

*Connecting the global minerals, metals, and materials community.*



## **Plan Now to Attend:**

### **Structural Materials, Heat Transport Fluids, and Novel System Designs for High Power and Process Heat Generation**

High-temperature sources are desirable for a wide range of engineering and industrial applications. Many renewable energy systems have the potential to develop a heat source for desirable high temperatures. Especially with the development of new Nuclear Power (NP), Clean Coal (CC) concepts as well as Concentrating Solar Power (CSP) concepts with high temperatures for process heat, hydrogen generation, or efficient energy storage become viable options. The push to higher temperatures (>750°C) increases the need for different heat transport fluids and raises the question of the limits of structural materials available and deployed today. Harsh environments (temperature, corrosion, stress from flow of heat transport fluids, time, cost, pressure and cyclic loading) make this application challenging for the materials deployed and the limit of what conventional materials may be exceeded.

In this symposium, we are providing a platform for a thorough discussion of all materials aspects associated with high-temperature heat transport systems especially deployed in CSP, NP, and CC systems with a particular focus on the structural materials. We are inviting application-oriented papers as well as fundamental scientific contributions associated with interaction of structural materials with novel heat transport fluids (liquid salt, liquid metal, hydrocarbon, supercritical steam, supercritical CO<sub>2</sub>, etc.) including new heat transfer design concepts. Mechanical strength, high-temperature durability, and corrosion resistance of structural materials in any of the environments listed are of interest. Expected session topics include:

- Materials for very high-temperature heat transport systems with novel heat transport media, including, but not limited to, liquid metal, salt, sand, supercritical CO<sub>2</sub>
- Materials in high-temperature, high-pressure water systems
- High-temperature properties of the structural materials, including thermal cycling
- Fundamental aspects of chemistry control to prevent corrosion in these systems
- Materials needs for new heat transfer designs

#### **Sponsored by:**

- TMS Structural Materials Division; TMS Functional Materials Division (formerly EMPMD)
- Corrosion and Environmental Effects Committee; Energy Conversion and Storage Committee

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