

# COMBUSTION WEBINAR

*Blast Off! An Introduction to the Combustion of Solid Propellants and Current Research Directions*

**Speaker:** Prof. Steven Son, Purdue University

**Time:** Oct. 31, 2020  
10 am EST; 4 pm Paris; 10 pm Beijing.

**Meeting:** Zoom

**Registration (required):**

Check <https://sun.ae.gatech.edu/combustion-webinar/>  
for details or directly contact [wenting.sun@aerospace.gatech.edu](mailto:wenting.sun@aerospace.gatech.edu)



COMBUSTION  
WEBINAR

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**Biography:** Prof. Son is the Alfred J. McAllister Professor of Mechanical Engineering at Purdue University and is affiliated with Purdue's Maurice J. Zucrow Laboratories. He received his Ph.D. from the University of Illinois at Champaign-Urbana in 1994. His research is in the field of combustion with an emphasis on energetic materials combustion. This includes nanoscale energetic materials, microscale energetics (microenergetics), heterogeneous combustion, reactive materials, combustion synthesis, and explosives safety. Prof. Son has given hundreds of invited presentations at national and international scientific meetings and is an author of over three hundred scientific publications. Prof. Son was an Associate Editor for *AIAA's Journal of Propulsion and Power* and is the Editor in Chief of the *JANNAF Journal of Propulsion and Energetics*. Before his academic career, beginning in 2006, he was a J. R. Oppenheimer Fellow, and Project Leader at Los Alamos National Laboratory in the High Explosives Sciences Group.

**Abstract:** When Michael Faraday introduced his famous lectures more than a century ago, he said, "there is no more open door by which you can enter into the study of natural philosophy than by considering the physical phenomena of a candle." Combustion remains an exciting and rich scientific area that can provide a foundation to build a scientific career. The study of energetic materials (propellants, explosives, and pyrotechnics) is one of the most exciting multidisciplinary and challenging combustion science research areas today. Indeed, the array of materials considered and range of length and time scales is unparalleled in combustion science. In this webinar, I will introduce the combustion of solid propellants to those unfamiliar with the topic, from the simplest homogeneous to complex metalized composite propellants. I will then present examples and challenges of current research directions including engineered particle ingredients with nanoscale inclusions, additive manufacturing of propellants, and the blending of pyrotechnic elements with propellants to potentially improve control and performance.