

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Course-based undergraduate research in upper-level fluid dynamics electives: A case study**<sup>1</sup> DANIEL HARRIS, KRISTY SCHLUETER-KUCK, ELIZABETH AUSTIN, KRISTINA COHEN, Brown University — Recently, undergraduate research, including courses incorporating authentic research experiences for undergraduates, has become a focus of STEM education. The benefits of such experiences, including deeper understanding of scientific concepts, developing student identity as scientists, and increased engagement of women and underrepresented minorities are well documented. We sought to extend the course-based undergraduate research experience (CURE) concept to an upper-level engineering elective in fluid dynamics by engaging students in research projects focused on building a device to produce or measure the flow of a fluid. This course module, run in parallel with traditional lecture activities, drew heavily on design activities including rapid prototyping and iteration, and additionally focused on disseminating the results of these studies with the broader fluid dynamics community. In this work, we outline the course structure and discuss the outreach activities and their impact beyond the classroom. Improvements implemented from the first and second year are discussed, and preliminary data suggesting the efficacy of course module is presented. Finally, future outlook and other perspectives resulting from this experience will be shared.

<sup>1</sup>This work is supported by funding from the Howard Hughes Medical Institute (HHMI).

Daniel Harris  
Brown University

Date submitted: 10 Aug 2020

Electronic form version 1.4