

Rocky Mountain AIChE News

October 2022

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October Section Meeting: Development of a Novel: Solid Oxide Fuel Cell / Gas Turbine Hybrid System

Czero is developing a novel Solid Oxide Fuel Cell/ Gas Turbine (SOFC/GT) hybrid system as part of a DOE ARPA-E INTEGRATE program. This project aims to demonstrate 70% natural gas (LHV) to electrical conversion efficiency at a 50 kWe scale. Such efficiency is markedly higher than typical power generating technologies at this scale without resorting to a combined heat and power bottoming cycle. To achieve this efficiency the system tightly integrates a high-temperature (850C) planar SOFC into the hot pressurized path of a Brayton cycle microturbine.

This presentation will cover the overall design and operating principals of the SOFC/GT system including modeling of the stack's electrochemistry and the steam methane reforming/ water gas shift reactions within a packed bed reformer. The INTEGRATE project is a collaboration between Nexceris as the PI and SOFC technology developer, Brayton Energy who is developing the system's custom turbomachinery, and Czero who is leading the overall system architecture development,

October Section Meeting

- Topic:** Development of a Novel: Solid Oxide Fuel Cell / Gas Turbine Hybrid System
- Speaker:** Mike Sprengel, PhD
Modeling and Simulation Team Lead at [Czero](#)
- Date:** Thursday, October 27th
- Time:** 6:00 – Introduction
6:05 - Career Discussion
6:15 - Technical Presentation
7:15 – Q & A
- Cost:** Free

REGISTRATION REQUIRED. More information can be found on our [website](#).

[Register](#)

After you register, you will receive instructions via email for joining the meeting.

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design, construction, controls development, and testing at our facility in Ft Collins, CO.



Speaker Biography: Mike Sprengel leads the Modeling and Simulation team at Czero and specializes in dynamic system modeling and supervisory control strategy development with a specific emphasis on accelerating the development and deployment of clean energy technologies.

VOLUNTEER AS A YOUNG PROFESSIONAL LIAISON (YPL)

We are looking for Young Professional Liaisons for each state – CO, NM, WY, SD & MT. Please send nominations to any section officer listed below.

AIChE Meetings

	2022
Nov 1	CCPS Pharma, Food and Fine Chemicals Workshop – Dust Hazard Analysis Houston, TX
Nov 2-3	November 2022 TSC Meeting Houston, TX
Nov 7-9	2022 Industry 4.0: Digital Transformation Conference Chicago, IL
Nov 13-18	2022 AIChE Annual Meeting Phoenix, AZ

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Open Liaison for other states including South Dakota and Wyoming

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The objectives of AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members, and to serve society, particularly where chemical, engineering can contribute to the public interest.

MEETING SCHEDULE

The Rocky Mountain Local Section (RMLS) of AIChE generally meets the second or third Tuesday of every month, September through May.