# The Office of Materials and Chemical Technologies and NE-43 Programs Stewardship

## FY25 CINR FOA Webinar

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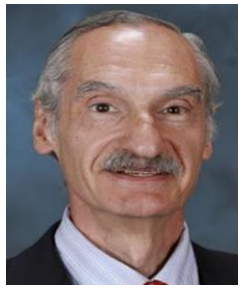
U.S. DEPARTMENT OF ENERGY

# Office of Materials and Chemical Technologies (NE-43) Staff & Program Responsibilities



**Dr. Bill Del Cul**
Aqueous Separations
Vapor Phase Separations
Hybrid ZIRCEX

**Ms. Kimberly Gray**
Off-Gas Captures and Immobilization
Advanced Waste Form Development

**Dr. Stephen Kung**
Uranium Mining

**Ms. Sue Lesica**
Materials Coordination
NE-5 ART and LWRS Materials R&D

**Ms. Tansel Selekler**
Materials Protection, Accounting & Control Technology
EBR-II for HALEU Production

**Dr. Ming Tang**
Innovative Nuclear Materials

**Dr. Jim Willit**
Pyroprocessing
Molten Salt Chemistry
Molten Salt Fuels

# NE-43 Program Stewardship
# (I) Materials Recovery & Waste Form Development (MRWFD)

**Mission** – Develop advanced fuel recycle technologies to improve resource utilization, reduce repository burden, limit proliferation risk and improve economics.

## MRWFD Technology Focus Areas

- Adv. Aqueous Processing
- Vapor Phase Separations
- Pyroprocessing / Molten Salt Separations
- Off-gas Capture and Immobilization
- Adv. Waste Form Development

# NE-43 Program Stewardship
# (II) Materials Protection, Accounting & Control Technologies (MPACT)

**Mission** – Develop innovative real (or near-real) time technologies, analysis tools, and advanced integration methods to supports the U.S. advanced fuel cycles technology developers to effectively and economically address nuclear materials control and accounting (MC&A) requirements.

## MPACT Technology Focus Areas

- Develop Domestic Safeguards Performance Models for Fuel Cycle Flowsheets
- Incorporate domestic safeguards into early R&D stage
- Sensors for real time measurements (concentrations, density…)
- Advanced electronics for Non-Destructive Assay (NDA)

# NE-43 Program Stewardship
# (III) Innovative Nuclear Materials

**Missions** – **(1)** Develop next generation fuel cladding and in-core materials and (2) address nuclear materials recycling and reuse with emphasis on maintaining long-term nuclear materials sustainability.

**INM Technology Focus Areas** – Develop Innovative Fuel **Cladding Materials**

- Materials Design – novel metallic alloy and/or new coating
- Material Performance under Extreme Conditions
- Material Fabrication and Manufacturing Technologies

# FY25 CINR FOA Topics
# Under NE-43 Program Areas

**Topic Area 3 – Nuclear Fuel Recycle Technologies** – Bill Del Cul & Jim Willit

- Developing adv fuel recycling technologies for irradiated fuels
- Addressing fundamental materials separations and recovery challenges that present significant degrees of technical risks and financial uncertainties.

**Topic Area 4 – Fuels** Molten Salt Fuels – Jim Willit

- 2023 workshop on the MSR Fuel Cycle Chemistry R&D needs *(https://publications.anl.gov/anlpubs/2024/02/187645.pdf)*

**Topic Area 10 — Licensing, Safety, and Security**

- Innovative MC&A Methods and Tools for Fuel Cycle – Tansel Selekler

**Topic Area 11 — Advanced Nuclear Materials**

- Innovative Cladding Materials – Ming Tang
- Innovative Materials for Off-gas Capture and Waste Forms – Kim Gray

**Topic Area 12 — Blue Sky**