1. **Postdoctoral position to study the condensation of the protolunar disk**

Job offer from the institut de physique du globe de Paris | CNRS UMR 7154

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| **Researcher in** | Computational physics/chemistry/mineralogy |
| **Duration** | One year, with possible one year extension |
| **Affectation** | IPGP, CAGE |
| **Salary** |  |
| **Date of publication** | May 24th , 2024 |
| **Starting date** | Earliest date possible after September 1st, 2024 |
| **Location** | Institut de Physique du Globe de Paris, 1 rue Jussieu, Paris 75005 |

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### The Institut de Physique du Globe de Paris

A world-renowned geosciences organisation, the IPGP is associated with the CNRS and an integrated institute of the Université Paris Cité. Bringing together more than 500 people, the IPGP studies the Earth and the planets from the core to the most superficial fluid envelopes, through observation, experimentation and modelling.

The research aeras are structured through 4 main unifying themes: Interiors of the Earth and Planets, Natural Hazards, Earth System and Origins.

The IPGP is in charge of labelled observation services in volcanology, seismology, magnetism, gravimetry and erosion. And the IPGP's permanent observatories monitor the four active French overseas volcanoes in Guadeloupe, Martinique, Réunion Island and Mayotte.

The IPGP hosts powerful computing resources and state-of-the-art experimental and analytical facilities and benefits from first-class technical support. The IPGP provides its students with geosciences training that combine observation, quantitative analysis and modelling, and that reflects the quality, richness and thematic diversity of the research conducted by the IPGP teams.

### Team Department

You will be part of the *ab initio* group within the CAGE team (Cosmochemistry, Astrophysics, and Experimental Geophysics), working on various aspects of matter under extreme conditions. CAGE brings together researchers interested in the formation of the solar system and its early evolution and the formation of the Earth and its ancient geologic history. You are expected to interact closely with the experimental teams at Sorbonne University and the University of Nantes, who are carrying out complementary experimental studies *in situ* at high pressure and temperature.

### Missions

An opening at the postdoctoral level is available in the ab initio team of IPGP to work on predicting the structure of filled ices and their thermodynamic stability.

The position is on the project ExoticICes, funded by the French National Research Agency (ANR).

### Activities

The successful candidate will run structural prediction software to explore the structures of ices and clathrates, will perform molecular dynamics simulations to study reaction kinetics and clathrate formation, phonon calculations to study the stability of these structures. He/she will use ab initio calculations, build interatomic potentials in machine learning, and perform large-scale atomistic simulations with these potentials. She/he will study the formation of salt-based clathrates, and then explore their stability and physical properties, like vibrational spectra, structural order/disorder, hydrogen diffusion, and predict their high-pressure phase transitions. Further studies will involve destabilization, decomposition, and search for superionicity.

### Expected Skills

The successful candidate should have a strong background in research, with experience in molecular dynamics simulations and statistical mechanics techniques. She/he should have a strong background in thermodynamics and mineral physics. Strong knowledge of machine learning techniques are required.

Solid programming skills such as Python are preferred.

Candidates who have excellent communication skills and the ability to work well in a team environment, who can work independently and manage one's own time effectively, and who show a strong interest in continuing research on liquid-vapor equilibrium and the ability to contribute to ongoing projects in this area are preferred.

### Obligations and risks

The job follows standard procedures and regulations currently in use in France with remote work reduced to a minimum.

### Training and experience required

A Ph.D. in chemistry, physics, or a related field with a focus on physical chemistry and thermodynamics.

A strong record of publications in relevant journals and conferences.

### How to apply

Please submit a cover letter and your CV before June 25th, 2024. You must also provide up to two referees who can provide an assessment of your previous work.