

STudent REseArch Mobility Programme (STREAM) Project proposal

Host University:

Université Paris-Sud

Field (drop-down list):

Natural sciences, mathematics and statistics

Specified field, subject:

Physics

Research project title:

Spectral imaging of primitive meteorites

Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Fev	Mar	Apr	May	Jun	Jul	Aug
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Possible duration in months:

1	2	3	4	5	6	7	8	9	10	11	12
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Alternatively, exact starting and end date: from date to date

Suitable for students in: Bachelor level Master level

Prerequisites:

Basic knowledge of optics and spectroscopy. Interest in planetary science.

Description (maximum 2,000 characters):

Primitive extraterrestrial materials (meteorites, interplanetary dust particles, grains from sample return missions) are characterized by a large mineralogical and compositional heterogeneity at different scales (from nm to mm). This witnesses the complexity of physico-chemical processes both in the solar nebula and in the parent bodies. In particular, in the matrix of primitive meteorites, different phases are observed close to each other, with very different formation and evolution history. The detection and characterization of different forms of extraterrestrial organic materials is particularly intriguing but also challenging, because of their relatively low abundance with respect to other phases. This compositional heterogeneity has been observed in the last decades by different techniques. Among these, micro-IR spectroscopy is a powerful tool as it is (a) totally non-destructive; (b) able to characterize the molecular vibrations, and (c) comparable to astronomical observations of primitive Solar System small bodies (asteroids, comets). The proposed research will make use of IR spectroscopy to perform spectral imaging analyses of primitive meteorites with a new imaging micro-spectrometer installed at the Synchrotron SOLEIL (France). This will allow to study the position of the different components of the meteorites as well as their assemblages and evolution (e.g. organic and mineral phases), and to provide useful data for interpreting observations of planetary surfaces.



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Faculty and/or Department:

UFR de Sciences, Département de Physique

<http://www.sciences.u-psud.fr>

Contact person, including position:

Séverine Fogel, Head of International Relations

Contact email:

severine.fogel@u-psud.fr

Deadline for nomination to reach host university:

2 months before the starting date

Notification of admission given by the end of:

Within 3 weeks

Additional information:



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