

2023 Fall ACS COMSCI symposium

Sunday morning

Critical Materials: Perspectives from the Industry, Government, and Research Communities: Strategic vision for critical materials

08:00am - 11:20am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Professor Young-Shin Jun, Organizer, Presider; **Dr. James D Kubicki**, Organizer, Presider
Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Co-Sponsor/Theme: **Co-sponsor - Nominal ENVR: Division of Environmental Chemistry Co-sponsor - Nominal GEOC: Division of Geochemistry Co-sponsor - Nominal ENFL: Division of Energy and Fuels Co-sponsor - Cooperative ENFL: Division of Energy and Fuels Co-sponsor - Cooperative ENVR: Division of Environmental Chemistry Co-sponsor - Cooperative GEOC: Division of Geochemistry**

Division/Committee: [COMSCI] Committee on Science

This symposium will focus on the research and development needs for critical materials as defined by Executive Order 13953 "Addressing the Threat to the Domestic Supply Chain From Reliance on Critical Minerals From Foreign Adversaries and Supporting the Domestic Mining and Processing Industries". There is a clear recognition for collaborations among the chemical research, industrial and governmental communities to address the supply chain of critical materials for economy, environment and national security needs. With the advances in the chemical community, this symposium is intended as a forum for the various communities to come together to share knowledge and strategies and to identify knowledge gaps.

Sunday

Introductory Remarks

08:00am - 08:10am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

3931563 - Critical materials: The perspective and programs in the Department of Energy

08:10am - 08:55am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Geraldine Richmond, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

3924836 - Overview of the National Energy Technology Laboratory's critical minerals and materials program

08:55am - 09:20am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Brett Hakey, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

3924907 - Towards a sustainable LCA framework for critical mineral production in the U.S.

09:20am - 09:45am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Shirley Sam, Presenter; **Priyadarshini Unknown**; **Roksana Roksana**; **Xinyao Shen**; **Tyler Davis**; **Michelle Krynock**; **Christy Pecyna**

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

Intermission

09:45am - 10:00am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

3915037 - Developing novel, highly selective critical materials separation technologies for diverse, low-grade feedstocks

10:00am - 10:30am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Tanya Prozorov, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

3925361 - How an appreciation of and investment in research information infrastructure and metadata will accelerate us towards a sustainable chemical future

10:30am - 10:55am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Suze Kundu, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday

3924200 - Process-level cost benchmarks to establish economic viability of environmentally and socially sustainable unconventional rare earth element feedstocks

10:55am - 11:20am USA / Canada - Pacific - August 13, 2023 | Location: Room 2022, West Bldg. (Moscone Center)

Alison Fritz, Presenter; **Thomas Tarka**; **Meagan Mauter**

Division: [COMSCI] Committee on Science

Session Type: Oral - Hybrid

Sunday afternoon

Critical Materials: Perspectives from the Industry, Government, and Research Communities: Multi-faceted Perspectives of Critical Materials

02:00pm - 05:30pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Professor Young-Shin Jun, Organizer, Presider; **Dr. James D Kubicki**, Organizer, Presider

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

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Introductory Remarks

02:00pm - 02:05pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

3931654 - Critical minerals and metals supply and demand; implications for the minerals industry, supply chains, recycling, and the development of circular economies

02:05pm - 02:50pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Simon Jowitt, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

3926536 - Revolutionizing processes to advance rare earth element separations

02:50pm - 03:15pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Santa Jansone-Popova, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

3903615 - Evaluation of critical minerals from U.S. shales

03:15pm - 03:40pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Maximilian Barczok, Presenter; **Mengling Stuckman**; **Wei Xiong**; **Meghan Brandi**; **Christina Lopano**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

Intermission

03:40pm - 03:55pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

3902047 - Role of geoscience departments in facilitating academic, industry and government collaboration on the critical mineral supply chain

03:55pm - 04:20pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Dr. James D Kubicki, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

3931655 - Evidence for Phanerozoic crustal oxidation from the evolution of manganese, iron, and copper minerals

04:20pm - 04:45pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Daniel Hummer, Presenter

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Sunday

Panel Discussion

04:45pm - 05:30pm USA / Canada - Pacific - August 13, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Panelists

- Geraldine Richmond – Under Secretary for Science and Innovation at the Department of Energy (DOE)
- Tanya Prozorov – Scientist, Ames National Laboratory
- Christina Lopano – Scientist, National Energy Technology Laboratory
- Kurt House – CEO, Kobold Inc.
- Simon Jowitt – Associate Professor, University of Nevada – Reno
- Suze Kundu – Director of Researcher and Community Engagement, Digital Science

Monday morning

08:00am - 11:40am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Dr. James D Kubicki, Organizer, Presider; **Professor Young-Shin Jun**, Organizer, Presider
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Introductory Remarks

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Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3922882 - Developing novel ligands chemistries for photoreactions and separations of critical rare earths

08:05am - 08:30am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Andrew Ferguson, Presenter; **Eric Schelter**; **Mark Jensen**; **Alan Sellinger**; **Ross Larsen**; **Melissa Gish**; **Dr. Justin Johnson**; **Iskander Douair**; **Kevin Ruoff**; **Ellen Song**; **Anastasia Kuvayskaya**; **Thomas Mallos**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3913844 - Mining and metallurgical wastes from porphyry copper deposits as potential sources of critical and strategic elements, a new approach toward a circular economy

08:30am - 08:55am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Etzigueri Gongora Ubeda, Presenter; **Francisco Romero**; **Luis Gerardo Martinez Jardines**; **Jose Santos Jallath**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3913834 - Hydrolysis behavior of erbium in near-neutral to alkaline aqueous solutions at 25 to 75 °C

08:55am - 09:20am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Hannah Han, Presenter; **Alexander Gysi**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3927148 - Critical Mineral Assessment of Mineral Carbonation Waste Streams

09:20am - 09:45am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Jon Yang, Presenter; **Sophia Bauer**; **Circe Verba**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3931656 - Carbonation of Ni- and Co-doped forsterite in humidified supercritical carbon dioxide

09:45am - 10:10am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

John Loring, Presenter; **Sebastian T. Mergelsberg**; **Tenley Webb**; **Mark Bowden**; **Odeta Qafoku**; **Sebastien Kerisit**; **Professor Young-Shin Jun**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

Intermission

10:10am - 10:25am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3928198 - High purity extraction of rare earth elements from low-grade resources using supercritical fluids

10:25am - 10:50am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Professor Young-Shin Jun, Presenter; **Yaguang Zhu**; **Guangcheng Wang**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3913325 - Advancing rare earth element characterization to inform recovery from coal ash materials

10:50am - 11:15am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Mengling Stuckman, Presenter; **Colleen Hoffman**; **Christina Lopano**; **James Hower**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3927842 - Determination of Dy complexation in hydrothermal fluids as a function of pH and temperature using solubility experiments and Raman spectroscopy

11:15am - 11:40am USA / Canada - Pacific - August 14, 2023 | Location: Room 2002, West Bldg. (Moscone Center)

Sarah Smith, Presenter; **Alexander Gysi**; **Nicole Hurtig**; **Artaches Migdisov**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday afternoon

Critical Materials: Perspectives from the Industry, Government, and Research Communities: Recovery of Critical Materials

02:00pm - 05:05pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

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Monday

3922914 - Selective ion transport in confinement

02:05pm - 02:35pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

Chong Liu, Presenter

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Monday

3923845 - Adsorption of rare earth elements on nanoporous oxides and metal-organic frameworks

02:35pm - 03:00pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

Dr. Anastasia Ilgen, Presenter; **Nadine Kabengi**; **Ronald Sikma**; **Dorina Sava Gallis**; **Kadie Sanchez**; **Jacob Smith**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

3927508 - Identifying predictive structural characteristics of metal-organic frameworks for the transport and separation of rare-earthed elements using machine learning

03:00pm - 03:25pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

Jacob Harvey, Presenter; **Dr. Anastasia Ilgen**

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Monday

Intermission

03:25pm - 03:40pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

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Monday

3926740 - Interfacial spectromicroscopy of water oxidation at Earth abundant solar photoanodes

03:40pm - 04:05pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

Prof. Franz M. Geiger, Presenter

Division: [COMSCI] Committee on Science

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Monday

3927681 - Re-mining red mud waste for rare earth elements recovery

04:05pm - 04:30pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

Xin Zhang, Presenter

Division: [COMSCI] Committee on Science

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Monday

3927998 - Scalable biosorption of rare earth elements using Bacillus Subtilis Spores

04:30pm - 04:55pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

Connor Clark, Presenter; **Audie Thompson**; **Chris Griggs**

Division: [COMSCI] Committee on Science

Session Type: Oral - In-person

Monday

Concluding Remarks

04:55pm - 05:05pm USA / Canada - Pacific - August 14, 2023 | Location: Room 2007, West Bldg. (Moscone Center)

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