COLLEGE OF ENGINEERING
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Mechanical Engineering Seminar Series

Sustainable Aviation Fuel Requirements and Opportunities

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Tuesday, January 18, 2022

Room 1303 EECS

4:00 p.m.

This seminar will also be streamed live at the following link

ME Seminar Zoom link (QR Code below)

Password 413824

Abstract

Aviation appears to be nearing a decarbonization inflection point, with sustainable aviation fuel being a keystone of the solution. Aviation safety is built on redundancy, as many systems have backup systems. There is, however, only one energy source on the aircraft for commercial aviation. Therefore, alternative aviation turbine fuels must undergo a strict evaluation and qualification process (i.e., ASTM D4054). This process historically requires the better part of a decade and the consumption of tens of thousands of gallons of alternative fuel for the formal qualification. For 5 years, the National Jet Fuels Combustion Program (NJFCP) focused on streamlining this process and developing tools to evaluate candidates' spray break-up and chemistry for altitude ignition and lean blowout. The tests have yielded test methods requiring low volume-low costs (multi-dimensional gas chromatography and VUV absorption spectroscopy). The outcomes and tools developed in the NJFCP will be discussed, and chemical compositions and properties associated with favorable safety performances will be emphasized.

Bio:
Joshua Heyne is Associate Professor of Mechanical and Aerospace Engineering at the University of Dayton. Since 2014, Professor Heyne has focused on aligning efforts and delivering objective criteria to help streamline the qualification process of alternative jet fuels as part of the 40 institutions and 150 member National Jet Fuels Combustion Program (NJFCP). Outside of the NJFCP's integration and coordination role, Professor Heyne works on sustainable aviation fuel (SAF) candidate prescreening, multidimensional gas chromatography with absorption spectroscopy, high-performance fuel formulation, forced ignition, and engine design to utilize SAF properties. He is a co-chair of the public-private partnership Commercial Aviation Alternative Fuels Initiative (CAAFI) R&D committee and coordinates across dozens of companies and research institutions as they commercialize low carbon aviation technologies. He holds four degrees from three universities, including a Ph.D. in Mechanical & Aerospace Engineering from Princeton University.

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