

International Sooting Flame (ISF) Workshop

Aims and Objectives

Aims of the ISF Workshop

- To advance understanding and predictive capability of flames with soot, to identify gaps in this understanding and to coordinate research programs to address them;
- To identify well defined target flames and coordinate additional experiments that provide suitable data for model development and validation, spanning a variety of flame types and fuels in each of the research programs;
- To establish an archive of the detailed data sets of target flames with defined accuracy and to provide a forum for the exchange and dissemination of these data;

Objectives and Targets for ISF-4

Objective 1: To advance understanding and prediction of inception-dominated ethylene flames:

Target 1: obtain new systematic data in inception-dominated laminar ethylene flames (such as counter-flow flames) to achieve conditions for key controlling parameters (such as residence time) that better match those that apply in the existing data sets for turbulent ethylene jet target flames. Data is sought for both atmospheric and elevated pressure conditions.

Objective 2: To advance prediction of sooting flames in the growth/agglomeration regimes of ethylene flames:

Target 2: obtain new systematic data in growth/agglomerated-dominated regimes of turbulent ethylene flames (such as the recirculation region of bluff-body flames) to achieve conditions for key controlling parameters such as residence time that better match those that apply in the existing data sets for laminar ethylene jet flames. Data is sought for both atmospheric and elevated pressure conditions.

Objective 3: To advance prediction of sooting flames with more practical fuels:

Target 3: establish a coordinated data base, building on existing data, in the laminar and turbulent regimes, and at a range of pressures, for

- methane flames and
- pre-vaporised heptane flames;

Objective 4: To engage with the international community through joint sessions with members of the Flame Chemistry and Measurement and Computation of Turbulent Flames (TNF) workshops to:

- advance both understanding and global coordination in the ongoing development of models of soot evolution, addressing PAH chemistry, soot inception, and soot oxidation;
- advance both understanding and global coordination in the ongoing development of models of turbulence-chemistry interactions;

Workshop Programs

For ISF-4, the workshop will be organised around the following two Research Programs:

- Laminar flames as a function of pressure: Chemical Kinetics (PAH, inception, growth and oxidation); Particle dynamics (moment methods, sectional models, coalescence vs. aggregation);
- Turbulent flames as function of pressure: jet flames, bluff body flames, swirl flames, pool fires, influence of scale;

International Sooting Flame (ISF) Workshop
Program (Final Draft)

Date	Time	Topic	Chair/Presenter
Friday 27 th	9:00 - 10:00	Registration and coffee	
	10:00 - 10:20	Welcome, aims and agenda	Speaker: Nathan
	10:20 - 10:50	Industry perspective "Carbon black challenges & technology frontiers"	Speaker: Roscoe Taylor, Orion Engineered Carbons
	10:50 - 11:10	Discussion	Chair: Wang
	11:10 - 11:40	Soot inception and growth: What do we know, and where do we go from here?	Speaker: Michelsen
	11:40 - 12:00	Discussion	Chair: Shaddix
	12:00 - 12:20	Review key outcomes from ISF-3	Speaker: Thomson
	12:20 - 13:00	Discussion	Chairs: Pitsch / Thomson
	13:00 - 14:00	Lunch	
	14:00 - 15:30	Turbulent flames (Atmospheric & pressurised)	Speakers: Mueller / Sun / Dreier Chair: Dally
	15:30 - 16:00	Coffee	
	16:00 - 17:30	Discussion: Turbulent flames	Chair: Geigle / Dally
		Break	
	19:00 - 22:00	Posters and Informal Dinner	
	Saturday 28 th	8:30 - 8:50	Progress and capabilities for turbulent sooting flames
8:50 - 9:30		Configurations and techniques for flames series from non-sooting to sooting	Discussion Panel: Simone Hochgreb, Venkat Raman, Bill Roberts
9:30 - 10:00		Joint discussion session with the TNF Workshop	Chairs: Dally / Mueller
10:00 - 10:30		Coffee	
10:30-10:50		Current knowledge on PAH chemistry: Mechanisms view	Speaker: Tiziano Faravelli Chair: Wang
10:50-11:10		Current knowledge on PAH chemistry: Reactions view	Speaker: Stephen Klippenstein Chair: Wang
11:10-11:30		Potential validation experiments for PAH chemistry	Speaker: Nils Hansen Chair: Thomson
11:30 - 12:30		Joint discussion session with Flame Chemistry Workshop	Chair: Pitsch / Wang
12:30 - 13:30		Lunch	
13:30 - 15:30		Laminar flames (Atmospheric & pressurised)	Speakers: Dworkin/Bisetti/Sirignano Chair: Wang / Thomson
15:30 - 16:00		Coffee	
16:00 - 17:00		Discussion: Outcomes and next target flames	Chairs: Shaddix / Wang
17:00 - 17:15		Feedback on Workshop	Chairs: Dally / Geigle
17:15 - 17:30		Closing remarks	Speaker: Nathan
17:30		Nominal closing time	