



## 2<sup>nd</sup> SGA-SEG-UNESCO- IUGS Short Course on African Metallogeny

### “Base Metals in Basins”



**Kitwe, Zambia  
17-21<sup>st</sup> June, 2013**



Africa is well endowed with mineral resources and yet much of Africa's mineral riches remain to be discovered. Mining has played a pivotal role in the economy of many African countries with contributions to foreign exchange earnings exceeding 50 % in many instances. There is no doubt that the exploitation of mineral deposits could form a substantial, if not the strongest, platform on which to base the future uplifting of the African economy. The discovery of new deposits as well as the economic and sustainable exploitation of known deposits requires skills that are not as readily available in many areas of Africa as they might be in other parts of the world. The aim of the newly founded Short Courses on African Metallogeny is to train young African geoscientists in the specific field of metallogeny, i.e. practical aspects of the genesis of ore deposits that can be applied in the formulation of future exploration strategies. These Short Courses on African Metallogeny are planned to be conducted on an annual basis in different parts of the continent.



It is with great pleasure that we herewith announce the second of these courses, which is being organized by the Society for Geology Applied to Mineral Deposits (SGA), supported by UNESCO, IUGS, the Society of Economic Geologists (SEG). Following on from the first successful course in Burkino Faso in 2012, this course will take place in Kitwe, Zambian Copperbelt, Zambia from June 17<sup>th</sup> to 21<sup>st</sup> June 2013.



This training course will provide an introduction to the mode of occurrence, genesis and economic significance of base metal deposits in basins. Specific commodities that will be dealt with in greater detail include copper, zinc and cobalt.

The course will comprise five days of training with lectures and practical exercises to be conducted in Kitwe, including core logging and a visit to one of the mines in the area. The course is aimed at geologists wishing to improve their skill base in modern integrated economic geology. It will help them to (i) better understand the genesis of a number of deposit types, (ii) improve the integration of their geological and geophysical data, (iii) better evaluate given projects, and (iv) develop better strategies for future exploration. It is expected that participants come from the mining/exploration sector, academia as well as government institutions. A reasonable command of English will be helpful as the language of the course will be English.



The **presenters** are all internationally recognized experts with many years of experience in the fields of economic geology.

**Stuart Bull:** Stuart is a leading researcher in all aspects of research pertaining to basin development and architecture, thereby providing a framework for, and constraining aspects of, ore genesis. With a particular focus on sediment-hosted Cu deposits of the Congolese, Zambian and Central Australian basin systems. He is also currently leading a project with OZ Minerals on their Prominent Hill IOCG mine in South Australia, and working on a project on trace element characteristics of pyrite in marine sediments over Earth history.



**Murray Hitzman:** Murray is the Charles F. Fogarty Professor of Economic Geology at Department of Geology and Geological Engineering, Colorado School of Mines. Research interests on deposit- to district-scale geology of ore deposits with a focus on iron oxide-copper-gold (IOCG), sediment-hosted stratiform copper, carbonate- and shale-hosted Zn-Pb-Ag, and Carlin-type Au.



**Philippe Muchez:** Philippe is professor at the University of Leuven in Belgium and head of the Ore Geology and Geofluids research unit. He carried out post-doctoral research at the University of Liverpool and at the Vrije Universiteit Amsterdam. His recent research focuses on the migration of fluids in sedimentary basins and on ore-forming processes in sediment-hosted deposits and pegmatites, especially in Central Africa.



**Steve Roberts:** Steve is a Professor at the School of Ocean and Earth Science, University of Southampton, UK. He has been investigating the Ore Deposits of Zambia for the past 10 years in both the Copperbelt and the Domes Region. His research interests include the formation of base and precious metals in a variety of geological settings, with a particular interest in modern and ancient Volcanogenic Massive Sulfide formation.



**John Walsh:** John is a professor in the Fault Analysis Group, Department of Geology, University College Dublin since its inception in 1985 and was its Director from 1996 to 2005. John's research interests include the long- and short-term (i.e. earthquake) growth of fault systems, the impact of faults on fluid-flow on a range of scales (e.g. basin to mineral deposit), and the definition of new analytical and modelling techniques for a range of fault-related technical issues.



**Jamie Wilkinson:** Jamie is a Reader at the Department of Earth Science and Engineering at Imperial College London. His research focuses on understanding the geochemistry of hydrothermal systems, in particular how metals are transported and deposited to form ore deposits. Current research focuses on metal transport and controls of fertility in porphyry ore deposits, the mineral chemistry of hydrothermal alteration and exploration applications, the use of transition metal isotopes (Zn Cu, Fe) for tracing hydrothermal processes, and the geochemistry of sediment-hosted Zn-Pb ore systems.



## Course Content

Sediment-hosted strata-bound ore deposits of copper, zinc, lead and cobalt occur worldwide, host a significant proportion of the global inventory of mineral deposits and are therefore of great economic importance. These deposits range in age from around 2000Ma to recent and typically occur within fault controlled sedimentary basins within intracratonic settings. Key controls on the formation of these deposits include the structural evolution, sedimentation and fluid flow regimes developed within individual basins.

This short course will review the primary geological, geochemical and structural controls on the location and timing of base metal mineral deposits in sedimentary basins. In detail, lectures will introduce a variety of ore-forming systems in sedimentary rocks and develop case studies for some of the world's most important ore deposits hosted by sediments, with a focus on the physical and chemical controls on hydrothermal mineralization, the recognition and characterization of ore-fluid reservoirs and alteration, and applications to exploration. Specific topics that will be addressed include: sedimentary basin analysis, structure, tectonics, fluid flow and paleo-environments, litho-geochemistry, alteration, and mineralogy of sediment-hosted ores, use of fluid and mineral equilibria in analysis of ore-forming systems, case studies of ore deposits in sediments and guides to exploration

Given that the Neoproterozoic central African Copperbelt is well known for its world-class disseminated stratiform Cu–Co and massive Pb–Zn–Cu ore deposits hosted within the Katangan sedimentary succession this will be a key focus of the workshop. However, material will also be introduced for other sedimentary basins including the Kupferschiefer, Alpine, Irish and Selwyn Basins. A particular focus will be to review the latest basin metallogenic models and specific ore deposit models that may be used in the exploration for large-tonnage base-metal ore deposits.

It is anticipated that participants in the course will gain a working knowledge of the geology and evolution of sedimentary basins and their contained mineral deposits, paleo-environmental conditions that may have contributed to the formation and preservation of the ores, mineralization during subsequent burial and diagenesis, and ore systems developed during metamorphism and deformation of sedimentary basins.

The course will be delivered through formal lectures with some associated practical sessions. It is anticipated that participants will be able to examine cores recovered from contrasting Copperbelt deposits and visit a mine site in the Copperbelt.

The following key **sessions** are currently planned. Some of them will be supplemented where appropriate by practical exercises and presentations from exploration companies active in the Copperbelt Region:

1. Introduction to Mineralization in Sedimentary Basins
2. Sedimentation and Mineralization in Basins
3. Tectonic Evolution and Mineralization of Basins.
4. Fluid Evolution in Basins and Ore Formation.
5. Case Studies
6. Guides to Mineral Exploration
7. Visit Copperbelt Mine and Core Shack

**Venue**

The 5-day workshop will be held at the conference centre of the Moba Hotel and Convention Centre located in Kitwe, Zambia.

**Number of participants**

A maximum of 50 participants is set for logistic reasons and in order to ensure maximum benefit for each participant. It is expected that participants from industry (c. 25) cross-subsidize participants from economically disadvantaged institutions (c. 25) – see below.

**Costs**

The course fees for participants from industry will be US\$ 1800.00 per person for the 5-day workshop. The course fee includes the 5-day workshop lectures and practicals, course materials and light meals during the course. Costs for travel to and from Kitwe, accommodation, breakfast and dinner are excluded. Subsidies will be made available to university staff and students according to available budget. Subsidies will be distributed following completion of a Pre-Registration Form and Application for Financial Support

**Accommodation**

Accommodation is available at the Moba Hotel which will offer discount rates to workshop participants, there are also a number of guest houses and lodges in the Kitwe area.



## Registration Form for Individuals

2<sup>nd</sup> SGA-SEG-UNESCO-IUGS

Short Course

on

African Metallogeny

**“Base Metals in Basins”**

Title:

First name:

Surname:

Company name

Company address:

Country:

Contact Tel.:

e-mail:

Registration fee for 5-days workshop ..... US\$ 1800.00

Total ..... US\$ 1800.00\_

I am an academic without sufficient funds or a student and apply for a subsidy ..... YES

NO

E-mail this form to Stephen Roberts at: [steve.roberts@noc.soton.ac.uk](mailto:steve.roberts@noc.soton.ac.uk)

Or fax to +44 (0)23 80593059

On confirmation of your places, we will ask you to transfer the registration fee to the following bank account:

Name of the bank: Credit Suisse

Address: Postfach 500, CH-8070 Zuerich, SWITZERLAND

Account holder: SGA

IBAN (International bank account number): CH4604835181963192000

BIC (Bank identification code): CRESCHZZ80A



## Registration Form for Companies

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on  
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**“Base Metals in Basins”**

Company name  
Company address:  
Country:  
Company Tel.:  
Administrative e-mail contact:

Attendee's Name 1:  
Attendee's Name 2:  
Attendee's Name 3:  
Attendee's Name 4:

Total registration fees for 5-days workshop (US\$ 1800.00 per person) ..... US\$ \_\_\_\_\_  
Grand Total ..... US\$ \_\_\_\_\_

E-mail this form to Stephen Roberts at: [steve.roberts@noc.soton.ac.uk](mailto:steve.roberts@noc.soton.ac.uk)  
Or fax to +44 (0)23 80593059

On confirmation of your places, we will ask you to transfer the registration fee to the following bank account:

Name of the bank: Credit Suisse  
Address: Postfach 500, CH-8070 Zuerich, SWITZERLAND  
Account holder: SGA  
IBAN (International bank account number): CH4604835181963192000  
BIC (Bank identification code): CRESCHZZ80A





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organized by  
*Society for Geology Applied to Mineral Deposits (SGA)*  
 to be held at  
*Moba Convention Centre, Kitwe, Zambia*

17<sup>th</sup> – 21<sup>st</sup> June 2013

### Pre-Registration Form and Application for Financial Support

Please send this form by e-mail to [Steve.Roberts@noc.soton.ac.uk](mailto:Steve.Roberts@noc.soton.ac.uk) not later than 31<sup>st</sup> March 2013.

For more information on the Short Course see <http://e-sga.org/>

#### PERSONAL INFORMATION

<b>First name:</b>		<b>Surname:</b>		
<b>Date of birth:</b>	<b>Place:</b>	<b>Country:</b>	<b>Male / Female</b> <input type="checkbox"/> / <input type="checkbox"/>	<b>Member SGA:</b> <input type="checkbox"/> <b>Member SEG:</b> <input type="checkbox"/>

#### PERMANENT RESIDENCE

<b>Street name and number:</b>		<b>Place:</b>		
<b>Province:</b>	<b>Country:</b>		<b>Postal Code:</b>	
<b>Telephone:</b>	<b>Fax:</b>		<b>e-mail:</b>	

#### EDUCATION

Education	Institution	Place	Country	Degree	Duration	
					from:	to:

#### INFORMATION ON HOME INSTITUTION OF APPLICANT

<b>Name:</b>						
<b>Street name and number:</b>				<b>City:</b>		
<b>Province:</b>		<b>Country:</b>		<b>Postal code:</b>		
<b>Telephone:</b>		<b>Fax:</b>		<b>e-mail:</b>		
<b>Position:</b>						
<b>Head of department:</b>						
Type of institution	University <input type="checkbox"/>	Geological Survey <input type="checkbox"/>	Research Centre <input type="checkbox"/>	Public enterprise <input type="checkbox"/>	Private company <input type="checkbox"/>	Other (detail) <input type="checkbox"/>



## INFORMATION ON PARTICIPANTS REQUESTING A SCHOLARSHIP

I am currently preparing/conducting the following:

a) BSc thesis (university)

b) MSc thesis (university)

c) PhD thesis (university)

d) Research work outside university (most relevant, institution) :

e) Other:

Brief motivation for your participation in the course :

Have you participated in previous SGA-SEG short courses?	YES <input type="checkbox"/>	NO <input type="checkbox"/>	I request a grant for:	Transport <input type="checkbox"/>	Accommodation <input type="checkbox"/>
I have received support from UNESCO, SGA, SEG or any other organization/institution for previous similar short courses	YES <input type="checkbox"/> Year:	NO <input type="checkbox"/>	I have received support/scholarship from UNESCO for other activities <input type="checkbox"/>	Which activity? Year:	

### LIABILITY

I assume full responsibility in case of accident, disability, illness or death that might occur during the course or the field trip. I herewith renounce any claim to financial compensation in respect of damage that could affect me as a result of participating in the course and/or the field trip and thus release the course organizers from whatever responsibility. I confirm that all information provided above is correct.

Name:

Date:

Signature: