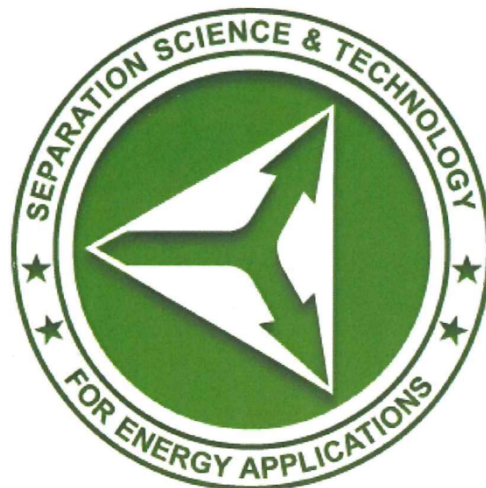


Twenty-Second Symposium on Separation Science and Technology for Energy Applications

November 3-6, 2025
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830





Symposium Agenda

Monday, November 3, 2025

Badging and Registration	7:30 – 8:00 a.m.
Welcome and Introduction	7:55 – 8:00 a.m.
Session I: Plenary Session	8:00 a.m. – 12:00 p.m.
Lunch (on your own)	12:00 – 2:00 p.m.
Session II: Sorption and Ion Exchange	2:00 - 4:50 p.m.
Session III: Student Lightning Talks	5:00 – 5:30 p.m.
Session IV : Poster Session and Reception	6:00 – 8:00 p.m.

Tuesday, November 4, 2025

Badging and Registration	7:30 – 8:15 a.m.
Session V: Solvent Extraction	8:15 – 11:55 a.m.
Lunch (on your own)	11:55 a.m.
Afternoon Free for individual discussions	
Session VI: Medical Isotopes	6:00 – 7:45 p.m.

Wednesday, November 5, 2025

Badging and Registration	7:30 – 8:15 a.m.
Session VII: Novel Separations	8:15 – 11:30 a.m.
Lunch (on your own)	11:30 a.m. – 1:30 p.m.
Session VIII: Nuclear Fuel Cycle Separations	1:30 – 4:45 p.m.
Banquet Reception	6:00 – 8:00 p.m.



Thursday, November 6, 2025

Badging and Registration	7:30 – 8:15 a.m.
Technical Session IX: DOE Applications	8:15 – 11:30 a.m.
Adjourn	11:30 a.m.



November 3, 2025
Monday Morning

Technical Session I
Iran Auditorium

Plenary Session

Chair: Lætitia Delmau (Oak Ridge National Laboratory)

- 8:00 a.m. Separation Needs for the Isotope Science and Enrichment Directorate
Jeremy Busby *Oak Ridge National Laboratory*
- 8:45 a.m. Practical Considerations in the Production of Rare-Earth Elements
David Harvey *MP Materials*
- 9:30 a.m. Open Questions and Opportunities in Solvent Extraction and Beyond
Bruce Moyer *Oak Ridge National Laboratory*
- 10:15 a.m. Break
- 10:30 a.m. Transforming Nuclear Waste Management – SHINE’s Integrated UNF Recycling and Transmutation Strategy
Abdul Momen *SHINE Technologies*
- 11:15 a.m. Separations for Radioisotope Recovery and Environmental Remediation
Paul Sylvester *Energy Solutions*
- 12:00 p.m. Lunch

November 3, 2025
Monday Afternoon

Technical Session II
Iran Auditorium



Membranes/Sorption/Ion Exchange Separations

Chair: Shalina Metzger (Oak Ridge National Laboratory)

- 2:00 p.m. Combined Electrocoagulation and Activated Carbon Treatment of Farm Wastewater
Swapnamoy Dutta *Oak Ridge National Laboratory*
- 2:25 p.m. Alkaline-Side Recovery and Purification of Uranium by Ion-Exchange
Joel Castillo *Pacific Northwest National Laboratory*
- 2:50 p.m. Loading and ion-Exchange Behavior of Zirconium Phosphate Nanoplatelets
Adrianna Orsi *University of Alabama - Birmingham*
- 3:15 p.m. Break
- 3:35 p.m. Electrochemically Enhanced Critical Materials Separations in 2D COF-MXene Membranes
Julia Chung *Lawrence Livermore National Laboratory*
- 4:00 p.m. High-Pressure Ion Chromatographic Chemical Separations for Inductively-Coupled Plasma Mass Spectrometry Assay at Oak Ridge National Laboratory
Tamara Keever *Oak Ridge National Laboratory*
- 4:25 p.m. Processing Elusive f-Elements at ORNL: ^{147}Pm , ^{249}Bk , ^{254}Es , and ^{257}Fm
Cristian Celis-Barros *Oak Ridge National Laboratory*



November 3, 2025
Monday Evening

Technical Session IV
6:00 – 8:00 p.m.

Poster Presentation and Reception

Chair: Lætitia H. Delmau (Oak Ridge National Laboratory)

- 1 **Krishna P. Gnyawali**, *Tennessee Technological University*, TODGA-Inspired, Amide Functionalized Bis-1,2,4-Triazinyl-2,6-Pyridine as a Complexant for Minor Actinide Extraction from Lanthanides
- 2 **Ashley Harvey**, *Oak Ridge National Laboratory*, Processing of Es-253/254 and Fm-257 from the Cf-252 Campaign
- 3 **Konstantinos Kavallieratos**, *Florida International University*, Lipophilic mono- and bis-Sulfonamidophenol Ligands as f-Element Chelators for High-Level Waste Separations under Alkaline Conditions
- 4 **Kenneth O. Klutse**, *Oak Ridge National Laboratory*, Crystal Clear: Insights into Rare Earth Separation via a Tunable Ligand
- 5 **Amanda Morgan**, *Indiana University*, Multi-Ion Complexes and Competition from Bulky BArF⁻ Anions for Chloride Binding in Ion Pairing Conditions
- 6 **Nathan Sims**, *Oak Ridge National Laboratory*, Recovery and Purification of Bk-249 from the Cf-252 Campaign
- 7 **Daniel G. Racz**, *University of Tennessee-Knoxville*, Improved Adjacent Lanthanide Separation with Diglycolamide Resins and Neutral Aqueous Complexants
- 8 **Shayla G. Wood**, *Tennessee Technological University*, Progress Towards the Hofmann Rearrangement of Heteroaryl Carboxamides to Afford Heteroaryl Amino Complexant Synthons
- 9 **Sara E. Speetjens**, *Pacific Northwest National Laboratory*, Robust Lithium Recovery from Lithium-Aluminum Matrices: A Scalable Ion Exchange Approach
- 10 **Lakshi M. Thilakarathne**, *Tennessee Technological University*, Development of Advanced Complexant Frameworks and Solvent-Impregnated Resins for Sustainable Separation of Trivalent Actinides from Lanthanides in Spent Nuclear Fuel
- 11 **Joshua O. Aggrey**, *Oak Ridge National Laboratory*, Synthesis of Aqueous Bis-lactam-1, 10-phenanthroline for Lanthanide Separation

November 4, 2025
Tuesday Morning

Technical Session V
Iran Auditorium



Solvent Extraction

Chair: Santa Jansone-Popova (Oak Ridge National Laboratory)

- 8:15 a.m. Understanding the Kinetics of Lanthanide(III) Extraction from Nitric Acid Media by TODGA with and without Phase Modifiers
Wyatt S. Noble *Colorado School of Mines*
- 8:40 a.m. Investigation of Rare Earth Solvent Extraction Separation from Monazite Feed
Tatiana Levitskaia *Pacific Northwest National Laboratory*
- 9:05 a.m. Partitioning of Np and Tc in the Direct Extraction Process Using DEHiBA Solvent
Peter Tkac *Argonne National Laboratory*
- 9:30 a.m. Synthesis of Sequence-defined Triazolophane Macrocycles: Toward the Binding of ReO_4^- for Dilute Liquid-Liquid Extraction
Luigi Gutierrez-Cruz *Indiana University*
- 9:55 a.m. Break
- 10:15 a.m. Direct Extraction of Uranium Oxides with Monoamide Ligands
Amy Speelman *Pacific Northwest National Laboratory*
- 10:40 a.m. Solvent Extraction Flowsheet Optimization of a Pm-147 Surrogate in N,N,N',N'-Tetraoctyl Diglycolamide Using the Argonne Model for Universal Solvent Extraction (AMUSE) Code
Clarice Phelps *Oak Ridge National Laboratory*
- 11:05 a.m. Extraction and Light-Driven Release of Superhydrophilic Oxoanions Using Amphiphilic Iminoguanidine Ligands
Nabarupa Bhattacharjee *Oak Ridge National Laboratory*
- 11:30 a.m. Characterization of f-Element Complexes with Hydroxypyridinone Chelators for Redox Stabilization and Extraction
Marlom Martinez *Florida International University*
- 11:55 a.m. Lunch

Afternoon Free for individual discussions



November 4, 2025
Tuesday Evening

Technical Session VI
Iran Auditorium

Medical Isotopes/Novel Separations

Chair: Subhamay Pramanik (Oak Ridge National Laboratory)

- 6:00 p.m. Advanced Separations for Scalable, High Specific-Activity, No Carrier-Added Lutetium-177 Production
MD. A. Momen *Shine Technologies*
- 6:25 p.m. Small-Scale ^{225}Ac Production from Photonuclear Transmutation of ^{226}Ra Targets
Cory Hawkins *NorthStar Medical Radioisotopes*
- 6:50 p.m. From Architecture to Selectivity: Computational Insights into Lanthanide-Ligand Complexation
Anton Pozdeev *Vanderbilt University*
- 7:15 p.m. Ligand Design for Rare Earth Separations: Crafting Selectivity with Precision
Subhamay Pramanik *Oak Ridge National Laboratory*

November 5, 2025
Wednesday Morning

Technical Session VII
Iran Auditorium



Novel Separations

Chair: Abdul Momen (SHINE Technologies)

- 8:15 a.m. Rare Earth Ion Transport in Small Diameter Metallic and Semiconducting Carbon Nanotube Porins
Alexsandr Noy *Lawrence Livermore National Laboratory*
- 8:40 a.m. Stimuli-Responsive Iminoguanadine Receptors for Selective Separation of Superhydrophilic Oxyanions from Ultradilute Aqueous Environments
Radu Custelcean *Oak Ridge National Laboratory*
- 9:05 a.m. Small Molecule Chelating Extractants for Select Economically Critical Metals
Stephen Long *National Energy Technology Laboratory*
- 9:30 a.m. Transuranic Trapping Inside Guanidinium-Uranyl-Carbonate Double Salt
Peter Zalupski *Idaho National Laboratory*
- 9:55 a.m. Break
- 10:15 a.m. Advancing Minor Actinide Extraction *via* Alkoxy-Functionalized BTPs
Jesse Carrick *Tennessee Technological University*
- 10:40 a.m. Chemoinformatics-Guided Design of MA Extractants – Integrating Fluorinated Solvents and Machine Learning
Masahiko Nakase *Institute of Science Tokyo*
- 11:05 a.m. Redox Behavior of Eu(III) Using TODGA-Functionalized Carbon Paste Electrodes
Erin Bertelsen *University of Massachusetts – Lowell*
- 11:30 a.m. Lunch



November 5, 2025
Wednesday Afternoon

Technical Session VIII
Iran Auditorium

Nuclear Fuel Cycle Separations

Chair: Gabriel Hall (Pacific Northwest National Laboratory)

Co-Chair: Peter Tkac (Argonne National Laboratory)

- 1:30 p.m. Effect of Radiolytic HNO_2 and DBP on the Extraction of Np in CoDCon
Gabriel Flores *Argonne National Laboratory*
- 1:55 p.m. Separation of TRISO Particles from bulk graphite
Gabriel Hall *Pacific Northwest National Laboratory*
- 2:20 p.m. Experimental Studies and Molecular Modeling of the Physicochemical Properties of Pure Monoamide Extractants
Clovis Poulin-Ponnelle *University of Montpellier, France*
- 2:45 p.m. Dissolution Characteristics of Mixed Oxide Fuel in Alniflex
Jarrold M. Gogolski *Savannah River National Laboratory*
- 3:10 p.m. Break
- 3:30 p.m. Np(V)/Np(VI) Equilibria and Kinetics in Advanced Nuclear Fuel Recycling
David Bettinardi *Argonne National Laboratory*
- 3:55 p.m. Correlating Radiolytic, Non-Radioactive Radical, and Computational Methods for Monoamide Degradation
Julia Brumaghim *Clemson University*
- 4:20 p.m. PUMAS – From Recycling to Multicycling: A Monoamide-based Solvent Extraction Process for C-Recovery of Uranium and Plutonium from Spent UOX and MOX Fuel
Loic Daronnat *Orano Recycling*
- 6:00 p.m. Banquet Reception at the Double Tree Hotel
Conference Banquet, Student Poster Awards, and After-Dinner Presentation



November 6, 2025
Thursday Morning

Technical Session IX
Iran Auditorium

DOE Applications

Chair: Thomas Shehee (Savannah River National Laboratory)
Co-Chair: Jarrod Gogolski (Savannah River National Laboratory)

- 8:15 a.m. Rethinking Rare Earth Element Separations: Harnessing Selectivity at the Leaching Stage
Lesta Fletcher *Oak Ridge National Laboratory*
- 8:40 a.m. Zirconium Tetrachloride ($ZnCl_4$) Recovery Utilizing Advance Chlorination, Sedimentation, and Microfiltration
Laura Arias Chavez *Oak Ridge National Laboratory*
- 9:05 a.m. Development of an Am/Bi Separation After Oxidation of Am(III) using $NaBiO_3$
Jennifer Pyles *University of Alabama at Birmingham*
- 9:30 a.m. Progress for HALEU Production at the Savannah River Site
Thomas C. Shehee *Savannah River National Laboratory*
- 9:55 a.m. Break
- 10:15 a.m. Analytical Capabilities in the Radioactive Materials Analytical Laboratory
Shalina Metzger *Oak Ridge National Laboratory*
- 10:40 a.m. Orphaned Fuels: Adopting a Domestic Nuclear Fuel Cycle
Richard Mayes *Pacific Northwest National Laboratory*
- 11:05 a.m. Removal of Calcium and Silica from Simulated Blowdown Water
Swapnamoy Dutta *Oak Ridge National Laboratory*
- 11:30 a.m. Concluding Remarks