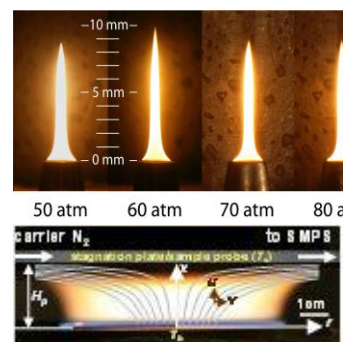




## Updated Communique for

# ISF-7

## Seventh International Workshop on the measurement and computation of reacting flows with carbon nanoparticles



*The Joint Committees of the ISF Workshop are pleased to invite original research contributions to, and participation in, the ISF-7 Workshop.*

- Dates:** ISF-7 will be held on Saturday 20<sup>th</sup> - Sunday 21<sup>st</sup> July 2024 as a joint forum together with the other satellite Workshops of The 40th International Symposium – Emphasizing Energy Transition. It is anticipated that registration will be undertaken via the website of the Symposium which, together with details of the venue, will be made available in the next few months.
- Call for contributions:** Researchers active in this field are invited to contact the relevant Program Leaders, listed below, and contribute original research to address current challenges identified herein associated with both the advancement of understanding and in the development and validation of predictive models for reacting flows containing carbon nanoparticles in environments of practical relevance.
- New framework for model development and comparisons:** A new open-source framework is being developed for presentation and discussion at ISF-7 to allow direct and transparent comparison of the output of calculations employing alternative types of models for the evolution of carbon nanomaterials in a series of well-characterised environments. This work has been undertaken in response to the need identified in previous workshops and actioned in ISF-6. Researchers wishing to contribute to this work are invited to contact the Program Leaders listed below.
- Ongoing research challenges:** Contributions are also called for research that address the following challenges which the ISF has selected as priorities for ISF-7:
  - Inception:** Further understanding is needed of the processes with which carbon nanomaterials first form from the gas phase, and what determines the preferential growth of different morphologies, to allow improved prediction of these processes that are robust to differences in operating conditions and relevant to a range of regimes of practical significance;
  - Morphology:** New ways are needed to characterise and model:
    - the key classes of morphology of carbon nanoparticles, and
    - the key chemical and environmental pathways that trigger each;
  - Influence of volume fraction:** New understanding is needed of influence of volume fraction on the evolution of carbon nanomaterials, which applies where volume fraction is high. This regime is different from combustion environments, where most previous data has been obtained, and where the influence of volume fraction is typically negligible;
  - Sub-grid-scale modelling:** Advances in the development and application of sub-grid-scale models for application to LES methods;

- **Advances in experimental methods:** Further advances are needed in the development and application of improved experimental methods (laminar and turbulent), particularly for the in-situ measurement of mixture fraction in the presence of nanomaterials, particle morphology and composition (C/H ratio);
5. **Format:** ISF-7 will be held in person, continuing to build on the successful features of ISF-6, and will include the following elements:
- **Industry speakers and panel discussion:** Topics to be confirmed.
  - **Poster presentations and prizes** for PhD students and Early Career Researchers, following the successful format of ISF-6.
  - **Detailed comparisons of models and experiments:** The research activities and contributions from the international community are coordinated within our workshop through the program leaders, listed below. The research of the contributors will be presented and reviewed to identify both the further progress since ISF-6 and the updated research priorities for the next two years. Challenges will be addressed through new data (both experimental and numerical) and include the identification of priorities for new data and the development of new measurement techniques and modelling approaches.
  - **New research activities to be presented in ISF-7:** In addition to the activities in Laminar and Turbulent Reactors, which will continue as per previous workshops, the following new activities endorsed at ISF-6 will be introduced:
    - **New program on methane pyrolysis:** For co-production of H<sub>2</sub> and carbon materials
    - **New research activities:** Particles derived from combustion via:
      - **Fires** – Biomass, wildfires, building fires;
      - **Sustainable aviation fuels (SAF)** – bio-derived & from CO<sub>2</sub>/H<sub>2</sub>
  - **Specialist panel discussions** will also be presented to address the following:
    - **Carbon materials:** Pathways to the production of alternative types of carbonaceous materials addressing complementary applications,
    - **Atmospheric forcing:** Impact of the use of emerging types of SAF, firstly on soot and other emissions arising from jet propulsion and, secondly, on the resulting atmospheric chemistry and radiant forcing;
  - **Childcare services** will be made available through the Milano hosts.

## Contact:

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| ISF website:                | <a href="http://www.adelaide.edu.au/cet/isfworkshop/">www.adelaide.edu.au/cet/isfworkshop/</a>                            |
| Laminar reactors:           | Dr Georgios Kelesidis <a href="mailto:gk545@sph.rutgers.edu">gk545@sph.rutgers.edu</a>                                    |
| Turbulent reactors:         | Dr Benedetta Franzelli <a href="mailto:benedetta.franzelli@centralesupelec.fr">benedetta.franzelli@centralesupelec.fr</a> |
| Common modelling framework: | Dr Reza Kholghy <a href="mailto:reza.kholghy@carleton.ca">reza.kholghy@carleton.ca</a>                                    |
| Fires:                      | Dr Chiara Saggese <a href="mailto:saggese1@lnl.gov">saggese1@lnl.gov</a>  |

## We are looking forward to welcoming you to ISF-7 in Milan!

**Organising Committee:** Prof Gus Nathan, Prof Heinz Pitsch, Prof Bassam Dally, Dr Chris Shaddix, Dr Klaus Peter Geigle, Prof Hope Michelsen, Prof Tiziano Faravelli, Prof Michael Mueller.

**Scientific Advisory Committee:** Dr Med Colket, Prof Andrea D'Anna, Prof Ömer Gülder, Prof Hai Wang, Prof Bill Roberts, Prof Peter Lindstedt, Prof Christof Schulz, Prof Henning Bockhorn, Prof Angela Violi, Prof Murray Thomson, *Industry Advisors:* Dr Enoch Dames, Mr Roscoe Taylor.

### Program Leaders and Co-leaders

**Laminar reactors:** Dr Chiara Saggese, Dr Georgios Kelesidis, Dr Reza Kholghy, Dr Joaquin Camacho.  
**Turbulent reactors:** Dr Benedetta Franzelli, Dr Zhiwei Sun, Dr Federica Ferraro.