

21st Annual Meeting of the North American Membrane Society 2011

(NAMS 2011)

**Las Vegas, Nevada, USA
4-8 June 2011**

ISBN: 978-1-62748-110-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2011) by the North American Membrane Society
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the North American Membrane Society
at the address below.

North American Membrane Society
University of Toledo/Chemical Engineering Department
2801 W. Bancroft Street- MS 305
Toledo, Ohio 43606-3390

Phone: 419-530-3649
Fax: 419-530-8086

names@eng.utoledo.edu

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

Electrokinetic Separations, Batteries, and Fuel Cells

Skyview 1

Monday June 6

Chairs: [Ruth Baltus](#), Clarkson University; [Peter N. Pintauro](#), Vanderbilt University

- 08:00 - 08:30 [Influence Of Confinement and Interfacial Interactions on the Structure and Transport Properties of Polymer Electrolyte Materials](#)¹¹¹¹
[Rowe](#) (Speaker), National Institute of Standards and Technology; [Page](#), National Institute of Standards and Technology; [Soles](#), National Institute of Standards and Technology
- 08:30 - 09:00 [Nafion/Polyphenylsulfone Nanofiber Composite Fuel Cell Membranes](#)¹¹¹¹
[Ballengee](#) (Speaker), Vanderbilt University; [Pintauro](#), Vanderbilt University
- 09:00 - 09:30 [Effect Of Concentration of Sulfonic Groups in the Ion Exchange Properties of Novel Fluorinated Copolyamides](#) ¹¹¹¹
[Pali](#), Universidad Autonoma del Carmen; [Jimenez](#), Universidad Autonoma del Carmen; [Hernández](#) (Speaker), Universidad Autonoma del Carmen; [Flores](#), Universidad Autonoma del Carmen; [Andrade](#), Universidad Autonoma del Carmen; [Aguilar-Vega](#), Centro de Investigacion Cientifica de Yucatán
- 09:30 - 10:00 [Poly\(phenylene\)-based Anion Exchange Membranes for Alkaline Fuel Cells](#)¹¹¹¹
[Hibbs](#) (Speaker), Sandia National Laboratories; [Fujimoto](#), Sandia National Laboratories; [Lambert](#), Sandia National Laboratories; [Kim, DS](#), Los Alamos National Laboratory; [Kim, YS](#), Los Alamos National Laboratory
- 10:00 - 10:30 [Polyvinyl Alcohol Nano-composites Impregnated with Potassium Hydroxide as Electrolytes for Direct Methanol Alkaline Fuel Cells](#)¹¹¹¹
[Pan](#), Chang Gung University; [Liu](#), Chung Yuan University; [Lue](#) (Speaker), Chang Gung University
- 10:30 - 11:00 [Fractionation of Divalent Ion from Monovalent Ion by Novel Electrodialysis](#)¹¹¹¹
[Zhang](#) (Speaker), K.U.Leuven; [Paepen](#), K.U.Leuven; [Pinoy](#), KaHo St.-Lieven; [Meesschaert](#), Katholieke Hogeschool Brugge-Oostende; [Van der Bruggen](#), K.U.Leuven

Gas Separations I

Skyview 3

Monday June 6

Chairs: [Mita Das](#), ExxonMobil Upstream Research Company; [William J. Koros](#), Georgia Institute of Technology

- 08:00 - 08:30 Understanding the Practical Upper Bound for Mixed-Gas CO₂/CH₄ Separations^{HHHG}
[Lin](#) (Speaker), Membrane Technology and Research, Inc.; [Serbanescu-Martin](#), Membrane Technology and Research, Inc.; [Zhou](#), Membrane Technology and Research, Inc.; [Merkel](#), Membrane Technology and Research, Inc.
- 08:30 - 09:00 Blended Polyimides for High Temperature Gas Separations^{HHHG}
[Klaehn](#) (Speaker), Idaho National Laboratory; [Orme](#), Idaho National Laboratory; [Peterson](#), Idaho National Laboratory; [Quarles](#), Texas Christian University
- 09:00 - 09:30 New Facilitated Transport Membranes Containing Sterically Hindered Polyamines for CO₂ Separation^{HHHG}
[Zhao](#) (Speaker), The Ohio State University; [Ho](#), The Ohio State University
- 09:30 - 10:00 Dimethyl Ether and Syn-Gas Permeability and Selectivity Through Poly[dimethyl siloxane] (PDMS) and Poly[4-methyl-1-pentene] (TPX) Membranes^{HHHG}
[Stewart](#) (Speaker), Idaho National Laboratory; [Orme](#), Idaho National Laboratory
- 10:00 - 10:30 Effect of Residual Solvent on the Permeation Behaviour of Mixed-Matrix Membranes Containing Micron- and Submicron-Sized SAPO-34 Particles^{HHHG}
[Kertik](#), Istanbul Technical University; [Tantekin-Ersolmaz](#) (Speaker), Istanbul Technical University
- 10:30 - 11:00 Inferences of the Structures of HBPI-Silica Hybrid Membranes in Gas Transport Properties^{HHHG}
[Yamada](#) (Speaker), Kyoto Institute of Technology; [Miki](#), Kyoto Institute of Technology; [Suzuki](#), Kyoto Institute of Technology

Membrane Surface Modification

Skyview 2

Monday June 6

Chairs: [Scott Husson](#), Clemson University; [Ranil Wickramasinghe](#), University of Arkansas







- 08:00 - 08:30 Small Molecule Deposition to Improve Membrane Fouling Resistance^{XXXX}**G**
[Miller](#) (Speaker), University of Texas at Austin; [Dreyer](#), University of Texas at Austin; [Kasemset](#), University of Texas at Austin; [Lee](#), University of Texas at Austin; [McCloskey](#), IBM Research; [Bielawski](#), University of Texas at Austin; [Paul](#), University of Texas at Austin; [Freeman](#), University of Texas at Austin
- 08:30 - 09:00 Developing High Performance Cation-Exchange Membranes for Protein Capture by Graft Polymerization^{XXXX}**I**
[Chenette](#) (Speaker), Clemson University; [Husson](#), Clemson University
- 09:00 - 09:30 Water Treatment by Iron-Iron Oxide Nanoparticle Catalyzed Free Radical Reactions in Aqueous Phase and in PAA Functionalized PVDF Membranes^{XXXX}**I**
[Gui](#) (Speaker), University of Kentucky; [Smuleac](#), University of Kentucky; [Ormsbee](#), University of Kentucky; [Bhattacharyya](#), University of Kentucky
- 09:30 - 10:00 Polybenzimidazole Forward Osmosis Membranes Functionalized for Increased Surface Charge and Hydrophilicity^{XXXX}**I**
[Flanagan](#) (Speaker), The University of Toledo; [Hausman](#), The University of Toledo; [Escobar](#), The University of Toledo; [Coleman](#), The University of Toledo; [Chung](#), The National University of Singapore
- 10:00 - 10:30 Molecular Design of Anti-Biofouling Membranes with Highly Effective Blood Compatibility via Plasma-Induced Surface Modification^{XXXX}**I**
[Chang](#) (Speaker), R&D Center for Membrane Technology and Department of Chemical Engineering; [Shih](#), R&D Center for Membrane Technology and Department of Chemical Engineering; [Wei](#), R&D Center for Membrane Technology and Department of Chemical Engineering
- 10:30 - 11:00 Impact of Pulsed Electric Field on Electrodialysis Process Performance During Consecutive Demineralization of a Model Salt Solution Containing a High Magnesium/Calcium Ratio^{XXXX} €
[Cifuentes-Araya](#) (Speaker), Université Laval; [Pourcelly](#), IEMM; [Bazinet](#), Université Laval

Membrane Transport I

Skyview 4

Monday June 6

Chairs: [Keith Murphy](#), Air Products and Chemicals; [Jennifer Willcox](#), Stanford University

- 08:00 - 08:30 [Carbon Dioxide Plasticization and Conditioning in Thick vs. Thin Glassy Polymer Films](#)  G
[Horn](#) (Speaker), University of Texas at Austin; [Paul](#), University of Texas at Austin
- 08:30 - 09:00 [Permeability Upper Bound Predictions from Transition State Theory Using the Non-Equilibrium Lattice Fluid Model](#)  H
[LOU](#) (Speaker), University of Toledo; [Lipscomb](#), University of Toledo; [Coleman](#), University of Toledo
- 09:00 - 09:30 [Computational Modeling of Reverse Osmosis Membrane Active Layers: Structure and Transport](#)  I
[Pitera](#) (Speaker), IBM Research; [Chen](#), ExxonMobil; [Na](#), IBM Research; [Sooriyakumaran](#), IBM Research; [Vora](#), IBM Research; [Dubois](#), IBM Research
- 09:30 - 10:00 [Improving the Selectivity of Dehydration Membranes by Applying a Non-Swelling Coating Layer: Experimental Results and Model Description](#)  I
[Wijmans](#) (Speaker), MTR, Inc.; [Huang](#), MTR, Inc.; [Daniels](#), MTR, Inc.; [Aldajani](#), MTR, Inc.; [Ly](#), MTR, Inc.; [Baker](#), MTR, Inc.
- 10:00 - 10:30 [Gas Transport Studies on Micro-Porous Membrane Materials: Sorption and Performance](#)  I
[Snider](#) (Speaker), Ohio State University; [Shqau](#), Ohio State University; [Verweij](#), Ohio State University
- 10:30 - 11:00 [Method for Detecting and Localizing Defects in Zeolite Membranes](#)  I
[Funke](#) (Speaker), University of Colorado; [Tokay](#), University of Colorado; [Oetter](#), University of Colorado; [Noble](#), University of Colorado; [Falconer](#), University of Colorado

Gas Separations II

Skyview 3

Monday June 6

Chairs: [Haiqing Lin](#), Membrane Technology and Research, Inc.; [Atsushi Morisato](#), Cameron-Cynara Membrane Systems

- 13:30 - 14:00 [Influence of Water Vapour on CO₂ and N₂ Permeability Through PEO Containing Block Copolymers and its Blends with Poly\(N-acryloylmorpholine\)](#) ⁰⁰⁰⁰ €
[Pauls](#) (Speaker), Helmholtz Zentrum Geesthacht.; [Fritsch](#), Helmholtz Zentrum Geesthacht.; [Gutiérrez Hernández](#), Helmholtz Zentrum Geesthacht,
- 14:00 - 14:30 [Effects of Thermal Annealing On A Polyamide-imide Membrane For Aggressive CO₂/H₂S Separations From Natural GAs](#) ⁰⁰⁰⁰ F
[Vaughn](#) (Speaker), Georgia Institute of Technology; [Koros](#), Georgia Institute of Technology
- 14:30 - 15:00 [Click Chemistry-derived Polymers of Intrinsic Microporosity \(PIMs\) with CO₂-philic Tetrazole Groups: Chemistry and Gas Transport](#) ⁰⁰⁰⁰ H
[Du](#) (Speaker), National Research Council, Canada; [Park](#), bWCU Department of Energy Engineering, Hanyang University; [Robertson](#), National Research Council, Canada; [Dal-Cin](#), National Research Council, Canada; [Scoles](#), National Research Council, Canada; [Visser](#), Vaperma; [Guiver](#), National Research Council, Canada
- 15:00 - 15:30 [An Adaptive Anhydrous Ionic Liquid Nano-Composite Membrane for Olefin-Paraffin Separations](#) ⁰⁰⁰⁰ I
[Pitsch](#) (Speaker), RWTH Aachen University; [Agel](#), FriedrichAlexanderUniversity ErlangenNuremberg; [Wasserscheid](#), FriedrichAlexanderUniversity ErlangenNuremberg; [Melin](#), RWTH Aachen University; [Wessling](#), RWTH Aachen University
- 15:45 - 16:15 [ZIF-7 and ZIF-8 Asymmetric Mixed-matrix Membranes](#) ⁰⁰⁰⁰ I
[Balkus](#) (Speaker), The University of Texas at Dallas; [Regner](#), The University of Texas at Dallas; [Eckert](#), The University of Texas at Dallas; [Ratanatawanate](#), The University of Texas at Dallas; [Ferraris](#), The University of Texas at Dallas; [Musselman](#), The University of Texas at Dallas
- 16:15 - 16:45 [Highly Permeable V-based BCC Alloy Membranes](#) ⁰⁰⁰⁰ I
[Dolan](#) (Speaker), CSIRO Energy Technology; [Song](#), CSIRO Process Science and Engineering; [Kellam](#), CSIRO Process Science and Engineering; [Liang](#), CSIRO Process Science and Engineering; [Zambelli](#), CSIRO Energy Technology
- 16:45 - 17:15 [Molecular Dynamics Simulation of Gas Diffusion through Amorphous Silica-Poly-4-methyl-2-pentyne Nanocomposites](#) ⁰⁰⁰⁰ J
[Nazarian](#) (Speaker), Harvey Mudd College; [Lape](#), Harvey Mudd College

Membrane Reactors and Bioreactors

Skyview 1

Monday June 6

Chairs: Willem Kools, Millipore, Inc.; Stephen Ritchie, University of Alabama

- 13:30 - 14:00 Large Scale Hydrogen Production in a Water Gas Shift Pd Based Membrane Reactor^{FFFF} F
Guazzone (Speaker), Worcester Polytechnic Institute; Catalano, Worcester Polytechnic Institute; Mardilovich, Worcester Polytechnic Institute; Kazantzis, Worcester Polytechnic institute; Ma, Worcester Polytechnic institute
- 14:00 - 14:30 An Inorganic Membrane Reactor Based Process for Hydrogen Production^{FFFF} H
abdollahi (Speaker), University of Southern California; Yu, University of Southern California; Hwang, University of Southern California; Ciora, Media and Process Inc.; Liu, Media and Process Inc.; Sahimi, University of Southern California; Tsotsis, University of Southern California
- 14:30 - 15:00 Carbon Dioxide Separation and Dry Reforming of Methane for Synthesis of Syngas by a Dual-Phase Membrane Reactor^{FFFF} I
Anderson (Speaker), Arizona State University; Norton, Arizona State University; Seshadri, Arizona State University; Lin, Arizona State University
- 15:00 - 15:30 Application of a Flow-Through Catalytic Membrane Reactor (FTCMR) for the Destruction of a Chemical Warfare Simulant^{FFFF} I
Motamedhashemi, University of Southern California; ; Egolfopoulos, University of Southern California; Tsotsis (Speaker), University of Southern California
- 15:45 - 16:15 High Temperature Membrane Reactors for Selective Removal of Methanol from the Transesterification of Dimethyl Carbonate with Phenol^{FFFF} I
Zhang (Speaker), Kansas State University; Rezac, Kansas State University; Kosaraju, Compact Membrane System, Inc.; Nemser, Compact Membrane System, Inc.
- 16:15 - 16:45 Transverse Vibration as a Fouling Mitigation Strategy in Membrane Bioreactors^{FFFF} I
Kola, University of New South Wales; Ye, University of New South Wales; Chen (Speaker), University of New South Wales; Le-Clech, University of New South Wales
- 16:45 - 17:15 Quorum Quenching for the Control of Biofouling in Membrane Bioreactor^{FFFF} I
Yang (Speaker), Seoul National University; Oh, Seoul National University; Lee, Seoul National University; Yeon, Woongjin R&D Center; Han, Paichai University; Lee, Paichai University

Membrane Transport II

Skyview 4

Monday June 6

Chair: John Pellegrino, University of Colorado at Boulder








- 13:30 - 14:00 Coupling Between Lumen, Shell, and Membrane Mass Transfer Resistances €
Hao (Speaker), University of Toledo; Lipscomb, University of Toledo
- 14:00 - 14:30 Molecular Dynamics Simulation of Water Transport through Carbon Nanotube Membranes under Pressure Difference F
Wang (Speaker), McMaster University; Dumont, McMaster University; Dickson, McMaster University
- 14:30 - 15:00 The Permeability of He, N₂, O₂ And CO₂ in Two Ionomer Membranes at Different Relative Humidities G
Catalano (Speaker), Worcester Polytechnic Institute; Myezwa, Alma Mater Studiorum-Università di Bologna; De Angelis, Alma Mater Studiorum-Università di Bologna; Giacinti Baschetti, Alma Mater Studiorum-Università di Bologna; Sarti, Alma Mater Studiorum-Università di Bologna
- 15:00 - 15:30 Pore-filled Cation-exchange Membranes H
Agarwal (Speaker), Bhabha Atomic Research Centre; Chaudhury, Bhabha Atomic Research Centre; Pandey, Bhabha Atomic Research Centre; Goswami, Bhabha Atomic Research Centre
- 15:45 - 16:15 Permeation Kinetics of Organic Vapor through Cation Modified Ionomers Í
Pomerantz (Speaker), Natick Solder Research Development and Engineering Center (NSRDEC); Schneider, Natick Solder Research Development and Engineering Center (NSRDEC); Zukas, Natick Solder Research Development and Engineering Center (NSRDEC)
- 16:15 - 16:45 The Influence of Water on Butanols Isomers Pervaporation Transport through Polyethylene Membrane Î
Petrychkovych, 1. Institute of Chemical Process Fundamentals v.v.i., Academy of Sciences o; von Langermann, Max-Planck Institute for Dynamics of Complex Technical Systems; Setnickova, 1. Institute of Chemical Process Fundamentals v.v.i., Academy of Sciences o; Uchytíl (Speaker), 1. Institute of Chemical Process Fundamentals v.v.i., Academy of Sciences o
- 16:45 - 17:15 Physicochemical Characterization of Transport in Nanosized Membrane Structures Ï
Darvishmanesh (Speaker), Katholieke Universiteit Leuven; Degreve, Katholieke Universiteit Leuven; Van Der Bruggen, Katholieke Universiteit Leuven

Pressure Retarded Osmosis and Forward Osmosis

Skyview 2

Monday June 6

Chairs: [MaryLaura Lind](#), Arizona State University; [Jeff McCutcheon](#), University of Connecticut


















- 13:30 - 14:00 [Surface Modification of Interfacially Polymerized Thin Film Composite Membranes for Engineered Osmosis](#)  J
[Arena](#) (Speaker), University of Connecticut; [McCloskey](#), IBM; [Freeman](#), University of Texas at Austin; [McCutcheon](#), University of Connecticut
- 14:00 - 14:30 [Modification of Commercially Available TFC Reverse Osmosis \(RO\) Membranes by Acid Treatment for Use in Forward Osmosis \(FO\)](#)  F
[Wang](#) (Speaker), University of Illinois Urbana-Champaign; [Rajagopalan](#), University of Illinois Urbana-Champaign
- 14:30 - 15:00 [Nanostructured Support for High Flux Thin-film-composite Engineered Osmosis Membrane](#)  G
[Bui](#) (Speaker), University of Connecticut; [Lind](#), Arizona State University; [Hoek](#), University of California, Los Angeles; [McCutcheon](#), University of Connecticut
- 15:00 - 15:30 [Fabrication of Thin-Film Composite Forward Osmosis Membranes on Electrospun Poly\(ethylene terephthalate\)](#)  H
[Hoover](#) (Speaker), Yale University; [Schiffman](#), Yale University; [Elimelech](#), Yale University
- 15:45 - 16:15 [Evaluating the Performance of a Combined Forward Osmosis And Membrane Distillation System for Wastewater Treatment](#)  I
[Husnain](#) (Speaker), The George Washington University; [Riffat](#), The George Washington University; [Mi](#), The George Washington University
- 16:15 - 16:45 [A Module-Level Model for Osmotically Driven Membrane Processes](#)  Î
[Prante](#), University of Nevada, Reno; [Achilli](#) (Speaker), University of Nevada, Reno; [Childress](#), University of Nevada, Reno
- 16:45 - 17:15 [Novel Dual-Stage FO System For Sustainable Protein Enrichment Using Nanoparticles as Intermediate Draw Solutes](#)  Î
[Ling](#) (Speaker), National University of Singapore; [Chung](#), National University of Singapore

Poster Session

Skyview 5/6
















Monday June 6

Chair: [Jeff McCutcheon](#), University of Connecticut

1. [A Fourier Transform Infrared Spectroscopy Based Biofilm Characterization Technique and Its Use to Show the Effect of Copper-Charged Polypropylene Feedspacers in Biofouling Control](#) 
[Hausman](#) (Speaker), The University of Toledo; [Escobar](#), The University of Toledo
2. [Amino-functionalized ZIF-8 crystals for CO₂ separation](#) 
[Zhu](#) (Speaker), University of Louisville; [Carreon](#), University of Louisville
3. [Applications of Sulfur Resistant High-Temperature Hydrogen Purification Membrane](#) 
[Tsai](#), T3 Scientific LLC, The University of New Mexico; [Tam](#) (Speaker), T3 Scientific LLC; [Jiang](#), The University of New Mexico
4. [Carbon Molecular Sieve Hollow Fiber Membranes for Ethylene/ethane Separation](#) 
[Xu](#) (Speaker), Georgia Institute of Technol; [Runqta](#), Georgia Institute of Technol; [Koros](#), Georgia Institute of Technol
5. [Ceramic Nanowire Membranes](#) 
[Zhang](#) (Speaker), Novarials Corporation; [Allegrrezza](#), CSC LLC
6. [Characterization of Membranes by Cross-sectional Confocal Laser Scanning Microscopy](#) 
[Marroquin](#) (Speaker), Clemson University; [Bruce](#), Clemson University; [Pellegrino](#), University of Colorado; [Wickramasinghe](#), University of Arkansas; [Husson](#), Clemson University
7. [Characterization of Nanoparticle Fouling on Polysulfone Ultrafiltration Membranes](#) 
[Hakim Elahi](#) (Speaker), The University of Toledo,; [Escobar](#), The University of Toledo,
8. [Characterization of Polymeric Nonwovens using Intrusion and Extrusion Porosimetry](#) 
[Soundara Manickam](#) (Speaker), University of Connecticut; [McCutcheon](#), University of Connecticut
9. [Characterization of Various Polyimide Membranes for O₂/N₂ Separation](#) 
[OH](#), Gyeongsang National University; [HWANG](#) (Speaker), Gyeongsang National University; [LEE](#), Aekyung; [NAM](#), Gyeongsang National University
10. [Cross-linked ZIF-8/Matrimid® Mixed-Matrix Membranes for Gas Separations](#) 
[Hsieh](#) (Speaker), The Univeristy of Texas at Dallas; [Musselman](#), The Univeristy of Texas at Dallas; [Balkus](#), The Univeristy of Texas at Dallas; [Ferraris](#), The Univeristy of Texas at Dallas
11. [Decolorization of Azo Dye with Pseudomonas luteola in a Membrane Bioreactor](#) 
[Lin](#), Chang Gung University; [Chen](#) (Speaker), Chang Gung University
12. [Design and Implementation of Mobile Crossflow Reverse and Forward Osmosis Systems for Undergraduate Education](#) 
[Anastasio](#) (Speaker), University of Connecticut; [McCutcheon](#), University of Connecticut
13. [Design and Testing of a Bench-Top Pressure-Retarded Osmosis Test System](#) 
[Cole](#) (Speaker), University of Connecticut; [McCutcheon](#), University of Connecticut
14. [Developing High Performance Cation-Exchange Membranes for Protein Capture by Graft Polymerization](#) 
[Chenette](#) (Speaker), Clemson University; [Husson](#), Clemson University
15. [Development of Advanced Membranes for Produced Water Treatment](#) 
[Wandera](#) (Speaker), Clemson University; [Wickramasinghe](#), University of Arkansas; [Husson](#), Clemson University
16. [Ethanol recovery from actual fermentation broth with integrated distillation-membrane process](#) 
[Vane](#) (Speaker), U.S. Environmental Protection Agency; [Alvarez](#), U.S. Environmental Protection Agency
17. [Functionalized Membranes for Membrane Chromatography](#) 
[Shethji](#) (Speaker),The University of Alabama; [Ritchie](#),The University of Alabama

18. Gas Transport in Poly(dimethylsiloxane) and Poly(4-Methyl-2-Pentyne)- Composite Films^{FI}
Loy, Harvey Mudd College; Nelson, Harvey Mudd College; Susca (Speaker), Harvey Mudd College; Peck, Harvey Mudd College; Lape, Harvey Mudd College
19. Hydrogen-selective Hydrophobic Microporous Silica Membranes for Water Gas Shift Reaction^{FI}
Wei (Speaker), Beijing University of Technology; He, Beijing University of Technology; Duan, College of Materials Science & Engineering, Beijing University of Technology; Nie, Beijing University of Technology
20. Imparting a Hydrophilic Character to Interfacially Polymerized Thin Film Composite Membranes by a Post-fabrication Surface Modification with Polydopamine for Forward Osmosis^{FI}
Arena (Speaker), University of Connecticut; McCloskey, IBM; Freeman, University of Texas at Austin; McCutcheon, University of Connecticut
21. Improved Mechanical Properties of Electrospun Nonwovens^{FI}
Huang (Speaker), University of Connecticut; Arena, University of Connecticut; Bui, University of Connecticut; McCutcheon, University of Connecticut
22. Improvement of Phenolic Antioxidant Enrichment of Cranberry Juice by Electrodialysis with Ultrafiltration Membranes (EDUF)^{FI}
Husson, Université Laval; Araya-Farias, Université Laval; Desjardins, Université Laval; Bazinet (Speaker), Université Laval
23. Integrated Electrolytic Sensors for Monitoring Concentration Polarization During Cross-Flow Nanofiltration^{FI}
Cobry (Speaker), University of Colorado; Bright, University of Colorado; Greenberg, University of Colorado
24. Lipid Separations by Commercial Polyamide Membranes Using Supercritical Carbon Dioxide as Solvent^{FG}
Akin (Speaker), University of Alberta, Canada; Temelli, University of Alberta, Canada
25. Mass Transfer in Multipass Parallel-Flow Membrane Extractors^{FG}
Yeh (Speaker), Tamkang University
26. Membrane Reactor Technology for Efficient Conversion of Succinic Acid into Industrially Useful Chemicals^{GG}
Kular (Speaker), Kansas State University; Dhiman, Kansas State University; Pfromm, Kansas State University; Rezac, Kansas State University; Katz, Kansas State University; Gupta, Kansas State University; Wilmoth, Kansas State University; Tomich, Kansas State University
27. Metal Coated Polymeric Membranes for Efficient Conversion of Carbohydrates to Value Added Products^{FG}
Dhiman (Speaker), Kansas State University; Kular, Kansas State University; Pfromm, Kansas State University; Rezac, Kansas State University
28. MEXSY MemBrain in Social Networks. The NAMS Virtual Club.^G
Seregin (Speaker), MetaFormula Inc; Apeltsin, University of California at San Francisco; Kartashov, MetaFormula Inc; Cherevichin, MetaFormula Inc
29. Mixed Matrix Silicone and Fluorosilicone/Zeolite 4A Membranes for Ethanol Dehydration by Pervaporation^G
Lin (Speaker), U.S. Environmental Protection Agency/NRC; Abar, U.S. Environmental Protection Agency/NCOA; Vane, U.S. Environmental Protection Agency
30. Modeling the Rejection of Rod Shaped Particles from Porous Membranes: Effect of the Convective Hindrance Factor^{FG}
Baltus (Speaker), Clarkson University; Agasanapura, Clarkson University; Chellam, University of Houston
31. Nafion/Polyphenylsulfone Nanofiber Composite Fuel Cell Membranes^{HF}
Ballengee (Speaker), Vanderbilt University; Pintauro, Vanderbilt University
32. Nanostructured Support for High Flux Thin-film-composite Engineered Osmosis Membrane^{HH}
Bui (Speaker), University of Connecticut; Lind, Arizona State University; Hoek, University of California, Los Angeles; McCutcheon, University of Connecticut

33. New Facilitated Transport Membranes Containing Sterically Hindered Polyamines for CO₂ Separation  H
Zhao (Speaker), The Ohio State University; Ho, The Ohio State University
34. Ni-Nb-Zr-(Ta, Co) Amorphous Alloy Membranes for Hydrogen Separation  H Ĩ
Paglieri (Speaker), TDA Research, Inc.; Dolan, Commonwealth Scientific and Industrial Research Organisation; Pal, University of Nevada, Reno; Kim, University of Nevada, Reno; Chien, University of Nevada, Reno; Lamb, Sandia National Laboratory; Talekar, University of Nevada, Reno; Chandra, University of Nevada, Reno; Moore, Los Alamos National Laboratory; Hubbard, Los Alamos National Laboratory
35. Optimization and Techno-Economic Analysis of Electrodialysis for RO Brine Minimization  H Ĩ
Zhang (Speaker), K.U.Leuven; Ghyselbrecht, Katholieke Hogeschool Brugge-Oostende; Vanherpe, K.U.Leuven; Meesschaert, Katholieke Hogeschool Brugge-Oostende; Pinoy, KaHo St.-Lieven; Van der Bruggen, K.U.Leuven
36. Performance Evaluation of a Novel Vertical Membrane Bioreactor for Nutrient Removal  H U
Reza (Speaker), Cole Engineering Group Ltd., Project Design Coordinator; Alvarez-Cuenca, Ryerson University, Department of Chemical Engineering, Professor
37. Polyamide Interfacial Composite Membranes Made From Various Diamines and Trimesoyl Chloride and the Effect Of Post-Polymerization Treatment Conditions on Separation Performance  F F
Xie (Speaker), The University of Texas at Austin; Freeman, The University of Texas at Austin; Byun, Virginia Polytechnic Institute and State University; McGrath, Virginia Polytechnic Institute and State University
38. Polybenzimidazole-Based Membranes for Synthesis Gas Separations at Elevated Temperatures  I G
Singh (Speaker), Los Alamos National Laboratory; Dudeck, Los Alamos National Laboratory; Benicewicz, University of South Carolina; Li, University of South Carolina; Jean, University of Missouri - Kansas City; Chen, University of Missouri - Kansas City; Berchtold, Los Alamos National Laboratory
39. Preparation and Gas Transport Properties of HBPI-PSQ Hybrid Membranes  I H
HIDEKI (Speaker), Kyoto Institute of Technology, Department of Biomolecular Engineering; YASUHARU, Kyoto Institute of Technology, Department of Biomolecular Engineering
40. Preparation and Properties of Cellulose Triacetate Forward Osmosis Flat Sheet Membranes  I I
KIM, Gyeongsang National University; HA (Speaker), Airrane Co. Ltd; NAM, Gyeongsang National University
41. Preparation of a Novel Thin Film Composite Membrane for Pressure Retarded Osmosis (PRO)  I Ĩ
Alsvik (Speaker), Norwegian University of Science and Technology (NTNU); Nilsen, Norwegian University of Science and Technology; Elimelech, Yale University; Hågg, Norwegian University of Science and Technology
42. Preparation of Perfluorocyclobutyl Polymer Thin Films for CO₂ Separations  I Ĩ
Zhou (Speaker), Clemson University; Scott, Clemson University; Wagener, Tetramer Technologies; Jin, Tetramer Technologies
43. Preparation of PTFE(Poly-tetrafluoroethylene) Membranes by Stretching Operations  I Ĩ
Park (Speaker), R&D Institute, Woongjin Chemical Co., Ltd.; Jung, R&D Institute, Woongjin Chemical Co., Ltd.; Cha, R&D Institute, Woongjin Chemical Co., Ltd.; Chi, R&D Institute, Woongjin Chemical Co., Ltd.; Moon, MicroFilter Business Division, Woongjin Chemical Co., Ltd.
44. Probing the Evolution of Glass Transition Temperature of the Barrier Layer on Reverse Osmosis Membrane upon Chlorine Induced Degradation  I Ĩ
Maruf (Speaker), University of Colorado at Boulder; Ahn, University of Colorado at Boulder,e; Greenberg, University of Colorado at Boulder; Ding, University of Colorado at Boulder
45. Progression of Fabrication Techniques for Thin Porous Metal Sheets as Membrane and Support  I J
Canfield (Speaker), Pacific Northwest National Laboratory; Liu, Pacific Northwest National Laboratory
46. Property of SPAES/phospho Tungstic Acid/Sulfonated Silica Composite Membrane Prepared by Sol-gel Method  I €
Nam, Gyeongsang National University; Hong, Korea Research Institute of Chemical Technology; Kim (Speaker), Korea Institute of Science and Technology
47. Responsive Hydrogel for Nanoparticles Synthesis and Water Detoxification  I F
Xiao (Speaker), University of Kentucky; Bhattacharyya, University of Kentucky

48. Selective Fractionation of Flaxseed Protein Hydrolyzate by Electrodialysis with Double Molecular Weight Cut-Off Ultrafiltration Membranes  H
Doven, Université Laval; Udenigwe, University of Manitoba; Aluko, University of Manitoba; Bazin (Speaker), Université Laval
49. Siliceous and ZIF Sodalites: Applications to Membrane Gas Separations  I
Stueve (Speaker), University of Cincinnati; Shah, University of Cincinnati; Gulianti, University of Cincinnati
50. Structure Control of Porous Polyamide Membrane for Semiconductor Industry  I
Nam (Speaker), Woongjin Chemical Co., Ltd.; Cha, Woongjin Chemical Co., Ltd.; Chi, Woongjin Chemical Co., Ltd.; Moon, Woongjin Chemical Co., Ltd.
51. Study of Gas Sorption of Light Gases in Zwitterion Functionalized Single Walled Carbon Nanotubes  I
Surapathi (Speaker), Virginia Tech; Marand, Virginia Tech
52. Sulfur Tolerant Pd-Au and Pd-Au-Pt Alloy Hydrogen Separation Membranes Fabricated by Magnetron Sputtering  I
Coulter, Southwest Research Institute; Gade, Colorado School of Mines; Chaudhari, Colorado School of Mines; Way, Colorado School of Mines; DeVoss, TDA Research, Inc.; Alptekin, TDA Research, Inc.; Pagliari (Speaker), TDA Research, Inc.; Pledger, IdaTech, LLC
53. Synthesis and Properties of Thin Film Composite HBP-g-silica RO membrane  E
Park (Speaker), Korea University; Kim, Korea University; Chun, Korea University; Kim, Korea University
54. Synthesis Of Dense Zeolite Y Membranes and Their Gas Separation Performance  F
Shgau (Speaker), The Ohio State University; Snider, The Ohio State University; Severance, The Ohio State University; Dutta, The Ohio State University; Verweij, The Ohio State University
55. Ternary Mixed-Matrix Membranes Containing Room Temperature Ionic Liquids  G
Atalay Oral (Speaker), Istanbul Technical University; Noble, University of Colorado; Tantekin-Ersolmaz, Istanbul Technical University
56. The Influence of Anoxic Condition on a Phosphate Removal Membrane Bioreactor  I
Qu (Speaker), Chung Yuan Christian University; Huang, Chung Yuan Christian University; You, Chung Yuan Christian University
57. Thermally Rearranged (TR) Polymers as Membranes for Ethanol Dehydration  I
Ba (Speaker), The University of Texas at Austin; Leo, The University of Texas at Austin; Czenkusch, The University of Texas at Austin; Ribeiro, The University of Texas at Austin; Paul, The University of Texas at Austin; Freeman, The University of Texas at Austin; Mensitieri, University of Naples Federico II
58. Thermally Rearranged Hydroxyl-functional Polyimides for Olefin/Paraffin Separations  I
Smith (Speaker), University of Texas at Austin; Tran, University of Texas at Austin; Gunawan, University of Texas at Austin; Sanders, University of Texas at Austin; Ribeiro, University of Texas at Austin; Freeman, University of Texas at Austin; Paul, University of Texas at Austin; Guo, Virginia Polytechnic Institute and State University; McGrath, Virginia Polytechnic Institute and State University
59. Water Gas Shift Reaction of Simulated Syngas in a Zeolite Membrane Reactor  J
Kim, University of Cincinnati; Provenzano (Speaker), University of Cincinnati; Xu, University of Cincinnati; Reddy, University of Cincinnati; Smirniotis, University of Cincinnati; Dong, University of Cincinnati
60. Water treatment by Iron-Iron Oxide Nanoparticle Catalyzed Free Radical Reactions in Aqueous Phase and in PAA Functionalized PVDF Membranes  E
Gui (Speaker), University of Kentucky; Smuleac, University of Kentucky; Ormsbee, University of Kentucky; Bhattacharyya, University of Kentucky
61. Interfacial Resistance of Dual-Layer Asymmetric Hollow Fiber Pervaporation Membranes  G
Jiang (Speaker), Central South University, China; Zhao, Central South University, China
62. Gamma-Alumina Supported Carbon Molecular Sieve Membrane for Propylene/Propane Separation  H
Ma (Speaker), Arizona State University; Wej, Membrane Technology and Research, Inc.; Kniep, Membrane Technology and Research, Inc.; Lin, Arizona State University

63. Mixed-Matrix Membranes Based on Different ZIFs and Thermally Stable Polymers for Gas Separations  I
 Kalaw (Speaker), The University of Texas at Dallas; Perez, The University of Texas at Dallas; Kochumuttom, The University of Texas at Dallas; Balkus, The University of Texas at Dallas; Musselman, The University of Texas at Dallas; Ferraris, The University of Texas at Dallas
64. Impact of Pulsed Electric Field on Electrodialysis Process Performance During Consecutive Demineralizations of A Model Salt Solution Containing a High Magnesium/Calcium Ratio  I
 Cifuentes-Araya (Speaker), Université Laval; Pourcelly, Institut Européen des membranes a Montpellier; Bazinet, Université Laval
65. Gas Permeation Studies of PBI, VTEC, PIM-1, and 6FDA-NDA Polymers at High Pressures and Temperatures  I
 Perez (Speaker), The University of Texas at Dallas; Kalaw, The University of Texas at Dallas; Musselman, The University of Texas at Dallas; Balkus Jr., The University of Texas at Dallas; Ferraris, The University of Texas at Dallas; Musselman, The University of Texas at Dallas
66. High Temperature Membrane Reactors for Selective Removal of Methanol from the Transesterification of Dimethyl Carbonate with Phenol  I
 Zhang (Speaker), Kansas State University; Rezac, Kansas State University; Kosaraju, Compact Membrane System, Inc.; Nemser, Compact Membrane System, Inc.
67. Sub-Tg Cross-linking of 6FDA/DAM-DABA Membrane for CO₂ Plasticization Reduction  I
 Qiu (Speaker), Georgia Institute of Technology; Chen, Georgia Institute of Technology; Xu, Georgia Institute of Technology; Koros, Georgia Institute of Technology
68. Preparation of PVDF Membranes with Inter-Connected Pores by a Combination of Nips and Tips  J
 Liu (Speaker), Chinese academy of Sciences; Tao, Chinese academy of Science; Xue, Chinese academy of Sciences
69. The Design for Pressure Retarded Osmosis (PRO) Membrane  €
 Kim (Speaker), Woongjin Cemical Co.; Lee, Woongjin Cemical Co.; Chi, Woongjin Cemical Co.; Im, Woongjin Cemical Co.
70. Parametric Sensitivity of Reverse Electrodialysis for Energy Production Using Difference in Salinity  F
 Patil (Speaker), University of Toledo, Toledo, OH; Lipscomb, University of Toledo, Toledo, OH
71. Static Mixing Spacer For Spiral Wound Module  G
 Iranshahi (Speaker), University of Toledo, CHEE department; Lipscomb, University of Toledo, CHEE department
72. Nano-Filtration of Simple Salt Solutions with Gamma Alumina Membranes: A Systematic Study  H
 Schillo (Speaker), The Ohio State University; Yu, The Ohio State University; Verweij, The Ohio State University
73. Surface Cross-Linked ZIF-8/6FDA-Durene Mixed-Matrix Membranes for Hydrogen Separation  I
 Wijenayake (Speaker), The University of Texas at Dallas; Balkus, The University of Texas at Dallas; Ferraris, The University of Texas at Dallas; Musselman, The University of Texas at Dallas
74. Membrane Reactor Technology Integrated Into IGCC Power Plants: An Economic Evaluation in the Presence of Uncertainty  I
 Koc (Speaker), Worcester Polytechnic Institute; Kazantzis, Worcester Polytechnic Institute; Ma, Worcester Polytechnic Institute
75. Silver Nanoparticles as an Efficient Carrier Agent for Propylene/Propane Separation  I
 Pollo (Speaker), Federal University of Rio de Janeiro; Habert, Federal University of Rio de Janeiro; Piacsek Borges, Federal University of Rio de Janeiro
76. A Novel Synthesis Method for Fabricating Evenly Dispersed Nanocomposite Polymer Membranes  I
 Susca (Speaker), Harvey Mudd College; Lape, Harvey Mudd College; Nelson, Harvey Mudd College; Ritz, Harvey Mudd College; Peck, Harvey Mudd College
77. Carbon Dioxide Plasticization and Conditioning in Thick vs. Thin Glassy Polymer Films  I
 Horn (Speaker), University of Texas at Austin; Paul, University of Texas at Austin
78. The Effect of EDTA on Hydrogen Permeation in Pd Composite Membranes  J
 Lewis (Speaker), Colorado School of Mines; Gade, Colorado School of Mines; Way, Colorado School of Mines

79. Effects of Sweep Gas Conditions on Oxygen Permeation Properties and Stability of La(0.6)Sr(0.4)Co(0.8)Fe(0.2)O(3-delta) Membranes ~~IIIF~~ JF
 Norton (Speaker), Arizona State University; Anderson, Arizona State University; Kniep, Arizona State University; Lin, Arizona State University
80. Oligonucleic Acids as Biomolecular Recognition Sites for the Design of Stimuli-Responsive Membranes ~~IIIF~~ JG
 Serrano Santos, University Rovira i Virgili; Llobet, University Rovira i Virgili; Özalp, University of the Basque Country; Schäfer (Speaker), University of the Basque Country
81. Preparation and Characterization of PVA/TiO₂ Hybrid membrane for gas separation ~~IIIF~~ JH
 Ahmad (Speaker), Norwegian University of Science and Technology, Trondheim; Deshmukh, Norwegian University of Science and Technology, Trondheim; Hagg, Norwegian University of Science and Technology, Trondheim
82. Application of a Flow-Through Catalytic Membrane Reactor (FTCMR) for the Destruction of a Chemical Warfare Simulant ~~IIIF~~ JI
 Motamedhashemi (Speaker), University of Southern California; Egolfopoulos, University of Southern California; Tsotsis, University of Southern California
83. Prediction of the Relative Permeability of Gases in Mixed Matrix Membranes ~~IIIF~~ JÍ
 Shimekit (Speaker), Universiti Teknologi PETRONAS; Mukhtar, Universiti Teknologi PETRONAS; Maitra, Government College of Engineering and Ceramic Technology; Murugesan, Universiti Teknologi PETRONAS
84. High Selectivity Carbon Molecular Sieve Dense Film Membranes for Ethylene/Ethane Separation ~~IIIF~~ JÎ
 Rungta (Speaker), Georgia Institute of Technology; Xu, Georgia Institute of Technology; Koros, Georgia Institute of Technology
85. The Fabrication and Characterization of the Sulfur Tolerant Composite Pd/Au Membranes for Hydrogen Separation ~~IIIF~~ JI
 Chen (Speaker), Worcester Polytechnic Institute; Ma, Worcester Polytechnic Institute; Payzant, Oak Ridge National Laboratory; Meyer, Oak Ridge National Laboratory
86. Evaluating the Performance of a Combined Forward Osmosis and Membrane Distillation System for Wastewater Treatment ~~IIIF~~ JJ
 Husnain (Speaker), The George Washington University; Mi, The George Washington University; Riffat, The George Washington University
87. Fabrication of Thin-Film Composite Forward Osmosis Membranes on Electrospun Poly(Ethylene Terephthalate) ~~IIIF~~ CF
 Hoover (Speaker), Yale University; Schiffman, Yale University; Elimelech, Yale University
88. Development of a Small-Scale Reverse Osmosis System for Energy Efficient Brackish Water Desalination at High Recoveries ~~IIIF~~ CG
 Schuetze (Speaker), Texas Tech University; Rainwater, Texas Tech University; Song, Texas Tech University
89. Effect of Dendrimer Macromoleculesize and Chemistry on Enhancing the Performance of NF Polyamide Membranes ~~IIIF~~ CH
 Saenz de Jubera (Speaker), University of Illinois at Urbana-Champaign; Gao, University of Illinois at Urbana-Champaign; Moore, University of Illinois at Urbana-Champaign; Mariñas, University of Illinois at Urbana-Champaign
90. Long-Term Testing of H₂ Permeable, PSS Supported Pd-Membranes Under Mixed Gas and Water-Gas Shift Reaction Conditions ~~IIIF~~ CI
 Augustine (Speaker), Worcester Polytechnic Institute; Mardilovich, Worcester Polytechnic Institute; Kazantzis, Worcester Polytechnic Institute; Ma, Worcester Polytechnic Institute
91. Membrane Drying of Ionic Liquid Solutions ~~IIIF~~ CI
 Du, University of Toledo; Lipscomb (Speaker), University of Toledo
92. Permeability Upper Bound Predictions from Transition State Theory Using the Non-Equilibrium Lattice Fluid Model ~~IIIF~~ CI
 Lou (Speaker), University of Toledo; Lipscomb, University of Toledo; Coleman, University of Toledo

93. Polybenzimidazole Forward Osmosis Membranes Functionalized for Increased Surface Charge and Hydrophilicity  €
Flanagan (Speaker), The University of Toledo; Hausman, The University of Toledo; Escobar, The University of Toledo; Coleman, The University of Toledo; Chung, The National University of Singapore
94. Effect of Ta Substitution on Hydrogen Solubility and Permeability of Ni₄₂Nb₂₈Zr₃₀ Amorphous Alloy  F
Pal (Speaker), University of Nevada, Reno; Chandra, University of Nevada, Reno; Pagliari, TDA Research Inc.; Lamb, Sandia National Laboratories; ; Kim, University of Nevada, Reno; Chien, University of Nevada, Reno; Talekar, University of Nevada, Reno; Flanagan, The University of Vermont; Dolan, CSIRO
95. Magnetic Responsive Membranes for Water Treatment  FH
Himstedt (Speaker), Colorado State University; Ulbricht, Universität Duisburg-Essen; Qian, University of Arkansas; Wickramasinghe, University of Arkansas
96. Colorimetric Sensor Arrays as Predictive Tools for Membrane Filtrations of Natural Waters  FI
Schauf (Speaker), University of Colorado at Boulder; Pellegrino, University of Colorado at Boulder
97. Sulfonated Poly(ether ketone quinoline) Membranes for Fuel Cells  FI
Sutrisno, University of Nevada, Reno; Pramudya, University of Nevada, Reno; Fuchs (Speaker), University of Nevada, Reno
98. Functionalized Calixarene Based Surfaces for Highly Selective Protein Capture  FI
Gulianti (Speaker), University of Cincinnati; Variyath, University of Cincinnati; Kim, University of Cincinnati
99. Laboratory Scale Separation of Plasmid Isoforms by Centrifugal Ultrafiltration  FI
Espah Borujeni (Speaker), The Pennsylvania State University; Zydney, The Pennsylvania State University
100. Effect of Pectin Lyase Pretreatment on the Cross-Flow Microfiltration of Açai Pulp  FI
Machado, University of São Paulo ; Haneda, University of São Paulo ; Trevisan, University of São Paulo .; Fontes (Speaker), University of São Paulo
101. An Adaptive Anhydrous Ionic Liquid Nano-Composite Membrane for Olefin-Paraffin Separations  FJ
Pitsch (Speaker), RWTH Aachen University; Agel, FriedrichAlexanderUniversity ErlangenNuremberg; Wasserscheid, FriedrichAlexanderUniversity ErlangenNuremberg; Melin, RWTH Aachen University; Wessling, RWTH Aachen University
102. Model Based Design of Gas Permeation Modules and Processes  GF
Scholz (Speaker), RWTH Aachen University; Wessling, RWTH Aachen University; Melin, RWTH Aachen University
103. Process Intensification by Pulsed Diafiltration for In-Situ Product Recovery  GG
Carstensen (Speaker), RWTH Aachen University; Klement, RWTH Aachen University; Buechs, RWTH Aachen University; Wessling, RWTH Aachen University; Melin, RWTH Aachen University

Advances in RO and NF

Skyview 2

Tuesday June 7

Chairs: [James McGrath](#), Virginia Tech ; [William Mickols](#), ConocoPhillips

- 08:00 - 08:30 Inorganic Meso-porous Membranes for Water Purification 
[Schillo](#) (Speaker), The Ohio State University;; [Verweij](#), The Ohio State University,
- 08:30 - 09:00 Effect of Dendrimer Macromoleculsize and Chemistry on Enhancing the Performance of NF Polyamide Membranes 
[Saenz de Jubera](#) (Speaker), University of Illinois at Urbana-Champaign;; [Gao](#), University of Illinois at Urbana-Champaign;; [Moore](#), University of Illinois at Urbana-Champaign;; [Mariñas](#), University of Illinois at Urbana-Champaign
- 09:00 - 09:30 Facile Fabrication of Superior Nanofiltration Membranes Containing Carbon Nanotubes 
[Roy](#), New Jersey Institute of Technology;; [Ntim](#), New Jersey Institute of Technology;; [Mitra](#), New Jersey Institute of Technology;; [Sirkar](#) (Speaker), New Jersey Institute of Technology
- 09:30 - 10:00 Impact of Zeolite Hydration State on Formation and Performance of Nanocomposite Membranes for Sea-Water Desalination 
[Lind](#) (Speaker), Arizona State University;; [Hoek](#), University of California, Los Angeles
- 10:00 - 10:30 Preparation and Characterization of Pore-Suspending Biomimetic Membranes Embedded with Aquaporin Z 
[Wang Honglei](#) (Speaker), National University of Singapore;; [Chung](#), National University of Singapore;; [Tong](#), National University of Singapore;; [Chen](#), National University of Singapore;; [Hong](#), National University of Singapore;; [JEYASEELAN](#), National University of Singapore;; [Armugam](#), National University of Singapore
- 10:30 - 11:00 Modeling Membrane Mineral Scaling in RO Channels - Coupling of Channel Hydrodynamics and Mass Transfer with Crystal Nucleation Kinetics 
[Lyster](#) (Speaker), University of California, Los Angeles;; [Cohen](#), University of California, Los Angeles

Bioseparations

Skyview 4

Tuesday June 7

Chairs: [Anthony Allegrezza](#), Consultant; [Jamie Hestekin](#), University of Arkansas







- 08:00 - 08:30 Process Intensification by Pulsed Diafiltration for In-Situ Product Recovery      
[Carstensen](#) (Speaker), RWTH Aachen University; [Klement](#), RWTH Aachen University; [Buechs](#), RWTH Aachen University; [Wessling](#), RWTH Aachen University; [Melin](#), RWTH Aachen University
- 08:30 - 09:00 Stimulus-Responsive Membrane with Reversible Gating Function Upon Small Molecule Recognition  
[Schäfer](#) (Speaker), NanoBioSeparations Group, POLYMAT, University of the Basque Country and IKE; [Özalp](#), NanoBioSeparations Group, POLYMAT, University of the Basque Country
- 09:00 - 09:30 Electrophoretic and Electroosmotic Flow Through Carbon Nanotube Membranes as Protein Channel Mimetic Pumps    
[Wu](#), University of Kentucky.; [Gerstandt](#), University of Kentucky.; [Hinds](#) (Speaker), University of Kentucky
- 09:30 - 10:00 Functionalized Membranes for Membrane Chromatography       F
[Shethji](#) (Speaker), The University of Alabama; [Ritchie](#), The University of Alabama
- 10:00 - 10:30 Purification of Pharmaceuticals: Organic Solvent Manofiltration! Why?     G
[Makowski](#) (Speaker), Evonik MET Ltd.; [Lim](#), Evonik MET Ltd.; [Livingston](#), Imperial College London; [Boam](#), Evonik MET Ltd.
- 10:30 - 11:00 Laboratory Scale Separation of Plasmid Isoforms by Centrifugal Ultrafiltration     H
[Espah Borujeni](#) (Speaker), The Pennsylvania State University; [Zydney](#), The Pennsylvania State University

Gas Separation System Design and Industrial Applications

Skyview 1

Tuesday June 7

Chairs: [Charles Page](#), Air Products-PERMEA; [Lloyd White](#), MTR Inc

- 08:00 - 08:30 Challenges in High Pressure Rig for Durability study of Polymeric Membrane in Natural gas Sweetening  I
[Uddin](#) (Speaker), Norwegian University of Science and Technology ; [Kim](#), Norwegian University of Science and Technology ; [Deng](#), Norwegian University of Science and Technology ; [Hägg](#), Norwegian University of Science and Technology
- 08:30 - 09:00 The Dow Chemical Companys (Dows) Membrane Test Unit  I
[Brayden](#) (Speaker), The Dow Chemical Company; [Barbay](#), The Dow Chemical Company
- 09:00 - 09:30 Model Based Design of Gas Permeation Modules and Processes  I
[Scholz](#) (Speaker), RWTH Aachen University; [Wessling](#), RWTH Aachen University; [Melin](#), RWTH Aachen University
- 09:30 - 10:00 Development of a Large Membrane Module for CO₂ Removal from Hydrocarbon Gas  J
[Morisato](#) (Speaker), Cameron; [Dietrich](#), Cameron; [Mahley](#), Cameron; [Peters](#), Cameron
- 10:00 - 10:30 The Fabrication and Characterization of the Sulfur Tolerant Composite Pd/Au Membranes for Hydrogen Separation  €
[Chen](#) (Speaker), Worcester Polytechnic Institute; [Ma](#), Worcester Polytechnic Institute; [Payzant](#), Oak Ridge National Laboratory; [Meyer](#), Oak Ridge National Laboratory
- 10:30 - 11:00 Sulfur Resistant High-Temperature Hydrogen Purification Membrane  G
[Tsai](#) (Speaker), T3 Scientific LLC, The University of New Mexico; [Tam](#), T3 Scientific LLC; [Jiang](#), The University of New Mexico

Membrane Formation I

Skyview 3

Tuesday June 7

Chairs: [Caleb Funk](#), Dow -Fllmtec; [Winston Ho](#), Ohio State University

- 08:00 - 08:30 Effects of Processing Conditions on the Structural and Permeation Properties of ZIF-8/Matrimid® Mixed-Matrix Membranes  I
[Thompson](#) (Speaker), Georgia Institute of Technology; [Koros](#), Georgia Institute of Technology; [Jones](#), Georgia Institute of Technology; [Nair](#), Georgia Institute of Technology
- 08:30 - 09:00 Polyamide Interfacial Composite Membranes Made From Various Diamines and Trimesoyl Chloride and the Effect Of Post-Polymerization Treatment Conditions on Separation Performance  I
[Xie](#) (Speaker), The University of Texas at Austin; [Freeman](#), The University of Texas at Austin; [Byun](#), Virginia Polytechnic Institute and State University; [McGrath](#), Virginia Polytechnic Institute and State University
- 09:00 - 09:30 Surface Modification of Porous Metallic Sheet  I
[Li](#) (Speaker), Pacific Northwest National Laboratory; [Wilcox](#), Pacific Northwest National Laboratory; [Rao](#), Pacific Northwest National Laboratory; [Canfield](#), Pacific Northwest National Laboratory; [Liu](#), Pacific Northwest National Laboratory
- 09:30 - 10:00 Synthesis of Defect Free Ordered Nanoporous Silica Membranes by Counter Diffusion Self Assembly Method  I
[Seshadri](#) (Speaker), Arizona State University ; [Lin](#), Arizona State University
- 10:00 - 10:30 From Adhesives to Gas Separation Membranes - Interfacial Self-Assembly in Silicone Films  J
[Ahn](#) (Speaker), Dow Corning Corp.; [Olney](#), Dow Corning Corp.; [McMillan](#), Dow Corning Corp.; [Hrabal](#), Dow Corning Corp.; [Wong](#), Dow Corning Corp.; [Greiner](#), Dow Corning Corp.
- 10:30 - 11:00 The Effects of Varying the Content of Nanoparticle Endcapped Polysulfone Polymers (POSS-Psf-POSS) on the Morphology, Compaction and Filtration Properties of Thin Film Nanocomposite Membranes  €
[Constantopoulos](#) (Speaker), Flinders University; [Markovic](#), Flinders University; [Barclay](#), Flinders University; [Clarke](#), Flinders University; [Ginic-Markovic](#), Flinders University

Fouling in Water Applications

Skyview 2

Tuesday June 7

Chairs: [Vicki Chen](#), UNESCO, University of New South Wales; [Isabel Escobar](#), University of Toledo

- 13:30 - 14:00 [Surface Modification of RO Membranes with Zwitterion Containing Polymers for Development of Low Biofouling Membranes](#)  H
[Ginic-Markovic](#) (Speaker), Flinders University; [Constantopoulos](#), Flinders University; [Barclay](#), Flinders University; [Markovic](#), Flinders University; [Clarke](#), Flinders University
- 14:00 - 14:30 [A Fourier Transform Infrared Spectroscopy Based Biofilm Characterization Technique and Its Use to Show the Effect of Copper-Charged Polypropylene Feedspacers in Biofouling Control](#)  I
[Hausman](#) (Speaker), The University of Toledo; [Escobar](#), The University of Toledo
- 14:30 - 15:00 [Development and Characterization of Antifouling Thin-Film-Composite Membranes for Seawater Desalination](#)  I
[RANA](#) (Speaker), University of Ottawa; [ABU TARBOUSH](#), University of Ottawa; [KIM](#), University of Ottawa; [MATSUURA](#), University of Ottawa; [ARAFAT](#), An-Najah National University; [CHUNG](#), Myongji University
- 15:00 - 15:30 [Novel Organic-inorganic Hybrid Materials for Fouling Control in Water Treatment](#)  I
[Kang](#) (Speaker), Samsung Advanced Institute of Technology; [Kim](#), Seoul National University; [Lee](#), Seoul National University; [Han](#), Samsung Advanced Institute of Technology; [Han](#), Samsung Advanced Institute of Technology; [Son](#), Samsung Advanced Institute of Technology; [Kong](#), Samsung Advanced Institute of Technology
- 15:45 - 16:15 [Scaling Mitigation in Reverse Osmosis Desalination via Flow Reversal Controlled by Ultrasonic Sensors](#)  J
[Lu](#) (Speaker), University of Colorado at Boulder; [Kujundzic](#), University of Colorado at Boulder; [Mizrahi](#), Ben Gurion University; [Cobry](#), University of Colorado at Boulder; [Wang](#), University of Colorado at Boulder; [Gilon](#), Ben Gurion University; [Greenberg](#), University of Colorado at Boulder
- 16:15 - 16:45 [Development of Advanced Membranes for Produced Water Treatment](#)  F
[Wandera](#) (Speaker), Clemson University; [Ranil Wickramasinghe](#), University of Arkansas; [Husson](#), Clemson University
- 16:45 - 17:15 [Colorimetric Sensor Arrays as Predictive Tools for Membrane Filtrations of Natural Waters](#)  G
[Schauf](#) (Speaker), University of Colorado at Boulder; [Pellegrino](#), University of Colorado at Boulder

Membrane Formation II

Skyview 3

Tuesday June 7

Chairs: [Ingo Pinnau](#), KAUST; [Thomas Schafer](#), Institute for Polymer Materials (Polymat), University of the Basque Country

- 13:30 - 14:00 Diluent Crystal Alignment in the Formation of Membranes via Liquid-solid Thermally Induced Phase Separation  I
[Funk](#) (Speaker), The Dow Chemical Company; [Lloyd](#), The University of Texas
- 14:00 - 14:30 Novel Polyphenylsulfone Flat Sheet and Hollow Fiber Membranes for Organic Solvent Nanofiltration: Preparation and Characterisation  I
[Darvishmanesh](#) (Speaker), Katholieke Universiteit Leuven; [Jansen](#), Institute on Membrane Technology (ITM-CNR); [Tasselli](#), Institute on Membrane Technology (ITM-CNR); [Tocci](#), Institute on Membrane Technology (ITM-CNR); [Luis](#), Katholieke Universiteit Leuven; [Degreve](#), Katholieke Universiteit Leuven; [Drioli](#), Institute on Membrane Technology (ITM-CNR); [Van der Bruggen](#), Katholieke Universiteit Leuven
- 14:30 - 15:00 Morphological Architecture of Dual-Layer Hollow Fiber for Direct Contact Membrane Distillation  I
[Wang](#) (Speaker), National University of Singapore; [Teoh](#), National University of Singapore; [Chung](#), National University of Singapore
- 15:00 - 15:30 Layer-by-Layer Assembly of Polymer-Clay Nano Brick Wall Membranes  I
[Grunlan](#) (Speaker), Texas A&M University; [Priolo](#), Texas A&M University
- 15:45 - 16:15 High-Flux MFI Zeolite Membranes Supported on YSZ Hollow Fibers for Pervaporation Separation of Ethanol/Water  J
[Gu](#) (Speaker), Nanjing University of Technology; [Shu](#), Nanjing University of Technology; [Xu](#), Nanjing University of Technology
- 16:15 - 16:45 Highly-Permeable Tubular Supports for Inorganic Membranes  €
[Chiu](#) (Speaker), The Ohio State University; [Snider](#), The Ohio State University; [McAllister](#), The Ohio State University; [Verweij](#), The Ohio State University
- 16:45 - 17:15 Fabrication of Thin Porous Metal Sheets as Membrane Support  F
[Liu](#) (Speaker), Pacific Northwest National Laboratory; [Canfield](#), Pacific Northwest National Laboratory

Membranes for Sustainability

Skyview 4

Tuesday June 7

Chairs: [Sudhir Kulkarni](#), Air Liquide; [Howard Meyer](#), Gas Technology Institute

- 13:30 - 14:00 [Ultrafiltration of Hot Water Wood Extracts to Separate Lignin From Extract Complex: Integrated Forest Biorefinery](#)  H
[Bhayani](#) (Speaker), State University of New York ; [Ramarao](#), State University of New York
- 14:00 - 14:30 [Multifunctional Membranes for Green Synthesis and Water Treatment Applications](#)  I
[Bhattacharyya](#) (Speaker), University of Kentucky; [Lewis](#), University of Kentucky; [Smuleac](#), University of Kentucky; [Varma](#), US EPA; [Sikdar](#), USEPA; [Datta](#), University of Kentucky
- 14:30 - 15:00 [Novel Membrane Technologies for Harvesting of Micro-Algae](#)  Í
[liu](#) (Speaker), Pacific Northwest National Lab; [Wilcox](#), Pacific Northwest National Lab; [Li](#), Pacific Northwest National Lab
- 15:00 - 15:30 [Performance of Polymeric Membranes of Microfiltration for the Confined Process of Microalgae Production and Concentration](#)  Î
[Moralez](#), University of São Paulo - USP ; [Lombardi](#), University of São Paulo - USP ; [Crmkovic](#), University of São Paulo - USP ; [Lombardi](#), Federal University of São Carlos - UFSCar ; [Fontes](#) (Speaker), University of São Paulo - USP
- 15:45 - 16:15 [Nanohybrid Membranes for Green Hydrogen Purification](#)  Ï
[Lau](#) (Speaker), National University of Singapore; [Liu](#), National University of Singapore; [Paul](#), University of Texas at Austin; [Xia](#), National University of Singapore; [Jean](#), University of Missouri; [Chen](#), University of Missouri; [Shao](#), Harbin Institute of Technology; [Chung](#), National University of Singapore
- 16:15 - 16:45 [Preparation of Perfluorocyclobutyl polymer Thin Films for CO₂ Separations](#)  Ì
[Zhou](#) (Speaker), Clemson University; [Husson](#), Clemson University; [Wagener](#), Tetramer Technologies; [Jin](#), Tetramer Technologies
- 16:45 - 17:15 [Thermally Induced Stepwise Structure Rearrangement of Poly\(hydroxyamide amic acid\) for Energy Development and CO₂ Capture](#)  J
[Wang](#) (Speaker), National University of Singapore; [Liu](#), National University of Singapore; [Chen](#), University of Missouri-Kansas City; [Jean](#), University of Missouri-Kansas City; [Chung](#), National University of Singapore

Nonpolymeric Gas Separation Membranes

Skyview 1

Tuesday June 7

Chairs: [Yi Hua \(Ed\) Ma](#), Worcester Polytechnic Institute; [Richard Noble](#), University of Colorado

- 13:30 - 14:00 [Effect of Ta Substitution on Hydrogen Solubility and Permeability of Ni₄₂Nb₂₈Zr₃₀ Amorphous Alloy](#)^{||||GJF}
[Pal](#) (Speaker), University of Nevada, Reno; [Chandra](#), University of Nevada, Reno; [Paglieri](#), TDA Research Inc.; [Lamb](#), Sandia National Laboratories; [Kim](#), University of Nevada, Reno; [Chien](#), University of Nevada, Reno; [Talekar](#), University of Nevada, Reno; [Flanagan](#), The University of Vermont; [Dolan](#), CSIRO, Australia
- 14:00 - 14:30 [Synthesis and Characterization of Thin Carbonate-Ceramic Dual-Phase Membranes for Carbon Dioxide Separation](#)^{||||GJH}
[Lu](#) (Speaker), Arizona State University; [Anderson](#), Arizona State University; [Lin](#), Arizona State University
- 14:30 - 15:00 [High Selectivity Carbon Molecular Sieve Dense Film Membranes for Ethylene/Ethane Separation](#)^{||||GJI}
[Rungta](#) (Speaker), Georgia Institute of Technology; [Xu](#), Georgia Institute of Technology; [Koros](#), Georgia Institute of Technology
- 15:00 - 15:30 [Thin-Sheet Zeolite Membranes and Applications for Energy Efficiency Enhancement](#)^{||||GJÎ}
[Liu](#) (Speaker), Pacific Northwest National Laboratory; [Rao](#), Pacific Northwest National Lab; [Hu](#), Pacific Northwest National Lab
- 15:45 - 16:15 [Template-Free Synthesis and Catalytic Cracking Deposition Modification of Bi-Layer MFI Zeolite Membranes on Ytria Stabilized Zirconia Support](#)^{||||GJÏ}
[Wang](#) (Speaker), Arizona State University; [Lin](#), Arizona State University
- 16:15 - 16:45 [Nitrogen Dissociation and Subsurface Diffusion within Group V Metals](#)^{||||GJJ}
[Wilcox](#) (Speaker), Stanford University; [Rochana](#), Stanford University; [Ozdogan](#), Stanford University
- 16:45 - 17:15 [Modeling, Fabrication and Evaluation of ZrCu and ZrCuTi Amorphous Alloys as Materials for High Temperature Hydrogen Separation Membranes](#)^{||||GJË}
[Sholl](#) (Speaker), Georgia Institute of Technology; [Barton](#), Western Research Institute; [Coulter](#), Southwest Research Institute

Emerging Membrane Technology I

Skyview 2

Wednesday June 8

Chairs: [Bruce Hinds](#), University of Kentucky; [Klaus-Viktor Peinemann](#), KAUST







- 08:00 - 08:30 The Benefits of Being Thin: Porous Nanocrystalline Silicon Membranes Four Years Later   
[McGrath](#) (Speaker), University of Rochester ; [Striemer](#), University of Rochester; [Gaborski](#), University of Rochester; [Fang](#), University of Rochester; [Snyder](#), University of Rochester; [Nehilla](#), University of Rochester; [Kavelenka](#), University of Rochester; [Fauchet](#), University of Rochester
- 08:30 - 09:00 Carbon Molecular Sieve Hollow Fiber Membranes for Ethylene/ethane Separation  
[Xu](#) (Speaker), Georgia Institute of Technology; [Rungta](#), Georgia Institute of Technology; [Koros](#), Georgia Institute of Technology
- 09:00 - 09:30 Formation of Cellulose Acetate Membranes via Phase Inversion Using Ionic Liquid as the Solvent  
[Xing](#), National University of Singapore; [Peng](#) (Speaker), National University of Singapore; [Chung](#), National University of Singapore
- 09:30 - 10:00 Separations Using Room Temperature Ionic Liquid Membranes  
[Noble](#) (Speaker), University of Colorado; [Gin](#), University of Colorado
- 10:00 - 10:30 Molybdenum Carbide Catalysts for Dense Group V Metal Membranes: A Low-Cost Approach to Hydrogen Purification  
[Gade](#) (Speaker), Colorado School of Mines; [Chmelka](#), Colorado School of Mines; [Adeyemo](#), Colorado School of Mines; [Vervuurt](#), Technische Universiteit Eindhoven; [Wolden](#), Colorado School of Mines; [Way](#), Colorado School of Mines
- 10:30 - 11:00 The Influence of Humidity on Electrospun Nanofiber Properties   
[Huang](#) (Speaker), University of Connecticut; [Bui](#), University of Connecticut; [Manickam](#), University of Connecticut; [McCutcheon](#), University of Connecticut

Membrane Applications I

Skyview 1

Wednesday June 8

Chairs: [Sal Giglia](#), Millipore Corporation; [Glenn Lipscomb](#), University of Toledo

- 08:00 - 08:30 High Temperature Water Gas Shift Reaction in a Modified Zeolite Membrane Reactor: Effect of Operation Pressure and Long Term Stability  **FE**
[Kim](#) (Speaker), University of Cincinnati; [Provenzano](#), University of Cincinnati; [Xu](#), University of Cincinnati; [Reddy](#), University of Cincinnati; [Smirniotis](#), University of Cincinnati; [Dong](#), University of Cincinnati
- 08:30 - 09:00 Carbon Supported Ionic Liquid Membranes for CO₂/N₂ Gas Separation  **FF**
[Mahurin](#) (Speaker), Oak Ridge National Laboratory; [Liu](#), Oak Ridge National Laboratory; [Wang](#), Nanotek Instruments Inc.; [Lee](#), Kyung Hee University; [Dai](#), Oak Ridge National Laboratory
- 09:00 - 09:30 Bio-inspired Onboard Membrane Separation of Water from Engine Oil  **FG**
[Yang](#), New Jersey Institute of Technology; [Thongsukmak](#), New Jersey Institute of Technology; [Sirkar](#) (Speaker), New Jersey Institute of Technology; [Gross](#), General Motors Research & Development; [Mordukhovich](#), General Motors Research & Development
- 09:30 - 10:00 Concentration of Clarified Thin Sugar Juice through Multistage-NF/RO Membrane Technology  **FH**
[Gul](#) (Speaker), Vienna University of Technology; [Harasek](#), Vienna University of Technology
- 10:00 - 10:30 Development of a Small-Scale Reverse Osmosis System for Energy Efficient Brackish Water Desalination at High Recoveries  **FI**
[Schuetze](#) (Speaker), Texas Tech University; [Rainwater](#), Texas Tech University; [Song](#), Texas Tech University
- 10:30 - 11:00 Comparison of Chemical Cleaning Versus Osmotic Backflushing for Seawater RO Membrane Fouling Control  **FI**
[Ramon](#) (Speaker), University of California, Los Angeles; [Nguyen](#), University of California, Los Angeles; [Hoek](#), University of California, Los Angeles

Membrane-based CO₂ Capture Technologies I

Skyview 3

Wednesday June 8

Chair: Benny Freeman, University of Texas

- 08:00 - 08:30 CO₂-philic Oligomers for the Selective Membrane Separation of CO₂/H₂ ~~FFFF~~Fi
Barillas (Speaker), University of Pittsburgh, National Energy Technology Laboratory; Enick, University of Pittsburgh, National Energy Technology Laboratory; Luebke, National Energy Technology Laboratory
- 08:30 - 09:00 Development of Mixed-Matrix Hollow Fiber Membranes Using MOFS for Carbon Dioxide Capture from Flue Gas ~~FFFF~~Fi
Sholl (Speaker), Georgia Institute of Technology; Dai, Georgia Institute of Technology; Koros, Georgia Institute of Technology; Han, Georgia Institute of Technology; Meredith, Georgia Institute of Technology; Huang, Georgia Institute of Technology; Walton, Georgia Institute of Technology; Watanabe, Georgia Institute of Technology
- 09:00 - 09:30 Effect of Ceramic/Carbonate Phase Ratio on Carbon Dioxide Permeation through Ceramic-Carbonate Dual Phase Membranes ~~FFFF~~FJ
Ortiz-Landeros (Speaker), Arizona State University; Anderson, Arizona State University; Norton, Arizona State University; Lin, Arizona State University
- 09:30 - 10:00 High Carbon Monoxide Test Conditions for Accelerated Qualitative Evaluation of Palladium Gold Alloy Membranes for Use in CO₂ Capture From Water-Gas-Shift Mixtures. ~~FFFF~~GF
Hatlevik (Speaker), Colorado School of Mines; Keeling, Pall Inc.; Rekczis, Pall Inc.; Way, Colorado School of Mines
- 10:00 - 10:30 Long-Term Testing of H₂ Permeable, PSS Supported Pd-Membranes Under Mixed Gas And Water-Gas Shift Reaction Conditions ~~FFFF~~GG
Augustine (Speaker), Worcester Polytechnic Institute; Mardilovich, Worcester Polytechnic Institute; Ma, Worcester Polytechnic Institute; Kazantzis, Worcester Polytechnic Institute
- 10:30 - 11:00 Investigation of the Bubble Point of Supported Ionic Liquid Membranes for CO₂ Gas Separation Applications ~~FFFF~~GH
Hopkinson (Speaker), National Energy Technology Laboratory; Luebke, National Energy Technology Laboratory

UF and MF
Skyview 4
Wednesday June 8

Chair: Uwe Beuscher, W.L. Gore & Associates















- 08:00 - 08:30 Low Pressure Limiting Flux and Protein Transmission Study: A Novel Approach to understand protein transport through Ultrafiltration Membrane 
Agarwal (Speaker), Indian Institute of Technology Delhi; Narsaiah, Central Institute of Post Harvest Engg & Technology
- 08:30 - 09:00 Experimental Study of Performance of Microfiltration Process Applied in Clarifying the Residual Vinasse from Sugar Cane 
Trevisoli, University of São Paulo (USP), School of Engineering of São Carlos.; Fontes (Speaker), University of São Paulo (USP), School of Engineering of São Carlos.
- 09:00 - 09:30 Removal of Heavy Metals from Aqueous Solutions by Sericin-Facilitated Ultrafiltration 
Khosa (Speaker), University of Waterloo; Shah, Quaid-i-Azam University ; Feng, University of Waterloo
- 09:30 - 10:00 Porosimetry and Particle Transport 
Shrestha (Speaker), University of Colorado; Grzenia, Colorado State University; Marroquin, Clemson University; Pellegrino, University of Colorado; Husson, Clemson University; Wickramasinghe, University of Arkansas
- 10:00 - 10:30 Recovery of Spent Drilling Fluids by Cross-Flow Microfiltration 
Wu (Speaker), M-I SWACO (A Schlumberger Company); Bingham, M-I SWACO (A Schlumberger Company)
- 10:30 - 11:00 GE's Sterilizable ePTFE Membranes for Variety of Microfiltration Applications 
TG (Speaker), GENERAL ELECTRIC (GE) Energy; Keller, General Electric (GE) Energy

Emerging Membrane Technology II

Skyview 2

Wednesday June 8

Chairs: [Dibakar Bhattacharyya](#), University of Kentucky; [Suzana Nunes](#), KAUST








- 13:30 - 14:00 Preparation and Application of Patterned Membranes for the Control of Biofouling In MBR for Waste Water Treatment  
[Won](#) (Speaker), Seoul National University; [Lee](#), Seoul National University; [Kim](#), Georgia Institute of Technology; [Lee](#), Seoul National University; [Khang](#), Yonsei University
- 14:00 - 14:30 Membrane-based Concentration of Aqueous Hydrogen Peroxide Solution  
[Roy](#), New Jersey Institute of Technology; [Thongsukmak](#), New Jersey Institute of Technology; [Sirkar](#) (Speaker), New Jersey Institute of Technology
- 14:30 - 15:00 Responsive Hydrogel for Nanoparticles Synthesis and Water Detoxification  
[Xiao](#) (Speaker), University of Kentucky; [Bhattacharyya](#), University of Kentucky
- 15:00 - 15:30 Parametric Sensitivity of Reverse Electrodialysis for Energy Production Using Difference in Salinity  
[Patil](#) (Speaker), University of Toledo; [Lipscomb](#), University of Toledo
- 15:45 - 16:15 Thermally Rearranged (TR) Polymers as Membranes for Ethanol Dehydration  
[Ba](#) (Speaker), The University of Texas at Austin; [Leo](#), Univeristy of Naples Federico II; [Czenkusch](#), The University of Texas at Austin; [Rebeiro](#), The University of Texas at Austin; [Paul](#), The University of Texas at Austin; [Freeman](#), The University of Texas at Austin; [Mensitieri](#), Univeristy of Naples Federico II
- 16:15 - 16:45 N-isopropylacrylamide (NIPAAM) Modified Cellulose Acetate Membranes  
[Chede](#) (Speaker), The University of Toledo; [Gorey](#), The University of Toledo; [Escobar](#), The University of Toledo; [Bothun](#), The University of Rhode Island
- 16:45 - 17:15 THF Dehydration by Pervaporation with Perfluorinated Composite Membrane   €
[Campos](#), Compact Membrane Systems; [Knopf](#), Compact Membrane Systems; [Maiumdar](#), Compact Membrane Systems; [Nemser](#) (Speaker), Compact Membrane Systems

Membrane Applications II

Skyview 1

Wednesday June 8

Chairs: [Felicia Nave](#), Prairie View A&M University; [Kamalesh K Sirkar](#), New Jersey Institute of Technology







- 13:30 - 14:00 Membrane Drying of Ionic Liquid Solutions  G
[Du](#) (Speaker), University of Toledo; [Lipscomb](#), University of Toledo
- 14:00 - 14:30 Thermally Rearranged Hydroxyl-functional Polyimides for Olefin/Paraffin Separations  H
[Smith](#) (Speaker), The University of Texas at Austin; [Tran](#), The University of Texas at Austin; [Gunawan](#), The University of Texas at Austin; [Sanders](#), The University of Texas at Austin; [Ribeiro](#), The University of Texas at Austin; [Freeman](#), The University of Texas at Austin; [Paul](#), The University of Texas at Austin; [Guo](#), Virginia Polytechnic Institute and State University; [McGrath](#), Virginia Polytechnic Institute and State University
- 14:30 - 15:00 MBR Process Modeling and Optimization Using Artificial Neural Network and Mechanistic Bioprocess Models  I
[Chen](#) (Speaker), Nanyang Technological University; [Luo](#), Nanyang Technological University; [Mu](#), DHI-NTU Research Center and Education Hub; [Zhang](#), DHI-NTU Research Center and Education Hub; [Andersen](#), DHI-NTU Research Center and Education Hub; [Jørgensen](#), DHI Denmark
- 15:00 - 15:30 Low Temperature Thermal-Crosslinking of 6FDA/DAM-DABA Membrane for Anti-Plasticization of CO₂ in Natural Gas Separation  I
[QIU](#) (Speaker), Georgia Institute of Technology; [Chen](#), Georgia Institute of Technology; [Xu](#), Georgia Institute of Technology; [Koros](#), Georgia Institute of Technology
- 15:45 - 16:15 VSep Membrane Filtration for Flowback Water  I
[Galimberti](#) (Speaker), New Logic - VSep
- 16:15 - 16:45 Hydrophobic Modification of Molecular Sieve and Zeolites Through Surface Membrane Coating Technology on CO₂ Adsorption  J
[Rao](#) (Speaker), Pacific Northwest National Laboratory; [Liu](#), Pacific Northwest National Laboratory
- 16:45 - 17:15 Korean Soju Liqueur Containing Oxygen Dissolved Using a Membrane Technology  I €
[Oh](#), Chungnam National University; [Cho](#), Chungnam National University; [Kong](#), Chungnam National University; [Lee](#) (Speaker), Chungnam National University

Membrane-based CO₂ Capture Technologies II

Skyview 3

Wednesday June 8

Chairs: [Tim Merkel](#), Membrane Technology & Research; [Ed Sanders](#), Air Liquide

- 13:30 - 14:00 Advanced Membrane System for Hydrogen Separation and Carbon Dioxide (CO₂) Capture  G
[Livingston](#) (Speaker), Eltron Research and Development Inc.; [Evenson](#), Eltron Research and Development Inc.; [Mackay](#), Eltron Research and Development Inc.; [Anderson](#), Eltron Research and Development Inc.; [Fauli](#), Eltron Research and Development Inc.; [Benjamin](#), Eltron Research and Development Inc.; [Del Negro](#), Eltron Research and Development Inc.; [Jack](#), Eltron Research and Development Inc.
- 14:00 - 14:30 Membrane Reactor Technology Integrated Into IGCC Power Plants: An Economic Evaluation in the Presence of Uncertainty  H
[Koc](#) (Speaker), Worcester Polytechnic Institute; [Kazantzis](#), Worcester Polytechnic Institute; [Ma](#), Worcester Polytechnic Institute
- 14:30 - 15:00 A Comparison of Hydrogen-Selective and CO₂-Selective Polymer Membranes for Pre-Combustion CO₂ Capture  I
[Zhou](#) (Speaker), MTR; [Thomas](#), MTR; [Lin](#), MTR; [Serbanescu](#), MTR; [Vu](#), MTR; [Merkel](#), MTR
- 15:00 - 15:30 CO₂ Capture by Sub-Ambient Membrane Operation  I
[Kulkarni](#) (Speaker), Air Liquide; [Hasse](#), Air Liquide; [Sanders](#), Air Liquide; [Tranier](#), Air Liquide; [Shanbhag](#), Air Liquide
- 15:45 - 16:15 Sweep-Assisted CO₂ Capture from Natural Gas Combined Cycle Power Plants: Studies on Process Design  I
[Wei](#) (Speaker), Membrane Technology and Research, Inc. ; [Merkel](#), Membrane Technology and Research, Inc. ; [Baker](#), Membrane Technology and Research, Inc.
- 16:15 - 16:45 Membrane-hybrid Processes for CO₂ Capture from Power Plants  I
[Follmann](#), RWTH Aachen University ; [Bayer](#), RWTH Aachen University ; [Harlacher](#) (Speaker), RWTH Aachen University ; [Scholz](#), RWTH Aachen University ; [Wessling](#), RWTH Aachen University ; [Melin](#), RWTH Aachen University
- 16:45 - 17:15 Liquid-Like Polyethylene Glycol Supported in Organic-Inorganic Membranes for CO₂ Removal  I
[Xia](#) (Speaker), National University of Singapore; [Liu](#), National University of Singapore; [Lau](#), National University of Singapore; [Chung](#), National University of Singapore

Physical Measurements

Skyview 4

Wednesday June 8

Chairs: [Alan Greenberg](#), University of Colorado; [Brandon Rowe](#), National Institute of Standards & Technology

- 13:30 - 14:00 **Mechanical Properties of Nanometer-Thin Polymer Membranes** 000001 €
[Chung](#) (Speaker), National Institute of Standards and Technology; [Lee](#), National Institute of Standards and Technology; [Beers](#), National Institute of Standards and Technology; [Stafford](#), National Institute of Standards and Technology
- 14:00 - 14:30 **Characterization of Membranes by Cross-sectional Confocal Laser Scanning Microscopy** 000001 F
[Marroquin](#) (Speaker), Clemson University; [Bruce](#), Clemson University; [Pellegrino](#), University of Colorado; [Wickramasinghe](#), University of Arkansas; [Husson](#), Clemson University
- 14:30 - 15:00 **Mechanical Degradation of Polyamide Active Layers upon Chlorine Exposure** 000001 G
[Lee](#) (Speaker), National Institute of Standards and Technology; [Chung](#), National Institute of Standards and Technology; [Howarter](#), National Institute of Standards and Technology; [Yoon](#), National Institute of Standards and Technology; [Stafford](#), National Institute of Standards and Technology
- 15:45 - 16:15 **Model Membrane Assemblies for RO and NF Applications** 000001 H
[Johnson](#), National Institute of Standards and Technology; [Yoon](#), National Institute of Standards and Technology; [Stafford](#) (Speaker), National Institute of Standards and Technology
- 16:15 - 16:45 **Development and Positron Annihilation Spectroscopy (PAS) Characterization of Torlon®-PES Based Defect-Free Dual-Layer Hollow Fiber Membrane with an Ultrathin Dense-Selective Layer For Gas Separation** 000001 I
[Li](#) (Speaker), National University of Singapore; [Li](#), Suzhou Faith & Hope Membrane Technology Co. Ltd; [Chung](#), National University of Singapore; [Chen](#), University of Missouri-Kansas City; [Jean](#), University of Missouri-Kansas City; [Kawi](#), National University of Singapore
- 16:45 - 17:15 **Influence of Porous Structure on Electrokinetic Properties of Polymer Membranes** 000001 Í
[Luxbacher](#) (Speaker), Anton Paar GmbH; [Yaroshchuk](#), Technical University of Catalonia