

Post-doctoral position on Astrochemistry/Planetology in Aix-Marseille University, PIIM laboratory.

Impact of space weathering to detect organic matter in mineral matrices simulating solar system bodies

This project investigates the origin and chemical evolution of extraterrestrial organic matter in past or present aqueous environments of Solar System bodies. Primitive bodies of our solar system, such as comets and asteroids, are rich in organic matter and their study can provide important information about the nature of the organic matter delivered to the planets and satellites of the solar system, which could have led to prebiotic chemistry. However, primitive bodies and planetary surfaces such as Mars are generally subject to space weathering (ultraviolet light, cosmic rays) due to the absence (or negligible presence) of an atmosphere. For the detection of OM in solar system bodies, it is of paramount importance to know the extent to which space weathering will affect their detectability and attenuate OM signatures. This topic is in line with the return of samples from asteroids (Hayabusa 2, Osirix-Rex), the current and future mission to Mars (Curiosity-ExoMars), and the observations of small Solar System bodies (e.g. Ceres and the TNOs), especially with the new opportunities provided by JWST.

This project will experimentally simulate the fate of organic matter on the surface of bodies (asteroids, Mars) using analogs and meteorites and define biases for the detection of OM in mineral matrices. The particularity of the project is to use in-house analogs, synthesized over the course of the [ORGAMISS ANR](#) project, which are mixtures of organics and minerals that have reacted under aqueous alteration simulating carbon-rich asteroids or Mars surface. The post-doctoral researcher will have to perform irradiation experiments (ultra-violet - ions) on these already synthesized analogs (and make new ones) and carefully follow their evolution. She/he will use infrared spectroscopy for comparison with remote observations of –planetary- surfaces to help refine the interpretation of spectra and make some predictions on the state of the OM. The analogs will also be measured with spare instruments of Mars missions (like OMEGA in collaboration) to allow direct comparison. The researcher will create a database of the samples that could be used for space mission data. The post-doctoral researcher will interpret and lead the writing of publications. Budgets are available for travels between labs and conferences. The candidate will join the team of the project ORGAMISS within the ASTRO team of the PIIM laboratory in Marseille (France), and work in collaboration with Celine Lantz from the IAS laboratory in Orsay (Institut d’Astrophysique Spatiale- France) and Fabien Stalport from the LISA laboratory in Créteil (Laboratoire Interuniversitaire des Systèmes Atmosphériques-France).

The preferred candidate will have a PhD (or close to completion) in astrochemistry, planetary sciences, chemistry or a closely related field, with knowledge and familiarity in spectroscopic techniques (IR, UV, Raman) and experimental works. The candidate should have demonstrated skills for experiments and/or analytics during the PhD or postdoctoral positions.

The salary will be dependent on the level of experience (between 31400 € and 36700 € gross annual salary).

This postdoctoral position will be for one year and funding is secured for a second year, contingent on satisfactory progress (ANR grant).

The starting date is expected before July 2026.

Please send a CV, a description of research interests, a publication list, and email addresses of 2 referees as a single PDF file to Vassilissa.vinogradoff@univ-amu.fr