

MetaSystems White Paper

HIGH THROUGHPUT DIGITIZATION OF PETROGRAPHIC SPECIMEN

Digital microscope based imaging has changed the way the findings of petrographic examinations are nowadays carried out, documented and presented. Moreover, automation of such studies offers huge improvements in productivity and potentially significant reductions in the unit costs of examinations. Automated high-throughput digitization of geo-materials using several microscopic techniques which are routine in this field currently represents a substantial step forward in this sense.

Assessing Petrography Samples

Upon arrival in the laboratory, geo-material samples are usually first examined with the unaided eye. Subsequently, several physical and chemical tests may be performed to assess parameters like the relative hardness or the presence of carbonate minerals.

In preparation of the microscope-based examination, the sample is often investigated on a low-power stereomicroscope. This step helps to determine the most appropriate location for thin sections and polished specimens for in-deep, high-resolution microscopy.

Manual microscopic analysis and documentation of petrographic samples is an arduous and time consuming process, which requires

many hours of man power for a set of specimens. Automation of this task would relieve analysts from this tedious work would increase productivity by offering more time for the interpretation and documentation of results.

Metafer for Petrography

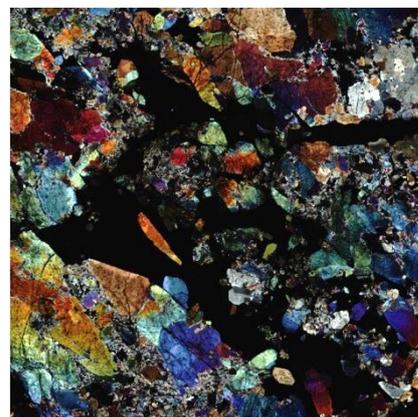
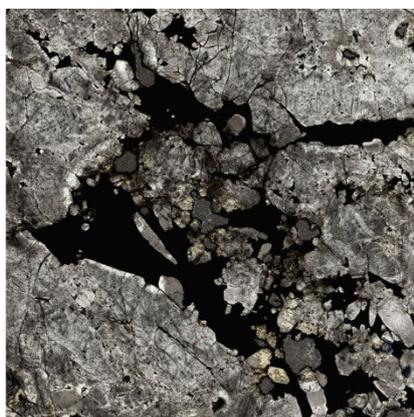
Based on more than 30 years of expertise in the development of automated solutions for microscopy and image analysis, MetaSystems has now developed an automated imaging system for unattended

scanning of geological samples. The new system is based on the renowned slide scanning platform Metafer which offers a unique combination of outstanding scanning hardware with high-performance imaging software. Therefore, it constitutes an extremely versatile and robust system for microscopy automation.

All-In-One Solution

Geosciences are a wide field addressing many different questions and topics. Accordingly, the

Fig. 1: The same section captured at 10x magnification with plane-polarized light (left) and with crossed polarized light (right).



PETROGRAPHY

requirements to imaging and sample analysis can differ remarkably.

Metafer is the first scanning platform for the digitization of geological samples that can be used for a high variety of contrasting methods and illumination techniques. This makes the system a genuine, all-in-one imaging solution for petrography, no matter whether translucent thin rock sections shall be observed with plane- and/or crossed-polarized transmitted light, whether block-

mounted, opaque and polished metal specimens shall be inspected using reflected light illumination, or whether coal samples are assessed with epi-fluorescence illumination.

Unrivalled Benefits

Metafer-generated, digital samples bear many advantages over manual microscopy. Full digital documentation, the possibility to visually combine different contrasting methods, and of course the ergonomic on-screen analysis

make Metafer the ideal solution for imaging in geosciences. The system scans unattended batches of up to 800 samples by means of the scalable robotic slide frame exchanger (SlideFeeder x80). All scanning parameters such as magnifications, illumination and observation techniques, as well as image processing parameters are neatly arranged in user-definable parameter sets (the so-called classifiers).

Features Overview

Metafer is an extremely flexible, fully configurable slide scanning platform. Due to its modularity, it is able to suit highly different requirements: different lab environments may address different purposes.

Available contrasting techniques
Plane-polarized light illumination, crossed-polarized light illumination with several rotation angles, transmitted light and reflected light illumination (for all polarized light modes), epi-fluorescence mode, Brightfield, DIC-Nomarski, phase contrast.

Sample Types
Suitable for standard thin-section slides and polished blocks for opaque materials.

Sample Capacity
8, 80, 160, ... , 800 samples (for capacities higher than 8 samples the SlideFeeder x80 is required).

Magnification Range
1.25x, 2.5x, 5x, 10x, 20x, 40x, 63x, 100x.

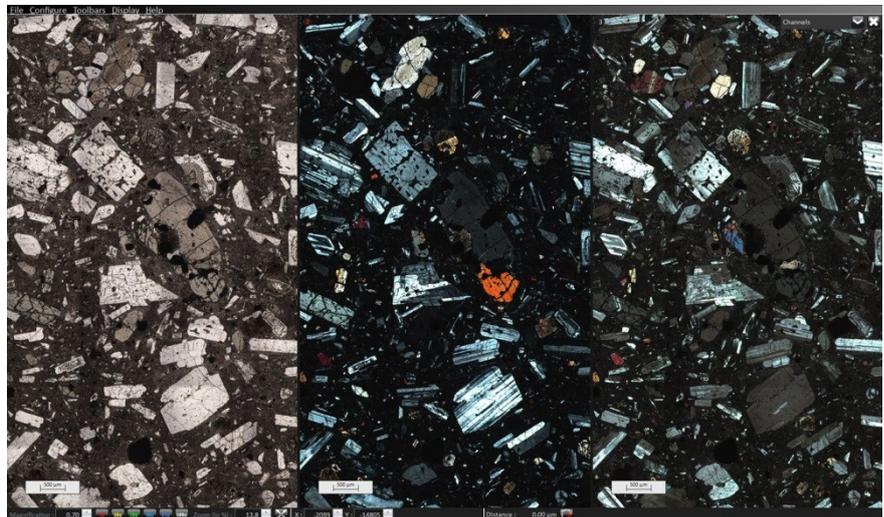


Fig. 2: Image of a Pyroxene in plane- and crossed-polarized light (two different angles). Petrographic characterization can be completed with a scanning electron microscope.



Document No.
WPC-Petrography-2019-05-01-X
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EUROPE

Germany, Altlusheim
Italy, Milano

info@metasystems-international.com
info@metasystems-italy.com

AMERICA

USA, Newton
Argentina, Buenos Aires

info@metasystems.org
info@metasystems-latam.com

ASIA & INDIA

China, Hong Kong
China, Taizhou
India, Bangalore

info@metasystems-asia.com
info@metasystems-china.com
info@metasystems-india.com

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info@metasystems-international.com
www.metasystems-international.com