

# SGA



**13TH SGA BIENNIAL MEETING  
NANCY – FRANCE  
24-27 AUGUST 2015**

## **WORKSHOP 5**

### **Fluids and Metals**

2 days - Pre-conference - 22<sup>th</sup> to 23<sup>th</sup> of August 2015

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**Venue:** Université de Lorraine, Faculté des Sciences et Techniques, GeoRessources, Entrée 3B, F-54506 Vandœuvre-lès-Nancy Cedex. <http://georessources.univ-lorraine.fr/content/localisation-0>

**Duration:** 2 days - 22<sup>th</sup> to 23<sup>th</sup> of August 2015

**Leaders:** Jean Dubessy, Research Director CNRS, GeoRessources;

(1) Marie-Christine Boiron (1), Michel Cathelineau (1), Marie-Camille Caumon (1), Larryn Diamond (2), Gaston Giuliani (3), Kalin Kouzmanov (4), Marc Lespinasse (1), Philippe Muchez (5), Karine Pistre (1), Gleb Pokrovski (6), Alexandre Tarantola (1), Laurent Truche (1)

(2) GeoRessources, UMR-CNRS-Université de Lorraine, Vandoeuvre-lès-Nancy (F)

(3) Rock-Water Interaction Group, Institute of Geological Sciences, University of Bern (CH)

(4) Centre de Recherche Péetrographique et Géo chimique, UMR CNRS-Université de Lorraine, Vandoeuvre-lès-Nancy (F)

(5) Department of Earth Sciences, University of Geneva (CH)

(6) Fysico-chemische Geologie, K.U., Leuven, Leuven (B)

(7) Geosciences Environnement Toulouse - UMR CNRS, Université de Toulouse (F)

**Attendants:** 20-30

This short course will only accept 30 participants on the base "first registered-first served"

Inscription to the SGA2015 congress is required to take part in the SGA2015 workshops/fieldtrips.

**Registration deadline:** 31<sup>th</sup> of Mai 2015

**Price:** covers courses, lunch (22<sup>th</sup> and 23<sup>th</sup> of August 2015), break refreshments and documents)

SGA student member/non-member: 150€ / 175€

SGA member /non-member: 200 € / 300 €

Fluids play a key role in the formation of ore deposits via the transport and the deposition of metals. What are the main geological fluids and their metal contents? What are the key parameters that must be known for deciphering the source-transport-deposition processes? What information can be derived from fluid inclusions in terms of P-T conditions, fluid-rock interactions, and fluid mixing and un-mixing, using microthermometry associated with phase diagrams and analytical techniques (Raman, LA-ICP-MS)? Complete understanding of an ore-forming process also requires knowledge of the parameters which control the solubility of metal-bearing phases. Experimental studies of mineral solubility, including metal speciation, and stability constants of dissolved metal-bearing species may allow ore-formation processes to be modeled. This short course will focus on the following items:

- Metals and main types of geological fluids. Questions addressed to establish conceptual models.
- Petrography of fluid inclusions and relating them to the geological context
- Reference chemical systems, thermodynamic models and their use in estimating density-composition data; fluid mixing and unmixing processes
- Experimental and thermodynamic analysis of solubility of metal-bearing minerals in fluids
- Case studies of ore-deposits (4): halogens, metal analysis, stable isotopes, and modeling.
- Practice: observation of certain phase changes with temperature; Raman and LA-ICP-MS analysis.

TIME	COURSE TITLE	SPEAKERS
<b>DAY I: 22<sup>nd</sup>/08</b>		
8h30-10h00	<b>Metals and main types of geological fluids</b>	Marie-Christine Boiron
10h00-10h30	<i>Coffee/tea break</i>	
10h30-11h15	<b>Petrography of fluid inclusions and their geological context: 1</b>	Michel Cathelineau
11h15-12h00	<b>The Fluid Inclusion planes: A tool for paleo-fluid flow reconstruction!</b>	Marc Lespinasse
12h00-14h00	<i>Lunch</i>	
14h00-15h15	<b>Basic of microthermometry; Reference chemical systems and PVTX reconstitution</b>	Jean Dubessy
15h15-16h30	<b>H<sub>2</sub>O–gas–salt fluids: Phase relations and their interpretation from fluid inclusions</b>	Larryn Diamond
16h30-17h00	<i>Coffee/tea break</i>	
17h00-18h00	<b>Post-trapping modification of fluid inclusions</b>	Alexandre Tarantola / Larryn Diamond
<b>DAY II: 23<sup>th</sup>/08</b>		
8h30-9h30	<b>Ore forming processes: the role of redox reactions in the Earth's crust</b>	Laurent Truche
9h30-10h30	<b>Solubility of metal-bearing phases: 2</b>	Gleb Pokrovski
10h30-10h45	<i>Coffee/tea break</i>	
10h45-11h30	<b>Case studies: I. Fluids and sediment-hosted ore deposits</b>	Philippe Muchez
11h30-12h15	<b>Case studies: II. Fluids of evaporitic origin in hydrothermal-metamorphic gems</b>	Gaston Giuliani
12h15-14h00	<i>Lunch</i>	
14h00-14h45	<b>Case studies: Fluid processes in magmatic-hydrothermal systems</b>	Kalin Kouzmanov
14h45-15h30	<b>Discussion about fluids and metals</b>	All participants
15h30-16h00	<i>Coffee/tea break</i>	
16h30-18h00	<b>Practice: microthermometry; Micro-Raman; LA-ICP-MS</b>	K. Pistre /M.C. Boiron / M.C. Caumon