

2-years Post-doctoral position at the Institute of Physics (University of Rennes)

“Study of ultrafast photo-induced effect near critical points in correlated molecular materials”

Application deadline: not before October 1st 2021 and open until a suitable candidate is found.

Materials science has moved from the observation to the control of the properties offered by complex systems. This fellowship proposes to investigate the response of correlated molecular conductors to ultrafast photo-excitations near critical points of the phase diagram where materials susceptibilities are diverging. It relies on a challenging combination of accurate control of thermodynamical parameters (pressure, temperature) with ultrafast pump-probe optical spectroscopy in the visible and infrared range. The objective is to explore the photo-responses beyond the linear regime and observe non-statistical hidden states in molecular correlated materials.

The successful candidate is expected to perform femtosecond optical spectroscopy on different correlated molecular materials while using a cryogenic pressure gas cell allowing to explore the phase diagram (5-300 K and up to 7 kbars or higher). Part of the research may also involve X-ray diffraction and optical spectroscopy at equilibrium under controlled thermodynamical parameters. This 2-years fellowship is funded by ANR project CRITICLAS and take place at the Institute of Physics of Rennes (IPR, France). This position will be carried out within the frame of the International Research Laboratory “DCM” (Dynamical Control of Materials) made with Japan (University Tokyo, Tokyo Institute of Technology, University of Tohoku).

Applicant profile: The candidate should have a PhD degree and a high knowledge of ultrafast optical techniques (pump-probe, femtosecond lasers, OPAs) and materials science. Previous experiences in infrared spectroscopy and/or correlated molecular materials is a bonus. Skills in data analysis and interfacing are mandatory. Good oral and written communication in English, as well as aptitude for teamwork are essential.

The global task will consist in:

- Developing and performing femtosecond optical spectroscopy under control environment
- Expanding the current setup towards the far-infrared range (5-15 μm)
- Analyzing and interpreting inhouse experiments
- Writing scientific articles and actively disseminating the result at conferences, workshops,...

Salary and employment conditions: The contracts retirement contributions and give right include full social security coverage and unemployment benefits. The net salary span from 2 000 € to 3 000 € / month (depending on experience). Post-doc have no teaching obligations at University. Rennes is a medium size French city less 1h30 train ride from Paris, offering a relaxing lifestyle with many cultural and sport activities.

The Team: the candidate will work inside the “Materials and Light Group” at the Institute of Physics of the University of Rennes 1. Our research is focused on ultrafast out-of-equilibrium phenomena in materials and molecules using optical and X-ray techniques with femtosecond to picosecond time resolution. The team is now part of a newly establish International Research Laboratory (IRL) involving French and Japanese Universities (University Tokyo, Tokyo Institute of Technology, Tohoku University).

More information can be found on the website <https://ipr.univ-rennes1.fr/en/materials-and-lightdepartement>

How to apply: Interested candidates should send a single pdf file with:

1. a cover letter
2. CV
3. main publication list with few sentences explaining the author contribution in each of them
4. The name of two to four referees

Interested candidates should contact:

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