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Wildfire Behavior in California and Beyond: Insights From the Laboratory Scale

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ABSTRACT: Wildfires have taken center stage in multiple regions around the globe. Rapid urban growth pushing human settlements closer to the wildland places people and their property closer to risk during fire events. Wildfire emissions including particulate matter, represent a public health concern due to correlations with heightened risk for respiratory and heart disease. Given the growing threat to people, property, and the environment, controlling, and predicting fire growth is of paramount importance. This is contingent on a rigorous understanding of wildfire dynamics which are governed by the laws of fluid mechanics and heat transfer. In this talk I will provide an overview of a selection of my research focused on ignition and spread behavior in the wildland and wildland-urban-interface. On the realm of wildfire ignition behavior, I will present results from our studies aiming to better understand the mechanisms leading to spot fire ignitions caused by failing power lines and mechanical equipment. There we investigate the role of wildland fuel species and metal particle ignition source properties on ignition behavior. On the realm of wildfire spread behavior, I will present results from experiments focusing on fire spread behavior in California ecosystems. I will introduce new and future directions in my research agenda including applications to air quality, bilingual (Spanish and English) fire hazards communications and education and, ‘smart’ fire safety. I will conclude by discussing my teaching and mentoring philosophy and vision.

BIO: Jeanette Cobian-Iñiguez is an assistant professor in the Department of Mechanical Engineering at the University of California, Merced. Prior to her current position, she was a Postdoctoral Scholar at the University of California, Berkeley working on smoldering fire behavior of simulated wildland fuels. She completed her Ph.D. at the University of California, Riverside. Jeanette’s new research group at UC Merced focuses on fundamental wildfire behavior, fire dynamics, and the effects of wildfire on the environment. She uses experiments and remote sensing to study laboratory and regional scale wildfire behavior. Jeanette is one of the co-organizers of the California Fire Science Seminar series. She has developed outreach activities and tools aimed teaching K-12 students and communities about wildfires and at increasing the involvement of future generations in STEM careers.