



**Joseph Dowling, Ph.D.**

**Fire Scientist and Mechanical Engineer**

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## **SUMMARY**

Joseph is a graduate of the UC Berkeley Fire Research Laboratory, where he conducted fire dynamics experiments and worked as the Laboratory Safety Coordinator. For the past nine years, he has studied fire tornados and oil spill fires, transferring from the UMD Fire Lab to UC Berkeley at the behest of his advisor and project director. As part of his research, Joseph has had familiarity with thermal science methods and instrumentation, data analysis, large-scale fire experiments, and hazardous materials handling. As a member of the Berkeley Fire Research Lab, he also has expertise in energy science and technology, wildland fire dynamics, fire safety systems, and engineering for reliability. The major results of his research have been published in *Fuel* and presented at the *International Oil Spill Conference*. Joseph comes from a family of five firefighters and brings a safety-oriented mindset to all of his engineering work.

## **EDUCATION**

Ph.D. Mechanical Engineering, University of California, Berkeley

M.S. Fire Protection Engineering, University of Maryland, College Park

B.S. Fire Protection Engineering, University of Maryland, College Park

## **RESEARCH AREAS**

- *In-Situ* Burning
- Fire Dynamics
- Soot and Smoke Emissions
- Extreme Wildfire Phenomena

## **PUBLICATIONS AND REPORTS**

W. Cui, J. L. Dowling, M. Hajilou, et al., “Large-scale field experiments on enhancing in-situ burning with fire whirls,” *Fuel*, 2026.

J. Dowling, W. Cui, M. Hajilou, and M. Gollner, “Fire whirl emissions and burning rates for crude oil slicks of varying thickness,” *Fuel*, vol. 393, 2025.

M. Gollner, E. Oran, Q. Wang, M. Hajilou, J. Dowling, and W. Cui, “Efficient remediation of oil spills using fire whirls,” Bureau of Safety and Environmental Enforcement, Tech. Rep., 2024.  
J. Zicherman, Contributors: J. Dowling, G. Stevick, “Fire Safety Update – Passenger Cars,” for METRA railroad, August 31, 2021.

## TALKS & SEMINARS

Dowling, Joseph; Cui, Wuquan; and Gollner, Michael. “Wall height effects on emissions from lab scale fire whirls in fixed-frame generators.” 14<sup>th</sup> U.S. National Combustion Meeting, March 17, 2025.  
Dowling, Joseph; Hajilou, Mohammadhadi; Cui, Wuquan; *et.al.* “Multi-scale experimental characterization of in-situ burning using fire whirls and the effect of slick thickness on burning efficiencies and emissions.” International Oil Spill Conference, May 16, 2024.  
Dowling, Joseph; Hajilou, Mohammadhadi; and Gollner, Michael. “Experimental characterization of enhanced *in-situ* burning using fire whirls on a three-wall structure.” 44<sup>th</sup> AMOP Technical Seminar on Environmental Contamination and Response. June 8, 2022.

## SELECTED INDUSTRY EXPERIENCES AND EXPERTISE

- Failure Modes and Effects Analysis
- NFPA Code Compliance
- Heat Transfer & Calorimetry
- Fire Dynamics
- Large-Scale/Hazardous Experimental Design

## AWARDS & HONORS

2022 Keith L. Markoff and Cristina T. Ruland Fellowship  
2021 12<sup>th</sup> US National Combustion Meeting Combustion Art Award for Technical Merit  
2015 – 2019 University of Maryland President’s Award for Academic Merit

## PROFESSIONAL AFFILIATIONS

The Combustion Institute  
Society of Fire Protection Engineers  
National Association of Fire Investigators

## SELECTED COUREWORK

- Advanced Fire Dynamics
- Enclosure Fire Modelling
- Engineering for Reliability
- Diffusion Flames and Burning Rate Theory
- Energy and the Environment
- Data Science for Energy