

CISTARTM

NSF Engineering Research Center

Center for Innovative and Strategic
Transformation of Alkane Resources

2026 YEAR NINE NSF SV & ANNUAL MEETING APRIL 15-16, 2026



RESPONSIBLY REALIZING THE POTENTIAL OF SHALE RESOURCES

Proposal Number: EEC-1647722

Fabio Ribeiro, Director

Linda Broadbelt, Deputy Co-Director

Ruilan Guo, Deputy Co-Director



MEETING LOGISTICS

2026 YEAR NINE
NSF SV & ANNUAL MEETING

WEBSITE

All meeting materials (agenda, presentations, posters, logistics) will be available on the CISTAR website under 'Events' or by visiting the following password protected site <https://bit.ly/26CISTARmeeting>. Username and password will be available at registration. Additionally, the agenda is available at <https://bit.ly/26CISTAR>.

MEETING LOCATION

The meeting will be held at the Hilton Rosemont/Chicago O'Hare, 5550 N. River Road, Rosemont, IL 60018. Unless otherwise noted, all events will take place in the Grand Ballroom on the first floor, in either Salon II or Salon I. The hotel has a Starbucks and onsite, full-service restaurant and lounge.

SHUTTLE SERVICE

The Hilton provides complimentary shuttle service from O'Hare every 30 minutes, and it operates on a first-come, first-served basis. The shuttle departs the hotel from the main lobby doors at 00 and 30 minutes past the hour and departs O'Hare from Terminal 2, Lower Level, outside Door 2C at 15 and 45 minutes past the hour. For Terminal 5 arrivals, take the tram to Terminal 2 and follow signs to the shuttle pickup area.

PARKING

To receive the \$15 discount, you will need to provide the front desk with your license plate information during the check-in process. Any local attendees can scan a QR code provided on-site to receive the discounted parking rate.

WIFI

To connect to the Hilton's wifi, select the network 'Hilton Honors Meeting' – click "I Have a Promotional Code" and enter meeting2026.

MEETING PROCEDURE

This will be a hybrid meeting, with the NSF SVT participating virtually. The meeting room will be equipped with A/V to display the presenter's slides. Presenters will speak from the podium in front of the projector screen, and their audio will be transmitted through the Zoom session. There is no need for attendees to join Zoom individually unless they prefer to do so. All online participants must be muted and per previous meetings, during Wednesday's session only NSF SVT members will be able to ask questions.

VIRTUAL PARTICIPANTS

For those attending remotely, the following Zoom links are below for each day. The links can also be found on the agenda.

Industry members will have a separate Zoom meeting for their private session with the NSF SVT.

Wednesday: <https://purdue-edu.zoom.us/j/96848437642?pwd=CXA1yK9F0qQYuL6PbBn98pblzrdTUj.1>

Thursday: <https://purdue-edu.zoom.us/j/96848437642?pwd=CXA1yK9F0qQYuL6PbBn98pblzrdTUj.1>

CONTACT INFORMATION

If you have an emergency or need more information, please contact:

Brittany Bright, Managing Director, 765-860-2172, bright9@purdue.edu

Jenni Mamph, Administrative Assistant, 765-532-8984, [jamamph@purdue.edu](mailto:jmamph@purdue.edu)

2026 CISTAR YEAR 9 ANNUAL MEETING & NSF SITE VISIT

AGENDA

HILTON ROSEMONT/CHICAGO O'HARE

5550 N River Rd, Rosemont, IL 60018

ALL TIMES ARE CENTRAL TIME (CT)

TUESDAY, APRIL 14, 2026

3:00 PM - Hotel check-in begins (Hilton Rosemont/Chicago O'Hare)

There are no scheduled meeting events Tuesday evening; early arrival is optional for faculty, industry, and staff. Please note: There is a separate agenda for the Fellows Institute activities with logistic information including arrival times.

WEDNESDAY, APRIL 15, 2026

The hotel will have a designated room for attendees' luggage on Wednesday prior to check-in at 3:00 PM. Guests are welcome to check with the front desk before 3:00 PM if an early check-in is possible. Unless otherwise noted, all events will take place in the Grand Ballroom, Salon II on the first floor. Additionally, unless otherwise noted, all participants (Faculty, Fellows, Industry, & EWD/ASI (Engineering Workforce Development and Access & Societal Impact Teams) are invited to attend all sessions. For remote participants, please use this Zoom link for Wednesday's presentations: <https://purdue-edu.zoom.us/j/96848437642?pwd=CXA1yK9F0qQYuL6PbBn98pblzrdTUj.1>

Time	Event	Presenter(s)
10:15 AM – 10:45 AM	Registration for All Attendees & Lunch Served	
10:45 AM – 11:00 AM	Welcome and NSF Site Visit Team Introductions (15 min.)	Fabio Ribeiro, Center Director
11:00 AM – 11:45 AM	CISTAR Year 9 Center Strategy (30 min. + 15 min. Q&A)	Fabio Ribeiro, Center Director
11:45 AM – 12:50 PM	Research Program Overview (50 min. + 15 min. Q&A)	Linda Broadbelt & Ruilan Guo, Deputy Co-Directors
12:50 PM – 1:00 PM	Break	
1:00 PM – 1:45 PM	Innovation Ecosystem Report (30 min. + 15 min. Q&A)	Peter Keeling, Industry & Innovation Director
1:45 PM – 2:15 PM	Break for Faculty, Fellows, EWD/ASI (Salon II) SVT Private Session with Industry (30 min.) *NSF and Industry only (Salon I)	
2:15 PM – 3:00 PM	Engineering Workforce Development & Impact Report (30 min. + 15 min. Q&A)	Maeve Drummond Oakes, EWD Director; Denise Driscoll, ASI Director; Elsa Castillo, ASI Co-Director
3:00 PM – 3:45 PM	NSF SVT Q&A Discussion Session with CISTAR Leadership Team (45 min.) (Salon II) Fellows & Industry Networking Session (Salon I)	
3:45 PM – 4:00 PM	Break	
4:00 PM - 5:30 PM	Poster Session with Refreshments	
4:00 PM – 4:45 PM	Poster Session: Group 1 Presents	

WEDNESDAY, APRIL 15, 2026 - CONTINUED

4:45 PM – 5:30 PM	Poster Session: Group 2 Presents	
5:30 PM – 6:00 PM	Break	
6:00 PM – 8:00 PM	Dinner	
7:00 PM – 8:00 PM	Dinner Presentation: <i>"How is the Balance between Discovery Research and Technology Advancement Evolving in Industry?"</i>	Stu Soled, Distinguished Research Associate at ExxonMobil (retired)

THURSDAY, APRIL 16, 2026

Hotel check out is at 12:00 PM. There will be a designated area for luggage. Unless otherwise noted, all events will take place in the Grand Ballroom, Salon II on the first floor. Additionally, unless otherwise noted, all participants (Faculty, Fellows, Industry, & EWD/ASI (Engineering Workforce Development and Access and Societal Impact Teams) are invited to attend all sessions. For remote participants, please use this Zoom link for Thursday's presentations: <https://purdue-edu.zoom.us/j/96848437642?pwd=CXA1yK9F0qQYuL6PbBn98pblz-rdTUj.1>

Time	Event	Presenter(s)
7:00 AM – 8:00 AM	Breakfast	
8:00 AM – 8:15 AM	Welcome and Introduction, Day 2 (15 min.)	Fabio Ribeiro, Center Director
8:15 AM - 12:00 PM	Engineering Workforce Development/Access and Societal Impact Breakout Session (Salon I)	
	Technical Research Highlights (Salon II)	
8:15 AM - 8:45 AM	Molecular-to-Systems Engineering for Energy Production (25 min. + 5 min. Q&A)	Jennifer Dunn, Thrust 7 Lead Alexander Dowling, UND
8:45 AM – 9:15 AM	AI and Quantum as the Frontiers in Process Systems Engineering (25 min. + 5 min. Q&A)	David E. Bernal, PU Can Li, PU
9:15 AM - 9:45 AM	Using Proton-conducting Ceramic Electrochemical Cells for Alkane Dehydrogenation (25 min. + 5 min. Q&A)	Brian Tackett, PU
9:45 AM - 10:00 AM	Break	
10:00 AM - 10:30 AM	Unravelling the Role of Deposited Carbonaceous Species on Propane Dehydrogenation Activity of Pt Based Intermetallic Catalysts (25 min. + 5 min. Q&A)	Abhaya Datye, UNM
10:30 AM - 11:00 AM	Technology Module Facilities at CISTAR Partner Institutions (25 min. + 5 min. Q&A)	Justin Notestein, NU
11:00 AM - 11:30 AM	Zeolite Materials for Selective Catalytic Transformations (25 min. + 5 min. Q&A)	Raj Gounder, Thrust 2 Lead
11:30 AM - 12:00 PM	Empowering Abundant, Reliable, and Affordable Energy for the Future (25 min. + 5 min. Q&A)	Fabio Ribeiro, Center Director
12:00 PM	Boxed Lunches Available; Hotel Check out	
12:00 PM – 1:00 PM	Industry Wrap-Up Discussion (Salon I)	
2:00 PM – 4:45 PM	Fellows Institute: GTI Energy Tour (Required for Fellows; Optional for Faculty/Industry)	

POSTER SESSION LIST

Yellow Highlight - Presents with Group 1, 4:00 PM - 4:45 PM;
all others present with Group 2, 4:45 PM - 5:30 PM

THRUST 4 - PROCESS SYNTHESIS AND DESIGN, LIFE CYCLE ANALYSIS AND ENVIRONMENTAL IMPACT

T4P8: Multi-scale Modeling for Reactor Design and Optimization

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| 1 | <i>Physics-Constrained Gaussian Process Surrogates for Catalytic Olefin Oligomerization Reactions</i> | Damian Agi (UND) | Dowling |
| 2 | <i>Simulation, Optimization, and Machine Learning of Bio Alcohol Dehydration in a Membrane Assisted Reactor</i> | Andres Cabeza (PU) | Bernal |

THRUST 1 - DEHYDROGENATION

T1P3: Regenerable, Thermally Stable Alkane Dehydrogenation Catalysts

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| 3 | <i>First Principles Analysis of Coke Formation on Pt-based Catalysts for Propane Dehydrogenation</i> | Yu-Hsiang Cheng (PU) | Greeley |
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T1P5: Non-Thermal Plasma-Assisted Alkane Dehydrogenation and Coupling

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| 4 | <i>Catalysis Considerations for Modeling Nonthermal-Plasma-Driven Ethane Dehydrogenation</i> | Denver Haycock (UND) | Schneider |
| 5 | <i>Effects of Operating Conditions on Nonthermal Plasma for Ethane Dehydrogenation</i> | Hannah Frankovic (UND) | Hicks |

T1P6: Non-Thermal Plasma-Assisted Alkane Dehydrogenation and Coupling

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| 6 | <i>Electrochemical Ethane Dehydrogenation Coupled with Power Generation in Protonic Ceramic Fuel Cells with Heterogeneous Catalysts</i> | Po-Chun Huang (PU) | Tackett |
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THRUST 2 - OLIGOMERIZATION

T2P1: Brønsted Acid-Catalyzed Olefin Oligomerization

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| 7 | <i>Assessing the Influence of Brønsted Acid Site Location in MFI Zeolites on Propene Oligomerization Rates and Selectivity</i> | Diamarys Salome Rivera (PU) | Gounder |
| 8 | <i>Elucidating the Mechanism of Propene and Methanol Reaction on MFI Zeolites and its Potential as a Kinetic Probe for Al Distribution</i> | Sarah Gustafson Wagers (PU) | Gounder |

T2P4: Oligomerization Catalyzed by Transition Metals Based on Non-Zeolites

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| 9 | <i>Impact of Nickel Nuclearity on Ethene Oligomerization over Polyoxometalates</i> | Alba Scotto d'Apollonia (UND) | Hicks |
| 10 | <i>Computational Evidence for the Comparable Catalytic Potential of Ni-Polyoxometalates and Ni-Zeolites in Ethylene Oligomerization</i> | Michael Appoh (UND) | Schneider |

T2P5: Non-Thermal C-C Bond Coupling to Various Products

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| 11 | <i>Selective Electrochemical Oxidation of Propylene in a Dual-vapor Phase Membrane Electrode Assembly</i> | Matthew Hayes (NU) | Seitz, Broadbelt |
| 12 | <i>Upgrading Ethylene Halohydrins with CO₂ via Electrochemical Carboxylation</i> | Andrew Weidner (NU) | Seitz |

THRUST 3 - C1 ACTIVATION

T3P6: Methane Dehydroaromatization

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| 13 | <i>The Effect of Aluminum on the Reaction-Regeneration of Fe/MFI for Methane Dehydroaromatization</i> | Anson Rowe (NU) | Marks, Notestein |
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T3P7: Electrochemical CO₂ Reduction to Multi-carbon Products using Single Atom Alloys

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| 14 | <i>AuPd Single Atom Alloys for Efficient Electrochemical CO₂ Reduction to CO</i> | Jiwon Kim (UTA) | Resasco |
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T3P9: Carbon-based Catalysts for Non-oxidative Coupling of Methane

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| 15 | <i>Quantifying Rates and Active Sites of Carbon Surfaces that Catalyze Non-oxidative Coupling of Methane</i> | Justin Rosa-Rojas (PU) | Gounder |
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THRUST 6 - MEMBRANE SEPARATIONS

T6P4: Microporous Polymer Membranes for CISTAR Gas Separations

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| 16 | <i>Solution-processable Pentiptycene-containing Polybenzoxazole Membranes for High Temperature Gas Separations</i> | Sandra Weber (UND) | Guo |
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T6P7: Engineering Tough Polymer Membranes via Sacrificial Bonds

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| 17 | <i>Effect of Ag⁺ and Ionic Liquid on the Mechanical and Transport Properties of Olefin/Paraffin Membranes</i> | Tiffany Jeng (UTA) | Sanoja |
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C2C Projects

C2C-6: Integrated Process Synthesis and Lifecycle Assessment

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| 18 | <i>Incentivizing Sustainable Aviation Fuel: Supply Chain and Policy Insights from Brazil</i> | Madelynn Watson (UND) | Dowling |
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TECHNOLOGY MODULES

Reactor Oligomerization Technology Module

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| 19 | <i>Stable and Tunable Production of Hydrocarbons on Small-Crystallite Zeolites</i> | Evan Sowinski (PU) | Ribeiro |
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Reactor Dehydrogenation Technology Module

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| 20 | <i>Long-Term Stability of Pt-Based Propane Dehydrogenation Catalysts</i> | Evan Sowinski (PU) | Ribeiro |
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