

# Colloquium Thermo- and Fluid Dynamics

## Scalable Energy Storage Using Chemical Potential

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As society attempts to decrease its consumption of fossil fuels, Thermochemical Energy Storage (TCES) has been identified as a potential solution for scalable, long duration storage of heat. TCES is essentially the utilization of reversible reactions, which have inherently higher energy storage densities compared to sensible or latent heat storage. Thermal energy for charging such a system can be derived from the sun, industrial waste heat, or electric heating. In this presentation, we share our recent TCES work for both Concentrated Solar Power (CSP) and industrial applications, including our development of a 1-kW prototype TCES reactor-heat exchanger. The talk will also include discussion of the fundamental challenges remaining to be solved to achieve technical and commercial viability.

*Dr. Nick AuYeung is an Associate Professor in Chemical Engineering at Oregon State University where his group works on both material and reactor development for thermochemical energy conversion applications which promote industrial decarbonization. He has received funding from the U.S. Department of Energy as well as private industry to pursue his work. Before becoming a faculty member, he was a postdoc at the Department of Mechanical and Aerospace Engineering at the University of Florida where he supervised two large solar thermochemistry projects on solar fuels and energy storage. Prior to UF, he received his Ph.D. at Oregon State University in Chemical Engineering working on water splitting for hydrogen production. He received his B.S. from the University of Connecticut in Chemical Engineering. He is active in both AIChE and ASME.*



**Date:** Wednesday, 7 February 2024

**Time:** 16:15 - 17:15h

**Place:** ETH Zurich, ML F 36

**Host:** Prof. Aldo Steinfeld, Renewable Energy Carriers