



EMU–SFMC WORKSHOP PETROCHRO2015

u^b

Compositional micro-mapping using XMAPTOOLS

–First Circular–

^b
UNIVERSITÄT
BERN

WHAT IS XMAPTOOLS?

New analytical techniques have recently come into play that transform raw electron microprobe X-ray images into maps of oxide concentration, which can then be used to depict the spatial distribution of each mineral phase at the microscale. Since his doctoral thesis, Dr. Pierre Lanari has been developing and enhancing XMAPTOOLS (Lanari et al., 2014), a set of MATLAB[®]-based graphical user interface programs for X-ray images processing and thermobarometry. The data reduction involves several steps such as (i) analytical standardization, (ii) classification to separate the different mineral phases and other parts of the maps such as fractures or mineral boundaries, (iii) structural-formula calculation and (iv) estimation of Pressure–Temperature conditions of crystallization. Concerning the latter aspect, XMAPTOOLS includes a set of ~50 empirical and semi-empirical thermobarometric functions and can easily be coupled with forward- (i.e. Gibbs free energy minimization) and inverse (i.e. multi-equilibrium) modelling calculations.

More information on the [XMAPTOOLS website](#).

WORKSHOP DESCRIPTION

This workshop is chiefly designed as an XMAPTOOLS beginner course, where participants will be introduced to the software and will learn to use it routinely. In addition, following up the young series of “Petrochronology” meetings, this workshop is thought to serve as an XMAPTOOLS-user meeting to enhance feedback from users to developers, share experience and ideas concerning specific uses of XMAPTOOLS, and communicate about recent and upcoming developments.

The workshop will be divided into three parts:

- General lectures on “Micro-mapping, XMAPTOOLS and applications in petrology” by invited speakers
- Practical course — “XMAPTOOLS: From its development to its routine use” (2 days)
- Session talks where the participants can present their applications (0.5 day)

PRELIMINARY SCHEDULE

Day 1

- Introduction: petrochronology and micro-mapping
- Quantitative X-ray mapping: theory
- * Why is XMAPTOOLS a MATLAB[®]-based application?
- * How to get started

Day 3

- * Pressure–Temperature maps
- Session talks
- Conclusion
- Final words by Prof. R. Oberhänsli (Uni Potsdam, Germany)

Day 2

- * Classification
- * Standardization of X-ray maps
- * Estimation of local effective bulk composition
- * Chemical analysis and filtering

◦ Lectures * Practicals

REGISTRATION

Interested participants should pre-register **by February 28th, 2015** on the [workshop website](#).

REQUIREMENTS

Personal computer with MATLAB[®] is required for practical courses. NB: a cheap MATLAB[®] student version can be purchased through the [Mathworks website](#).

Optional: EMPA X-ray maps and spot analyses for own samples (see approach and EMPA-operating conditions in [Lanari et al. 2014](#) and [here](#)).

All the MATLAB[®] application codes and programs used will be provided at the beginning of the course. Wi-Fi Internet will be available to allow for VNP connections.

PRACTICAL INFORMATION

Address	Inst. of Earth and Environment Science, University of Potsdam Karl-Liebknecht-Str. 24–25, 14476 Potsdam–Golm (Germany)
Speakers	Dr. Pierre Lanari — Uni Bern, Switzerland Chloé Loury — Uni Nice–Sophia-Antipolis, France Stephen Centrella — Uni Münster, Germany Dr. Amaury Pourteau — Uni Potsdam, Germany
Organisers	Dr. Amaury Pourteau (pourteau@geo.uni-potsdam.de) Dr. Pierre Lanari (pierre.lanari@geo.unibe.ch)
Language	English
Fees	Shall cover accommodation, commuting with public transportation, as well as snacks and drinks supplied during breaks. This workshop is a non-profit event. Speakers are funding their enrolment to this workshop with their own research credit.
Support	The European Mineralogical Union will support two international (i.e. not affiliated to German universities) Master or doctoral students with a grant of €200 each. Grant application shall be sent directly to Pierre Lanari and Amaury Pourteau, and shall include a CV, a concise summary of recent achievements and/or on-going projects, and a brief cover letter. Awardees are expected to present, to the lecturers and attendees, their current research the last day of the workshop. Deadline is same as for pre-registration (February 28 th , 2015). Decision will be communicated in the following weeks. French PhD students may apply for support from the Société Française de Minéralogie et Crystallographie (more information on the workshop website in early February).
Funding	University of Potsdam; University of Bern

Further information concerning accommodation, access from airport or train stations, and local transportation will be provided once the number of participants can be assessed.

For further information on the workshop content as well as on XMAPTOOLS in general, feel free to contact Pierre Lanari (pierre.lanari@geo.unibe.ch).

