



Post-doctoral position in the development of x-ray texture tomography to study biomineralized tissue

A **36-month postdoctoral position** is available at the Institut Fresnel in Marseille, France, an academic joint laboratory of Aix-Marseille University, CNRS and Ecole Centrale.

The crystallographic texture is a major determinant for the behaviour of materials. Despite this importance, appropriate, quantitative methods to study the crystallographic texture in biomaterials in 3D are missing. In the framework of a project funded by the European Research Council (ERC Starting grant 'TextOM'), our group is aiming to develop texture tomography as a quantitative tool to study the crystallographic texture in 3D, based on previous work [1]. We finally want to use it to study the mechanical behaviour of a functionally graded, hierarchically organized biomaterials, the bone-tendon insertion. This work is embedded in the larger research context of the COMiX team [2], whose expertise lies in the development of characterization techniques for complex crystalline materials with a specific focus on biomineralization.

Position

The selected post-doctoral researcher will take active part in the ERC project, which requires:

- Mathematical formulation of the texture tomography inversion problem
- Design and numerical implementation of the numeric inversion code
- Experimental implementation of texture tomography at synchrotron light sources (European Synchrotron (ESRF), Grenoble, France) and carry out experimental campaigns on biomineralized samples

The selected post-doc should demonstrate a sound scientific background and very good knowledge of numerical methods, allowing him/her to conduct the outlined research activities. He/she will work under the direct supervision of a CNRS scientist and will interact with other researchers in the team as well as scientists at the ESRF during the implementation of the method. The position entails furthermore multiple scientific visits to the European Synchrotron (ESRF) during the experimental implementation.

Requirements

- PhD degree with sound expertise in synchrotron science, scientific computation, applied mathematics, inversion problems, x-ray diffraction, biomineralization or a related discipline.
- Very good knowledge in object-oriented programming, familiarity with python is a bonus
- Highly-developed critical and analytical skills
- Capability to work in an interdisciplinary, international team

Terms of employment

The post-doctoral position is a three-year full-time appointment under a contract with the French National Centre for Scientific Research (CNRS), starting preferentially in September 2022. Gross salary will depend on the experience of the candidate, up to approx. 43,000 €/year (net salary: up to approx. 34,000 €/year).

Application

Candidates are requested to submit:

- a cover letter explaining shortly the relevance and motivation of the application
- a detailed CV
- a reference letter
- 2 major publications
- 3 academic references

The application should be addressed to tilman.grunewald@fresnel.fr

Selection will be based on merit and potential, measured in terms of academic record and personal achievement. Creativity, proactivity and capacity for teamwork will also be taken into account.

The selection process will be closed as soon as a good candidate is recruited

References

[1] T. Grünwald et al, Science Advances 6 (24), 2021 DOI: 10.1126/sciadv.aba4171

[2] <https://www.fresnel.fr/spip/spip.php?article1374&lang=en>

Please contact the Principal Investigator for further information

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