Catalysts are an integral part of many chemical processes. Catalysts are usually made of a dense but porous material such as activated carbon, zeolites, etc. that provide a large surface area. Liquids that are produced as a byproduct of a gas reaction at the catalyst site transport to the surface of the porous material, slowing down transport of the gaseous reactants to the catalyst active site. Understanding the dynamics of the liquid droplet in the gas channel is critical to maintain performance and durability of the catalyst assembly.

Our goal in this workshop is to develop a mathematical model to understand how different surface properties and operating conditions affect the dynamics of the droplet or the formation of liquid film. Specifically, we are interested in the physical conditions where the droplet moves up, moves down, and where liquid film is formed.