Contribution ID: **503** Type: **Invited Oral**

C2Or2B-03: [Invited] A vertically integrated cryogenic hydrogen testing laboratory

Tuesday 20 May 2025 11:45 (15 minutes)

Over the last 15 years, the Hydrogen Properties for Energy Research (HYPER) laboratory has completed cryogenic hydrogen research in a university laboratory setting safely and sustainably. However, the current demand for cryogenic hydrogen research facilities is rapidly outpacing available testing capacity. Future growth of the nascent cryogenic hydrogen industry will be significantly hindered if the available testing capacity is not improved. In this presentation, the key tools enabling HYPER to conduct this research are presented, which have led to the development of multiple customizable cryostats. Scale of the facilities is continuing to increase. Last fall, the US Department of Energy selected the HYPER-Flow and HYPER-Fuel projects for funding which will add the world's first continuous liquid hydrogen flow loop and a Medium/Heavy-Duty liquid hydrogen refueling station. The resulting combination of equipment spans Technology Readiness Levels 3-7, making HYPER a vertically integrated facility for the production of startup companies in the cryogenic hydrogen sector.

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Session Classification: C2Or2B - [Special Session] Liquid Hydrogen Testing for Aircraft