Lithostratigraphic and structural analysis of Precambrian terranes Agate/WAXI Training

14 to 20 October 2023

Yamoussoukro, Cote d'Ivoire

Consists of 3,5 days of lectures/ practicals, and 3 field days applying concepts from the lectures.

This course is for geologists wishing to build upon their existing training in mapping structurally complex volcano-sedimentary terranes. From a structural point of view this course covers fundamental principles of structural geology with emphasis on faults and shear zones, folds, structural controls on ore shoot location and geometry. From a lithofacies analysis point of view, this course covers fundamental aspects of volcanic and sedimentary processes, and includes practical exercises for lithological mapping using both drill core and field exposures.

This course will be run from Yamoussoukro including a series of lectures, classroom exercises as well as field excursions in the nearby region.

Structural and lithostratigraphic analysis are complementary studies that are vastly underutilized in the mining and mineral exploration industry. This situation stems from thefollowing factors:

- A lack of understanding that these skills add value to mining operations and exploration programs. This is a matter of understanding ore systems, the controls structure and host stratigraphy have on mineralisation, as well as the benefits of understanding the relative iming of events in a host sequence.
- A lack of knowledge of structural and volcano-sedimentological principles. This issue is a matter of classroom training. Most graduate geologists have training in geochemistry and petrology and their applications, but are commonly weak in field mapping and structural geology.
- A lack of confidence. Many geologists lack confidence in applying structural and volcanosedimentological principles to solve practical problems. These points can be addressed through training and with an emphasis on "boots-on-the-ground" and "eyes-on-the-rock".

Programme

- Many industry geologists have the required skills, but too often receive little encouragement or mentoring in applying them. Students of this course will have the opportunity to build their confidence by applying their knowledge gained from the lectures to practical field problems using drill core and outcrop exposures.
- A lack of time. Proper application of structural geology techniques and field mapping/ lithological logging of core requires time that is difficult to find, given the production pressures of a mining operation and the performance pressures of an exploration program. In industry, one is constantly pressured to optimize time, and structural mapping and details of the host lithology are often perceived to be of lesser importance.

The aim of this course is to address the problems described above, by combining structural geology and lithofacies analysis in volcanic terranes in order to demonstrate that a surprising amount of value can be added through sound structural and lithological interpretation of relatively small datasets.

Day	Course Element - Yamoussoukro Cote d'Ivoire	Lecturer
Day 1 Sat Oct 14	14:00 - 17:30 Back to Basics of Structural Geology, Structural mapping and techniques, structural geology, fluid flow and ore deposit formation	PH/NT Lecture
Day 2 Sun Oct	08:30 - 17:30 Mapping folds, form line mapping practical; Faults, veins and shear zones (part I) with map analysis practical	PH/NT Lecture
Day 3 Mon Oct 16	08:30 - 17:30 Faults, veins and shear zones (part II) with block diagram and fault analysis practical; Introduction to practical volcanology; magmas, lavas and intrusions; magma fragmentation and pyroclastic processes	PH/NT Lecture
Day 4 Tues Oct 17	08:30 - 17:30 Epiclastic rocks and practical; rock identification and naming with practical; reconstructing volcanic terranes and applications to mineral exploration	PH/NT Lecture
Day 5 Wed Oct 18	08:30 - 17:30 Field excursion to Yaouré Kossou; fault analysis in outcrop; preparing a graphic log from drill core	PH/NT Field
Day 6 Thurs Oct 19	08:30 - 17:30 Field excursion to the Toumodi Greenstone Belt; preparing a graphic log in the field	PH/NT Field
Day 7 Frid Oct 20	08:30 - 17:30 Field excursion to the Toumodi Greenstone Belt; reconstructing structure and stratigraphy	PH/NT Field

To bring: Hat, field boots, compass, hand lens, note book or field book, colouring pencils.

Information

Course Leaders: Pat Hayman & Nicolas Thebaud

Patrick Hayman is a senior lecturer and coordinator of the Earth Science major at Queensland University of Technology. Upon completion of an MSc. degree, Pat worked for several diamond exploration and mining companies in Canada before moving to Australia to obtain his PhD. His research focusses on mineral systems exploration at the regional to local scale, using expertise in physical volcanology. Dr. Hayman's research is primarily on volcanic terranes ranging in age from modern to the Precambrian, especially in Australia, Canada and West Africa. He has extensive field experience in kimberlites/diamonds and greenstone successions hosting orogenic gold, and has worked in VMS, komatiite-hosted Ni sulphide and Cu-porphyry systems. Pat's research is currently focussed on the emplacement and formation of Au-mineralised dolerites, greenstone terrane formation on either side of the Archean-Proterozoic boundary, and basalt petrogenesis. These projects are supported by industry partners, geological surveys and the Australian Research Council. Pat also teaches an annual Volcanology and Resources short-course in Merimbula (Australia) designed primarily for industry geologists.

Nico Thebaud has completed his Ph.D in 2006 between the University of Paris 6 and the University of Sydney. During his PhD studies NT conducted competitive and interdisciplinary research, combining hard-rock field geology, structural geology, and petrography with cutting edge analytical techniques including high-resolution synchrotron microfluorescence X techniques for the analysis of single fluid inclusions. He applied this multidisciplinary approach to characterised and model the geometry and hydrodynamics of a Mesoarchean plumbing system in the Pilbara, to constrain the scale and magnitude of fluid circulations, their relationships with Archaean crustal geodynamics and their impact on the formation of ore deposits. From 2006 to late 2007 he spent 18 months expanding his skills and experience in mineral exploration as a structural geologist for Mercator Gold Australia. He joined the CET in October 2007 and is currently the Hamond and Nisbet fellow.

Registration Fees

For the full 6,5 days of training,
WAXI Sponsors US$1,600 per attendee - Non-WAXI sponsors US$1,900 per attendee

Price inlcudes	*Price does not include*
Lunchtime meals, morning, afternoon tea	*Evening meals, accomodation,*
Training materials	*Fligths/transport to and from*

Language

English and French

Duration

6,5 days - the training will start on the Saturday 14 October **at 14:00h**

Where

Yamoussoukro, Cote d'Ivoire

Registration

Register using the form on the next page and or email: corinne.debat@agate-project.org

Full payment to be received before before the start of the course.

Certificate of Attendance

Upon completion, participants will receive a certificate of attendance

AGATE PROJECT

Knowledge, Skills, Networks in Earth and Planetary Science

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Either complete this form or register online:

https://agate-project.org/training-courses/short-courses/

Company .....

Address .....

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Phone .....

Administrative Email contact .....

Attendee's First Name Surname1.....

Attendee's Name Surname 2.....

Attendee's Name Surname 3.....

Attendee's Name Surname 4.....

Participant(s) first language.....

Total Registration Fees .....

invoice addressed to .....

Can your company provide a 4x4 vehicle for the duration of the field trips? discount will apply: .....

US$1,600 per person for WAXI sponsors &

US$1,900 for non-WAXI sponsors

Email: Corinne.Debat@agate-project.org

On confirmation of your places, we will ask you to transfer the registration fee to a bank account to be announced. **Registration valid only when the invoice is paid in full**.