CIMNE®

**International Centre for
Numerical Methods in Engineering**

hr
HR EXCELLENCE IN RESEARCH

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JOB VACANCY ANNOUNCEMENT

VAC-2025-27 – **Postdoctoral position in Bayesian strategies for geophysical inversion**

Number of places: 1

Category: PDOC 2

Workplace: CIMNE - Barcelona

Salary (gross): 35.186,46 €

Weekly working hours: 40

Duration: 2 years

Functions to be developed:

This postdoctoral fellowship is part of the DeepGeo (Computational Engineering Supporting Future Clean Energy via Deep Geothermal Prospection) project, funded by Spanish Ministry of Science, Innovation and Universities and the Research National (2024-207).

DeepGeo proposes to develop an innovative, efficient and effective data-fusion paradigm, robust to data missing limitations, to inform and enhance international exploration efforts for deep geothermal resources, from global to regional scales. The main goal of DeepGeo is to develop numerical tools aiming at i) complement the strengths and resolutions of multiple satellite and land-acquired datasets and ii) a novel combination of Machine Learning, probabilistic inverse theory, state-of-the-art computational modelling.

We are seeking a postdoctoral fellow to develop numerical tools based on Bayesian inversion techniques, Machine Learning and Model Order Reduction that allow for i) integrate data from different sources, ii) control the quality and uncertainty of the model predictions, iii) accelerate the computation of forward model predictions via Model Order Reduction, making it possible to include processes that were prohibitively expensive in previous inversions.

Specific challenges that are expected to be tackled are:

- Combine uncertainties arising from the different items of the inversion procedure. Namely, data, forward model (in particular from discretization and model reduction), and the inversion strategy itself.
- Optimize the parametrization in order to describe the geophysical structure with the lowest number of parameters while guaranteeing sufficient accuracy (adaptive parametrization).
- Devise smart browsing of the parametric space enhancing the capacities of the Markov-Chain Monte-Carlo strategies.

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Required skills:

- Recent PhD in Mechanical and/or Computational Engineering, Geophysical Modelling, Applied Mathematics or related fields
- Strong background in numerical modelling and data-science
- Good command of oral and written English
- Fluent communication in an international background and ability to work in an interdisciplinary team

Other valued skills (not mandatory):

- Experience in Bayesian approaches (preferably for inverse problems)
- Motivation to contribute mentoring PhD students

Qualification system:

The requisites and merits will be evaluated with a maximum note of 100 points. Such maximal note will be obtained summing up the following points:

- Academic qualifications: 30%
- Training and development: 5%
- Professional experience: 5%
- Knowledge of the Catalan language: 5%
- Knowledge of the English language: 20%
- Selective tests and interview: 35%

Candidates must complete the "Application Form" form on our website, indicating the reference of the vacancy and attaching the required documents.

The deadline for registration to the offer ends on March 30th , 2025 at 12 noon.

The preselected candidates may be requested to send the documentation required in the "Requirements" and "Merits" sections, duly scanned, and may be called to go through selection tests (which might be of eliminatory nature) and / or personal interviews.

Commitment to inclusitvity:

At CIMNE, we champion workplace equity, diversity, and inclusion. We're committed to fostering a culture where everyone can thrive, leveraging diverse talents and backgrounds. We welcome all applicants regardless of color, religion, gender, origin, abilities, gender identity, sexual orientation, pregnancy or any other characteristic. Join us in building a community that values, celebrates, and respects every individual.

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HR Excellence in Research:

CIMNE welcomes and supports the principles of European Commission's *European Charter for Researchers* and the *Code of Conduct for the Recruitment of Researchers*, embracing a transparent, attractive, and open labour market in research. The centre's Human Resources Strategy for Researchers (HRS4R) includes an action plan with actionable short and long-term actions to support a high-quality working environment for all. Further information can be found here.

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