

COMBUSTION WEBINAR

Numerical prediction of pollutants and soot emissions in turbulent flames

Speaker: B. Cuenot – CERFACS, Toulouse France

Time: March. 27th 2021

10 am EST; 3 pm Paris; 10 pm Beijing.

Zoom Meeting ID: 959 5515 8623

Passcode: combustion

Check <https://sun.ae.gatech.edu/combustion-webinar>

for details or directly contact wenting.sun@aerospace.gatech.edu



COMBUSTION
WEBINAR



Biography: Dr-HdR B. Cuenot graduated from Ecole Centrale de Paris in 1990, and obtained her PhD in 1995 and HdR in 2000, both in the field of numerical combustion. She is now the leader of the combustion research group at CERFACS, developing advanced and massively parallel software for the numerical simulation (DNS and LES) of turbulent reacting flows, cold plasma flows and heat transfer (including thermal radiation) in industrial systems. Her research covers pollutant emissions, ignition and extinction, combustion efficiency and thermal fatigue of combustion chambers, and is published in more than 100 peer-reviewed journal papers. B. Cuenot has been distinguished as a Fellow of the Combustion Institute in 2018 and is a member of the Editorial Board of Combustion and Flame since 2018. She will co-chair the next International Symposium on Combustion, to be held in 2022 in Vancouver.

Abstract: The production of combustion pollutants such as carbon and nitric oxides, as well as soot, is a current major concern of the energy production sector. It results from the complex interaction between turbulence, spray dynamics, chemistry and heat transfer and is therefore extremely difficult to predict with simple laws. To understand and control the various physical processes at play, numerical simulation is a powerful tool but must be carefully designed to achieve the required accuracy while maintaining a reasonable computational cost. It is based on the concept of Large Eddy Simulation (LES), which has proven its efficiency for the study of turbulent flows. This lecture will address the modeling issues raised by the LES of 3D turbulent gaseous and spray flames, taking into account their detailed chemical structure, in non-adiabatic complex geometries. A complete methodology will be proposed and validated against laboratory-scale experiments. Then the performance of the LES approach will be demonstrated and illustrated in a series of industrial applications.

Combustion Webinar Organization Committees

Advisory Committee

Yiguang Ju (Princeton University)
Fei Qi (Shanghai Jiao Tong University)
Philippe Dagaut (CNRS-INSIS)
Gautam Kalghatgi (Univ of Oxford/Saudi Aramco)
Med Colket (UTRC, Retired)

Chung K. (Ed) Law (Princeton University)
Katharina Kohse-Höinghaus (University of Bielefeld)
Kaoru Maruta (Tohoku University)
Kelly Senecal (Convergent Science)
Toshiro Fujimori (IHI Inc.)

Technical Committee

Wenting Sun (Georgia Tech) **Chair**
Lorenz R Boeck (FM global)
Liming Cai (Tongji University)
Zheng Chen (Peking University)
Matthew Cleary (The University of Sydney)
Stephen Dooley (Trinity College Dublin)
Tiegang Fang (North Carolina State University)
Aamir Farooq (KAUST)
Michael Gollner (UC Berkeley)
Wang Han (The University of Edinburgh)
Jean-Pierre Hickey (U. Waterloo)
Xinyan Huang (Hong Kong Polytech Univ.)
Tai Jin (Zhejiang University)
Tina Kasper (University Duisburg-Essen)

Isaac Boxx (DLR) **Co-Chair**
Deanna Lacoste (KAUST)
Davide Laera (CERFACS)
Joseph Lefkowitz (Technion)
Qili Liu (Purdue University)
Yushuai Liu (IET, CAS)
Zhandong Wang (USTC)
Nicolas Noiray (ETH Zurich)
Guillermo Rein (Imperial College London)
Xingjian Wang (Florida Institute of Technology)
Jun Xia (Brunel University London)
Huahua Xiao (USTC)
Dong Yang (SUST)
Suo Yang (University of Minnesota)
Peng Zhao (University of Tennessee, Knoxville)

Disclaimer

- The presentation materials and comments made by the lecturer and participants are only for research and education purposes.
- All presentation materials are the sole properties of the lecturer and the Combustion Webinar organizer, and cannot be published and disseminated without written approvals from both parties.
- This lecture may be recorded and released to public.
- **Please use Chat or Raise Hand to ask your questions.**
- **Please turnoff microphone. Webinar will be locked after 30 minutes.**
- **Recorded lectures are on *Combustion Webinar YouTube Channel***
https://www.youtube.com/channel/UCSsO7e9VIn__RejSiAPF0JA