Job Post: Experimental research scientist on the physics of glasses at CEA SPEC.

The SPEC, SPHYNX group has an opening for a full-time research scientist in the domain of the physics of glasses.

About the Laboratory and the team:

CEA is the Alternative Energies and Atomic Energy Commission, a French public research organization in the areas of energy, defense and security, information technologies and health technologies. Its condensed matter physics department (SPEC) is a CEA-CNRS research unit with about 160 people, and is part of Paris-Saclay University. It conducts multidisciplinary research on condensed matter physics, from quantum physics to complex systems. Within SPEC, the SPHYNX group (about 40 people including 18 permanent staff from CEA and CNRS) conducts experimental, theoretical and numerical research on physical systems located far from equilibrium. Its research topics currently concern active matter, glassy systems and slow dynamics, heterogeneous fracture and new materials, turbulence and climate, complex fluids for energy.

Job description:

We are looking for a highly motivated person to conduct research on glass transition and the role of amorphous order [1], both in the formation of glasses (around their glass transition temperature Tg), and in the mechanical properties of these same glasses when in their solid state (at T<<Tg). Indeed, there are recent theoretical predictions on this subject [2] that await to be tested by experiments specifically designed to confirm or disprove the link between mechanical responses (plasticity, yielding) and amorphous order. To develop these researches, the recruit will rely, in particular, on the activities of F. Ladieu's team (web) establishing the existence of amorphous order (non-linear responses [3] and more recently optical manipulation of molecules in vitrifiable systems [4]). In addition, the recruit will have access to develop his project to the broad spectrum of equipment and techniques in SPEC, in particular the state-of-the-art AFM of SPHYNX (web) and a clean room for micro/nanofabrication (web).

Required qualification:

The recruit requires a PhD in experimental materials physics or condensed matter physics. He/she should also have a solid competence in one or more of the following areas: statistical physics, e.g. disordered systems, amorphous, granular or heterogeneous materials, soft matter, complex fluids, etc. He/she will have demonstrated his/her ability to engage in innovative experiments, from their design to the interpretation of the obtained physical results. He/she will also have demonstrated his/her writing skills, which he/she will use for writing articles as well as research projects and project proposals (ANR for example). Knowledge in experimental solid mechanics, nanomechanics, micro/nano-lithography, rheology or dielectric spectroscopy will be considered an asset.

Human qualities are an important aspect. On the one hand, the recruit will have to integrate into the SPHYNX glass team and reinforce the existing activities, in synergy with researchers concerned. On the other hand, concerning the development of his own project in glass nanomechanics, the recruit will rely on tools/skills already present in the laboratory, in close collaboration with the technicians, researchers and engineers of the laboratory. In the long run, the recruit will be led to assume tasks of collectivity or institutional interest.

How to apply:

Applicants must provide a curriculum vitae, a list of publications, recommendation letters, a short statement of their past research experience and accomplishments, a letter of motivation describing the suitability of their profile for the position, and the project (in 2 pages) that they wish to propose within the framework described above.

The application file should be submitted before 22 August 2021 on the CEA recruitment web platform by connecting to https://www.emploi.cea.fr/offre-de-emploi/emploi-experimental-research-scientist-on-the-physics-of-glasses-at-cea-spec-h-f_17505.aspx

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[1] See e.g. F. Arceri et al., « Glasses and aging: a statistical mechanics perspective » https://arxiv.org/abs/2006.09725

[2] E.g. M. Ozawa et al., "Random critical point separates brittle and ductile yielding transitions in amorphous materials", Proceedings of the National Academy of Sciences, Volume: 115 Issue: 26, Pages: 6656-6661, (2018), DOI: 10.1073/pnas.1806156115

[3] See for a review: S. Albert et al, "Third and fifth harmonic responses in viscous liquids", Journal of Statistical Mechanics: Theory and Experiment, Volume: 2019, Issue: 12, Article number: 124003, (2019), DOI: 10.1088/1742-5468/ab371e.

[4] PhD dissertation of Paul Datin (2019) : « Manipulation optique de molécules pour l'étude de la transition vitreuse », https://tel.archives-ouvertes.fr/tel-03084257