

P/O/E/T/S

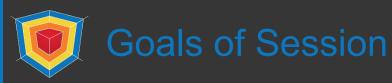
CENTER FOR POWER OPTIMIZATION OF ELECTRO-THERMAL SYSTEMS

Materials Workshop Template

2022 Annual Meeting

October 18 – Noon to 2:00pm PDT







Materials selection and development has been at the heart of POETS efforts since the start of the center; however, they take a significant amount of time to assess, develop and mature. This session will explore the development and integration of new materials and materials systems for electro-thermal power density improvements.

Outcomes:

- Review POETS active research in the area of materials over the last several years.
- Address some of the challenges and industry needs surrounding materials research.
- Identify focus areas of fundamental research and enabling technologies where POETS can contribute as we move forward





Session Facilitated by Dr. Sonya Smith

- 20 Min Industry Presentation
 - TBD Working with NASA Ames
- 60 Min Technology Presentations
 - 15 Min Materials enabling higher heat fluxes for components with the goal of improved thermal management. (Dr. Ashegi)
 - 15 Min Novel materials and approaches for high power and energy density thermal energy storage (Dr. Miljkovic/Dr. Braun/Dr. Lyding)
 - 15 Min Nitride materials in power electronics (Dr. Stillwell)
 - 15 Min Cryogenics for conventional systems and for superconductivity (Dr. Haran, Dr. Mantooth)
- 40 Min Guided discussion
 - Challenges and needs regarding materials and how POETS can contribute.
 Group encouraged to rank and stack ideas to ensure POETS is focusing on highest need objectives.

Tasks for Technical Presentation

- Provide high-level introduction of topic area
- Highlight current state of POETS research; including challenges
- Showcase specific projects that demonstrate POETS competency





Faculty – Please insert your slides here and return to Owen by **Monday, October**17 for placement into the overall slide deck.

For Information Only

Tasks for Technical Presentation

- Provide high-level introduction of topic area
- Highlight current state of POETS research; including challenges
- Showcase specific projects that demonstrate POETS competency

Audience

- POETS' Industry Reps multi-disciplines
- POETS' Faculty
- POETS' Students

Support

- If you want to include graphics or information on a POETS project in your topic area that is not your project, let Owen know and he can pull that information.
- If you have some papers or documents you would like to provide the IAB/Students to help with technical backgrounds, please provide them to Owen and he will disseminate prior to event.





Not including Battery Chemistry

Superconducting cables

Continue to look for 1st, 2nd, 3rd, tier suppliers





Simulating material impacts at the system level

Materials for High Heat Flux

Novel Materials/methods for Thermal Management

- PCM
- Additive manufacturing for heat sinks

Nitride Materials for Power Electronics

GAN

Superconductors

- Cryocooler
- Power electronics
- Cables

Battery Modeling Lifecycle (Industry)

Battery Weight/Heat - Material Solutions

High Temperature Capacitors and Inductors

Improving energy storage (general)

Taking advantage of SiC fab capabilities