Multiphase Flow and Combustion Beamline

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Multiphase flows and combustion represent some of the most technologically important and theoretically challenging flowfields in modern society. The efficiency and pollutant formation of combustion engines directly impacts climate change and human health. X-ray diagnostics have great power to probe these flowfields in ways traditional diagnostics cannot, providing crucial data to better control combustion. While APS has built a significant user community studying multiphase flows and combustion, current facilities cannot support the studies of these flows in real time and under real conditions that are needed to better understand, design, and control combustion devices. This proposal outlines the scientific justification for a new facility dedicated to studies of multiphase flows and combustion at real scale and under real conditions, fully exploiting the high coherence and hard x-ray flux that will be delivered by the APS-U to probe these challenging environments.

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