

COMBUSTION WEBINAR

100+ Years of Combustion Research and Its Relevance to Applications

Speaker: Prof. Fokion N. Egolfopoulos, the University of Southern California

Time: *Oct. 10, 2020*
10 am EST; 4 pm Paris; 10 pm Beijing.

Meeting: *Zoom*

Registration (required):

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Biography: Fokion N. Egolfopoulos is a William E. Leonhard Professor of Engineering in the Department of Aerospace and Mechanical Engineering at the University of Southern California. He obtained his Diploma degree in 1981 from the National Technical University of Athens, and his Ph.D. degree in 1990 from the University of California at Davis after having spent the last two years of his doctoral research at Princeton University. He is a recipient of the Silver Medal of the Combustion Institute at the Twenty-Second International Combustion Symposium. He has authored and co-authored one hundred and forty seven (147) archival journal publications, eleven (11) editorial comments, two (2) book chapters, one hundred and sixty (160) conference proceedings and reports, and has given one hundred and sixty two (162) invited and contributed scholarly addresses. He is a Fellow of the Combustion Institute, a Fellow of the American Society of Mechanical Engineers (ASME), and an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA). Since 2009 he is the Editor in Chief of Combustion and Flame, after having served as an Associate Editor of the journal from 2003 until 2008.

Abstract: Almost 100 years ago, the foundation of combustion research as we know it today was established. The work of Semenov in the 1920's revealed the importance of chain reactions towards improving the understanding of combustion and explosion processes. Since then, unprecedented advances have been made in theory, modeling, and experiments that allowed for gaining in-depth insight into chemistry and transport phenomena that include the challenging topic of turbulence-flame interactions. Theory guided the evolution of modeling and laser diagnostics, which have evolved to the level of exascale and 100+ MHz levels respectively. In today's world, the issue of climate change is dominating all decisions related to energy conversion made by Industry and Governments. Additionally, air and space propulsion systems advance, and guidance is needed regarding the prediction of their performance at ever increasing pressures. To address those needs, accurate quantitative answers will be required, and qualitative or semi-quantitative projections may not suffice. The question of whether current understanding of combustion phenomena and the associated models can provide what is needed will be addressed in this presentation. An exhaustive literature search of laminar and turbulent flame studies will reveal what is the current status with emphasis on fuels and thermodynamic conditions. Then, the adequacy of existing understanding and the needs for the next frontiers of combustion research will be discussed.