

**Willing to experience intersectoral, interdisciplinary and/or international research? Apply with Centrale Nantes to the MSCA Postdoctoral fellowship 2025 call for proposals and join us!**

### Candidate profile

We are seeking a highly motivated postdoctoral researcher with a strong background in computational simulation and a passion for pushing scientific boundaries. The ideal candidate will possess:

Expertise in simulation tools, particularly Flow3D or similar thermomechanical simulation software.

Experience in additive manufacturing: A deep understanding of 3D printing technologies and their application in mechanical or materials engineering.

Curiosity about microgravity environments: An interest in understanding how varying gravitational conditions affect manufacturing processes.

Desirable skills: Knowledge of experimental design for microgravity conditions (e.g., parabolic flights, drop towers) is a plus but not required.

### Project description

Supervisor: Tugdual Le Neel

Keywords: Additive Manufacturing, 3D printing, Metal, Simulation, Flow3D, Space, thermomechanical, DED

#### Topic open:

Space, the new frontier: What if the absence of gravity revolutionized materials? This project explores how microgravity conditions can fundamentally alter the manufacturing processes of advanced materials, particularly through additive manufacturing. Building on preliminary findings that demonstrate enhanced material properties produced off Earth, the project aims to:

1. Model microgravity phenomena: Simulate manufacturing processes under various gravitational conditions, leveraging advanced tools such as Flow3D.
2. Design Earth-based experiments: Develop methodologies to mimic microgravity effects using tools like parabolic flights or drop towers.
3. Validate findings: Conduct experiments to corroborate simulation results and refine manufacturing techniques for both terrestrial and extraterrestrial applications.

This research promises to advance the understanding of material behavior in non-terrestrial environments and lay the groundwork for innovative applications in space exploration and beyond. Join us in reshaping the future of manufacturing by leveraging cutting-edge simulation and experimental techniques.

## Call information

Organisation	Ecole Centrale Nantes
Research field(s)	Additive Manufacturing, processes, metallurgy
Researcher Profile	R1 – First stage researcher
Country	France
Application deadline	31 March 2025
Type of contract	Temporary
Job status	Full-time
Hours per week	39
Offer starting date (estimated)	1 Apr 2026
Is the job funded through the EU Research Framework Programme?	Horizon Europe – MSCA European Postdoctoral Fellowship

## Research environment

Centrale Nantes is a top-ranked institution recognized internationally for its excellence in research and education, particularly in engineering and technology. It is known for its leadership in fields such as **marine engineering**, **civil engineering**, and **mechanical engineering**, frequently appearing in the upper echelons of global rankings. For example, it ranks **125th worldwide in Mechanical Engineering** according to the **QS World University Rankings by Subject 2024**, reflecting its prominence in this area.

Additionally, Centrale Nantes is positioned in the **top 300 globally for Engineering**, and in the **top 500 for Physical and Computer Sciences** in the **Times Higher Education World University Rankings by Subject 2024**, highlighting its multidisciplinary strength.

Notably, Centrale Nantes was named **the top institution in France in the "Engineering Schools to Change the World"** ranking, compiled by **Les Echos START and ChangeNOW**, which evaluates schools based on their contributions to social and ecological transitions. This ranking showcases its dedication to sustainability and innovative solutions to global challenges.

Centrale Nantes' research extends beyond traditional engineering disciplines. It is recognized for pioneering work in **artificial intelligence** and **robotics**, often ranking among the **top 100 worldwide** in these fields. Its **computational mechanics** and **hydrodynamics** research centers are considered among the best in Europe, further cementing its status as a leader in cutting-edge scientific research.

Through strong global partnerships and innovative initiatives, Centrale Nantes continues to enhance its reputation as a world-class institution in scientific and technological research, with a strong focus on sustainability and impactful solutions for societal challenges. Please take look at our institution before submitting your application: <https://www.ec-nantes.fr/>

## Profile required

### Eligibility criteria - Specific Requirements

- **You are a First-stage or an Experienced Researcher** eg. in possession of a doctoral degree at the time of the call deadline (10<sup>th</sup> Sept 2025) and a maximum of 8 years full-time equivalent experience in research (self-assessment tool [here](#)).
- **You comply with the mobility rule:** eg. you must not have resided or carried out your main activity (work, studies, etc.) in France for more than 12 months in the 36 months immediately before the call deadline (September 10th, 2025). All nationalities welcome!
- **You want to carry out an innovative research:** only the best proposals will be selected by the European Commission. All domains of research are eligible!
- **You already have great achievements in research:** Curriculum Vitae is an important criterion of MSCA application.

## Conditions of employment

Duration	12 to 24 months
Salary	Around €6 000 (fully loaded cost of employment) per month Exact salary to be published in the MSCA PF call in April 2025.
Support to mobility and family	mobility allowance (€ 710 per month) + family allowance (€ 660 per month) if applicable - both allowances are fully loaded cost of employment
Secondment	An interdisciplinary and/or intersectoral mobility (3 months up to 1/3 of fellowship) is possible <b>when relevant</b>
Additional benefits:	- Teleworking possible - 75% transport reimbursement - Sustainable mobility bonus (if cycling or car-pooling)

## Selection process

How to apply to MSCA Postdoctoral Fellowship with Centrale Nantes:

### Step 1: Find a supervisor at Centrale Nantes (application before March 31st, 2025)

- *Select a pre-determined topic.* You apply in **English** to one or two research subject(s) provided by supervisors (please see table 2 below):
  - Detailed Curriculum Vitae (including list of publications);
  - A concise statement of research's relevance to the selected topic/duration, along with a detailed proposal outlining your project idea for the MSCA Postdoctoral Fellowship;
  - Link and/or information about your doctoral thesis;
  - Contact information of two references (not mandatory, recommended).

Please apply by sending your application to [pauline.rouaud@ec-nantes.fr](mailto:pauline.rouaud@ec-nantes.fr) and [yolaine.lebeau@ec-nantes.fr](mailto:yolaine.lebeau@ec-nantes.fr) before **March 31st, 2025**. Please always include both contacts so that your request can be processed as quickly as possible.

If your application is retained (feedback at the latest: end of April 2025), then, the next step is to apply jointly to the MSCA PF (call launched by the European Commission - HORIZON-MSCA-2025-PF-01-01).

### Step 2: Prepare the application to the MSCA PF

#### April-May 2025

- You receive an informative MSCA-PF starter package via an online meeting with advice on institutional aspects and horizontal issues (open science, gender, ethics and research data management...) - fellow + supervisors + EU project managers
- You elaborate jointly the research approach with your supervisor(s) (April 2025)

#### June 2025

- One joint meeting in Nantes. You receive a dedicated training session "Preparing for an Horizon Europe MSCA Postdoctoral Fellowship" advice on how to write your proposal - fellow + supervisors + EU project managers

#### July-August 2025

- Online meeting for proofreading - fellow + supervisors + EU project managers

#### September 2025

- Online meeting for administrative support for your MSCA PF application - fellow + supervisors + EU project managers
- We apply for you (deadline for the application: September 10th, 2025)

Please read this page to understand how MSCA PF works: <https://marie-sklodowska-curie-actions.ec.europa.eu/actions/postdoctoral-fellowships/6-steps-to-prepare-your-application>

Centrale Nantes is committed to equality and diversity. In line with our CSR commitments, this call is open to all.