

Post-Doctoral Advanced pre-salt carbonates quantitative  
imaging REF.: 25PDR314  
University of São Paulo

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Posted Feb. 13, 2025, set to expire Jun. 15, 2025

**Job Title** Post-Doctoral Advanced pre-salt carbonates quantitative imaging REF.: 25PDR314  
**Department** Department of Structures (DES), Computacional Mechanics Laboratory (LabMec)  
<https://sites.usp.br/rcgi/>  
**Institution** University of São Paulo  
São Paulo, São Paulo, Brazil

**Date Posted** Feb. 13, 2025

**Application Deadline** Mar. 10, 2025

**Position Start Date** Apr. 1, 2025

**Job Categories** Post-Doc

**Academic Field(s)** Civil Engineering  
Engineering - Other

**Job Website** <https://sites.usp.br/rcgi/opportunities/>

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**Job  
Description**

**Research theme area:**

Development of Numerical Techniques and Software for Inversion Problems with Seismic Processing Applications.

**Abstract:**

The candidate will collaborate with researchers from the project AVENIR promoted by Total Energies at the Research Centre for Greenhouse Gas Innovation of POLI-USP at the University of São Paulo. Summary of the program and projects can be found at the RCGI website (<https://sites.usp.br/rcgi/>).

The objective of the project AVENIR– Anisotropic ViscoElastic Seismic Imaging – is to build highly efficient, domain-specific language software tools to perform full waveform inversion (FWI) based on three-dimensional, tilted transverse isotropic (TTI) viscoelastic wave modelling. To achieve this goal, the team will first work on the construction of three-dimensional viscoelastic TTI kernels to be run efficiently in GPGPU hardware. The project will be developed in three branches: Branch A will explore finite-differences discretization using the software Devito, Branch B will focus on high order finite-element discretization using the software spyro, and Branch C will be devoted to the development of robust elastic FWI algorithms.

More specifically, the post-doc researcher will carry out his/her research in branch B. The postdoc will develop his/her research in mesh generation and adaptation for finite and spectral elements and in the development of algorithms and strategies to match the applications of the acoustic wave model and elastic wave model in distinct regions in space. The development of the solver will be based on spyro (<https://github.com/NDF-Poli-USP/spyro>), which is based on Firedrake (<https://www.firedrakeproject.org/>). The mesh generation/adaptation can be based on SeismicMesh (<https://github.com/krober10nd/SeismicMesh>) or on Gmsh (<http://gmsh.info>).

**Description:**

The applicant will contribute to the following main objectives of the project:

1. Development of mesh generation and adaptation algorithms to produce optimized spatial discretization for finite element-based anisotropic elastic and viscoelastic wave propagation;
2. Develop interface matching strategies to allow the coupling with acoustic solvers (and consequently save computing time in the propagation through the water layer).

**Requirements to fill the position:**

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This project is suitable for a highly motivated candidate and requires programming skills and knowledge on numerical methods. The candidate must have a PhD degree in engineering, computing, mathematics, physics, or geophysics. Knowledge of English is required. Experience in the development of large-scale numerical methods and high-performance computing is highly desired.

**INFORMATION ABOUT FELLOWSHIP:**

This call offers one grant for this project. This post-doctorate fellowship is funded by FUSP – Fundação de Apoio a Universidade de São Paulo. The fellowship will cover a standard maintenance stipend of R\$12.000,00 per month.

**MORE INFORMATION:**

<https://sites.usp.br/rcgi/opportunities/>

Position: **Post-Doctoral Fellowship REF.: 25PDR314**

[Access here](#) AND APPLICATION AT REF **Post-Doctoral REF.: 25PDR314**

**Contact Information**

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

**Contact**      RCGI  
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