



Post-doctoral scientist position at Géosciences Montpellier, France :

40Ar/39Ar and in situ K/Ar dating of clay minerals, for application to tectonics, hydrothermalism, diagenesis and mineral resources studies

Géosciences Montpellier (www.gm.univ-montp2.fr/) invites applications for the following position :

- Full time **Post-Doctoral Scientist** position for **12 months renewable**.
- Starting date: **february-march 2019** (flexible)
- Annual gross salary: **29-31.3 k€** (depending on experience - this includes social insurances).

The candidates should have obtained their PhD no more than 6 years before the starting date. The postdoctoral researcher will work within the framework of the project DDAKAR (Datation Directe des Argiles par K/Ar) coordinated by Patrick Monié and funded by the Défi ISOTOP from CNRS and of various projects ongoing at Géosciences Montpellier.

Executive summary of the project :

Clay minerals are ubiquitous in low temperature processes of the Earth surface and subsurface but their dating remains difficult mainly in relation with their structure, their exchange property and their complex polyphased crystallisation. However it can be achieved thanks to K/Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ dating techniques for some high interfoliar charge TOT minerals containing non exchangeable potassium in octahedral sites : illite, celadonite, glauconite. These clay minerals allow studying a broad range of low temperature sedimentary, hydrothermal and tectonics processes and associated mineral resources. In the Argon lab in Montpellier, $^{40}\text{Ar}/^{39}\text{Ar}$ dating of clay minerals is carried out routinely for dating of shallow crustal faulting which occurs in the crust's brittle regime. The objective of the post-doctoral position is to develop in situ K/Ar dating of clay minerals using UV-Laser-Induced Breakdown Spectroscopy coupled with noble gas mass spectrometry. A dedicated line has to be constructed, evaluated and put into production. This approach will allow eliminating the splitting of the dated sample for the conventional K/Ar technique as well as the recoil effect linked to the sample irradiation necessary for $^{40}\text{Ar}/^{39}\text{Ar}$ dating. We will focus on challenging study cases where the clay minerals dating is the clue for our understanding of uppermost crustal evolution. The results of this project will offer new perspectives for the large scientific community involved in LT geo- and thermo-chronology (Géosciences Montpellier is a member of the THERMONET network from french CNRS-INSU). The candidate will also be encouraged to participate to the overall activities of the argon lab, including a wider approach of the Ar-Ar and K-Ar dating techniques to other LT phases in association with numerous colleagues specialized in clay minerals mineralogy from Poitiers, Besançon and Aix-Marseille universities and with industrial partners.

Required qualifications:

- ♣ PhD in Geosciences with a strong background in noble gaz geochronology
- ♣ theoretical knowledge and hands-on experience in $^{40}\text{Ar}/^{39}\text{Ar}$ and/or K/Ar dating techniques
- ♣ theoretical knowledge in laser induced breakdown spectroscopy and/or clay minerals mineralogy would be greatly appreciated
- ♣ skills in mathematical-physical data evaluation
- ♣ experience in laboratory work and in multidisciplinary teamwork
- ♣ oral/written communication skills in English

Tasks:

- ♣ development of in situ K/Ar dating,
- ♣ independent research in $^{40}\text{Ar}/^{39}\text{Ar}$ dating (preparation, measurements and data evaluation)
- ♣ publication and presentation of results in international journals and at conferences
- ♣ acquisition of (inter-)national third-party funding
- ♣ supervision of technicians, undergraduates and graduates students (if applicable)

Review of the applications will start January 1st and close on February 15th. The call is open until the position is filled. Applications should be sent via e-mail in a single pdf document to Patrick Monié (patrick.monie@gm.univ-montp2.fr) and Philippe Münch (munch@gm.univ-montp2.fr) with: (i) a cover letter outlining experience and expertise relevant to the project, (ii) a complete CV including a list of publications, and (iii) at least two letters of recommendation.