

**Abstract:**

With the aim of decarbonizing the transportation industry and energy sector, a lot of attention has been given to hydrogen combustion. For the last decade, gas turbines have been retrofitted, modified or created to burn hydrogen blends or pure hydrogen, aiming to significantly reduce their greenhouse gas emissions.

However, burning hydrogen comes with its share of challenges from production, storage, and transportation to combustion and material degradation. Is hydrogen really that green? It is not that simple, and hydrogen is definitely not that easy to deal with.

This presentation provides the background of Anne's thesis research and will define and describe those challenges with a focus on material degradation through enhanced oxidation and hydrogen embrittlement due to hydrogen combustion.

**Short Bio:**

Anne is a PhD candidate under Dr. Xiao Huang and a guest worker at the Structure and Materials Performance Laboratory (SMPL) of the National Research Council Canada (NRC). Her research is focused on oxidation and environmental resistance of high entropy alloys and their practical application in high-temperature environments such as gas turbines and jet engines.

Anne has significant experience with oxidation testing, thermogravimetric analyses, electronic microscopy, experiment design and mechanical testing. A highlight of her research: she worked in collaboration with SMPL and the Propulsion and Power Laboratory (PROPEL) and used a hydrogen combustion chamber to cyclically expose alloys to a pure hydrogen flame and study their degradation.

Her final experiment involves characterizing the tensile strength and fracture toughness of chosen alloys in standard atmosphere and in a hydrogen-containing environment.