

JOB OFFER – POST-DOCTORAL

Post doc position on hydrogen combustion in gas turbines (M/W)

OFFER INFORMATION

Reference: E&S-25-TP-HYPOWERGT
Team: E&S

Location: 42 Avenue Gaspard Coriolis – 31057 Toulouse
Contact person: T. Poinot and O. Dounia

Period: 1 year - from: 01/10/2026

Salary: 40 K€/year (gross)

Level of education required: PhD

Key words: Combustion ; hydrogen ; explosions ; near-wall

CERFACS

Cerfac is a private research, development, transfer and training center for modeling, simulation and high-performance computing. Cerfac designs, develops and proposes innovative software methods and solutions to meet the needs of its partners in the aeronautics, space, climate, environment and energy sectors. Cerfac trains students, researchers and engineers in simulation and high-performance computing.

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HOSTING TEAM - E&S

The Energy & Safety team, formerly the CFD-Combustion team, focuses on cross-disciplinary activities aimed at developing, optimizing and deploying scientific codes dedicated to advanced combustion calculations in industrial geometries. The team focuses on the simulation of flows, applying them to aircraft, rockets, helicopters, car engines, turbines and more. The result is essential tools for a wide range of applications, with the leitmotiv: let's calculate systems before we build them. More specifically, team members develop models and tools covering chemical reduction, turbulence, combustion, two-phase systems, combustion instabilities, etc., to meet both academic and industrial challenges. Thanks to its position, the team collaborates with numerous scientific groups, design offices of Cerfac associates, and other Cerfac teams.

CONTEXT

CERFACS is working on combustion safety scenarios related to the transition to hydrogen in electricity-generating gas turbines as part of the European HYPOWERGT project (<https://hypowergt.eu>). The turbines targeted are those of Baker Hughes and Ansaldo. The decarbonization of these turbines involves the combustion of methane-hydrogen mixtures or pure hydrogen. In certain scenarios, such as turbine shutdown phases, it is possible that unburned hydrogen may end up in the stack and encounter oxygen and hot zones, leading to particularly dangerous explosions. CERFACS is responsible for studying these scenarios as part of the HYPOWERGT project, which also brings together several European manufacturers and research centers: SNAM, LUCART, NUOVO PIGNONE, ANSALDO, TOTALENERGIES, EQUINOR, SINTEF.

MISSION

The specific topic targeted for the postdoc is the realization of DNS and LES of combustion in these configurations in collaboration with the existing doctoral student and the senior members of the team. A fundamental study of the ignition of hydrogen mixtures close to hot walls is also planned. These studies will allow a better understanding of the LES results that will be carried out on the complex geometry of the real Baker Hughes NOVA-LT turbine installed in Florence. Calculations of the experiments set up within the framework of the ERC SAFE-H2 at the IMFT are also possible (cerfacs.fr/safe-h2). Although detonation is not the focus of the study, the fact that some untimely ignitions can lead to detonations could also be studied.

DESIRED PROFILE

- PhD defended less than 3 years ago.
- Expertise in combustion, hydrogen, simulations, HPC, DNS, LES, theory

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To apply, please send your CV and covering letter to poinsot@cerfacs.fr, dounia@cerfacs.fr, applications are open until 01/07/2026.

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