



Postdoctoral Researcher Position

Modelling, CFD and Experimental Development of an Innovative Absorption Injector

Shape the Future of Sustainable Cooling

Cooling demand is growing rapidly worldwide, creating an urgent need for more energy-efficient and sustainable technologies. Thermally driven absorption systems offer an attractive alternative to conventional vapour-compression technologies, particularly when powered by renewable energy or industrial waste heat.

The INJECTA project aims to develop an innovative passive injector for ammonia–water ($\text{NH}_3/\text{H}_2\text{O}$) absorption systems. By harnessing the pressure and energy available within the thermodynamic cycle, the injector is designed to improve fluid circulation without relying on conventional mechanical pumping. This approach has the potential to enable more compact, efficient and reliable absorption cooling systems.

We are seeking a highly motivated Postdoctoral Researcher to join this ambitious research project and contribute to the development of this innovative technology.

Your Mission

The Postdoctoral Researcher will play a key role in the development and validation of the absorption injector, covering the full research cycle from physical modelling to experimental demonstration.

Your main tasks will include:

- Developing simplified 0D thermodynamic and hydrodynamic models for preliminary injector design and sensitivity analysis;
- Developing advanced multiphase and multi-species models and performing CFD simulations to investigate flow, mass, momentum and energy transfer within the injector;
- Contributing to the detailed design and manufacturing of injector prototypes;
- Adapting and operating an experimental test bench for the thermo-hydraulic characterisation of the injector;
- Conducting experimental campaigns and validating numerical models against experimental data;
- Analysing results and identifying opportunities for performance optimisation;
- Publishing research results in international journals and contributing to patent applications.

The project offers the opportunity to follow an innovative technology through the complete development process:

Physical modelling → CFD simulation → prototype development → experimental validation → scientific publications and technological innovation.

Your Profile

You should hold a PhD in Energy Engineering, Mechanical Engineering, Thermodynamics, Fluid Mechanics, Process Engineering, or a related field.

We are looking for a creative and enthusiastic researcher with a strong background in one or more of the following areas:

- Thermodynamics and energy systems;
- Multiphase flows and fluid mechanics;
- CFD and numerical modelling;
- Experimental thermal or fluid systems;



- Scientific programming and data analysis.

Experience with absorption systems, ammonia–water mixtures, injectors/ejectors or phase-change phenomena would be an advantage, but is not mandatory. You should be scientifically curious, proactive and able to work independently while enjoying collaboration in a multidisciplinary research environment. A good command of written and spoken English is essential.

Why Join Us?

This position offers a unique opportunity to work on an innovative and potentially disruptive energy technology addressing one of the major challenges of the energy transition: delivering sustainable cooling with significantly reduced electricity consumption.

You will join CEA LITEN, a leading European research institute dedicated to new energy technologies, and benefit from:

- Access to advanced numerical and experimental facilities;
- A stimulating and multidisciplinary research environment;
- Opportunities to publish in international scientific journals and present your work at major conferences;
- The possibility to contribute to technological innovation and patent development;
- The opportunity to build a strong scientific profile at the interface between fundamental research, numerical modelling and experimental technology development.

The project is expected to generate 2–3 scientific publications and contribute to 2–3 patent applications related to injector design, system architecture and control strategies.

Practical Information

- Position: Postdoctoral Researcher
- Contract duration: 24 months
- Location: CEA LITEN – INES Site, Le Bourget-du-Lac, France
- Starting date: January/February 2027 (flexible, depending on the candidate's availability)
- Salary: minimum 40.8 k€/year

How to Apply

Interested candidates are invited to submit:

- A detailed CV;
- A cover letter describing their research interests and motivation;
- A list of publications;
- Contact information for one or two scientific references.

For further information about the position and the INJECTA project, please contact:

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