Workshop on
Turbulent
Combustion of
Sprays

8th International Workshop on the Turbulent Combustion of Sprays (TCS-8)*

Steigenberger Nile Palace Luxor Hotel and Convention Centre, Room Prince
January, 22, 2023, 8:30 - 16:30

Program (version of January 10, 2023)

8:30-9:15:	Registration and poster setup	
9:15-9:30:	Welcome and announcements	(Chair: Assaad Masri)
9:30-10:30:	Invited lecture by **Dr. Aymeric Vié**	(Chair: Eva Gutheil)

Challenges in the numerical simulation of sprays in turbulent liquid-fueled swirled burners

10:30-11:00:	Coffee break	
11:00-13:00:	Presentation/discussion on benchmark test cases	(Chair: Assaad Masri)
11:00-12-00:	CORIA Rouen Spray Burner	
12:00-12:30:	Sydney Needle Spray Burner	
12:30-13:00:	Cambridge Swirl Spray Flames	
13:00-14:30:	Lunch and posters	
14:30:15:30:	Invited highlight presentations by young researchers.	(Chair: Andrea Giusti)

Ral Bielawski (Univ Michigan): Atomization by interaction with shocks
Ambrus Both (BCS, Barcelona): Evaporation of volatile droplets in flame-like conditions
Callum Kennedy (Univ Sydney): Sprays for material synthesis using flame spray pyrolysis

15:30-15-50	Coffee break	
15:50-16:30	Overall evaluation and future directions (Chair: to be decided)	

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الجمعية المصرية للطاقة المتجددة

Thanks to ESRE for supporting the organization of the workshop

* **Further information** on the program and on registration is on the next page.

ABSTRACT OF INVITED LECTURE

Dr. Aymeric Vié
Laboratoire EM2C, CNRS & CentraleSupelec, Université Paris-Saclay, France

Challenges in the numerical simulation of sprays in turbulent liquid-fueled swirled burners

In aeronautical combustion chambers, several physical phenomena must be considered for predictive simulations, such as combustion, turbulence, or two-phase flows. Furthermore, the design of combustion chambers, with multiple swirler stages and injectors, leads to a great richness in the behavior of the combustion chamber, for example, on pollutant emissions or acoustic activity. In this presentation, I will first discuss how turbulent swirled spray combustors can generate a wide variety of flame archetypes, using as an example the results of the BIMER experimental test rig of the EM2C laboratory. Then, I will open the discussion to today's challenges in terms of modeling. I will focus on the spray and highlight the state-of-the-art for different modeling blocks and the challenges in accuracy and efficiency.

BENCHMARK TEST CASES

Interesting new insight will be gained from the comparative study of models and experiments.

CORIA Rouen Spray Burner (60')

Coordinators: Prof. Bruno Renou, CORIA, France
Antoine Stock, CORIA (Test Case n°1 : Reactive flow)
Dr. Julien Carmona, CORIA (Test Case n°2 : Atomisation and dense spray)

Online presentations:

- A brief introduction to the CORIA configurations	(Bruno Renou)
- Test-case 1 - Numerical data	(Antoine Stock)
- Test-case 2 - Experimental update	(Chetankumar Vegad, CORIA)
- Test-case 2 - Numerical data	(Julien Carmona)

Q&A and discussion

Sydney Needle Spray Burner (30')

Coordinators: Dr. Gajendra Singh (IIT Mandi, India)
Prof. Assaad Masri (University of Sydney, Australia)

Online presentation: Dr. Gajendra Singh (IIT Mandi, India)
-Introduction of the Sydney Needle Burner
-Discussion of results
Q & A and discussion

Cambridge Swirl Spray Flames (30')

Coordinators: Prof. Andrea Giusti (Imperial College, UK)
Prof. Epaminondas Mastorakos (Cambridge Univ., UK)

Presenter: Andrea Giusticontributions on cases studied also in the previous TCS workshop are presented in a unified way. Next, details and challenges of a new Cambridge database will be presented.

Registration for TCS8 is required and can be done at
https://www.ercoftac.org/events/8th-international-workshop-on-turbulent-combustion-of-sprays/
For registrations after January 12, payment using PayPal rather than via invoice is strongly preferred.