Activities of SGA Student Chapters

The SGA network links existing Chapters (Baltic Chapter with 52 members, http://www.sga.agh.edu.pl; Prague Chapter with 35 members, http://sga.cuni.cz; and Siberian Chapter with 15 members). This year two new Chapters were established: in Barcelona with 36 members (http://www.bcn-sga.cat/index.php) and in Colombia (Industrial University of Santander). New Chapters are expected to be formed in Nancy (France), Tehran (Iran), and Peru. The Barcelona SGA Chapter took the opportunity of the SGA Keynote Speaker Program that was created by the society in 2011. SGA student members can invite an SGA Keynote Speaker to present a lecture at their university. More info is available at the SGA website (http://www.e-sga.org). SGA also sponsored scientific session at various conferences and supported SGA students to attend the meetings like Goldschmidt 2012 in Montreal, IAS 2012 in Schladming, Austria, EMC 2012 in Frankfurt or the 11th Freiberg Short Course in Economic Geology. A student devoted programme is also planned for the 12th SGA meeting in Uppsala in 2013 (http://www-conference.slu.se/sga2013/). SGA Network is also open to everyone on Facebook (facebook: SGA Network).

This issue of SGA News wants to highlight the growing and very interesting activities of these Student Chapters by placing them at the forefront of the newsletter in the place usually dedicated to the leading article. Five reports on the most recent activities of the Prague, Siberian and Barcelona SGA Student Chapters are therefore presented in the following pages.

By this way we would like to put the accent on the important and active role of students in our society and on the initiatives they are carrying out to improve their own knowledge and understanding of geological processes associated with the formation of ore deposits. Seeing this we can say that the future of our Society is in good hands!

Massimo Chiaradia, Editor of SGA News
Jan Pašava, Secretary General SGA

1. Tin mineralization and alteration styles in the northwestern Bohemian Massif, Czech Republic: A field trip report from the SGA Student Chapter Prague

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The SGA Student Chapter in Prague, Czech Republic, devoted its first field trip in 2012 to cassiterite mineralization and associated alteration in the northwestern part of the Bohemian Massif. We visited the Hieronymus mine at Čista and the active quarry at Krasno. The Sn-W deposits are hosted in apical parts of highly evolved lithium- and fluorite-rich granites of the Saxothuringian zone. These magmas represent final differentiation products of magmatic activity during waning stages of Variscan continental collision in central Europe, emplaced at 324-312 Ma. This metallogenic province includes classical sites of tin exploration and mining, e.g., Krasno, Cínovec/Zinnwald, Altenberg, Sadisdorf, Ehrenfriedersdorf, Geyer and Krupka, that lasted from the 9th century.
The Cista tin deposit is a hydrothermal vein-type mineralization. Hydrothermal alteration processes were driven by fluids released during crystallization of the Kru-dum granite body. Subsequent decrease in temperature and pressure caused changes in chemical equilibria in aqueous fluids and caused the formation of postmagmatic greisens. The late stage of alteration is characterized by Sn-W mineralization, predominantly found along structural heterogeneities. The cassiterite and wolframite enrichment is related to two distinct settings: lenses or patches of hydrothermal quartz and subordinate individual quartz veins (up to 12 cm thick), found both in the granite and surrounding paragneisses. The second mineralization style is a heterogeneously disseminated ore (with grades up to 1.5 wt.% Sn) within the granite body that follows contact with the host paragneiss in a zone about 100 m thick.

The occurrences of tin and tungsten mineralization had been explored and exploited in this area for several centuries. The first reference to extraction of ore near Čistá comes from the 14th century, however, the detailed history of mining near the Čistá town is difficult to reconstruct, because most of the documents were destroyed in a fire in 1772. The mining had progressed mainly at the beginning of 16th century, was maintained until 1631, when the mining operations ceased. The exploration and minor mining continued throughout the 19th century until the World War II. The total amount of tin mined from Hieronymus is estimated to be 500-700 tons. Although the tin grade in the Hieronymus mine has never been as large as in the other mines in the surroundings, it has great historical importance. At present, the Hieronymus mine serves particularly as a nice example of medieval mining with hand-made tunnels with well-preserved pickaxe cuts as well as some rock fragmentation techniques (fire setting) from the 16th century. Due to its uniqueness, the mine is being prepared for the public opening as part of the Czech-Bavarian GeoPark.

The other field trip stop was the active quarry near Krasno. This open pit exploits alkali feldspar granites and alkali feldspathites as raw materials for ceramic, glass and...
chemical industry. It is situated in a deeper part of the Krudum granite intrusion (in the footwall of tin-bearing greisen zones) that experienced substantial alkali feldspar alteration. The parental granites belong to the Li-F-rich, zinnwaldite-bearing granites but were affected by several stages of post-magmatic hydrothermal alteration. These include quartz dissolution, breakdown of zinnwaldite, and precipitation of albite and microcline. The feldspathization is a process that was synchronous with greisen alteration and tin mineralization in the Krudum granite body. The feldspathites occur in the lowest portions of the granite body that was affected by influx of external, possibly meteoric or formational fluids into hot interior of the solidified intrusion. During outflow through the apical part of the intrusion, the fluids were cooling down and caused pervasive or vein-type greisen alteration accompanied by cassiterite precipitation. Because of its low Fe content (< 0.6 wt. % FeO) the feldspathites have widespread usage in ceramic and glass industry. The quarry is operated by KMK GRANIT Co. with annual production of 150-200 000 tons of fine-grained feldspatite.

To summarize, the field trip was successful and fulfilled our geological educational expectations, yet it provided several opportunities for mineral and rock collecting (we found particularly instructive specimens of zinnwaldite, smoky quartz, beryl and apatite). Finally, we would like to thank the staff members of the KMK GRANIT Co. for the possibility to visit the Krasno quarry and to members of the Hieronymus mine team for their permission and underground tour of the mine.

2. Volcanic-rt of the SGA Student Chapter Prague

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As in the previous years, the autumn field trip of the SGA Student Chapter Prague (Czech Republic) represents the main annual educational event. This year, our target was to visit various products of volcanic activity in the Neogene arc in the Carpathians (Slovakia) and inspect their associated mineralization types, ranging from skarn to porphyry, mesothermal and epithermal styles. During four days we were exploring different mineralization types associated with the evolution of the Miocene Štiavnica stratovolcano: gold mineralization of the intermediate-sulfidation type in Banska Štiavnica and Hodruša (museum and dump of the Rozálie mine), magnetite skarns in Úškrtova Dolina, and secondary mineralization in L’ubietová and Spania Dolina. We also had the opportunity to visit the secondary linoquartzite deposits with plant remnants in the Kremnické Vrchy Mts.

The area is located in the western part of Slovakia. The Banska Štiavnica ore district is situated in the central zone of the largest stratovolcano in the Central Slovakian volcanic field of Neogene age, emplaced in the inner part of the Carpathian arc overlying the Hercynian basement. The volcanic activity was related to subduction of the flysch belt under the Carpathian arc and to subsequent back-arc extension. Lexa et al. (1999) recognized in the Banska Štiavnica stratovolcano several stages of evolution: (1) eruption and construction of a largeandesite stratovolcano, (2) pre-caldera andesite stage, (3) partial erosion of volcanic products and emplacement of diorite intrusion by subsurface cauldron subsidence, (4) continuing erosion of the volcano remnants and intrusion of granodiorite to quartz-diorite stocks and dyke swarms surrounding the granodiorite pluton where iron-rich skarns, base metal stock-work mineralization with advanced argillic alteration developed, (5) subsidence of the caldera accompanied by extrusive activity of evolved andesites and simultaneous emplacement of quartz-diorite sills and dykes in the form of near-surface ring dykes, (6) renewed activity and eruption of more primitive andesites, (7) long-lasting uplift of a resurgent horst in the centre of the caldera accompanied by rhyolitic intrusions and volcanic products, occurred between 16.5 and 10.5 Ma. The late stage horst uplift was asymmetric and was responsible for deeper erosion of the northwestern part of the volcanic system. Construction stages of the stratovolcano were accompanied by various types of hydrothermal alteration and mineralization ranging from early intrusion-related iron skarns and porphyry-copper systems to late high-level base- and precious-metal veins. An epithermal system related to the post-caldera uplift has the dominant significance in the metallogeny of the ore district. According to their ore assemblages, the epithermal veins were divided into three types: (1) base-metal veins, (2) Au-Ag veins in...
also extraction of copper, zinc and lead. The Rozália mine is located in the interior of the volcanic edifice. The Rozália sulphide-rich Cu-Pb-Zn-bearing vein is a part of an epithermal vein system related to the horst uplift and it contains very low concentrations of gold (0.4-0.5 ppm Au), classified as an intermediate-sulfidation stage of epithermal mineralization. The Au mineralization occurs as S to SE-dipping veinlets that are hosted in pre-caldera andesites that are intensely fractured and altered (pyritized and silicified hydrothermal breccia in the vicinity of a shallow granodiorite pluton). The orientation of the veins was affected by the presence of a set of quartz-diorite porphyry sills and by younger steeply dipping Rozália base-metal veins. The base-metal veins are related to the resurgent horst uplift in the caldera centre, where three evolutionary stages can be distinguished: (1) pervasive silicification and pyritization with low grade mineralization, (2) formation of the main gold mineralization, and (3) a low-temperature stage (mainly quartz, Ca-Fe carbonates, pyrite and sphalerite). Pressure fluctuations during ore formation indicate opening of the hydrothermal system and transition from supra-hydrostatic to hydrostatic conditions at shallow depth (~550 m). Gold precipitation is considered to be the result of prolonged fluid boiling as the main driving mechanism for decrease in the Au solubility. Stable isotope data point to a mixed magmatic and meteoric origin of the fluids.

After visiting Hodruša we moved to the Úškrtova Dolina valley, which follows the contact of granodiorite stock and the surrounding carbonates (dolomitic limestones). This subvolcanic intrusion led to the formation of fassaite skarns along its exocontact. Skarns are rich in magnetite and mineralized with pyrite. From the mineralogical point of view, the locality is significant for small crystals of pleonaste, a variety of hercynite, which occurs as black thin laths or in small cavities. The Banská Štiavnica volcanic complex hosts a number of minerals that occur in hydrothermal cavities. Pervasive silicification led to the formation of secondary quartzites that host long prismatic quartz crystals often in aesthetic clusters. Another locality of this type was the occurrence of secondary minerals in the Špania Dolina valley. In one day we traversed mountains to examine the copper mineralization that is found in a 4 km long and 1.5 km wide zone with N-S trend between Panské dielo and Staré Hory. This Cu mineralization formed during three principal stages: (1) quartz-siderite stage with pyrite mineralization, (2) copper-sulphide stage mainly with chalcopyrite and (3) barite-sulphide stage. A similar mineralization style also occurs in L’ubietová, a district that we visited on the fourth day. Here, the assemblages are phosphorus-rich and host phosphates and arsenides as main secondary minerals. L’ubietová is also a type locality for libethenite and euchroite. The accompanying siderite-sulphide mineralization has a stockwork-impregnation nature enplaced in volcanosedimentary complexes related to Permian mafic volcanic activity. We completed our excursion program by the central or western part of the horst and (3) Au-Ag veins related to marginal faults of the horst. Formation of the hydrothermal system and precipitation of Au mineralization is related to the initial stage of caldera subsidence that changed the hydrologic conditions. Circulating fluids preferentially used open subhorizontal structures with limited connection to the paleosurface. The ring fractures acted as conduits that focused the hydrothermal ore-forming fluids. A differentiated shallow magma chamber was a probable source of heat and of the chemical components for the fluids.

Dump in Špania Dolina.

Sphalerite, galena and chalcopyrite, Banská Hodruša.
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Gold deposits: from theory to exploration practise, SGA Short Course, Mokrsko gold deposit, Czech Republic - Contact: Zdenek Pertold zdenek.pertold@natur.cuni.cz, http://www.e-sga.org

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a stop in Slanská (Kremnické Vrchy Mts.). These mountains are built up by andesite and rhyolite volcanics including pyroclastics. Late stages of volcanic activity were accompanied by widespread silification leading to the formation of secondary quartzites. The postvolcanic silica mineralization is found in andesite lavas and pyroclastics but also in the form of precipitates in lakes. The limnoquartzites (hydrothermal precipitates) often contain remnants of fossil plants.

This field trip was the first excursion under guidance of our new chapter president Luboš Vrtiška and its new treasurer Vít Peřestý. Since the SGA Student Chapter Prague continues to grow and accepts new members, these four days provided us not only with a rich educational experience in volcanic-related mineralization styles in Slovakia but also helped to revitalize the partly new team of our chapter. Finally, we would like to thank our guide in the Hodruša mine, Mr. Ivan Karsten, for his time and attractive explanations as well as Mr. Petr Černý for his support of this field trip.

References
3. Stratabound and vein mineralization in the northwestern Bohemian Massif, central Europe: A field trip report from the SGA Student Chapter Prague

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The metamorphic complexes of the northwestern Bohemian Massif host several mineralization styles that span stratiform base-metal deposits, stratabound skarn mineralization as well as low-temperature hydrothermal veins. During the second trip in 2012, the SGA student chapter in Prague, Czech Republic, visited several examples of these mineralization styles, exposed mainly in historical mines.

The Mědník deposit, a calcic-ferroan skarn with stratabound sulfide mineralization, produced silver, copper and iron since medieval times. The Mědník deposit is situated near the village of Měděnec (Kupferberg) in the central part of the Krušné hory Mts. (Erzgebirge) in the Czech Republic. The deposit is located in the Saxothuringian zone, hosted in Neoproterozoic supracrustal sequences but deformed and metamorphosed during Variscan orogeny at 380-340 Ma. The host rocks are medium-temperature and high-pressure metamorphics including mica schists, orthogneisses and migmatites with intercalations of eclogites, amphibolites, marbles and skarns. The skarn complex in the vicinity of Měděnec hosts magnetite ores and less often Cu-Pb-Zn sulphide ores. Late fractures are filled with calcite veins accompanied by Ag, As, Co, Ni, Bi represented by native silver, bismuth, rammelsbergite, skutterudite, akanthite, and proustite etc.

The deposit has been known since the 15th century. Initially, the silver-bearing copper ores were mined but later, from 1540, pyrite and chalcopyrite were mined as raw materials for vitriol (sulphuric acid) production. The production of vitriol and consequently mining stopped in 1860, and the underground workings were re-opened as a tourist attraction (malachite caves) in 1890. Today remarkable traces of hand mining using pickaxes and fire setting can still be seen.

New mining activities started in 1950s in order to extract magnetite, followed by an unsuccessful attempt to produce uranium. Subsequently, production of garnets and mica concentrates as well as mining of copper with accompanying silver continued. The mine produced 323 tons Cu and 800 kg Au between 1968 and 1990.

The second location visited was Mýtinka, about 4 km SW of Měděnec, a complicated fold structure containing migmatites, orthogneisses and mica schists intensely fractured and filled with quartz gangue. Quartz veins located at fault intersection are usually mineralized with hematite that formed from low-temperature hydrothermal fluids. Overall, the field trip was very successful. We would like to thank Mr. Ivan Cáder, a local enthusiast, for his efforts to make the old Měděnec mine accessible for visitors.
4. News from the Siberian Student Chapter

Ilya Prokopyev, Irina Tretiakova, Olga Gavryushkina

IGM SB RAS, Novosibirsk, Russia

In 2012 the Siberian Student Chapter organized the traditional mineralogical field trip in the Skalinsky open-pit mine (Novosibirsk region) for students from the Geology-Geophysics department of Novosibirsk State University.

For more than thirty years the Skalinsky open pit has been exploiting and providing a lot of regional enterprises with gravel material for building. The open-pit mine is situated in granite rocks of the Kolyvansky magmatic massive, in which pegmatites with cavities are widespread. Well-cut quartz crystals, microcline, albite, topaz, beryl and other minerals were found in these pegmatites.

During the field trip students had the possibility to observe features of pegmatite mineralization, including structure of veins and cavities, distribution of minerals and others. Moreover, the basic principles of open pit exploration were presented directly at the mine.

Several crystals of beryl, black quartz...
and beautiful crystal of blue topaz, which is the largest one found in this open pit, were collected for the Novosibirsk mineralogical museum.

A second activity of the Siberian Student Chapter was the organization of mineralogical lectures for participants to the Siberian Geological Olympics. More than 100 pupils from different Siberian cities attended the talks and showed interest to geological science. As a result, the Novosibirsk Club of Young Geologist invited students of the SGA Siberian Chapter to give a series of lectures.

One more interesting event was The 6th Siberian International Early Career Geoscientists Conference. The SGA Siberian Chapter participated in the organization of two post-conference field trips: “Mineralogy and Metallogeny of Northwestern Altai” and “Geodynamic, Magmatism and Stratigraphy of Gorny Altai”. Both excursions were unique opportunities to visit geological examples of different types of ore deposits, magmatic and sedimentary rocks, and geodynamic complexes and enjoy wonderful views of the Altai nature.

5. News from the Barcelona SGA Student Chapter

Thomas Aiglsperger (President) and Lisard Torró i Abat (Vice-President)
Dept. Cristal·lografia, Mineralogia i Dipòsits Minerals - Facultat de Geologia, Universitat de Barcelona, C/ Martí i Franquès s/n, 08028 Barcelona (Catalonia), Spain

First of all a short introduction: the Barcelona SGA Student Chapter was founded by SGA student members from the University of Barcelona (UB) in summer 2012 and has grown rapidly to 36 members by now. The SC includes currently undergraduate,
Figure 2: SGA student members observing pegmatite samples during comprehensive lesson (photo by Omar Corrales Cazorla).

Figure 3: Participants of the SGA Scientific Session at the University of Barcelona (photo by Omar Corrales Cazorla).

Figure 4: Dr Marieke Van Lichtervelde from the Géosciences Environnement Toulouse (photo by Omar Corrales Cazorla).

Figure 5: SGA field trip to the Cap de Creus pegmatitic area at the Costa Brava (photo by Omar Corrales Cazorla).

Figure 6: Participants of the SGA field trip to Cap de Creus (photo by Omar Corrales Cazorla).
First activities of the BCN-SGA Student Chapter

A three day workshop (10th - 12th of October) on pegmatites was organized by the Barcelona SGA Student Chapter at the University of Barcelona. A total of 50 persons participated in this first activity of our SC, including invited speakers from France, Portugal, Basque Country and Catalonia, as well as students from Portugal, Angola and Catalonia. The workshop started with a comprehensive two-hour lesson on the basics of pegmatites given by MSc Sandra Amores, covering sample observation of pegmatite characteristic minerals and textures. This lesson was gratefully acknowledged by the students, especially by those who did not know much about pegmatites yet. The scientific session was held on October 11th with six outstanding talks given by our national and international invited lecturers. The diverse program included new findings from Lithium pegmatites exploration and exploitation in northern Portugal (Barroso-Alvão case study), an example of a complete evolution from granitic to highly evolved pegmattic facies (Pinilla de Fermoneselle rare element pegmatite, Spain), geochemical zoning and evolution in pegmatite fields (example from Giraul River, Angola), description of fluid inclusions in pegmatites (Cap de Creus case study) as well as new experimental data from rare element pegmatites and its comparison with natural rocks. We would like to give our most sincere thanks to Dr. Alexandre M. Lima, Dr. Encarnación Roda, Dr. Joan Carles Melgarejo, Dr. Pura Alfonso, Dr. Salvador Martínez and Dr. Marieke Van Lichtervelde for following our invitation and for highlighting this event with their expertise. On the third day of the workshop we visited the Cap de Creus pegmatitic area at the Costa Brava. This field trip was led by Dr. Joan Carles Melgarejo and Dr. Pura Alfonso and allowed us to observe several types of pegmatites. It was a great opportunity to understand formation and evolution mechanisms of these bodies, to see and interpret mineral zoning, and even to learn some exploration tricks on identification of the more evolved pegmatites: watch out for mitridatite!! The BCN-SGA Student Chapter wants to thank all supporters of this activity (SGA, UB, BKC, Zanuy Tex-Mex) who made this successful event possible.

Dr. Robert F. Martin from the McGill University (Canada) visited Barcelona for the 100th anniversary of our mineralogy department in October and kindly agreed to give two lectures for SGA students about „Punctuated anorogenic magmatism and its links with metallogeny“ and „Femic magma: a new player in the game”.

Carl E. Nelson, senior consulting geologist and since September 1988 president of Recursos del Caribe, S.A. (www.cbmap.net/consulting/carl-e-nelson), kindly agreed to give two talks for the SGA Barcelona Student Chapter during his stay in Barcelona in November: “The Pueblo Viejo deposit (Dominican Republic): characteristics and genetic models” and “The role of the geologist in a junior mining company: conversation with a 30-year experience consulting geologist”.
The 34th International Geological Congress, held in Brisbane, Australia from 5th to 10th of August (see photos), was a major success with just over 6000 attendees. SGA had a significant presence at the congress, sponsoring two symposia and having a presence at the Springer booth. In addition, I represented SGA at the IUGS Council activities as part of the Australian delegation. Other SGA officers consulted at the conference about IUGS activities included Anna Vymazalova and Nikolay Bortnikov.

The two SGA-sponsored symposia, 7.1 (New age metals: the geology and genesis of ores required for a changing economy and a carbon constrained world), and 8.5 (Exploration and discovery: diagnosis and prognosis - are we in need of cure?) were very well attended, particularly symposium 7.1. This symposium, which was scheduled against a porphyry-epithermal symposium and several other economic geology-related symposia, consistently attracted an audience of over 100, with several presentations attracting well over 200. It was highlighted by keynotes by Rod Eggert on the economics of rare earth and other „new age metals“ and by Peter Collins on the geology of lithium and related pegmatite deposits. A total of 19 presentations and 13 posters were given at this symposium, which lasted a full day. It is planned that the results of this symposium constitute a special issue of Mineralium Deposita.

Symposia 8.5 was also well attended, with most talks attracting an audience over 100 and some attracting 200. The highlight was a keynote by Richard Schoddie on the exploration success rates in copper exploration. The symposium lasted half of a day with nine presentations and six posters. With one exception due to illness, all speakers presented in both symposia.

Four issues of significance to SGA were discussed at the IUGS Council meeting. As part of a strategic plan tabled and endorsed in principle by the council, it was proposed that affiliated organisations have a vote at the council. A second item that was highlighted was the SGA’s short course in metallogeny held in Burkino Faso (see photos and article in SGA News issue 31). The third item of importance was the selection of India (New Delhi) as the host for 36th IGC (the 35th IGC will be hosted in Capetown in 2016). The vote for India was by a significant majority over the bid by Canada (Vancouver), although the Cana-
Delegates meet the ‘locals’ in the exhibition hall.

dian team plan to bid for the 37th IGC. The Indians are considering moving the timing of the 36th IGC to March and not during the northern hemisphere summer when the meeting is traditionally held. The final issue was the election of IUGS officers: Roland Oberhänsli (Germany) as President, Ian Lambert (Australia) as Secretary General, and Marko Komac (Slovenia) and Yildirim Dilek (USA) as Vice-Presidents.

During the meeting between the IUGS executive and affiliated organisations, the SGA short course held in Burkino Faso was again highlighted as activity that the IUGS wants to promote. SGA currently is held in high regard by IUGS. SGA Council looks forward to a continued relationship with IUGS Council. A brief article on the role and activities of the IUGS is included below.

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The International Union of Geological Sciences (IUGS) and links with SGA

Ian Lambert
Secretary General, IUGS (2012-2016)

What is the IUGS?
The IUGS is one of the largest non-governmental scientific organizations in the world. Founded in 1961, IUGS is a member of the International Council of Science (ICSU) and is the scientific sponsor of the International Geological Congress. With 121 national (or ‘adhering’) members, the Union aims to promote and encourage development of the Earth sciences through the support of broad-based scientific studies relevant to the entire Earth system; to apply the results of these and other studies to preserving Earth’s natural environment, using all natural resources wisely.
and improving the prosperity of nations and the quality of human life; and to strengthen public awareness of geology and advance geological education in the widest sense.

The IUGS has a number of initiatives to support the activities of over a hundred Affiliated Organisations, largely international geoscientific organisations such as SGA. IUGS also has a number of commissions that, among other things, establish international geoscientific standards. An example of this is the International Commission on Stratigraphy (www.stratigraphy.org) that has developed an established international stratigraphic timescale and published global correlation charts.

The most visible activity of the IUGS is scientific sponsorship of the International Geological Congress. This series of scientific meetings began in 1878, with the first meeting in Paris, and have continued regularly every 3–4 years (except during periods of global conflict) over the past fourteen decades. Meetings have been held in all continents except Antarctica. Currently the meetings are held every four years, with the next due in Cape Town in 2016. SGA regularly sponsors symposia at these meetings as an Affiliated Organisation.

The day-to-day running of the IUGS is through its Executive Committee (EC), which is at least partly renewed at the Council meeting held at each IGC. In fact, the 34th IGC in Brisbane saw new people endorsed for all but two Councillor positions on the EC.

Links between IUGS and SGA

The new EC is very motivated to increase the visibility and relevance of the Union and is keen to interact with Affiliated Organisations, including SGA, through side meetings at large international conferences where feasible, and formal and informal contacts. A major strategic direction for the new EC will be developing high profile international initiatives which ensure optimal geoscience inputs in initiatives addressing major challenges. One approach will be for IUGS to develop and seed fund some multidisciplinary systems approaches to address these challenges, potentially in collaboration with IUGG and other GeoUnions under the International Council for Science (ICSU). SGA may wish to canvass ideas with other IUGS affiliated organisations with interests in future minerals and energy resources, with a view preparing a conceptual proposal for discussion, along with other ideas, at the IUGS’ annual Executive meeting in February 2013.

SGA has already benefited from its association with the IUGS. IUGS monetarily supported the SGA short course on metallogeny in Burkino Faso and encourages similar activities, particularly in developing countries.

More information about the IUGS can be found at www.iugs.org, and more information about the next International Geological Congress in Cape Town can be found at www.35igc.org.

Ian Lambert
Secretary General, IUGS (2012-2016)
The SGA website

Daniel Layton-Matthews, Chief Editor SGA website
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http://www.e-sga.org
N. Arndt, University of Grenoble, France; C. Ganino, University of Nice, France

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*** Regional restrictions apply.
M. Baskaran, Wayne State University, Detroit, MI, USA (Ed.)

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SGA

Society for Geology Applied to Mineral Deposits (www.e-sga.org)

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I would like to become a member of the Society for Geology Applied to Mineral Deposits and to receive my personal copy of Mineralium Deposita. Membership fees will be due after acceptance of the membership application by the SGA Council.

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Send the Membership Application Form to:

Dr. Jan Pasava

SGA Executive Secretary

Czech Geological Survey

Klárův 131/3

CZ-118 21 Praha 1

CZECH REPUBLIC

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Fax: ++(420)-2-51015748

E-mail: secretary@e-sga.org
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Contact person:
prof. Zdeněk Pertold
zdenek.pertold@natur.cuni.cz

An official short course website will be announced at www.e-sga.org in mid-January 2013
SGA, the Geological Survey of Sweden and the Nordic mining industry invite you to the 12th SGA Biennial Meeting:

Mineral deposit research for a high-tech world

12–15th August 2013, Uppsala, Sweden

Second circular

www.akademikonferens.uu.se/sga2013
Invitation

The Geological Survey of Sweden and the local organizing committee are proud to announce the 12th SGA Biennial Meeting which will be held in the university city of Uppsala. The meeting will take place at the Uppsala University main building within walking distance to most downtown hotels.

The 12th SGA Biennial Meeting will provide excellent opportunities to present and exchange knowledge within the field of mineral deposit research. Sweden has a history of mining and metals refining stretching back more than a thousand years. Its metal ores and other mineral resources, and the knowledge about how to use them, have been key elements in building the prosperity of the country.

There will be a wide variety of activities available to both delegates and accompanying persons, in terms of excursions and of all the interesting social activities that Uppsala and nearby Stockholm have to offer.

It is my pleasure to warmly invite you to Sweden and Uppsala. We look forward to seeing you at the 12th SGA Biennial Meeting.

Kaj Lax
Chairman of the local organizing committee, Head of department, Geological Survey of Sweden.

Venue

The conference will be held at the Uppsala University main building, located in the centre of the town. Built in the 1880s and hosting a magnificent and spacious foyer and a Grand Auditorium, it is often used for academic ceremonies such as inauguration of full professors and the doctor’s degrees ceremonies. The University main building also has many smaller lecture halls of various sizes and it is therefore often used for conventions and conferences. The venue is centrally located in a beautiful area within walking distance to most downtown hotels. The building has free unlimited wireless internet access.

The workshops and short courses will primarily be held at Geocentrum – the Department of Earth Sciences at Uppsala University and at the Geological Survey of Sweden.

The official language of the meeting, workshops and excursions will be English.

Committees

Local organizing committee

Kaj Lax
Geological Survey of Sweden (chairman)
Alireza Malehmir
Uppsala University
Erik Jonsson
Geological Survey of Sweden
Iain Pitcairn
Stockholm University
Katarina Nilsson
Geological Survey of Sweden
Kjell Billström
Swedish Museum of Natural History
Magnus Ripa
Geological Survey of Sweden
Peter Hedlin
Uppsala University (student representative)
Pär Weihed
Luleå University of Technology (SGA liaison)
Raimo Lahtinen
Geological Survey of Finland
Rodney Allen
Boliden Mineral AB
Rognvald Boyd
Geological Survey of Norway

Scientific committee

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Geological Survey of Sweden (chairman)
Axel Müller
Geological Survey of Norway
Christopher Juhlin
Uppsala University
Gilles Bellefleur
Geological Survey of Canada
Henrik Stendal
Bureau of Minerals and Petroleum Greenland
Holly Stein
Colorado State University
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Jochen Kolb
Geological Survey of Denmark and Greenland
Kirsti Loukola-Ruskeeniemi
Geological Survey of Finland
Pasi Eilu
Geological Survey of Finland
Raimo Lahtinen
Geological Survey of Finland
Rodney Allen
Boliden Mineral AB
Thomas Wagner
University of Helsinki
Wolfgang Maier
Oulu University
Scientific Program

The scientific (technical) program of the meeting will be held over four days, from Monday the 12th of August to Thursday the 15th of August 2013.

Plenary sessions will be held during the mornings of Monday and Tuesday, with scientific sessions taking place in the afternoons. Wednesday and Thursday will be entirely devoted to the scientific sessions, excepting the SGA general meeting and awards presentations. Poster presentations will be organised during the entire four days, in two sets of sessions in association with relevant oral presentations.

Depending on submitted abstracts, the scientific committee may decide on changes, merges and cancellations of the suggested sessions and subsessions.

Scientific Sessions and Convenors

S1 Present and future of metals and minerals
S1.1 New metal needs and new deposit types. Pär Weihed
S1.2 Sustainability in mining and exploration: the role of geosciences. Jeremy Richards & Rognvald Boyd

S2 Methods and advances in mineral deposit studies
S2.1 3D modelling of ore deposits. Alireza Malehmir, Tobias Bauer & Gervais Perron
S2.2 New advances in geophysical mineral exploration. Christopher Juhlin & Hans Thunehed
S2.3 New analytical methods and applications in mineral deposit studies. Hugh O’Brien & Yann Lahaye
S2.4 Advances in mineral chemistry of Fe oxides: ore-forming processes and implications for exploration. Georges Beaudoin & Thomas Angerer
S2.5 Ore mineralogy and geometallurgy. Pertti Lamberg & Federica Zaccarini
S2.6 New advances in geochemical exploration. Pertti Sarala & Rob Hough S2.7 Predictive modelling. Vesa Nykänen & John Carranza

S3 Ore forming processes and deposit types
S3.1 Volcanic-hosted base and precious metal deposits. Rodney Allen & Fernando Tornos
S3.2 Sediment-hosted deposits. Ross Large & Jan Pašava
S3.4 Magmatic and hydrothermal hypogene and supergene iron ores. Steffen Hagemann, Paul Duuring & Thomas Angerer
S3.5 Porphyry systems and epithermal deposits. Jeffrey Hedenquist & Ferenc Molnar
S3.6 Ore deposits associated with mafic and ultramafic rocks. Wolfgang Maier & Michael Lesher
S3.7 Orogenic gold deposits. Pasi Eilu, Richard Goldfarb & Iain Pitcairn
S3.8 Hydrothermal ore-forming processes. Thomas Wagner & Kalin Kouzmanov
S3.9 New developments in the understanding of IOCG deposits. Roberto Xavier & Brian Rusk
S3.10 Tethyan metallogeny. David Leach & Zengqian Hou
S3.11 Metallogeny of the Urals. Richard Herrington
S3.12 Skarn deposits – 138 years after Törnebohm. Nils Jansson & Zhaoshan Chang
S3.13 Uranium and thorium deposits. Frank Bierlein & Michel Cuney

S4 Fennoscandian mineral deposits
S4.1 Metallogeny of Fennoscandia: The Shield, the Caledonides and the Oslo rift. Raimo Lahtinen & Krister Sundblad

S5 High-tech elements – deposits and processes
Yasuhide Watanabe & Laura Lauri

S6 Industrial minerals
S6.1 Industrial minerals. Axel Müller & Håvard Gautneb
S6.2 Construction materials. Richard Prikryl & Karel Miskovsky

S7 Open session. Karin Högdahl & George Morris
Excursions

A number of pre- and post- conference excursions will be arranged in association with the SGA 2013 meeting in Uppsala. Excursions to Finland, Greenland, Norway, Russia and Sweden will be available. They will all mainly focus on mineral deposits, both metals and industrial minerals, and their settings, and offer opportunities to see several world- famous (in some cases even world- class) deposits and districts.

Details of each excursion will be available on the SGA 2013 webpage. They will be run depending on attendance.

Finland and Russia
FINRUS Ni-Cr, PGE deposits of Finnish Lapland and the Kola peninsula, pre-conference. RUS Gold Deposits of the Russian North East, pre-conference.
FIN1 Orogenic gold, Finland, post- conference. FIN2 Proterozoic base metal deposits along the Archean-Proterozoic boundary in central Finland, pre- conference.
Contact person: Raimo Lahtinen, Geological Survey of Finland (GTK).
Photo: Erik Jonsson.

Greenland

Norway

Sweden
SWE1 The Skellefte district, geology and base metal deposits, pre-conference. SWE2 The gold line and Au-deposits in the Skellefte district, pre-conference. SWE3 Norra Kärr REE-Zr project and the birthplace of the light REEs, pre-conference.
SWE4 Bergslagen, post-conference. SWE5 IOCG and related deposits in northern Fennoscandia, post- conference.
SWE6 One day excursion to the historic Sala Ag deposit, post- conference. SWE7 One day excursion to the island of Utö, post-conference.
SWE8 City walks to see ornamental and building stones in the Uppsala cathedral. Contact person: Magnus Ripa, Geological Survey of Sweden (SGU).
Workshops and Short Courses

A number of workshops and short courses will be arranged in association with the SGA 2013 meeting in Uppsala. More detailed information will be provided on the conference webpage. Those interested in offering short courses or workshops, please contact the local organizing committee at: sga2013@sgu.se.

New proposals will be considered until December 7th, 2012.

**Workshops**

W1: 3D/4D Modelling of Mineral Deposits. Dr. Nigel Phillips & Dr. Gervais Perron, Mira Geoscience.

W2: Applied Structural Geology in Exploration and Mining. Dr. Chris Bonson, Dr. Ivo Vos and Paul Stenhouse, SRK Consulting.

W3: BIF-hosted iron ore systems: Genesis and exploration models. Prof. Steffen Hagemann, Thomas Angerer, Paul Duuring, Centre for Exploration Targeting-University of Western Australia. Prof. Lobado, Prof. Figueiredo e Silva, Prof. Rosier University Federal Minas Gerais at Belo Horizonte, Brazil.

W4: Archaean-Proterozoic basic and ultrabasic magmatism of the Karelian and Kola cratons. To be held pre- excursion in Oulu, Finland.

Prof. Eero Hanski, Prof. Wolfgang Maier, Oulu University, Finland.

**Short Courses**


S2: Fluids, minerals and melts: Investigating hydrothermal processes using laser ablation-ICP-MS techniques. Dr. Brian Rusk, Western Washington University, USA.

**Students**

The future and development of economic geology depends on the involvement of graduate and postgraduate students. Therefore, students within a broad field of ore deposits research are invited and encouraged to submit abstracts and present their results at the 12th SGA biennial meeting in Uppsala. The meeting offers a great opportunity for students to interact with leading scientists, other young researchers and the industry in an inspired and informal environment.

Attractive benefits are being offered to students to encourage their participation in SGA2013 including:

**Reduced registration fees**

The registration fee for all students is at a reduced level, with SGA student members paying the lowest registration fee.

**Student grants**

To support participation of students at the conference, a limited number of grants are open for students who are senior authors of accepted abstracts. For these grants, SGA student members are prioritised. The student grants will be awarded upon the acceptance of an abstract for oral or poster presentation at the conference, and will be based on the financial need and scientific relevance of the submitted contribution. An application form for student financial support will be available on http://www-conference.slu.se/sga2013/students.

**Free excursions**

Several pre- and post-meeting excursions to Nordic countries and Russia are being organized. For students, a limited number of free registrations will be offered (only one per trip). An application form will be available on the conference website. The Greenland and North-east Russia excursions are excluded.

**Student awards**

The best student oral and poster presentation will be awarded a certificate and a prize of 300 USD.

**Social evening ‘Student & Industry’**

All registered students are also invited to a social event organized by the industry to discuss future projects, employment opportunities or just to mingle with a range of different types and sizes of mining and mineral exploration companies, active in the Nordic countries and elsewhere. For further information about this event, please contact Rodney Allen: rodney.allen@boliden.com.

Do not hesitate to contact the Student Committee members if you have any questions, comments or suggestions.

The SGA Student Committee

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Student SGA2013 Local Organizing Committee Peter Hedin
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Social Program

Conference Banquet at Uppsala Castle

The Uppsala Castle dates back to the 16th century and is the site of numerous historical events. Today, the castle houses the art collection of Uppsala city and Uppsala University and a museum on peace. It is also the residence of the county governor. The conference banquet will include a three-course dinner in the magnificent Hall of State, where Queen Christina of Sweden abdicated her throne in June of 1654.

Location

The castle is located centrally: an easy 15–20 minute walk from several downtown hotels, and a 10–15 minute walk from the conference venue, also facing the beautiful botanical gardens.

Destination Uppsala

Uppsala’s profile as a city of learning, with close proximity to Stockholm and Stockholm-Arlanda Airport and a wide variety of modern and historical experiences that only the Uppland region can offer, lays the foundation for a winning concept for both national and international meetings.

A town with two universities

Uppsala is the fourth largest city in Sweden, with a steadily increasing population of around 200,000. The city retains the charm of a small town while offering major urban opportunities and attractions. Here are two universities, the Swedish University of Agricultural Science and Uppsala University, founded in 1477. Uppsala is considered to be the religious and historic centre of Sweden.
People
The city has a solid base of knowledge and tradition from which to progress. At the same time, the atmosphere is youthful, and more than 40,000 university students are a significant factor to this vivacity.

Uppsala also hosts Sweden’s oldest botanical gardens, the Garden of Linnaeus, founded by the great natural scientist himself. Carl Linnaeus’ professorial residence is situated in the garden.

Just outside of the city you can visit his summer residence, Linnaeus’ Hammarby.

Sightseeing
Uppsala boasts the largest cathedral in Scandinavia, one of Sweden’s most famous locations of prehistoric artifacts (Old Uppsala), a unique anatomical theatre built in the 1600’s by Olof Rudbeck the Elder, the great university library (Carolina Rediviva) with the Silver Bible, Uppsala Castle dating back from the mid-1500’s, and many more marvellous sites and attractions.

The city’s geographical location, only 20 minutes from Stockholm-Arlanda airport and 45 minutes from Stockholm, the capital, has made Uppsala an attractive place for meetings and to establish new companies.

Getting to and around Uppsala

Transport
Uppsala has a well functioning public transportation system and taxis are also available at the Central Station.

Sweden has a highly efficient rail network spanning the entire country. For those traveling by car, Sweden offers a well-maintained network of roads and motorways which makes Uppsala easy to access by car. Delegates will also have the possibility to travel to Stockholm by boat. Ferries regularly connect Stockholm to Finland, Estonia, Latvia and Poland. Trains from Stockholm Central Station to Uppsala Central Station depart at least twice an hour from 6 am to 11 pm and the journey takes 40 minutes. Stockholm-Arlanda International Airport is situated between Uppsala and Stockholm. The airport offers 170 destinations worldwide and 70 airlines. Easy access buses and trains run frequently directly from the airport to Uppsala city centre and the trip takes 20–45 minutes. You can go by taxi straight from the airport to your hotel in Uppsala for approximately 55 €, if the price is agreed on beforehand (if not, the price may turn out much more expensive).

Currency
The Swedish monetary unit is the Swedish krona (SEK), divided into 100 öre. Exchange rates in October 2012:

Euro 1=SEK 9 USD 1=SEK 7 GBP 1=SEK 11. Major credit cards are accepted almost everywhere. There are several currency
exchange offices and cash dispensers at Stockholm Arlanda International Airport and in Uppsala. Exchange rates may vary. To see current exchange rates, please visit oanda.com. or x-rates.com.

**Accommodation**
There are several hotels and hostels within walking-distance from the conference centre. For more information, please visit the conference webpage.

**Lunches**
There will be an option to pre-purchase lunch at registration. However, there are several restaurants in downtown Uppsala. Prices vary between c. 10 and 15 €. Going downtown, eat lunch and walk back will take approximately 1 hour.

**Security**
Uppsala is a peaceful city and the only risk to consider is pickpockets – always keep an eye on your belongings. The same goes for Stockholm, where there are more tourists and therefore also more pickpockets.

**Weather**
At the time of the conference the weather in Uppsala is either sunny or rainy, due to thunderstorms. Temperatures vary from c. 15 to 25 °C and it might be windy.
Important information

Registration

<table>
<thead>
<tr>
<th>Registration fees</th>
<th>By May 31 at the latest</th>
<th>After May 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGA member</td>
<td>SEK 4300</td>
<td>SEK 5000</td>
</tr>
<tr>
<td>Student, SGA member</td>
<td>SEK 2000</td>
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<tr>
<td>Non-member</td>
<td>SEK 5300</td>
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<td>Student, non-member</td>
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</tr>
<tr>
<td>Accompanying person</td>
<td>SEK 1000</td>
<td>SEK 1500</td>
</tr>
</tbody>
</table>

Registration fees include:
- Access to all technical and plenary sessions.
- Morning and afternoon refreshments.
- Ice breaker party.
- All meeting materials including the final programme and conference abstract volume in digital format.

Lunch is not included in the registration fee, but during registration lunch can be purchased for an additional fee of c. 580 SEK. A printed copy of the proceedings can be ordered in conjunction with registration for an additional fee.

Exhibits
Limited space is available for exhibits at the conference venue. Please contact the local organizing committee (sga2013@sgu.se) for more information regarding reservation and prices.

Sponsorship
Sponsorship is available in different categories—please contact the local organizing committee for a detailed offer (sga2013@sgu.se).

Please note
Only abstracts by authors who have paid their registration fee (limit two papers per first author) by May 31st will be included in the conference program and abstract volume.

Important dates

7 January 2013
- Opening of abstract-submission available via website.
- Registration opens.

8 February 2013
- Abstract submission deadline.
- Applications close for student support.

8 March 2013
- Editorial decisions from convenors.

5 April 2013
- Final revised abstracts from authors due.

30 April 2013
- Notification of final acceptance or rejection of abstract.

31 May 2013
- Deadline for early bird registration. Deadline for notification of student support. Last day to receive a full refund of registration.

15 June 2013
- Last day to receive partial refund for cancellation.

Information on field trip registration deadline varies between the different excursions and will be posted on the conference website.

For more information and registration:
www.akademikonferens.uu.se/sga2013
50th SGA Anniversary meeting
Welcome back to the roots of SGA

13th SGA Biennial Meeting

Nancy, France, August 24-27, 2015
Mineral Resources in a Sustainable World

sga-2015@univ-lorraine.fr