

"Here at the Li Research Group, we focus on the **design, synthesis, and characterization** of **nanomaterial-based catalyst and reagent particles** for biomass and fossil energy conversions, green liquid fuel synthesis, CO₂ capture, and pollutant control. Our research also encompasses **chemical reaction engineering** and **process synthesis** and **optimization**. Density Functional Theory (DFT) based methods are also used to elucidate the particle reaction mechanisms and to identify potential ways to improve particle performance."

— **Fanxing Li**, *Alcoa Professor & University Faculty Scholar*

Chemical Looping Dry Reforming for Sustainable Syngas Production



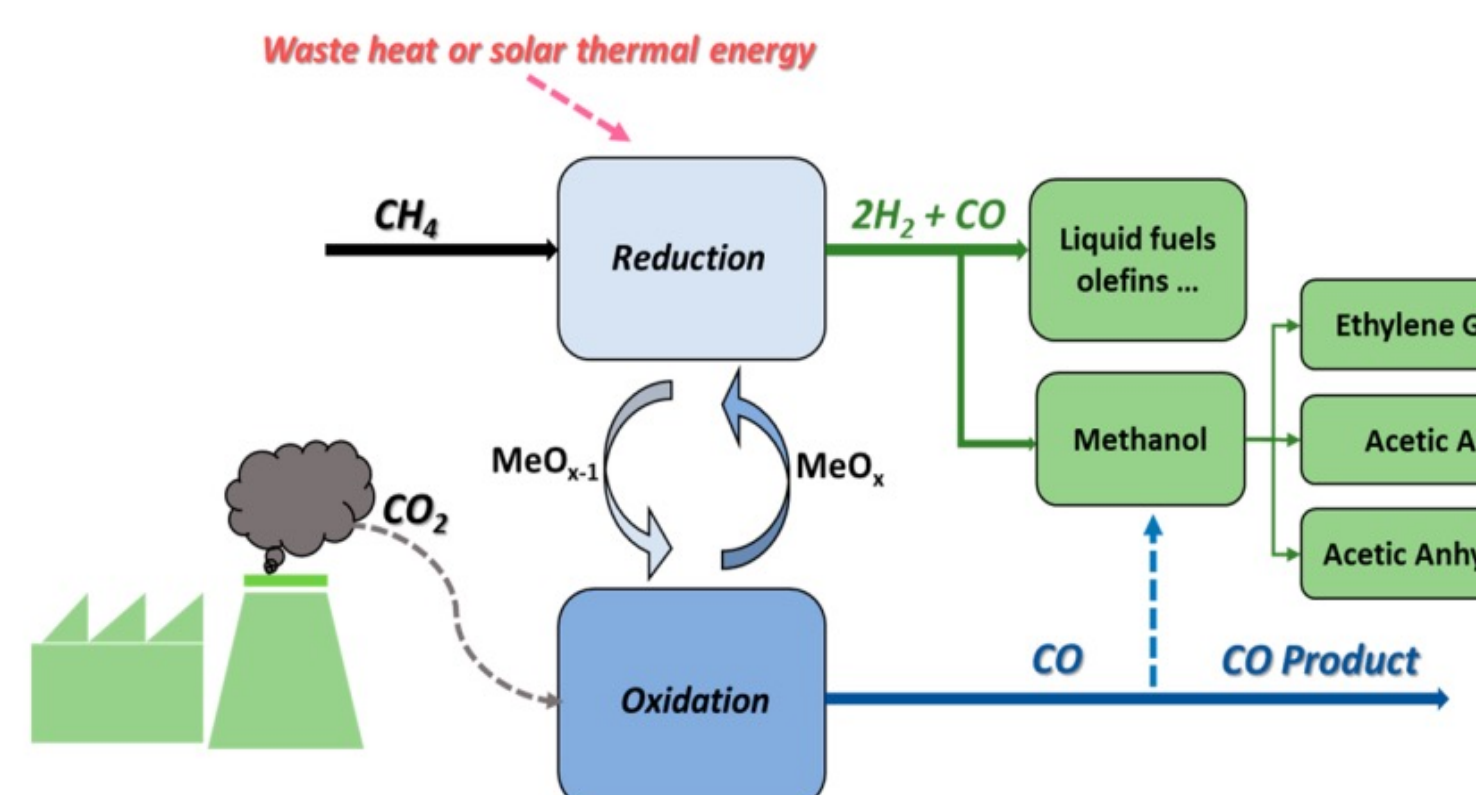
Will Martin



Sherafghan Iftikhar



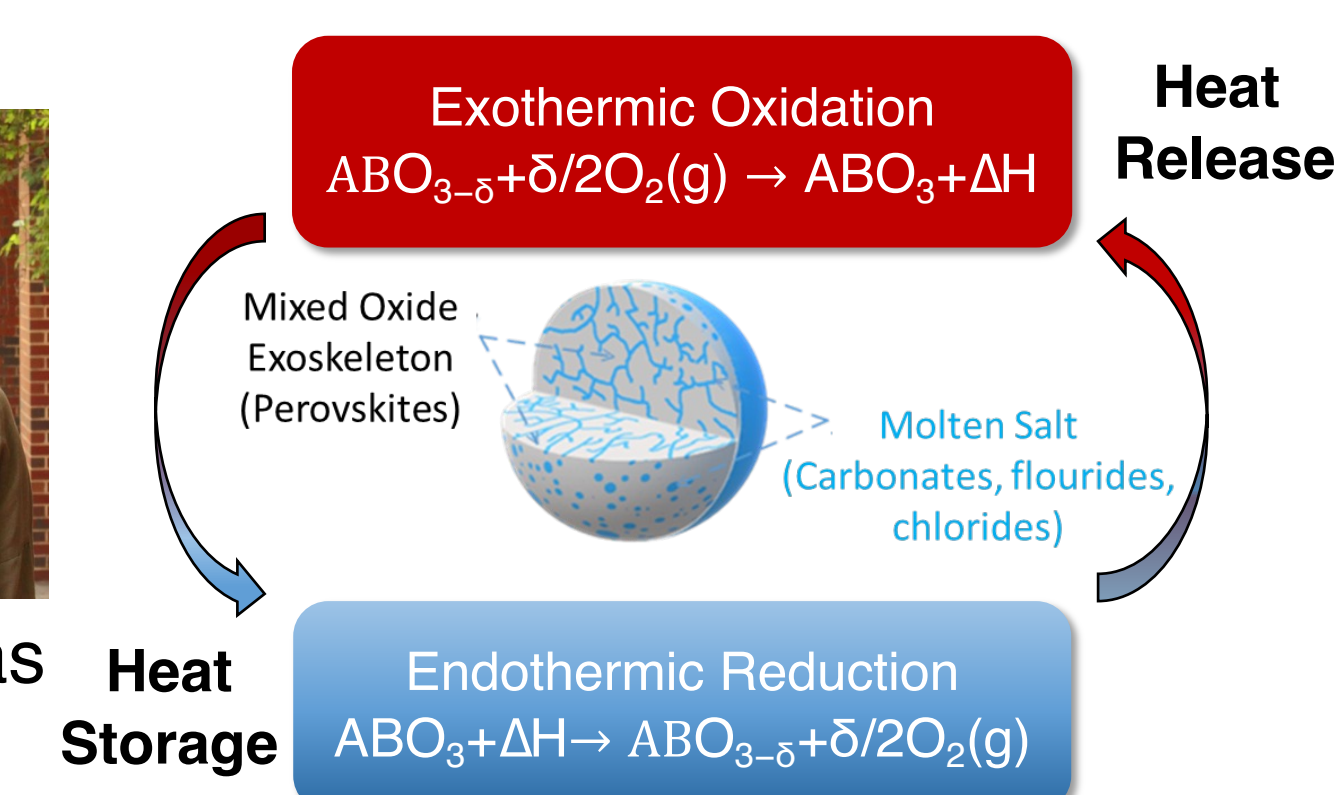
Chongyan Ruan



Thermochemical Looping Energy-Storage



Hilal Bektas



Pilot-Scale Reactor Demonstrations

Super-equilibrium Reformer

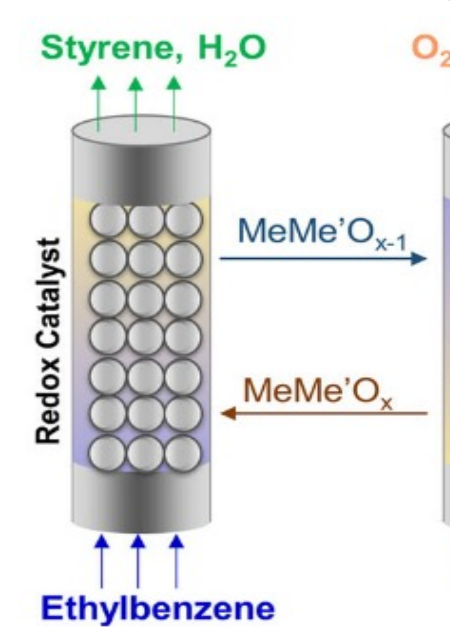


Dual Fluidized Bed Reactor



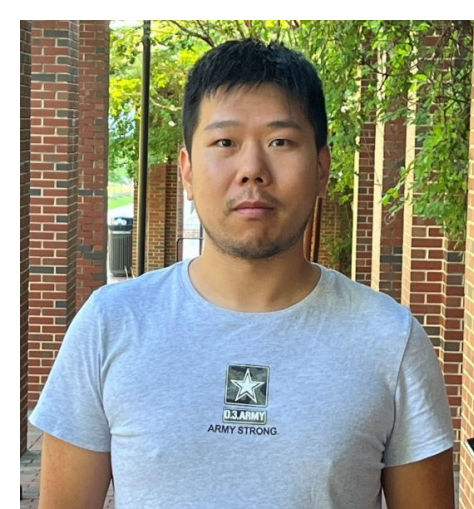
Chemical Looping Oxidative Dehydrogenation

CL-ODH of Alkylbenzene Compounds

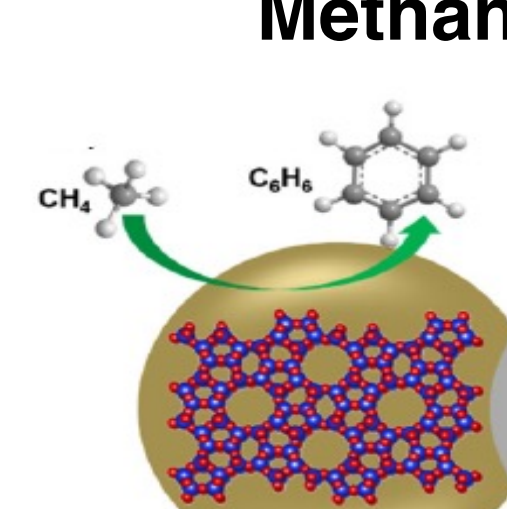


Aaron Frye

Oxidative Coupling and Dehydroaromatization of Methane



Baitang Jin



Ibrahim Sultan

Chemical Looping for Carbon Capture and Utilization

Molten Salt-Mediated Ethane ODH with Integrated CO₂ Capture



Dennis Chacko

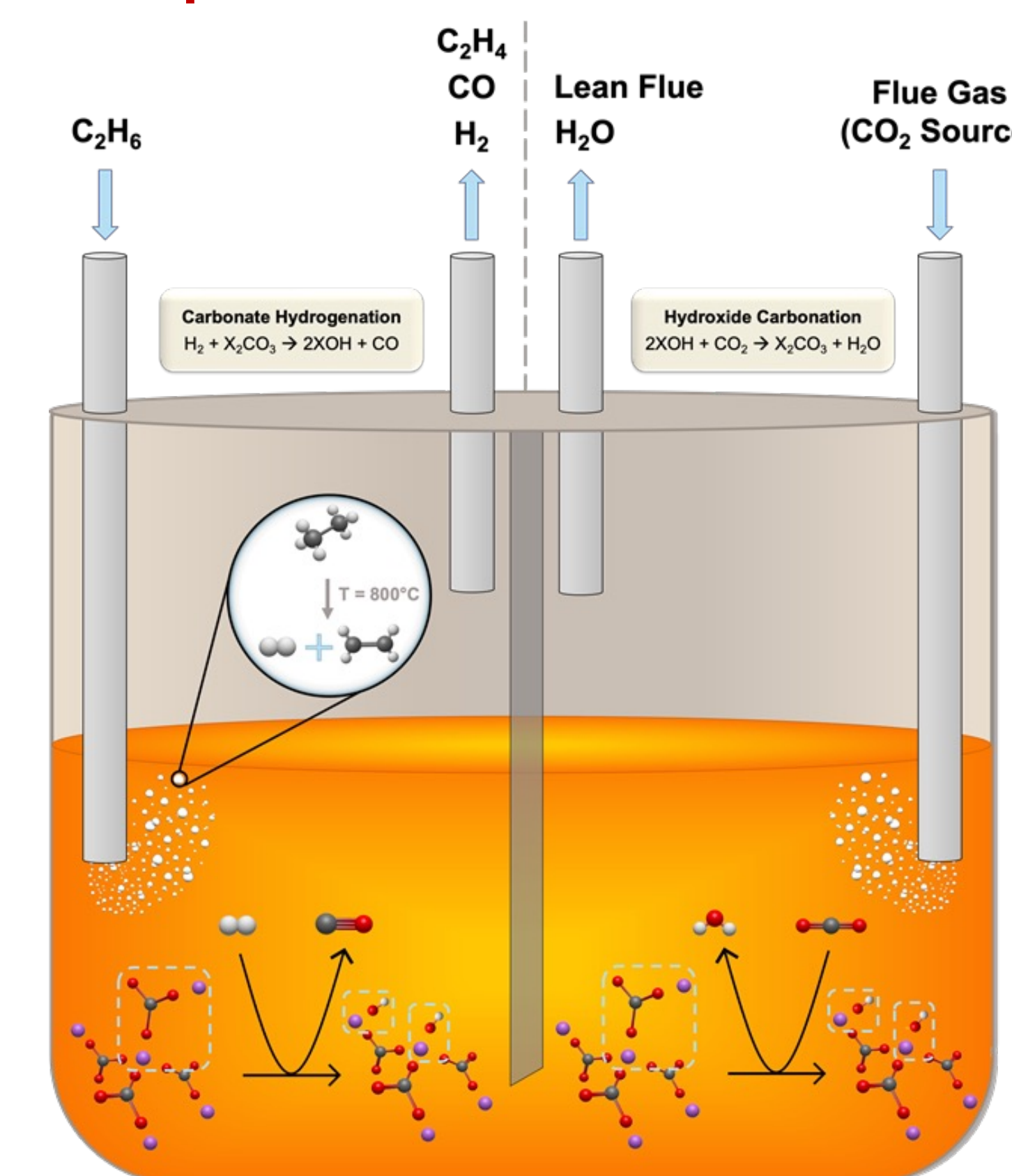
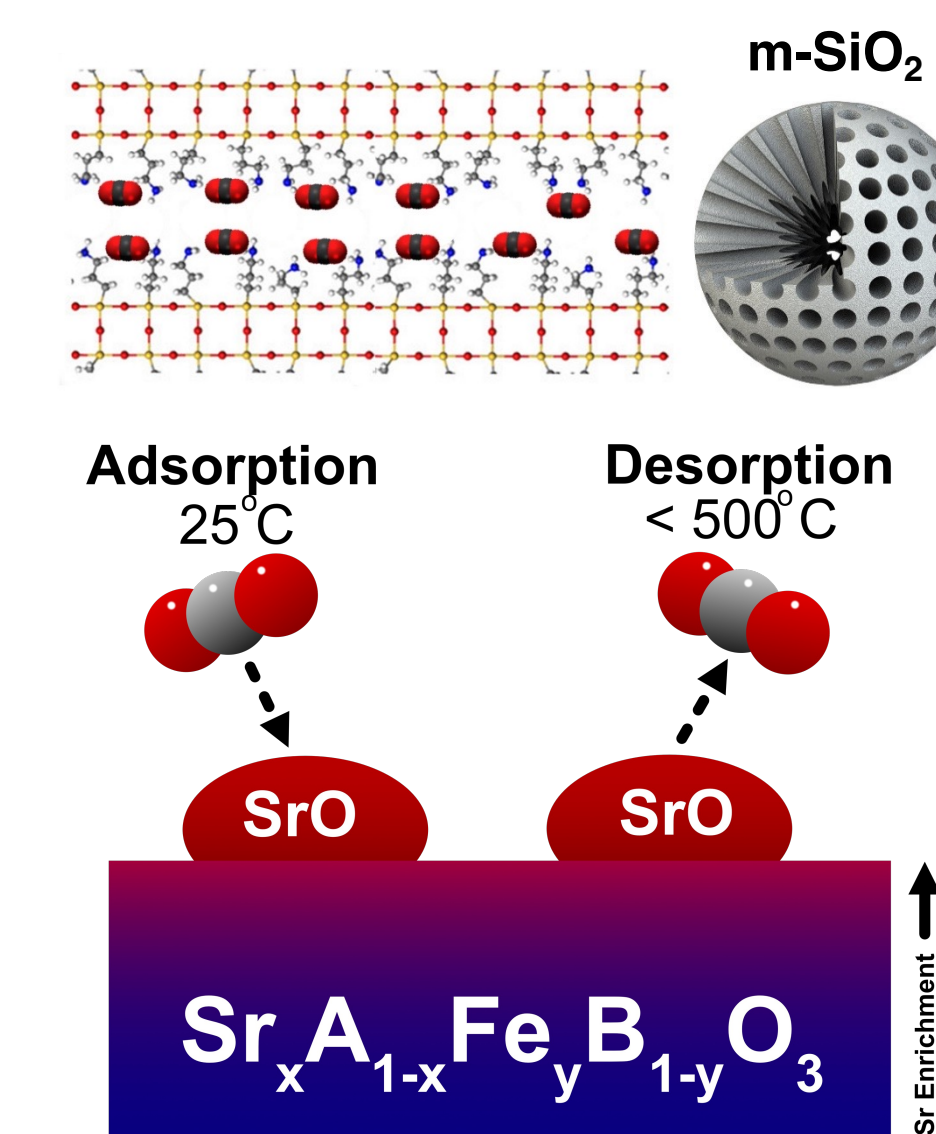


Kyle Vogt-Lowell

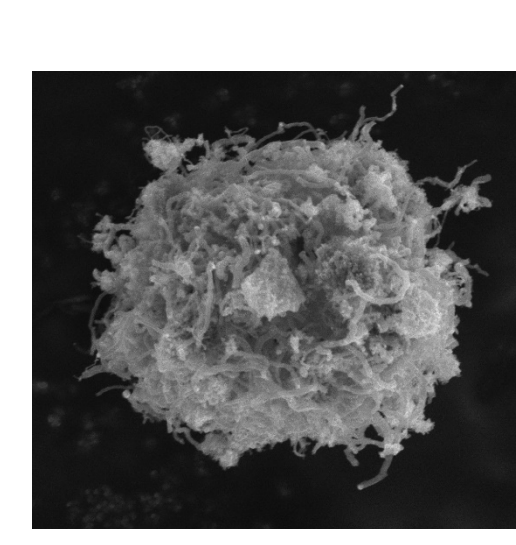
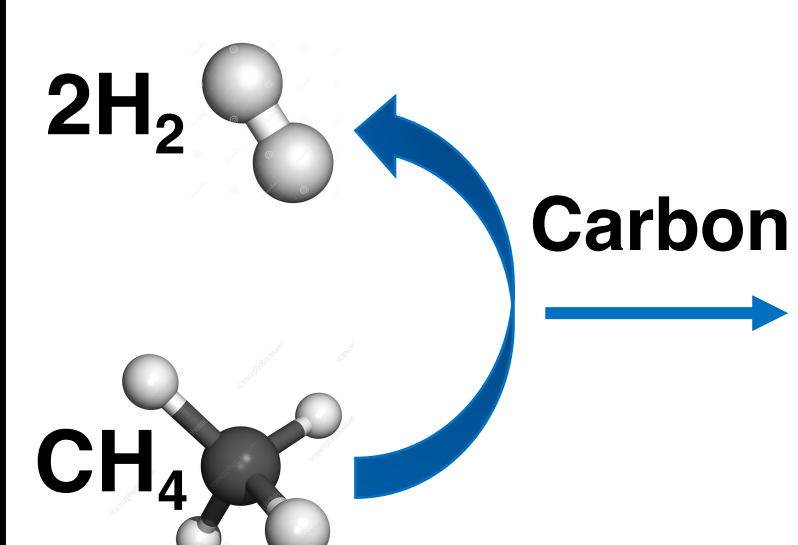
Direct CO₂ Capture From Ambient Air



Seyedamin Razavi



Methane Pyrolysis for Hydrogen and Carbon Nanotube Production



Sherafghan Iftikhar

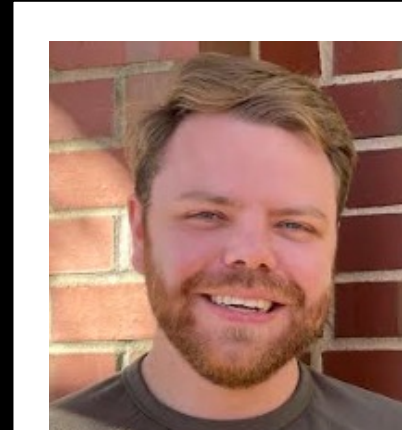


Sam Portillo



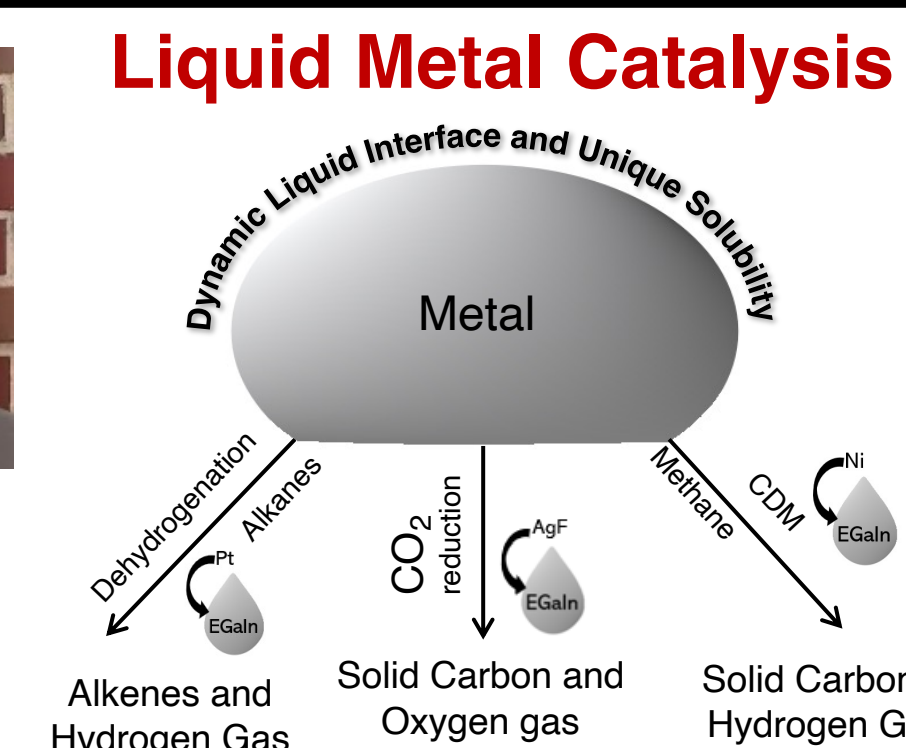
Mohammedreza Kosari

Liquid Metal Catalysis



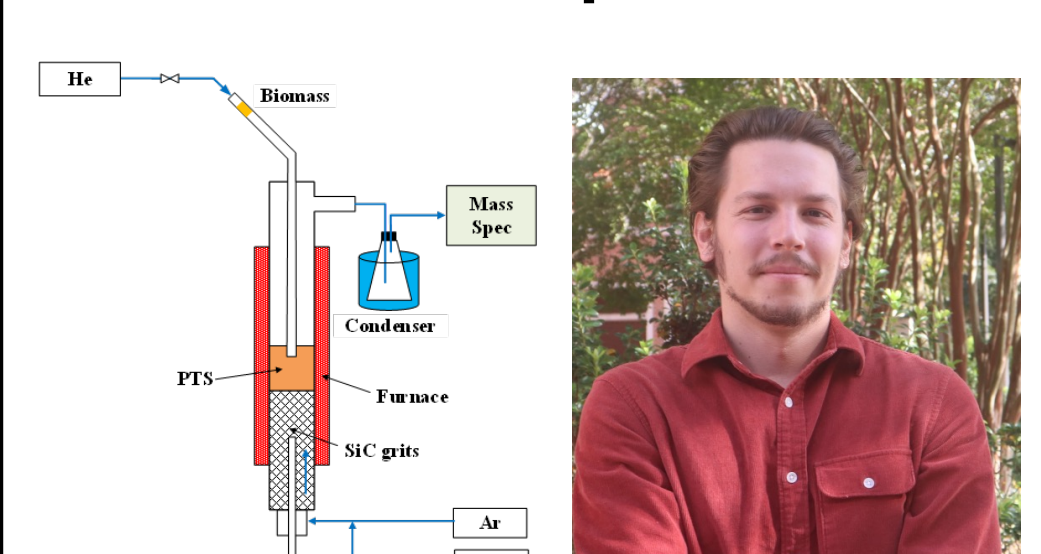
Micah Dickens

(co-advised with Dr. Dickey)



Biomass Conversion for Renewable Hydrogen and Fuels Production

Sorption-Enhanced Oxidative Steam Reforming



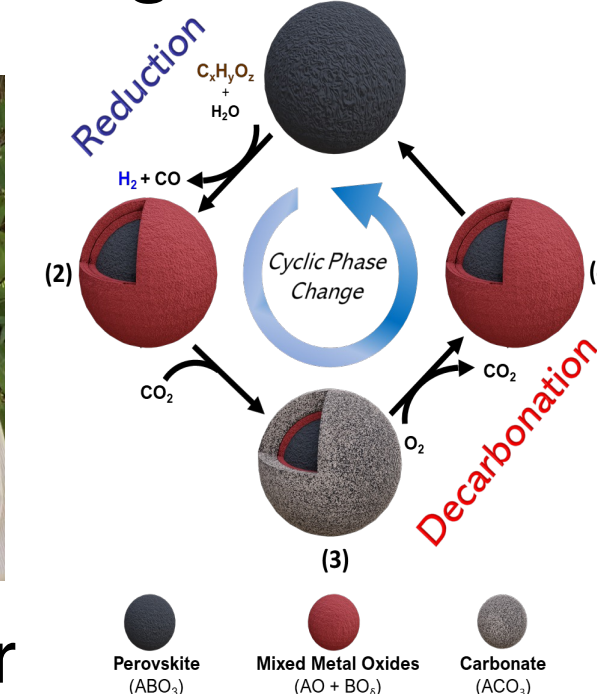
Leo Brody



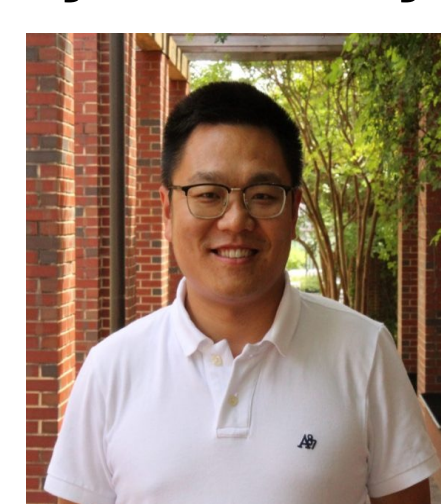
Mahe Rukh



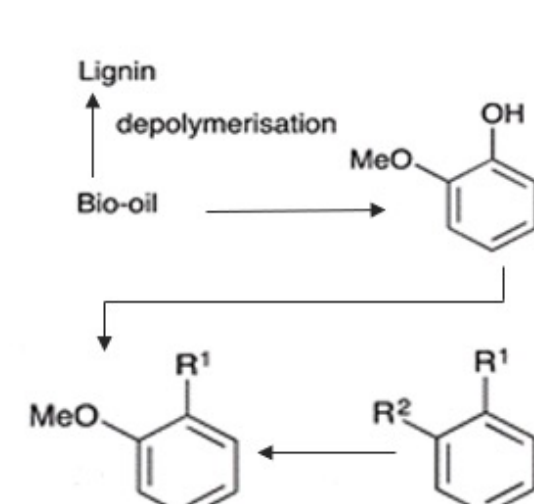
Casey Killmer



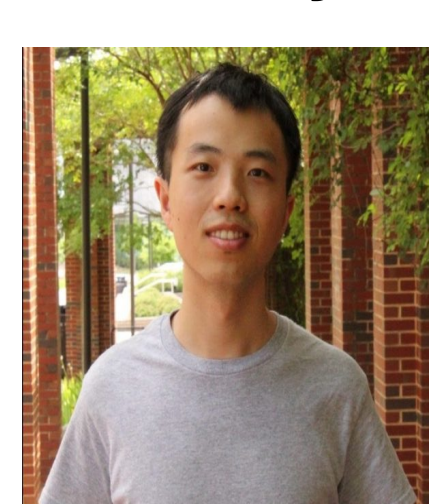
Hydrodeoxygenation of Bio-oils



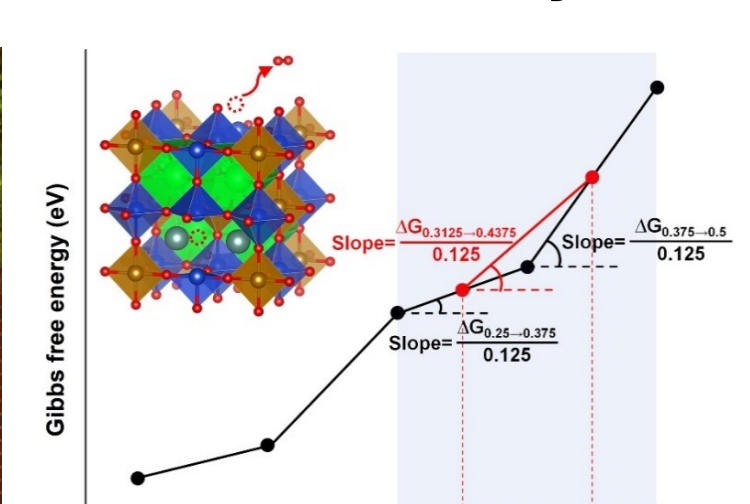
Chongyan Ruan



Density Functional Theory



Kunran Yang



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