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DEVELOPING A COMMUNITY OF PRACTICE FOR IMPLEMENTATION OF COMBUSTION CONCEPTS IN UNDERGRADUATE COURSES

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Communities of practice (COPs) have long been known to enhance the performance of those in the COP through knowledge sharing and a strong sense of community. In this work, the PIs will develop a community of practice through a network of early-career academics to implement combustion concepts into undergraduate courses by sharing targeted teaching materials with the greater combustion community. This idea was first developed as part of the NSF-sponsored early-career researcher workshop, entitled “Building a sustainable combustion research community,” and is now supported by the 2018 CAREER grants of PIs O’Connor and West. Together, this work will focus on developing classroom material for required undergraduate courses, including thermodynamics, fluid mechanics, and heat transfer, with the goal of exposing undergraduate students to interesting combustion-related topics and informing a large audience of the vital role that combustion plays in technology and society. The teaching materials will take various forms. First, we will develop and disseminate case studies based on current events or relevant technologies that highlight both important combustion fundamentals as well as broader implications like ethics, health, and society. Second, we will develop computational exercises using interactive Jupyter notebooks and the Python interface to Cantera. We will also collaborate with educational experts and graphic artists to develop a comic broadening the appreciation for and interest in combustion science. However, the COP is intended to share materials developed by other educators besides the PIs. This poster will discuss the framework of this new network and opportunities for collaborating with the PIs in this new endeavor.