Short Course Description

Title
First International Short Course on "Application of Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) to Earth Sciences"

Description
The Petro-Volcanology Research Group at the Department of Physics and Geology of the University of Perugia (Italy) is offering a 3-day short course on the application of Laser Ablation Inductively Coupled Plasma Mass Spectrometry within the field of Earth Science. The course will focus on the following topics:

- Trace element determination of geological matrices
- U/Pb geochronology of accessory materials
- Application of elemental imaging to geological problems.

The course is strongly based on the practical use of LA-ICP-MS, data reduction and interpretation. Applicants will be trained in the "hands-on" operation equipment, using the two LA-ICP-MS instruments available at the Petro-Volcanology Research Group (see http://pvrg.unipg.it for further technical information). A selected number of applicants will have the opportunity to analyze their own data, free of charge, in the four months following the short course. Selection will be based upon the submission of a short research proposal.

Location and Dates
Petro-Volcanology Research Group at Department of Physics and Geology, University of Perugia, Italy - May, 25-27, 2016.

Aims
The aims of the course are:

a) to provide a practical introduction to the LA-ICP-MS technique;
b) to allow attendees to discover the potential uses of LA-ICP-MS in their own research;
c) to train applicants using a "hands-on" approach;
d) to train applicants in data reduction techniques and interpretation;
e) to establish connections among participants, with a view to developing future collaborations.

Target
The workshop targets PhD students and advanced Master students, as well as Postdoctoral candidates and senior scientists. A series of lectures will be provided on the application of LA-ICP-MS in Earth Sciences.

Free access to the LA-ICP-MS analytical facility
We offer the opportunity for PhD students and Early Career Scientists (PhD degree obtained no longer than 6 years ago) to present a short (max 2 A4 pages) proposal to obtain free access to our LA-ICP-MS facility for a maximum of 3 days. We will cover LA-ICP-MS analytical costs but not the costs related to accommodation.
Proposals will be evaluated by the Lab management staff, and use of the LA-ICP-MS facility will be awarded to the best three submissions. Winners will be announced during the short course, and the analyses will then be planned for a time period in the 4 months following the course. The PVRG facility will support the awarded researchers during data acquisition, reduction and interpretation. Proposals focused on petrological and volcanological applications are particularly encouraged.

Registration (free of charge)
Participants are kindly requested to register for the workshop by sending an e-mail to Maurizio Petrelli (maurizio.petrelli@unipg.it).

Deadline
The deadline for both registration and submission of proposals for the access to the LA-ICP-MS facility is April 25, 2016.

Provisional Program

Day 1 Morning session:
Theory - principles of LA-ICP-MS
a) Introduction to Laser Ablation-Inductively Coupled Plasma Mass Spectrometry
b) A voyage through the infinite potentials of LA-ICP-MS in Earth Sciences, including the study of melt, fluid and multiphase inclusions, tephra samples, U/Pb geochronology, and the analysis of experimental samples.

Day 1 Afternoon session:
Practical methods
a) Preparing the LA-ICP-MS instrumentation for analyses
b) How to prepare and run automated experiments by LA-ICP-MS
c) Running an experiment for Trace Element determination by LA-ICP-MS

Day 1 Evening:
Dinner

Day 2 Morning session:
Theory and Practical methods
a) Data reduction and uncertainties in LA-ICP-MS (theory)
b) Performing data reduction in LA-ICP-MS (Trace Elements)

Day 2 Afternoon session:
Practical methods
a) Prepare and perform U/Pb geochronology experiments on accessory minerals by LA-ICP-MS

Day 3 Morning session:
Theory and Practical methods
a) Performing data reduction in LA-ICP-MS (U/Pb geochronology)
b) Data validation and modeling in Python. Comparisons with literature data extracted from large geochemical databases (e.g. GEOROC)

Day 3 Afternoon session:
Practical methods
a) Elemental imaging by LA-ICP-MS and its application in geological processes.