Object: 3 years post-doc position in Physical Chemistry and Organic Chemistry applied to the quest of the Origins of Life in ASTRO team at the PIIM laboratory of the Aix-Marseille University in France

Context: Since fifteen years, the ASTRO team draws a unique scenario that starts from the primitive dense molecular cloud up to the development of a prebiotic chemistry at the surface of the early Earth. They develop experimental approaches questioning the origin of the organic matter observed in the various interplanetary bodies of our solar system. They demonstrated that a part of this matter could be related to the chemistry occurring during the collapse of the native dense molecular clouds and its evolution to a protoplanetary disk. The accretion step could have then led to an incorporation of a fraction of this primitive organic matter in asteroids and comets, where, depending on the body, secondary alterations could have occurred, leading to a new evolution of the organic content. As observed on Earth with the presence of meteorites, the organic content of interplanetary bodies may have been delivered at the surface of the early Earth, 4.3 to 3.8 Go ago. This extraterrestrial organic matter may have been an important reservoir of organic matter that could have played a role in the emergence of life on the early Earth.

Objectives the scientific project: The aim of this position is to built, under the supervision of Pr. Grégoire Danger and in collaboration with Dr. Robert Pascal, Dr. Louis Le Sergeant d'Hendecourt and Dr Vassilissa Vinogradoff, a chemistry lab dedicated to prebiotic chemistry experiments. In our case, prebiotic chemistry experiments are developed in order to understand the chemistry occurring in the context of the early Earth using two complementary approaches:

1. A holistic approach that concerns the understanding of the environmental conditions that could drive an emergence of a selectivity from a molecular diversity as represented by the extraterrestrial reservoir of organic matter. What conditions to the emergence of a system chemistry capable of presenting a chemical evolution.
2. A reductionist approach that aims to investigate the reactivity possibly occurring in the conditions explored in 1. by working on simple chemical systems to understand the role of specific chemical compounds such as nitriles, thiols and others.

Objectives of the candidate: He/She will have thus to integrate the current project already developed in the holistic approach, while he/she will develop the reductionist approach. The candidate will be part of a unique interdisciplinary project, and complement with his/her skills in physical chemistry and organic chemistry the expertise already available in the ASTRO team at the PIIM laboratory. The candidate will supervise with Pr. Grégoire Danger a PhD student on the holistic approach, who has started in December 2023. A new PhD student will start his position in October 2024 on the reductionist approach and will directly work with the candidate.

Situation of the position: the research will be carried out within the ASTRO team at the Physique des Interactions Ioniques et Moléculaires laboratory of the Aix-Marseille University in France. This team is part of the Origines Institute of the Aix-Marseille University. The team is also involved in the national action PEPR Origins, the French Society of Astrobiology, and is part of different international actions in astrochemistry and astrobiology, such as the European Astrobiology Institute.
We seek for a motivated and a high rank candidate, having a scientific expertise sufficient to successfully apply for a permanent position at CNRS to continue to develop this part of the ASTRO team project.

Administrative information:

- The position is for three years. The raw salary will depend on the candidate experience, but will be at maximum of 53 k€ per year.
- Applicants must have a PhD in analytical chemistry, physical chemistry or organic chemistry by the date of appointment.
- The starting date would be fall to mid 2024, depending on the applicant's availability.
- Applicants should submit a cover letter, CV, list of publications, and a statement (2 pages max) explaining research interests and qualifications, and arrange for two letters of recommendation.
- Review of applications will begin upon receipt until the position is filled and all applications received by the deadline will receive full consideration.
- Selected applicants will be interviewed. They will have to present their research background and to propose a project in relation with the aim of the current position. The selection of the candidate will be held after these interviews.

Application Deadline: February 15th, 2024
Audition Deadline: March 15th, 2024
Starting date: June, 2024
End Date: June, 2027
Attention To: Grégoire Danger - Email: gregoire.danger@univ-amu.fr

Selected references:

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6. 5-(4H)-Oxazolones as Effective Aminoacylation Reagents for the 3′-Terminus of RNA. Z. Liu, C. Hanson, G. Ajram, L. Boiteau, J-C Rossi, G. Danger, R. Pascal* Synthetic Letters, 2017, 28, 73-77

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