversion*   | PCC      | N-227A              |
| 12:30 PM                      | 529       | Sustainable Pathways to Clean Hydrogen and Synthetic Fuels IV*                             | PCC      | W-103B              |
| 12:30 PM                      | 530       | Conversion of Waste Plastic into Liquid Fuels  | PCC      | N-121A              |
| 3:30 PM                       | 538       | Poster Session: Sustainability and Sustainable Biorefineries*                              | PCC      | Exhibit Hall E      |
| 3:30 PM                       | 539       | Poster Session: Waste Plastics   | PCC      | Exhibit Hall E      |
| 3:30 PM                       | 554       | Biotechnological Production of Food and Feed Ingredients*                                  | PCC      | N-126B              |
| 3:30 PM                       | 576       | Analysis and Assessment for Solving the Plastic Waste Crisis                               | PCC      | N-121A              |
| 6:15 PM                       | 578       | William R. Schowalter Lecture  | PCC      | North Ballroom 120D |
| <b>THURSDAY, NOVEMBER 11</b>  |           |  |          |                     |
| 8:00 AM                       | 592       | Design and Analysis of Carbon Capture and Negative Emissions Technologies - Experimental   | PCC      | N-225B              |
| 8:00 AM                       | 593       | Environmental Issues involving Biochar   | PCC      | N-225A              |
| 8:00 AM                       | 613       | Advances in Life Cycle Assessment  | PCC      | N-226A              |
| 8:00 AM                       | 614       | Biological Conversions and Processes for Renewable Feedstocks                              | PCC      | N-226B              |
| 8:00 AM                       | 615       | Policy and Sustainability  | PCC      | N-226C              |
| 12:30 PM                      | 628       | Design and Analysis of Carbon Capture and Negative Emissions Technologies - Models         | PCC      | N-225B              |
| 12:30 PM                      | 629       | Waste Plastic - Recycle, Reuse and Remediation Strategies*                                 | PCC      | N-225A              |

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|----------------------------|-----------|---|----------|--------|
| 12:30 PM                   | 635       | Developments in Alternative Fuels and Enabling Technologies*              | PCC      | W-103A |
| 12:30 PM                   | 648       | Climate Change and Engineering Sustainability                             | PCC      | N-226A |
| 12:30 PM                   | 649       | CO <sub>2</sub> Capture for Power Generation                              | PCC      | N-226C |
| 12:30 PM                   | 650       | Life Cycle Analysis of Bio-Based Fuels, Energy, and Chemicals             | PCC      | N-226B |
| 3:30 PM                    | 657       | Applied Math for Energy and Environmental Applications*                   | PCC      | W-101B |
| 3:30 PM                    | 661       | Design and Optimization of Integrated Energy Systems                      | PCC      | N-225B |
| 3:30 PM                    | 662       | Waste Plastic - Recycle, Reuse and Remediation Strategies II*             | PCC      | N-225A |
| 3:30 PM                    | 679       | Chemical and Catalytic Conversions and Processes for Renewable Feedstocks | PCC      | N-226B |
| 3:30 PM                    | 680       | Resilient and Sustainable Supply Chains and Product Systems               | PCC      | N-226A |
| 3:30 PM                    | 681       | Sustainable Energy: Generation and Storage                                | PCC      | N-226C |
| <b>FRIDAY, NOVEMBER 12</b> |           |   |          |        |
| 8:00 AM                    | 692       | Design and Optimization of Integrated Energy Systems II                   | PCC      | N-225B |

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