# TopFuel 2027 – Call for Papers

**After the successful Topfuel 2024 in Grenoble, TopFuel 2027 comes back again in Europe!**

## We're pleased to welcome you all again from 10th – 14th October 2027 at the Clarion Sign Hotel in Stockholm, Sweden.

TopFuel's primary objective is to bring together leading international specialists in the field, from operators and engineering companies, designers and manufacturers, research institutes and universities, regulators and technical supporting organizations, to share experiences and advances in nuclear fuel technology, and to use the findings of the latest cutting-edge research to achieve high reliability, performance and safety of nuclear fuels for today and advancing technologies to explore a safe path into the future together :

The **TopFuel 2027** Programme Committee is calling for both oral and poster presentations in the following tracks:

**Track 1. Operation and experience**

a. Fuel operating experience and performance: reliability and leakers, degradation and failures, handling issues, water-side corrosion and hydriding, stress corrosion cracking, fuel assembly and component distortion, poolside examination and hot cell Post-Irradiation Examinations (PIEs);
b. Fuel assembly repair and reconstitution;
c. Failed fuel monitoring, water chemistry and corrosion/crud/dose countermeasures;
d. In-core fuel management: mixed core operation, fuel reload optimization, flexible operation (power manoeuvring and load follow operation), extended operating domain (e.g. extended cycle length and power uprates), and end of reactor life (management of final cycles);
e. Long-term operation (LTO) and its implications on fuel operation, core design and maintenance (e.g. reduction in neutron fluence to reactor components);
f. Fuel supply strategy;
g. Operational data acquisition, automatic analysis and Artificial Intelligence (AI) applications.

**Track 2. Advances in fuels for water-cooled reactors including Small Modular Reactors (SMRs)**

a. Fuel assembly design innovations;
b. Processing and manufacturing, including progress in additive manufacturing;
c. Cladding and structural materials development; mechanical and corrosion behaviour;

d. Fuel design improvements to support longer cycles, 5%-10% enrichment, high burnup, fluence reduction and efficient disposal;
e. Considerations of new operating conditions and environment (such as boron-free, KOH chemistry, coolant thermal hydraulics and power) associated with SMRs;
f. Experiences with and testing of Advanced Technology Fuel and control rod designs;
g. In-reactor performance of Advanced Technology Fuels in normal operation and during Anticipated Operational Occurrences (AOOs);
h. Qualification, licensing, and deployment scenarios for Advanced Technology Fuels;
i. Economic aspects of Advanced Technology Fuels deployment strategies;
j. Application of AI in design, materials and manufacturing.

**Track 3. Advanced Modular Reactor fuel performance demonstration**

a. New fuel concepts (e.g. TRISO fuel, fast reactor fuels and molten salt reactor fuels);
b. Fuel qualification for advanced reactors;
c. Fuel performance modelling and safety analyses of fuel for advanced reactors;
d. Fuel supply chain technical challenges (enrichment, manufacturing, transportation);
e. Fuel management and core design of advanced reactors.

**Track 4. Back End: closed fuel cycle, used fuel storage, transportation and re-use**

a. Closed fuel cycles and strategies;
b. Re-use after transportation/storage;
c. Interim storage, dry storage, wet storage, and long-term storage strategies (including Advanced Technology Fuels);
d. Handling and transportation of damaged, high burnup and non-standard fuels (including Advanced Technology Fuels); handling and treatment of leaking fuel;
e. Spent fuel safety: R&D activities, ageing issues, criteria and regulations;
f. Spent fuel and back end of advanced reactors fuels;
g. Long term fuel database management.

**Track 5. Transient fuel behaviour and safety related issues**

a. Transient fuel behaviour and modelling, including Advanced Technology Fuels, (RIA, LOCA, ATWS, PCI/SCC, PCMI, post-CHF, et cetera);
b. Safety and design criteria including time-at-temperature, Design Extension Conditions (DEC); safety analysis and licensing for current fuel and Advanced Technology Fuels;
c. Emerging issues related to fuel safety (e.g., fuel behaviour under extended loss of cooling; transient fission gas release; cladding ballooning and burst mechanisms; fuel fragmentation, relocation, and dispersal; long-term coolability; re-criticality);
d. Quantification and management of margins;
e. In-pile and out-of-pile test results and analyses.

**Track 6. Modelling, analysis, and methods**

- **a.** Development, verification, validation, and uncertainty quantification (VVUQ) of fuel performance modelling codes;
- **b.** Multi-physics multi-scale modelling and validation; water chemistry, corrosion and CRUD modelling;
- **c.** Validation databases;
- **d.** Transposition to in-reactor and back-end conditions;
- **e.** Fuel design and safety analysis methods, including uncertainty analysis;
- **f.** Data-driven and AI technology applications; Application of AI in fuel performance simulation, including use of surrogates, and coding assistants;
- **g.** Modelling of Advanced Technology Fuels.

**Track 7. Innovations for in-reactor fuel testing**

- **a.** Innovative instrumentation and experimental methods;
- **b.** Innovations in in-reactor fuel material testing;
- **c.** Development and performance of irradiation rigs specific to fuel;
- **d.** Qualification, validation, commissioning and uncertainties of testing methods.

**TopFuel 2027 – Key dates**

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| Deadline abstract submission: | 12 February 2027 |
| Announcement to authors: | 12 March 2027 |
| Deadline Full Paper submission: | 14 May 2027 |
| Deadline Final Full Paper submission (after peer-review): | 15 August 2027 |
| Deadline PPT/CV submission: | 1 October 2027 |
| **TopFuel 2027, Clarion Sign, Stockholm:** | **10 – 14 October 2027** |

**Click below to submit your abstract:**

**TopFuel 2027 ConfTool Submission System**