



SGA News

August 2024
Number 55



18TH SGA Biennial Meeting
2025 Colorado School of Mines
Golden, Colorado USA

Mineral Resources for Our Ever-Changing World



SGA News

Contents

No. 55 August 2024

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SGA News is a publication of SGA (Society for Geology Applied to Mineral Deposits) and appears twice a year.

SGA News can be also read in the SGA homepage on Internet:
<http://www.e-sga.org>

CONCEPT AND PRINTING
WMXDesign GmbH
Heidelberg, Germany

LAYOUT
David Banks, Leeds, UNITED KINGDOM
WMXDesign GmbH

DEADLINE FOR SGA NEWS No. 55
28th February 2025

SGA NEWS – MAILBOX
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Society for Geology Applied to Mineral Deposits

Report on Membership, January 1, 2023 to December 31, 2023

44 regular and 300 student members applied for membership in 2023

Algeria	6
Argentina	3
Australia	8
Austria	3
Belgium	5
Benin	1
Brazil	2
Bulgaria	1
Burundi	1
Cameroon	2
Canada	16
Colombia	26
Czech Republic	40
Denmark	1
Ecuador	1
Finland	8
France	14
Georgia	1
Germany	26
Hungary	1
China	3
India	1
Italy	8
Japan	2
Kazakhstan	8
Korea	1
Lithuania	1
Mali	1
Mexico	1
Morocco	13
New Zealand	2
Norway	1
Peru	52
Poland	9
Romania	1
Russia	4
Slovakia	2
South Africa	10
Spain	12
Sweden	14
Switzerland	10
Turkey	7
United Kingdom	3
USA	9
Uzbekistan	2
Zimbabwe	1

Mineralium Deposita

THEMATIC ISSUE ON RARE METALS (LI-Cs-TA-Sn) IN PEGMATITES

Mineralium Deposita invites contributions to a thematic issue on Rare metals (Li-Cs-Ta-Sn) in pegmatites. This initiative is coordinated by AE Rui Wang with the help of guest editors Anouk Borst, Robert Linnen and John Slack.

Innovative manuscripts of international interest and from a broad range in terms of geography and scientific methods are invited. Papers should be concise, not more than 80,000 characters (including spaces), with up to 12 graphical items. Manuscript submission is via the European editorial office and is open until end of 2024.

The SGA Mobility Grant - updated

Are you in contact with an SGA member who runs a laboratory that could answer some of your research questions? The SGA Mobility Grant can help to bring you together! The SGA Mobility Grant offers an opportunity for regular SGA members to apply for (i) travel funding (up to €1000) to travel to a facility with an SGA background and (ii) funding to cover analytical costs (up to €1000) arising from the visit.

To be eligible applicants must have been an SGA member for at least 3 continuous years (i.e. paid up membership fees for the last 3 years). Student members are not eligible for the grant but up to 2 years of student membership can count toward the required 3 years of membership. To apply send your completed application form to the SGA Mobility Grant coordinator (thomas.aiglsperger@ltu.se).

A list of laboratories and application form is available from the SGA Website.

CALL FOR NOMINATIONS - SGA AWARDS 2025

At the upcoming SGA Biennial meeting in Golden in 2025, the Society for Geology Applied to Mineral Deposits will recognise the achievements of three scientists for geological research applied to mineral deposits and outstanding service to the Society

The SGA Young Scientist Award recognises scientists at the beginning of their careers.

The SGA-Newmont Gold Medal recognises the career of the awardee involving "unusually original work in the mineral deposit sector, which shall be broadly interpreted to encompass major contributions to (1) the science through research and (2) the development of mineral resources through mine geology, exploration and discovery.

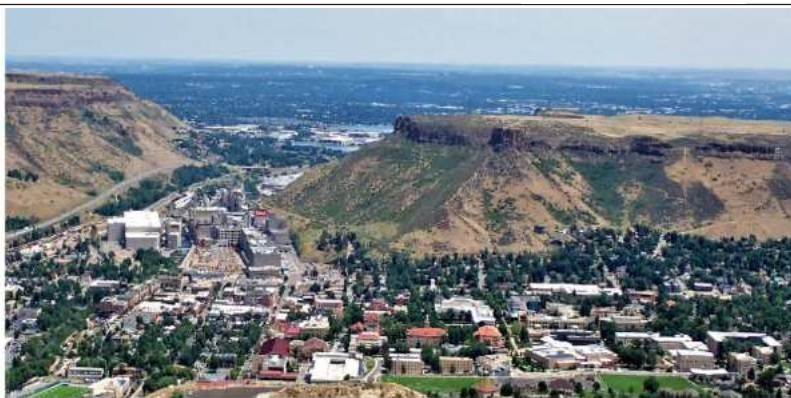
The SGA-KGHM Krol Medal is based in memory of Gerardus L. Krol (1912-1984) who played a key role in the foundation and development of the Society and recognizes outstanding service to SGA.

For all awards, letters of support from three SGA members are required. All nomination forms and letters should be sent to the SGA Executive Secretary with a copy to the Chairman of the Awards Committee, whose addresses can be found on the nomination form. All nominations and letters of support (either digital or hard copy) must be received by 31 March 2025. More details and nomination forms can be found on the Awards page of the SGA website.

Mineral Resources for Our Ever-Changing World



August 3-7, 2025



THE VENUE

Golden is home to the Colorado School of Mines (CSM), which was founded in 1874. The Conference will be held in the Green Center on the CSM campus.

2025 THEMES WITH SESSION CHAIRS

- Metallogenic evolution of the North American continent (R. Goldfarb, C. Hart, E. Holley, S. Piercey)
- Sustainability of future critical mineral resources (M. Harlaux, S. Jowitt, P. Verplanck, Z. Chang)
- New frontiers in analytical techniques for the explorationist (M. Steele-MacInnis, A. Vymazalova)
- Applications of structural geology to understanding ore controls (A. Hughes, Y. Kuiper, D. Ryhs, N. Thébaud)
- Environment, Society, and Governance (ESG): Challenges related to economic geology (K. Goodenough, M. Hitzman)
- Ore deposits associated with magmatic systems
 - Porphyry/epithermal deposits (G. Bozkaya, P. Chadwick, T. Christie, D. Cooke, Z. Yang)
 - Alkaline magmatism and carbonatites (S. Decree, N. Coint, D. Ollinger)
 - Volcanogenic massive sulfides: a session in remembrance of Jim Franklin (M. Hannington, J. Relvas)
 - Tin-tungsten deposits (B. Lehmann, J. Mao)
 - Magmatic Ni-Cr-Cu (PGE) deposits (S. Dare, C. Li, W. Maier, E. Mansur)
- Sedimentary processes and ore formation: Special session to honor the career of David Leach (S. Boulel, L. Fontboté, K. Kelley, J. Pašava, Y. Song, S. Spinks)
- Targeting mineral deposits in metamorphic terranes (A. André-Mayer, P. Garofalo, S. Hagemann, J. Kolb, P. Mercier-Langevin, I. Pitcairn)
- Plate tectonics and secular distribution of mineral systems (D. Huston, H. Frimmel, Y. Li, S. Pehrsson)
- SGA-SEG session: Geochemical processes in ore deposition (J. Hedenquist, C. Laflamme, G. Pokrovski, S. Simmons)
- Discovery through geophysics, remote sensing, and hyperspectral techniques (E. Anderson, J. Austin)

Plus some exciting plenary speakers to be announced soon!

FAST FACTS

SGA CONFERENCE OVERVIEW

The SGA Conference is a premier forum for exchange of ideas on issues related to mineral deposit research, exploration, development, and the environment.

WHEN

August 3-7, 2025

WHERE

Colorado School of Mines campus, Golden, CO, USA

WHAT

Four days of oral and poster presentations, pre- and post-conference short courses and exciting field trips, plus accompanying persons program and other social activities

EXPECTED NUMBERS

600-700 national and international delegates. Delegate representation includes academia, industry, government research organizations, consultants and service providers.

HISTORY

SGA conferences have been held in Australia, Canada, Chile, China, Czech Republic, Finland, France, Greece, Ireland, New Zealand, Poland, Scotland, Spain, Sweden, Switzerland, and the UK

SGA 2025 WILL BE THE FIRST EVER IN THE U.S.

ABSTRACT SUBMISSION AND REGISTRATION ALONG WITH STUDENT GRANT APPLICATIONS WILL OPEN JANUARY 6, 2025

PLAN AHEAD!

Colorado School of Mines





18TH SGA BIENNIAL MEETING

Golden, Colorado, USA August 3-7, 2025

Thank You to Our 2025 Sponsors!!

LOCAL ORGANIZING COMMITTEE

Conference Chair

Karen Kelley

Technical Program

Rich Goldfarb

Short Courses

Katharina Pfaff

Field Trips

Mary Doherty

Erik Tharalson

Lew Kleinhans

Social Program

Ben Frieman

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SILVER

Sponsorship of SGA 2025 provides a unique opportunity for companies to show their support for the advancement of mineral deposit research and exploration in an International forum. Please see our website for details of sponsorship opportunities: <https://sga2025.org>

FIELD TRIPS

Trip itineraries are subject to change slightly. Additional information on field trips including pricing will be available on the Conference website as they are finalized

PRE-CONFERENCE TRIPS

ALASKA GOLD

Duration: 7 days
 Leaders: Doug Kreiner and Erin Marsh

Beginning in Fairbanks and ending in Anchorage, this trip will include Fort Knox, Livengood, Shorty Creek, Pogo, Manh Choh, and the Valdez Creek placer. It will also highlight the critical minerals work that has been done in the upland and supported by the USGS Earth Mapping Resources Initiative. Lastly, it would provide an overview of a number of different deposit types: 1) Paleocene porphyry Au(-Cu) (Shorty Creek), 2) Cretaceous intrusion related Au (Fort Knox, Livengood/Money Knob), 3) quartz-hosted Au (Pogo), 4) Late Cretaceous skarn Au related to a porphyry (Manh Choh), and 5) Placer Au related to orogenic Au veins at Valdez Creek.

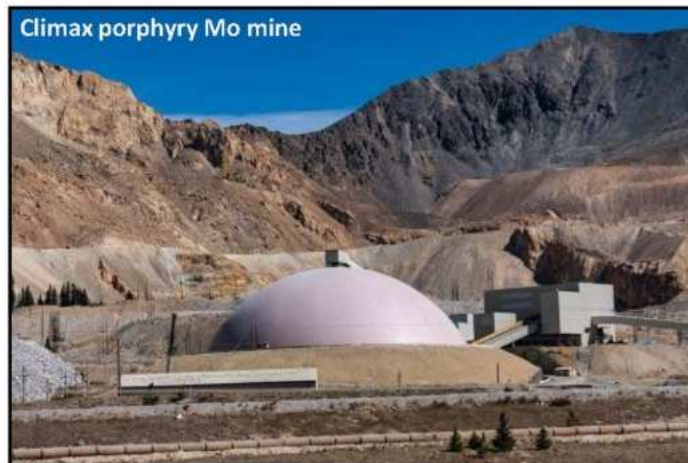


Pogo mine from Leise Ridge

CLIMAX PORPHYRY MO, COLORADO

Duration: 1 day
 Leaders: Mac Canby, Freeport McMoRan geologists

The world-class molybdenum deposit at Climax has produced Mo concentrate intermittently for more than 100 years. The Climax deposit, which is genetically associated with Oligocene rhyolitic and granitic stocks, is a complex igneous hydrothermal system characterized by multiple intrusive and mineralizing events. The orebodies are composed of molybdenite stockwork veinlets that form dome-shaped masses centered on an intrusive stock. This trip will emphasize current knowledge of these deposits as well as mining history.



Climax porphyry Mo mine

BUTTE PORPHYRY SYSTEM, MONTANA

Duration: 5 days
 Leaders: Eric Anderson, John Dilles, Kyle Eastman, Mark Reed, Chris Gammons, Karen Lund, Kaleb Scarberry

The world-class deposits of the Butte mining district, Montana have a long history of production leading to the area being referred to as the "Richest Hill on Earth." The deep porphyry Cu-Mo deposits are overlain by shallow Cu-rich (Au-Ag-Pb-Mn-Zn bearing) zoned-lode deposits hosted in the Butte granite phase of the Boulder batholith. This 5-day field trip will explore the geology and mineral deposits that occur within and around the Boulder batholith. We will visit underground and open pit workings and observe mineralization and alteration in historic deep drill holes of the Butte district. This trip will compare the Butte mining district to other types of deposits associated with the batholith including skarn, carbonate replacement, stockwork, and lode-vein deposits. In addition, we will discuss environmental issues associated with historical mining, and provide updates on current research and future directions for critical commodity production.



Continental Pit: supergene portion of Butte orebody



Butte ore from Continental Pit (chalcocite, bornite)

POST-CONFERENCE TRIPS

SAN JUAN VOLCANIC FIELD, COLORADO

Duration: 5 days

Leaders: Mario Guzman, Doug Yager, Mary Doherty, Steve Enders

Note: High elevation (>3 km above sea level)

The San Juan Volcanic Field in Southwest CO provides an opportunity to compare several intermediate-sulfidation (IS) and high-sulfidation (HS) type epithermal mining districts, and porphyry, as well as various volcanic welded tuffs, lavas and caldera features. The trip will include visits to subeconomic Cu-Mo porphyry prospects, the world class Creede epithermal deposit, and the Summitville HS- epithermal deposit. The trip will focus on mineralization in a geologic context, but each site visited has legacy mining issues, and thus we will explore topics in volcanology, mining history and environmental stewardship.



CRIPPLE CREEK AU-TE DEPOSIT, COLORADO

Duration: 1 day

Leaders: Richard Piilco, other Newmont geologists

Note: High elevation (>2.5 km above sea level)

This trip will include an overview of the active mining area and deposit discussion with Newmont geologists at the core shed. Cripple Creek is a world class alkalic epithermal deposit and has produced more than 20 million ounces of gold (historical and modern production) from a diatreme complex. The Oligocene-aged volcanism hosts vein and disseminated-style mineralization extending to depths of more than 1,000 m from present-day surface.

Cresson pit with lamprophyre dike, Cripple Creek



TOPS AND BOTTOMS OF CARLIN-TYPE SYSTEMS, UTAH AND NEVADA

Duration: 5 days

Leaders: Mike Ressel and Jim Wise

This field trip focuses on three aspects of Eocene Carlin-type gold deposits in the Great Basin of Nevada and Utah, western United States: 1) recent discoveries of deep, high-grade deposits and overviews of some major deposits, 2) the shallow expressions of Carlin-type systems, and 3) the relationships of deposits to regional Eocene processes including arc magmatism and intrusion, sedimentary basin development, and extension. The links between these regional processes led to the unique metallogeny of this region.

Carlin-type Cortez open-pit with Mt. Tenabo in background



YELLOWSTONE HYDROTHERMAL SYSTEM, WYOMING

Note: This is a combined SGA and SEG trip

Duration: 5 days

Leaders: Jeff Hedenquist and Stuart Simmons

Note: High elevation (>2 km above sea level) and a 7 km hike

This tour will focus on the geology and geochemistry of the Yellowstone hot spot, volcanic and hydrothermal deposits. As the largest concentration of active geysers known globally, we will view active travertine deposits and learn about the dynamic geologic environment associated with one of the largest known calderas, 10,000 hydrothermal features including over 500 geysers, and highly active seismic zone.



Mammoth hot springs, Yellowstone

SHORT COURSES

Please see our website for description of each course
www.sga2025.org

PRE-CONFERENCE

1. **Mapping micro-XRF and automated mineralogy for mineralogical and geochemical characterization – 1 day**
Nigel Kelly (Bruker)
2. **Exploration of sediment-hosted metals – 2 days**
Ali Jaffri (Applied Stratigraphix)
3. **Orogenic Gold – 1 day**
Jochen Kolb (Karlsruhe Institute of Technology), Georges Beaudoin (Université Laval), Iain Pitcairn (Stockholm University), Nicolas Thébaud (University of Western Australia), and Rich Goldfarb (Colorado School of Mines)
4. **Ore microscopy – 2 days**
Simon Kocher (Colorado School of Mines), and Tobias Fusswinkel (RWTH Aachen)
5. **Tectonic and structural framework for precious metal deposits in North America – 3 days**
Dave Rhys (Panterra), Franck Valli (Newmont), and Amanda Hughes (University of Arizona)
6. **Database design to capture and archive geological observations – 1 day**
Wiley Skewes (Alamos Gold Inc.)

SOCIAL ACTIVITIES

The 2025 SGA Conference social program aims to provide a mix of organized social events and a relaxed atmosphere for registrants and accompanying persons to interact in an informal setting. Planned events include:

- Sunday evening icebreaker and Welcome Function at the conference venue (Green Center, CSM campus)
- Monday evening student-industry event in downtown Golden (Buffalo Rose event center)
- Tuesday evening Gala Dinner at the Mount Vernon Canyon Club
- Wednesday evening of optional organized activities TBA

Plus craft brewery night, event at the Colorado School of Mines mineral museum, and other activities



POST-CONFERENCE

1. **Fluid and melt inclusions in ore systems – 2 days**
Matthew Steele-MacInnis (University of Alberta) and Tobias Fusswinkel (RWTH Aachen)
2. **Mineral Economics – 1 day**
Rod Eggert (Colorado School of Mines)
3. **UAV-borne hyperspectral mapping approaches – 1 day**
Frederike Koerting (HySpex) and Katerina Savinova (University of Queensland)
4. **Concepts and Application of Machine Learning to Mining Geoscience: A Practical Course - 2 days)**
Francisca Maepa (BHP)
5. **Geological mapping in mineral exploration – 1 day**
Andreas Dietrich (Dietrich Consulting)

ACCOMPANYING PERSONS PROGRAM

A full and varied accompanying persons program will be offered and may include some or all of the following activities and visits:

- Golden's finest museums that include the Buffalo Bill, the Museum of Mountaineering, the Colorado music Hall of Fame at Red Rocks amphitheater, and the Dinosaur Ridge museums.
- Visit to Boulder and Chautauqua park at the foot of the "Flatirons"
- Denver cultural tour of Botanical Gardens and Natural history museum

STUDENT PROGRAM

As with all SGA Biennial Meetings, a strong student program is planned. The following incentives will be offered to encourage strong student participation at the conference:

- Heavily discounted registration fees
- Cash prize for best oral presentation
- Cash prize for best poster presentation
- Industry-Student Evening function (Monday) where students can meet Industry representatives
- Student travel awards
- One free student registration on selected field trips

We highly encourage student participation in oral and poster presentations



Visit our website at www.sga2025.org for more details

Questions? Send queries to sganetwork2023@gmail.com

Smart Exploration Research Centre

We are proud to announce the opening of the Smart Exploration Research Centre, a centre for knowledge and innovation for exploration of critical raw materials funded from 2024-2029 by the Swedish Foundation for Strategic Research. The centre comprises a consortium in academic institutions and industry partners in Sweden and is hosted by Uppsala University. See the homepage: www.smartexploration.se for more details and contact information.

AMKVO Prevas BitSimNOW samarkand TYRENS Epiroc FIRST QUANTUM MINERALS LTD Nordic Iron Ore EURO BATTERY MINERALS

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University of Economic Geology University of Witwatersrand DMG

www.hzdr.de/ee_shortcourse

**19th FREIBERG SHORT COURSE
IN ECONOMIC GEOLOGY**

December 9-13, 2024

**Professor Judith Kinnaird
Professor Paul Nex**

University of Witwatersrand

**Critical Raw Materials:
A Global Perspective**

HEINOLTZ INSTITUTE FREIBERG
HiF

Prof. Dr. Jens Gutzmer | Dr. Richard Gloaguen | Dr. Sandra Birtel | Manuela Wagner
Helmholtz Institute Freiberg for Resource Technology | Charnitzler Straße 40 | D-09596 Freiberg/Germany | contact@hiif.hzdr.de

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1/4 page = 125 EUR; 1/8 page = 70 EUR

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9th SGA-IUGS-SEG-UNESCO SHORT COURSE ON AFRICAN METALLOGENY

How can West Africa best use its mineral wealth for economic development?

The 9th Short course of African metallogeny will use titanium, zirconium, phosphate, and bauxite as examples, to explore challenges and opportunities to add value in-country to mined materials.

West Africa plays a key role as an important supplier of these materials. Can West Africa mine, concentrate, and produce intermediate metal compounds? This could enable the economic transition envisaged by the African Mining Vision 2050 and the Agenda 2063 of the African Union.

The target audiences are engineers and geologists in exploration and mining companies, but also those from the processing sector and geological surveys, PhD and Masters' students, researchers, and university lecturers."

The goal of these short courses is to develop personal skills and competencies in exploration and mining.

25th – 29th November 2024
Dakar, Senegal
 organized by
Society for Geology Applied to Mineral Deposits
National Geological Survey of Senegal
UNESCO, IUGS, RFG, SEG



The meeting will discuss the mineral wealth of West Africa and its optimal use for economic development, in the current context of the global energy transition and decarbonization of the mining and metallurgical industries.

TOPICS

- ❖ The role of technology metals in the energy transition in West Africa.
- ❖ Environmental impact, managing environmental degradation, sustainable mining.
- ❖ Titanium-zircon oxide deposits: opportunities and risks for West Africa
- ❖ Bauxite a critical raw material: opportunities and risks for West Africa
- ❖ Phosphate deposits: opportunities and risks for West Africa.



The short course will comprise 2,5 days of lectures, workshops (personal skill development) and evening events, as well as 2,5 days of practical training and excursion to the Titanium sand deposits mined by Eramet, and to nearby mine sites.

Fieldtrips

- 2 days (Thursday 28th and Friday 29th November) Field excursion and mine visit at Eramet mine and to nearby mine sites.

Organizing Committee

- **Rokhaya Samba** (Director of National Geological Survey of Senegal)
- **Mahamadane DIENE**, Director of ENSMG
- **Malick Faye** (SGA president Young Scientist chapter /AJGES Senegal,)
- **Doro Niang** (President of AJGES, Vice President of SGA Senegal)
- **Raymond SAGNA** (Director of Exploration and Applied Geology, SGNS, Senegal)
- **Alla Diaw** (Director of Laboratories, SGNS Senegal)
- **Fatoumata Dramé** (Director of Documentation and Information, SGNS, Senegal)
- **Ibrahima Maal**, (Chef de département Géosciences UAM)
- **Cheikh Ibrahima Youm** (Enseignant-Chercheur, UCAD)
- **Beate Orberger** (SGA resp. for African Metallogeny Short Courses, Université Paris Saclay, Catura Geoprojects, France)
- **Ismahene Chaouche** (SGA, African Metallogeny short course co-coordinator, UTHB, Algeria)
- **Edmund Nickless** (IUGS chair Resourcing Future Generations Initiative, UK)
- **Riad Ben El Khaznadji**((FSTGAT/USTHB). ALGERIA)
- **Mouloud Issaad**((FSTGAT/USTHB). ALGERIA)
- **Filadelphia Mbingeenko** (Vice President SGA Subsaharian Africa Windoek, Namibia)
- **Mary Immaculate Neh Fru** (SGA, African Short Course workshop activity-coordinator, CRGM, Garoua Cameroon)

Course structure and social events

- Registration, icebreaker: Sunday 24th November at Cheikh Anta Diop University
- Lectures: Monday 25th – Tuesday 26th October (2,5 days)
- Course dinner: Monday 25th November in Gorée Island
- Workshop (personal skill development): Wednesday 27th November

Indicative FEES (€)

(exact fees will be depend on sponsorship)

Lectures:	
Students	250€
Academia / government / parastatal	500€
Industry	1000€
Online participation	100€
Field trips	
Students	200€
Academia / government / parastatal	400€
Industry	600€

Preregistration link



https://docs.google.com/forms/d/e/1FAIpQLSc-4ALF9Sk4e_tKYKg1avwSHJOG1uatCNRB3Rg3TDnFOXaOkQ/viewform?usp=pp_url

<p>General information : Beate Orberger beate.orberger@catura.eu</p>	<p>Register for the UNESCO scholarship Ishmahen Chaouche chasanc@gmail.com Beate Oberger beate.orberger@catura.eu</p>	<p>Registration enquiries: Rokhaya Samba DIENE rokhaya.samba@sgns.gouv.sn</p>
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SGA COUNCIL 2024

Executive Committee (2024-2025)

President:	Stanislaw Mikulski (Poland)
Vice-President:	Patrick Mercier-Langevin (Canada)
Vice-President for Student Affairs:	Anna Vymazalová (Czech Republic)
Executive Secretary:	Jan Pašava (Czech Republic)
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Promotion Manager:	Sophie Decree (Belgium)

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 Karen Kelley (USA) – MD North American Office
 David Banks (UK) - SGA News
 John Slack (USA) – Special Publications
 Iain Pitcairn (Sweden) – SGA website

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Australia/Oceania:	Cam McCuaig (Australia)
Europe:	David Holwell (UK)
North Africa and Middle East:	Rabah Laouar (Algeria)
North America:	Melissa Anderson (Canada)
Sub-Saharan Africa:	Filadelphia Mbingeneeko (Namibia)
South America:	Luis Fernando Páez Sinuco (Colombia)

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 Georges Beaudoin (Canada)
 Gülcan Bozkaya (Turkey)
 Tony Christie (New Zealand)
 Arifudin Idrus (Indonesia)
 Sven Petersen (Germany)
 Xiaoming Sun (China)
 Ghislain Tourigny (Canada)
 Denis Schlatter (Switzerland)

Ex-officio members, SEG:

President: Stephen J. Piercey (Canada)
 Executive Director: Jennifer D. Craig (USA)

Councillors through December 31, 2027

Elena Amplieva (Russia)
 Carmen Conde (Spain)
 Paolo Garofalo (Italy)
 Nils Jansson (Sweden)
 Crystal Laflamme (Canada)
 Nicolas Saintilan (Switzerland)

Ex-officio members, IAGOD:

President: Tania Martins (Canada)
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 Alla Dolgopolova (UK)

Guide to authors for the SGA News

David Banks; Chief editor SGA News

School of Earth and Environment, University of Leeds, Leeds, UNITED KINGDOM; editor-sga-news@e-sga.com

There are three types of submission: (1) regular article; (2) reports of SGA student chapters; and (3) reports related to SGA. Regular articles should present scientific studies of the geology, mineralogy and geochemistry of mineral deposits or other topics related to mineral deposits. Reports of SGA student chapters should represent detailed description of activities. They must be reviewed by the scientific supervisor of the respective chapter prior to submission. Make sure that the field reports include the exact location (coordinates if available) of each station described. There is no restriction to the length of a contribution, but it should be concise and informative. All figures should be informative and of good quality. The language of SGA News is British English and all contributions need to be formatted as such. When submitting a text, do not include figures or tables and their captions. Present the latter at the end of the Word file and submit the figures separately, instead.

Text formatting

Manuscripts need to be submitted in Word. Use a normal, plain font (10-point Times) for text. Format the text as little as possible. For emphasis, use the format tools of Word (e.g., italics or capitals). Do not use the shift button for capitalizing a whole word. Do not use field functions, tab stops or other commands for indents, or the space bar. Do not insert extra lines between paragraphs; use the Word formatting tools instead. Use the table function, not spreadsheets, to make tables. Abbreviations should be defined at first mention and used consistently thereafter. Please always use internationally accepted signs and symbols for units (SI units).

References

SGA News uses the style that is also used in *Mineralium Deposita*. Check https://www.springer.com/earth+sciences+and+geography/geology/journal/126?detailsPage=plcti_1060362 for further information.

Figures and Tables

All figures and tables are to be numbered using Arabic numerals. They should always be cited in text in consecutive numerical order. The format in the text is "(Figure 1; Table 1)". For table and figure captions use "Fig. 1: xxxxx." and "Tab. 1: xxxxx."

Figures need to be submitted as separate files in jpg-format at a resolution of 300 dpi. They need to be formatted to fit the column format of SGA News: (1) 4 cm wide or (2) 8.3 cm wide for the 3-column part and 6.1 cm wide for the 2-column part. Make sure that the figures are of good quality.

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APPLICATIONS to SGA for meeting sponsorship must be submitted to Jan Pašava, SGA Executive Secretary. Please contact Jan Pašava for forms and further information.

Ideas and Suggestions for SGA-sponsored activities are welcome and should be addressed to Jan Pašava or any other member of the Council (see e-sga.org for list of members).

Dr. Jan Pašava, SGA Executive Secretary
Czech Geological Survey, Klárov 131/3
CZ-118 00 Prague 1
Czech Republic

News of the Society

Jan Pašava (SGA Executive Secretary)

Czech Geological Survey, Geologická 6, 152 00 Praha 5, Czech Republic, jan.pasava@geology.cz

The Hybrid-Council Meeting was organized on May 7, 2024 from 9,00 to 17,00 CET at the University Complutense (Medicine building, Dr. Severo Ochoa 7) in Madrid, Spain by Carmen Conde (SGA Council member). Sixteen Council members were present in person and four were on-line. The rest of the Council members sent their apologies.

Stanislaw Mikulski (SGA President) and Jan Pašava (SGA ES) welcomed new SGA Council members and thanked all outgoing Council members for their hard work. He also thanked Carmen Conde from the University Complutense for hosting the meeting and providing hospitality. Hartwig Frimmel (SGA Treasurer) introduced a new SGA Treasurer Assistant Lisa Wasitschek, who took over this position with effect from April 1, 2024. Council welcomed Lisa on board, wishing her all success and greatly appreciated past responsible and very effective work by Christine Linge who had been in this position for 9 years. Then Council approved suggested agenda.

Roll call and Apologies:

Present: D. Banks, G. Beaudoin (for the morning part of the meeting), G. Bozkaya, C. Conde, S. Decree, H. Frimmel, Shao Yong Jiang, K.D. Kelley, B. Lehmann, P. Mercier-Langevin, S. Mikulski, N. Jansson, J. Pašava, I. Pitcairn, J. Slack, and A. Vymazalová.

On-line: P. Garofalo, T. Christie, C. Laflamme, Luis Fernando Páez Sinuco,

Guests - present: L. Wasitschek (Assistant, SGA Treasurer) – for the part of the meeting

Guests – on-line: J. Craig (SEG Executive Director) and A. Wolz (SEG Fundraising, Sponsorship, and Development Coordinator) for item 11-3, S. Hagemann (CET Director at the University of Western Australia), S. Troy (President IAEG) and C. Andrew - for item 8;

Apologies for absence: T. Aiglsperger, Cam McCuaig, D. Holwell, A. Idrus, R. Laouar, F. Mbingeneeko, B. Orberger, S. Petersen, N. Saintilan, D. Schlatter, and X. Sun.

1. Minutes of previous Council meeting (August 28, 2023 Zurich, Switzerland)

After checking the actions by the SGA Executive Secretary (with some of the items pending), the Minutes were unanimously approved.

2. Reports of officers on Council:

2.1. Report from President

2.2. Report from Executive Secretary

2.3. Report from Treasurer

2.4. Report from Promotion Manager

2.5. Report from Chief Editor, SGA News

2.6. Report from Chief Editors, MD

2.7. Report from Chief Editor SGA Special Publications

2.8. Report from the Chief Editor SGA website

2.9. Report from the Chairman of the SGA Educational Fund

2.10. to 2.16 - Reports from Regional VPs: Asia - missing, Australia/Oceania - missing, Europe - missing, North Africa and Middle East - missing, Sub-Saharan Africa - missing, North America - missing, South America - presented by J. Pašava on behalf of Luis Páez Sinuco

Council expects to receive full missing reports at the next Council meeting.

After discussion, Council approved the presented reports with great thanks and suggested the following motions:

Karen Kelley to check with Clarivate Analytics on the status of evaluation of the SGA Books of Proceedings from the Rotorura (2022) and Zurich (2023) meetings.

Anna Vymazalová to advise all SGA Chapters to offer links to keynote speaker presentations during online meetings organized by a given Chapter to other Chapters.

All Council members to consider nominations of SGA Honorary members for spring 2025 Council meeting and summer SGA General Assembly vote.

Sophie Decree (with help of Council members) to adapt all roll-ups used in Zurich (Anna Vymazalová to update info on student support from SGA EF including the

data from Zurich-2023) and inform all RVP's on this so that new versions could be used for SGA booth/promotion in different regions. We need to have complete sets of updated posters/roll-ups and other promotional items at every RVP's office.

Sophie Decree to prepare a draft proposal for the promotion of the 60th SGA Anniversary in 2025 (logo, promotional items etc).

David Banks to work jointly with SGA Council on the preparation of the SGA News no. 55 (deadline for contributions August 31, 2024). Calendar of events related to economic geology with marked those, sponsored or co-sponsored by SGA will become a part of the Newsletter.

Nic Saintilan to submit the Final Report for the SGA Biennial Meeting in Zurich 2023 to the next Council Meeting.

Bernd Lehmann and Karen Kelley in collaboration with Springer to adapt submission system to MD so that it would discourage submission of articles exceeding 20 printed pages.

John Slack to check Publishing Agreement on Book Series with Springer for Society benefits.

Iain Pitcairn to adapt SGA website so that the members who log in can go directly where they want to go without directing them to "Edit Account" site.

Iain Pitcairn to explore possibilities of improving the outlook of the SGA website but without changing its fundamental structure and also to ask Blueways for a quotation to create a file repository for Council agenda and supporting documents to be accessible by council members.

SGA Council approved that reasonable travel and accommodation costs (subject of the SGA Executive Committee approval) are offered for recipients of the SGA-Newmont Gold (or SGA Gold) Medal, SGA Young Scientist Award and SGA-KGHH Silver Krol Medal. Iain Pitcairn to add this info to texts describing these SGA Awards on website.

Iain Pitcairn to advertise Council decision on creating a new category of SGA mem-

bers who could be exempt from further SGA membership fees provided they have reached a minimum age of 70 years and have been fully paid-up members of SGA for at least 30 years – pending motion.

SGA Council decided that applications for SGA student membership can be accepted as long as an applicant can provide valid document of student status/enrollment without a time limit.

Stanislaw Mikulski to transfer SGA EF Agenda to P. Mercier-Langevin and to send excel file with a list of companies to all Council members for adding personal contacts. It is important that the fund-raising process is well coordinated with efforts by LOC of the 18th SGA Biennial Meeting. Council highly appreciated all donations from SGA members in 2023.

Luis Paez to collaborate with Eugenio Ferrari to secure SGA promotion at the upcoming proEXPLO 2025.

3. The 17th SGA Biennial Meeting – Final Report

The Report will be presented to the next Council meeting.

4. The 18th SGA Biennial Meeting – update

The report was presented by K. Kelly. The 18th SGA Biennial Meeting will be held on the Colorado School of Mines (CSM) campus in Golden, Colorado, USA, from August 3-7, 2025.

The LOC is working on the scientific program, and the lists of short courses and fieldtrips. Several of the session themes are integrated with either short courses or fieldtrips, which should ensure strong participation. Four parallel sessions are planned, including one large room for opening and closing ceremonies, and the General Assembly with a seating capacity of 1400 (this will also be used throughout the conference for sessions that are expecting large numbers of people), and 2 rooms with seating capacity of 120 and 170. The fourth session will be held in an adjacent building that has seating capacity of 150. Exhibits will be downstairs in Friedhoff Hall in the Green Center.

Depending on how many posters we receive, some will be downstairs with the exhibitors, and some will be in the main reception hall upstairs. The idea is that all posters will remain up for the duration of the entire Conference (but authors will be

asked to attend them at certain times).

In the main reception area upstairs, we would like to offer tables for student chapters (free), so they can showcase their activities and have close networking with other student chapters as well as delegates during the conference.

Lunches will be offered as part of the registration fee.

The Opening Ceremony is Monday morning, August 4, 2025. Poster sessions will be viewed during coffee breaks and lunch (11:30 am to 1:00 pm) every day, and in the afternoon of the 4, 5, and 6th of August, from 4 to 6 pm.

The Student-Industry Event will be Monday evening, August 4 at the Buffalo Rose event center in downtown Golden.

The SGA General Assembly is planned for Tuesday morning, August 5, 2025. The Gala Dinner will be held on Tuesday evening, August 5, 2025 at the Mount Vernon Canyon Club. The Closing Ceremony will take place in the afternoon of Thursday, August 7, 2025 after the conclusion of the morning scientific sessions.

Council highly appreciated all efforts by the LOC and approved presented report with great thanks.

Action:

All Council members to promote the 18th SGA Biennial Meeting.

Karen Kelley to work with Patrick Mercier-Langevin, Stanislaw Mikulski, Cam McCuaig to avoid duplicities in SGA fund raising for the 18th SGA Biennial Meeting and SGA EF.

Karen Kelley to plan SGA Awards Ceremony for the Opening Ceremony and presentation of the best student oral and poster presentations for the Closing Ceremony.

5. Results of SGA 2023 Ballot

The report was covered in the Report of Chief Editor, SGA website.

6. SGA Awards – update

The Report was presented by I. Pitcairn. The SGA Awards evaluation procedure was updated slightly to make it clearer. The description of the process is now on the website – see <https://e-sga.org/awards/>

Council members are now expected to complete the evaluation form, which will be forwarded with the set of candidates when the time comes for the next round

of awards.

It has been suggested to the awards committee that it be possible that nominations for some awards that are unsuccessful can be re-used in the next round of awards. The rationale is that it takes a lot of effort to get letters of support in particular, and that these could easily be re-used if an unsuccessful candidate is to be re-nominated for the following round of awards.

Council approved to allow unsuccessful nominations for the SGA-Newmont Gold Medal and the SGA-KGHM Silver Kroi Medal to be re-submitted to the following round of awards with the same letters of support but that a new updated nomination form be filled out by the person nominating.

In the case of the SGA Young Scientist Award, the letters of support need to be updated but should still perhaps be allowed to be re-used.

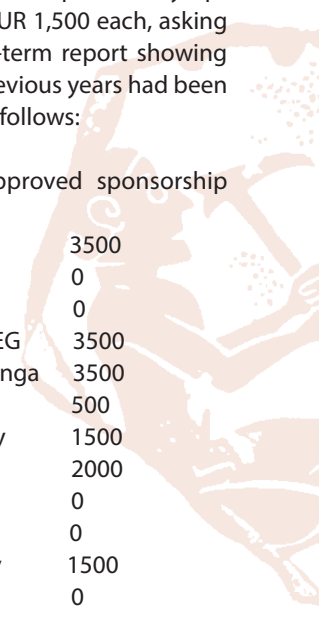
Action:

I. Pitcairn to adapt description of SGA Awards evaluation procedure on website as approved by Council.

7. Status of development of SGA Student and Young Scientist network.

The report was presented by Anna Vymazalová. In 2024 we have 21 SGA Chapters. The following Table shows the list of Chapters with approved budgets for 2024. It was suggested to approve the budgets as follows. For Erlangen and Nancy Chapters it was suggested to preliminary approve the support EUR 1,500 each, asking from them the mid-term report showing how money from previous years had been spent. Others are as follows:

Chapter name in 2024 (EUR)	Approved sponsorship
Baltic	3500
Barcelona/SEG	0
Black Forest-Alpine	0
Colombia-Bogota/SEG	3500
Colombia-Bucaramanga	3500
Cordoba	500
Erlangen preliminary	1500
Kazakhstan	2000
Laval/SEG	0
Moscow	0
Nancy preliminary	1500
NW-Russia	0



Peru	2000
Prague	4000
Senegal	1500
Siberia	0
Turkey	0
UK	0
UWA - Australia/SEG	500
South Africa	
Morocco	2000

approved in fall 2023

After discussion, Council approved presented report and suggested budgets for the SGA Chapters with great thanks.

Action:

Anna Vymazalová to inform representative of all SGA Chapters about approved budgets for 2024.

8. Evaluation of bids for the 19th SGA Biennial Meeting (2027)

By the deadline, SGA received two high-quality bids – one from Australia (CET-UWA, Perth) and the second one from Ireland (IAEG, Dublin). After communication with both proponents who provided their replies to SGA Council member's questions they also had a chance to introduce their bids via on-line communication during the Council meeting. After a long discussion and evaluation of both bids Council decided by a majority vote that the SGA 2027 Meeting will be held in Perth, Australia. However, Council encouraged the Irish group to consider resubmitting their strong bid for SGA 2029.

Actions:

Jan Pašava to inform Steffen Hagemann about Council approval of the bid for the 18th SGA Biennial Meeting (September 2027, Perth, Australia).

Jan Pašava to inform Séan Troy on Council decision and encourage the Irish group to resubmit their bid for the SGA 2029 Meeting after publishing Call for proposals for the SGA 2029 Meeting.

9. Membership drive report

The Report was presented by S. Decree. Since April 2023, SGA accepted a total of 227 new student members, mostly due to the promotion made by the Chapters in Colombia, Czech R., France, Germany, Morocco, Peru, Russia, Spain and Sweden. Compared to the last period (2022-2023), we also see a slight increase of the regular

members (38 members in this report vs. 21 members in the last report). A slight decrease of the membership balance can be seen, compared to April 2023. This one is related to the decrease of student members. Number of regular print and electronic members is overall similar.

Action:

All Council members and Chapters to work jointly with the aim to promote SGA membership benefits.

10. Requests for sponsorship

Requests for sponsorship discussed at the Madrid Council Meeting:

Plate Tectonics, Sedimentation and Metallogeny through Time (November 26-28, 2024 Dharwar, India) – request for sponsorship of two SGA keynote presentation Shao-Yong Jiang and H. Frimmel (total of EUR 2,000)- to be decided by Council

Action:

Council approved a total budget of EUR 2,000 in support of two SGA keynote speakers. Jan Pašava to inform Prof. V.S.Hegde (convener)

proEXPLO2025 – The second International SEG-SGA-IIMP Presentation Contest pro-EXPLO 2025 – Luis Paez, L. Torro, E. Ferrari proposed awards:

Award for the best oral presentation – undergraduate.

Award for the best oral presentation – post-graduate (master's and doctorate).

Award for the best poster presentation.

Awards will include:

Subscription (membership) to the Society of Economic Geologists (SEG; <https://www.segweb.org>) and the Society for Geology Applied to Mineral Deposits (SGA; <https://e-sga.org>) for the current year (2025). Should the winner already be a member of the SEG and/or SGA during 2025, the corresponding membership costs would be covered for 2026.

Free download of digital publication edited by the SEG (<https://www.segweb.org/store>).

Free registration to the SGA congress (<https://sga2025.org>) in 2025.

Course/seminar organized by IIMP in 2025 to be chosen by the winner.

Acknowledgment of winners in the magazine SEG Discovery.

Additional support to travel expenses for the to 3 winners (EUR 500, 250 and 150)

Action:

SGA Council approved a total of EUR 1,050 for all suggested awards and asked for acknowledgement of winners in the SGA Newsletter (text and photos to be sent to the Chief Editor, SGA News, Dr. D. Banks at d.a.banks@leeds.ac.uk). J. Pašava to inform L. Paez on the Council decision.

Requests for sponsorship approved by SGA Council per rollam

SGA promotion at CAG23 (September 2023, Windhoek, Namibia) – F. Mbingeneeko - EUR 660 (250 space + 410 booth)
SGA Student Chapter - Peru (November 9-12, 2023) – support to the meeting and field trip - EUR 1,500

SGA Keynote speakers program – Prague Chapter/November 2023/H. Frimmel –EUR 358

SGA Moroccan Student Chapter – approved support of EUR 2,000 for 2024 activities

SGA Keynote speakers program – Baltic Chapter/December 2023-Cracow/D. Holwell-short course/ EUR 310

SGA Keynote speakers program – MDSG Meeting/January 2024/D. Holwell keynote + GBP 300 bismuth sponsorship

SGA Keynote speakers program – N. Jansson/ The 36th Nordic Geological winter meeting/ January 2024/ - EUR 3,510 covering keynote speaker P. Ledru + additional support for SGA promotion and keynote presentation by Pasi Eilu

GAC-MAC (Brandon, MB, Canada, May 2024) - silver-level sponsorship plus a booth (total of a. 1,200 Euro), approved M. Anderson, P. Mercier-Langevin et al.

SGA Keynote speakers program - SGA Baltic Chapter Meeting (May 6-9 Lulea, Sweden) – EUR 981 approved to support José María González-Jiménez (Univ. of Granada)

Ni-Cu symposium (August 6-8, 2024 Thunder Bay, Canada) – M. Anderson et al. – EUR 1,000 approved to sponsor SGA student members and to have a table for SGA2025 promotion.

11. Any other business

Adapted proposal for the SGA Mobility Grant which should offer a limited support for analytical works for students – update

The report was presented by J. Pašava on behalf of T. Aiglsperger. Following the Council's decision, the SGA Mobility Grant has been upgraded by the possibility to also request funding for analytical costs. The new application template with now two funding options (i.e. for travel and for analyses; each max. 1000 €) has been published on the SGA homepage together with an updated explanation text (see <https://e-sga.org/home>). In addition, a table showing all laboratories participating in this program (currently 11 laboratories from 7 countries with a total of 47 laboratory facilities) is now visible via a link on the homepage.

Thanks to the great success of the 17th SGA Biennial Meeting in Zürich, that has produced a significant surplus, ETH's share of this surplus has been donated to the SGA-EF in order to support SGA students also with covering costs of analyses to be conducted in the context of the SGA Mobility Grant.

Action:

T. Aiglsperger to work together with Nicolas Saintilan, Iain Pitcairn and possibly other Council members on ideas how to use an increased budget for attracting more applicants for the grant.

All Council members to advertise the SGA Mobility Grant in their home institutions.

The 9th SGA-UNESCO-IUGS-SEG Short Course on African Metallogeny – update

The Course on African Metallogeny will be held in Dakar, Senegal between the 25th and 29th November 2024. The short course is organised by the SGA (B. Orberger and her team); the SGNS (the National Geological Survey of Senegal); UNESCO; IUGS; RFG and SEG. Beate provided the flyer for more details including a link for the registration – see <https://e-sga.org/home/> for more details. Council greatly appreciated effort by Beate Orberger and her team.

SGA-SEG collaboration

P. Mercier-Langevin informed SGA Council on his participation in the SEG Council Meeting (March 2, 2024, Toronto, Canada). Jennifer Craig (SEG Executive Director) then appreciated collaboration between SGA and SEG and informed Council on planned

SEG Meetings which should be organized always in September (2025 – Brisbane, 2026 – ?, 2027 – Brazil, 2028 – Whistler). SGA Council appreciated SEG invitation to the SEG 2024 (Namibia) Meeting and approved the Affiliate agreement. After a discussion on how to improve our collaboration and to justify similar treatment of both Societies at each Society meetings, it was decided to prepare a new MoU concerning collaboration in mutual conferences/meetings.

Actions:

J. Pašava to send signed SEG Conference Affiliate Agreement to J. Craig.

P. Mercier-Langevin to prepare a draft of MoU which will be distributed by J. Pašava to SGA EC and after feedback sent to SEG for review.

Nomination for IUGS Awards – update (D. Banks)

No nominations were received by D. Banks.

12. Date and place of the next SGA Council meeting (Bologna, Italy, October 21-23, 2024, precise venue and timing to be announced in due time).

13. Informative list of past activities
17th SGA Biennial Meeting (August 28-September 1, 2023 Zurich, Switzerland) – N. Saintilan, C Chelle-Michou et al.
IAEG 50 Meeting (September 8-10, 2023 Galway Bay Hotel, Galway County, Ireland) – D. Banks et al. - SGA keynote presentation by S. Decree

The 8th SGA-UNESCO-IUGS-SEG Short Course on African Metallogeny (October 9-13, 2023 Johannesburg, CIMERA South Africa) – B. Orberger/F. Mbingeneeko et al.

The Report was presented by Jan Pašava on behalf of Beate Orberger. Council greatly appreciated efforts by Beate Orberger and her team and emphasized the importance of this very successful geo-educational event, which was organized under financial sponsorship of UNESCO and IUGS and in collaboration with other societies.

Action:

Beate Orberger to work jointly with her team, SGA Council and LOC on the preparation of successful 9th SGA-UNESCO-

IUGS-SEG Short Course on African Metallogeny and to submit updated budget on the planned 2024 course to SGA Treasurer when available.

SGA Keynote speakers program – Prague Chapter Meeting/November 2023/H. Frimmel – EUR

SGA Student Chapter Meeting - Peru (November 9-12, 2023) – support to the meeting and field trip - EUR 1,500

SGA Keynote speakers program – SGA Baltic Chapter Meeting (December 2023-Cracow) –D. Holwell-short course/ EUR 310

The annual Mineral Deposits Study Group (MDSG) AGM (January 3-5, 2024, Edinburgh, Scotland), jointly hosted by the University of Edinburgh and the British Geological Survey- bismuth sponsorship approved (GBP 300) + SGA keynote (D. Holwell)

The 36th Nordic Geological winter meeting, January 10-12, 2024, Goteborg, Sweden – N. Jansson et al. – P. Ledru - keynote, P. Eilu – keynote and SGA promotion – EUR 3 510

SGA Keynote speakers program - SGA Baltic Chapter Meeting (May 6-9, 2024 Lulea, Sweden) – EUR 981 approved to support José María González-Jiménez (Univ. of Granada)

GAC-MAC (May 19-24, 2024, Brandon, MB, Canada,) - silver-level sponsorship plus a booth (total of a. 1200 Euro), approved – M. Anderson, P. Mercier-Langevin et al.

14. Informative list of future activities

Ni-Cu symposium (August 6-8, 2024 Thunder Bay, Canada) – M. Anderson et al. – a. EUR 1000 approved to sponsor SGA student members and to have a table for SGA2025 promotion.

European Mineralogical Conference 2024, (18–23 August 2024 Dublin, Ireland) A. Vymazalová et al. – up to 2 000 EUR approved for 4 student grants

SEG 2024 Conference: Sustainable Mineral Exploration and Development (September 27-30, 2024, Windhoek, Namibia) SGA sponsorship

The 9th SGA-UNESCO-IUGS-SEG Short Course on African Metallogeny (November 26-29 2024 Dakar, Senegal (B. Orberger et al.)

The International Seminar on Plate Tectonics, Sedimentation and Metallogeny Through Time, (November 26-28, 2004 Dharwad India). Organised by the Geological Society of India and the Geology Wind of Civil Engineering Dept., SDM College of Engineering and Tecnology in Dharwad. SGA sponsored - approved 2000 Euros for travel support of two SGA invited speakers (S.-Y. Jiand, H.E. Frimmel)

The International Congress of Prospectors and Explorers – proEXPLO 2025 (May 5-7, 2025 Lima, Peru) – E. Ferrari and Luis Paez de Sinuco – SGA sponsorship of student awards (EUR 1,050)

18th SGA Biennial Meeting (August 3-7, 2025, Golden, Colorado, USA) – K. Kelley et al.

19th SGA Biennial Meeting (preliminary - late August/early September 2027, Perth, Australia). S. Hageman et.al.

IAGOD Quadrennial Meeting (August 30 - September 2, 2006, Porto. Portugal).



Participants of the SGA Hybrid Council Meeting (May 7, 2024) in front of the Medical building of the Complutense University in Madrid, Spain.

From left to right: Shao Yong Jiang (SGA RVP - Asia), J. Slack (Chief Editor, SGA Special Publications), N. Jansson (SGA Council member), G. Bozkaya (SGA Council member), A. Vymazalová (SGA VP for Student Affairs), K.D. Kelley (Chief Editor, Mineralium Deposita, North American Office), D. Banks (Chief Editor, SGA News), F. Tornos (the former SGA President, recipient of the SGA-KGHM 2023 Silver Krol Medal), S. Decree (SGA Promotion Manager), I. Pitcairn (Chief Editor, SGA website), S. Mikulski (SGA President), J. Pašava (SGA Executive Secretary), H. Frimmel (SGA Treasurer).

Change of the SGA Treasurer's Assistant

Hartwig Frimmel, SGA Treasurer

Dept. of Geodynamics and Geomaterials Research, Institute of Geography and Geology, University of Würzburg

It might be worth reminding our members that SGA is an international non-profit organization run entirely by volunteers. It has never been the aim of SGA to earn money. Whatever financial surpluses result from whatever SGA activity are there to benefit the membership at large. This has always been a trademark of SGA and reflects a commitment by SGA councilors and others to serve the wider geo-community and not personal interests. Nobody on the SGA Council receives any money for serving our members in whatever way. The only exception is the Treasurer's Assistant, who helps in the Treasurer's office with everything that revolves around registration of new members, renewal of memberships, general maintenance of the membership data base, all financial transactions and bookkeeping. For the past nine years, this job was done on a part-time basis by Christine Linge, who, in her normal life, works as secretary at the Department of Geodynamics and Geomaterials Research at the University of Würzburg. Many SGA members, from the Executive Council to student members, had exchanges with Christine, mainly by email. Initially, this had caused Christine lots of headaches because she didn't speak much English, and she took it upon herself to acquaint herself with this foreign language to be able to communicate with the large SGA family that is distributed all over the world; for example to explain frustrated want-to-be members, why their credit card doesn't work, to help students getting funds granted to them for conference attendance or workshop participation to the right bank account, to check budgets submitted for various SGA activities, or to inspect whether people who want to benefit from SGA are actually paid-up SGA members, to mention just a few. Amongst the Council members, she interacted mainly with Jan Pašava as executive secretary, Anna Vymazalova in connection with paying out money to student chapters and individual student support, Iain Pitcairn as website manager and, of course, myself as treasurer.



The outgoing Treasurer's Assistant, Christine Linge (left), the Treasurer, Hartwig Frimmel (centre), and the new Treasurer's Assistant Lisa Wasitschek (right) in front of a young olive tree for Christine, in the Mineralogical Museum of the University of Würzburg.

Christine stepped down at the end of April 2024 for family reasons, inter alia wanting to spend more time with her recently born grandchildren

The SGA Council expressed its gratitude to her at the last council meeting in Madrid in May 2024, which she could not attend personally. Immediately after her return from a well-deserved vacation, exploring the Nile valley, I had the pleasure of handing over a Certificate of Appreciation and a small gift to Christine in the name of SGA on 27 May 2024. Christine did a tremendous job for SGA, and I am sure that everyone who worked with her can attest to this.

For the day-to-day business and thus the functionality of a society such as SGA, a staff member such as Christine is critical. Her resignation from the position

could have been a real shock, but thankfully she informed us well in advance, enabling us to find a successor, from the same department. Since 1 April 2024, the new Treasurer's Assistant is Lisa Wasitschek, currently a junior lecturer and PhD candidate in our department. Being of the next generation, she has great plans of helping to move the SGA Treasurer's activities from the analogue to the digital world. The close spatial proximity to Christine, and also to me as treasurer, facilitated a smooth transition, probably unnoticed by most of our members. Lisa was introduced to the SGA Council at its May meeting in Madrid. We wish her success in her activities, and I look forward to working with her.

SGA Student Chapter Activities

SGA Russian North-West Student Chapter–Field trip to Southern Urals

Anna Titova, Alina Saratova, Anna Pazukhina, Nadezhda Vasilyeva, Lidia Sokolova, Nikolay Fursov
Institute of Earth Sciences, Saint-Petersburg State University, 199034 Saint-Petersburg, Russia

From the 19th to the 24th of September 2023, active members of the Russian North-West Chapter of The Society for Geology Applied to Mineral Deposits (SGA) organized a geological excursion in the Southern Urals.

The first stop on our trip was the Magnesite Mining and Processing Plant in Satka. This is one of the largest operational magnesite mines in the world. We started our visit by visiting the corporate museum of Magnesite, where we learned about the stages of production and the models of sections of the plant. We also saw samples of rocks and manufactured refractory materials. After that, we went to the observation platform at the active Karagay quarry, and then to the worked-out quarry at Berezovskoye. The rocks we saw included Upper Proterozoic limestones and dolomites, as well as concordant magnesite deposits interspersed with dolerite dikes. Finally, we visited the mill. There, we got to see the operation of a multi-pod furnace and a robotic complex that monitors the quality of the finished product.

The second point of our excursion was to the Maly Kuibas iron ore mine in Magnitogorsk, which is being exploited by open pit mining. The type of ore is skarn-magnetite and this mine is particularly popular with mineralogists as it provides a great opportunity to collect beautiful samples of calcite, garnet and other minerals. At the quarry, we observed the operation of a drilling rig, and also visited the nearby Magnitogorsk Iron and Steel Plant to see the processing of the iron ore raw material.

On the third stop of our geological excursion, we descended into the Uzelga mine at the copper and tin deposit. At a depth of 640 meters in the mine, we were able to get a closer look at the geological structure of mineralization and mining technology. Uzelga is classified as a type of copper ore deposit that



Students observe the mineralogical collection of the Magnezit Museum



Members of the field trip on the viewing platform in the Karagay quarry



Uzelga mine, 640 horizon

formed during the development of Ordovician-Carboniferous island arcs. The ore consists mainly of chalcopyrite, sphalerite, and pyrite, and the host rocks are of magmatic origin with a predominantly mafic and felsic composition. Afterward, we visited the town of Karabakh and the Zolotaya Gora copper-gold mine. The mine, located in the upper region of the Karabakh Mountains, is a massive hyperbasite of the alpine type. This deposit is part of a band of rock formations shaped like dikes and is rich in intermetallic gold and copper minerals. The town is famous for its copper smelting factory, which over the past century has caused significant pollution. As a result, the area has been classified as an ecological disaster, there are no trees on the mountains surrounding the mine and streams are red and purple.

The final day was spent at the Ilmensky Mineralogy Reserve in Miass. This is one of only a few such reserves in the world, and over 300 distinct minerals have been identified within its boundaries. A variety of new rock types, including firsite and miaskite, as well as new minerals such as monazite and ilmenite have also been discovered. We visited Mines No. 13, 14 and 15 as well as mine No. 50, also known as Blumovskaya. Mine No 13 was notable for its extensive hornblende exposures, which formed aggregates up to 0.5 metres long and were accompanied by mica, apatite and idiomorphic zircon. At Mine No.14 we observed graphite-bearing gneiss and pegmatites with radial graphite spherulites. Mine No.50 also yielded fine samples of amazonite, garnet, biotite, topaz and aquamarine. These were all discovered during our field visit. Rare earth minerals, such as samarskite and zircon, were also documented by researchers. In 1913, a samarskite from mine No.50 was sent to Marie Curie's laboratory for further study.

After our excursion, we visited the Ilmensky State Natural Science Reserve Museum. The museum houses a systematic collection of rare minerals, as well as an impressive geological map of the region surrounding the Ilmen Mountains, made using materials from the Urals.

The geological excursion became possible thanks to the efforts of the activists



(top left)
Skarns of the Maly Kuibas deposit

(top right)
Sample of chalcopyrite ore with calcite vein from Uzelga mine

(left)
Contact of gold-bearing rodingite dyke and host serpentinites at the Zolotaya Gora deposit



Topaz found during the trip to the Blumovskaya mine

of the SGA North-West Chapter and its scientific supervisor, Associate Professor of the Department of Geochemistry Olga Valentinovna Yakubovich. Gratitude for help in the organization, excursions, and lectures is expressed to the staff of the Institute of Mineralogy of the Urals Branch of the Russian Academy of Sciences: E.V. Belogub, V.V. Maslennikov, V.A. Popov and M.A. Rassomakhin. We would like to thank Magnezit Combine, Magnitogorsk Iron and Steel Works, Uchaly Mining and Metallurgical Combine for excursions to the production facilities. The participants are grateful for the support of St Petersburg University and the Director of the Institute of Earth Sciences, Kirill Valentinovich Chistyakov.

SGA Keynote speaker Professor Hartwig E. Frimmel in Prague

Jan Kulhánek, SGA Student Chapter Prague



PŘÍRODOVĚDECKÁ
FAKULTA
Univerzita Karlova

Seminář Geologické sekce



Prof. Hartwig E. Frimmel
Geodynamics and Geomaterials Research
University of Würzburg, Germany

**Giant Impacts and the Formation
of Ore Deposits**

Pátek 3. listopadu 2023 od 13:
Mineralogická posluchárna PŘF UK, Alberto

Inviting Professor Hartwig to our faculty provided a unique opportunity not only to hear his lecture but also for students to engage with a renowned figure in the field of geology. To underscore the significance of Professor Hartwig's contributions, we would like to share a brief overview of his biography:

Hartwig E. Frimmel, who obtained his PhD in geology at the University of Vienna, is Professor and Chair of Geodynamics and Geomaterials Research at the University of Würzburg, Germany. He is also associated with the University of Cape Town where he had previously climbed the academic ladder from lecturer to

The SGA Student Chapter Prague was honoured to host a seminar for the entire geological section of the Faculty of Science, Charles University in Prague, featuring Professor Hartwig E. Frimmel from the University of Würzburg, Germany. The lecture, held on November 3rd, 2023, drew a diverse audience ranging from bachelor students to professors, reflecting the broad appeal of the topic, "Giant Impacts and the Formation of Ore Deposits," within the geological sciences community.

The presentation was supplemented with a succinct annotation: "Some of the largest impact sites known on Earth overlap in space with exceptional concentrations of ore deposits. This has led to speculations on a potential addition of extraterrestrial metal compounds to the Earth's crust on an economic scale. Using the three largest impact structures as reference, the likely controls of large impacts on metallogeny were discussed, and it was shown that metal endowment was strongly controlled by the regional geological make-up of the crust prior to impact."



After-seminar discussion during the related sport activities.
(The students did let him win occasionally!!)

associate professor. He was leader of the Earth Science subprogram within the South African National Antarctic Program, member of the Geoscience Scientific Standing Committee of the Scientific Committee on Antarctic Research (SCAR), former president of the Society for Geology Applied to Mineral Deposits (SGA), and director of Lithoscope consultancy. He has served on several editorial boards (incl. *Mineralium Deposita* for the past 23 years), on the International Commission on Stratigraphy, as assessor for numerous national research funding and government agencies, and as consultant to mining/exploration companies as well as government bodies. His research interests developed over more than three decades from metamorphic geology and fluid-rock interaction to metallogenesis and economic geology. A special focus has been the study of sediment-hosted base metal and gold deposits, especially those of the Witwatersrand-type. His research output includes more than 200 articles and book chapters as well as three books.

After the lecture, an engaging discussion was organized in the meeting room of the Institute of Petrology and Structural Geology, providing students with the opportunity to further delve into the topics covered by Professor Frimmel's presentation. Against the backdrop of pleasant refreshments, students exchanged ideas and posed questions, enriching their understanding of the subject matter and discovering more about the Prof. Frimmel broad experiences from the world. Later in the evening, a dinner meeting was organized at a local restaurant, bringing together representatives from the SGA (Hartwig Frimmel and Anna Vymazalová, members of the SGA Executive Committee, and Prague Chapter representatives) for further networking and discussions. This gathering offered an informal setting for participants to connect with SGA representatives, facilitating valuable exchanges of ideas and insights.

We extend our gratitude to Professor

Frimmel for his engaging lecture and enthusiastic participation in post-seminar discussions. Our gratitude extends to the SGA, namely SGA Keynote Speaker Program, and the Geological Section of Charles University for generously supporting the organization of this event. Their contributions made it possible to host Professor Frimmel's lecture and

facilitate enriching discussions and networking opportunities, enhancing the academic experience for all participants.



Audience in the seminar in the Mineralogical lecture room for Hartwig Frimmel's presentation.



After-seminar discussion in the meeting room of Institute of Petrology and Structural Geology.

SGA Student Chapter Prague

Field trip to the Ore Mountains, Czech Republic (petrological overview, mining history, and current mineral deposits)

Jan Kamenský^{1,2}, Jan Kulhánek¹

¹ Faculty of Science, Charles University, Prague, Czech Republic

² Czech Geological Survey, Prague, Czech Republic

The SGA Student Chapter Prague honours its long-standing tradition of organizing an annual autumn field trip, and this year was no exception. Scheduled for late autumn (November 17–19, 2023) the trip was strategically planned to allow the participation of first-year bachelor geology students. Our destination of choice this year was the captivating mineralogical sites and historically significant localities of the Ore Mountains in the NW Czech Republic. Sixteen students participated in the excursion, led by chapter advisor Dr. Jan Kulhánek and president Jiří Klepp.

Geological settings:

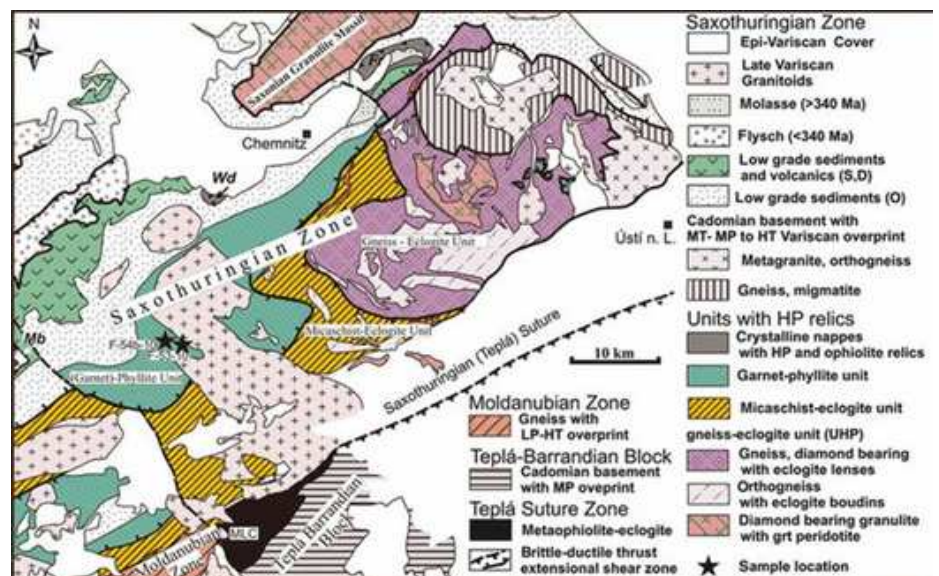
The European Variscan Belt finds its easternmost exposure in Central Europe, shaping the Bohemian Massif. The Ore Mountains, a historically significant mining region, are situated within the Saxothuringian Zone (SZ), the SW–NE-trending belt which extends in the NW part of the Bohemian Massif. The SZ is tectonically separated from the Teplá-Barrandien unit (TBU), lying along its southeastern border. Within this framework, the SZ represents the lower plate that underwent subduction beneath the hanging wall of the TBU along a prominent Variscan suture (e.g., Franke, 1989; Jouvent et al., 2022). Comprising primarily complexly over-thrusted and over-folded metamorphic nappe units of diverse metamorphic grades, the Ore Mountains exemplify accretionary wedge formation between the SZ and TBU. From the deeper levels of the subduction channel, rocks of high- to ultra-high-pressure metamorphism, such as eclogites, blueschists, and coesite or diamond-bearing paragneisses and granulites, have been exhumed (see Jouvent et al., 2022). The Variscan and post-Variscan tectono-magmatic activities are closely associated with

the formation and subsequent remobilization of the polymetallic ores in the area. The Bohemian Massif also underwent significant magmatic and volcanic activity during the Cenozoic era. Much of this volcanic activity was concentrated along the Eger Rift, aligning with the Saxothuringian Variscan suture, and constituting the northeastern branch of the European Cenozoic Rift System (Ulrych et al., 2011). Evidence of this volcanic activity is also observable in the Ore Mountains, where well-preserved remnants of Cenozoic volcanism, erupting through the metamorphic basement, form prominent hills in the surrounding landscape.

The field trip began at the hut at Boží Dar, an old mining town near the Czech-German border, on the evening of November 16th, 2023, which served as our

base for the entire excursion. The next morning, November 17th, we visited several localities following the broad geological introduction at the hut. Our first visit took us to Abertamy town, where we visited a private collection of mining artifacts and ore minerals from the surrounding localities, such as Abertamy, Jáchymov, and Stříbro.

Continuing our trip, we embarked on a brief tour of the surroundings of the closed Mauritius mine, the oldest tin mine in the Czech part of the Ore Mountains, with its origins tracing back to the 16th century. This historical site, now open for tourists, offered a glimpse into centuries-old mining practices. Our time at the Mauritius mine also afforded opportunities for mineralogical sampling, with notable finds including specimens of hematite sourced from the mine's excavation sites



The schematic geological map of the Saxothuringian Zone according to Faryad & Kachlík (2013).

and observation of the metasomatic process causing formation of greisens and associated tin mineralization along the veins cutting the granitic body. In the vicinity of the Mauritius mine was also possible to observe Schnepf's pinge, a sinkhole formed atop the remnants of a former tin mine, following the steep vein planar orientation. Our itinerary then led us beyond the confines of the Ore Mountains to the significant mineralogical site of Huber Stock, situated near Horní Slavkov (GPS: 50° 8' 19" N, 12° 48' 28" E). Geologically characterized as a greisenized plutonic elevation, Huber Stock stands as a testament to the region's diverse mineral wealth, with notable occurrences of tungsten and tin mineralization. Historical records indicate subsurface mining activities dating back to the 13th century, with a notable period of pit quarry operations from 1973 to 1976. Notably, Huber Stock boasts a rich mineralogical diversity, with 117 documented minerals, including five designated type localities, underscoring its significance in the field of mineralogy.

Our second day of the trip began with a visit to Meluzína Hill, a prominent feature in the landscape. Comprised mainly of eclogite, a high- to ultra-high metamorphic rock, Meluzína Hill offers insights into the region's geological history. Originating from the subducted oceanic Saxothuringian plate, the rock was subducted deep beneath the TBU plate into the Earth's mantle before being exhumated back to crustal levels, shedding light on past plate tectonic processes. Discussions at the site focused on reconstructing the pressure-temperature conditions that shaped these rocks, along with an examination of the "atoll texture" of garnets commonly observed in metamorphic rocks of the area.

Our journey then took us to Horní Halže, where we explored remnants of iron ore mining. Here, a small heap served as a reminder of the area's industrial past, with quartz veins often displaying a distinct violet color, earning the site the nickname Amethyst heap.

Next, we visited Mědník Hill in Měděnec, where iron ore extraction occurred from the 15th to the 19th century. The site's skarn body, associated with the poly-

metallic mineralization, showcased visible garnet, diopside, and magnetite grains, providing insights into the region's mining heritage.

Finally, we arrived at Volyně u Kadaně, a forested area housing loose rocks indicative of mining activity focused on a quartz hydrothermal vein renowned for the associated fluorine and tungsten mineralization. Characterized by a brecciated and honeycombed texture due to fluorite leaching, the vein revealed small fluorite and scheelite crystals, easily

the area. Our excursion concluded at the Blahuňov locality, known for hydrothermal veins cutting through gneiss formations. Here, participants observed collectible fluorite-quartz specimens, with the quartz exhibiting a carnelian variety.

With our cars loaded with mineral samples, we concluded our excursion and returned to Prague, reflecting on our experiences over the past three days. Our exploration had not only

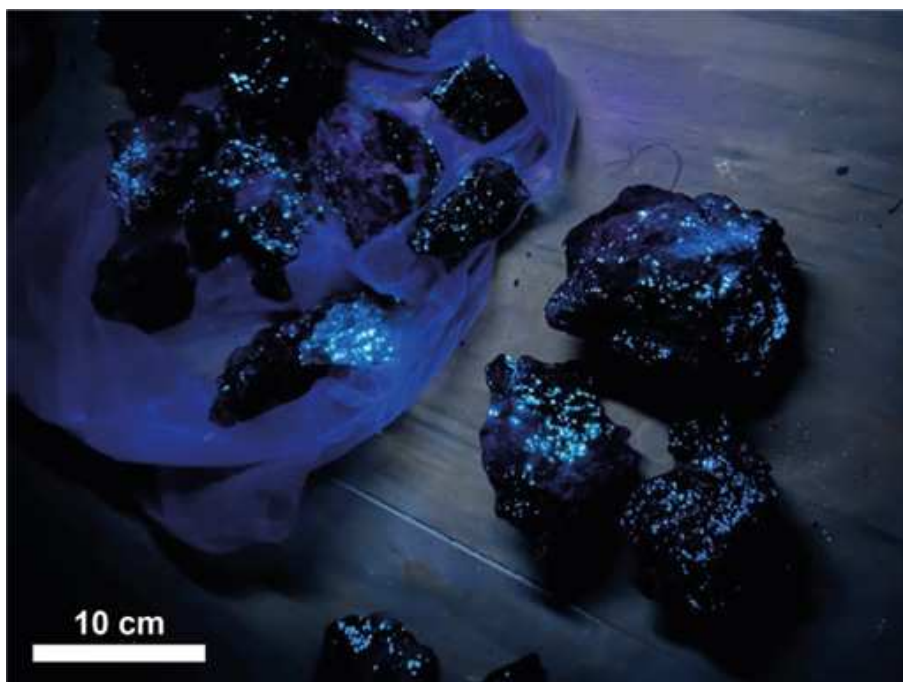


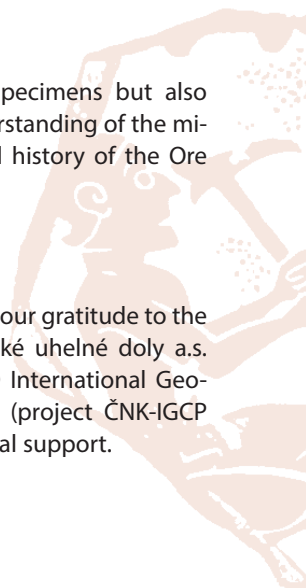
Photo of collected scheelite-rich samples from the site Volyně u Kadaně under short-wave UV light. Photo by A. Ignasheva

recognizable under the short-wave UV light. Our final day began with a visit to the Kovářská site, where we examined fluorite-barite veins that were actively mined in the 1970s and 1980s. Though mining activities have ceased, remnants of these veins remain, offering opportunities for mineral collection. Participants had the chance to collect specimens of fluorite and barite from surrounding mining heaps, providing tangible connections to the area's mining history. Moving on, we also visited a reclaimed heap near Hradiště u Kadaně, focusing on collecting hematite crystals, characteristic of

yielded valuable specimens but also deepened our understanding of the mining and geological history of the Ore mountains.

Acknowledgments

We wish to extend our gratitude to the company Severočeské uhelné doly a.s. and to the UNESCO International Geoscience Programme (project ČNK-IGCP 637) for their financial support.





Group photo in front of the historical mining gallery in Měděnec. Photo by J. Klepp.

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Group photo of the Prague SGA student Chapter members visiting the Giant mountains area with RNDr. Vlastimil Pilous

Excursion to the Giant Mountains 2023

To welcome the new school year, the Prague SGA student chapter decided to organize a three-day field trip to the Giant Mountains and their surroundings. We started the entire excursion with a visit of the Turnov museum. The tour of the museum took place with the curator of mineralogy and geology collections, Mgr. Jan Bubal, to whom we are very grateful for the entire exposition and tour. We saw examples not only of mineralogy, but also paleontology and petrography. The main highlight was the visit of the newly installed comprehensive exhibition How mountains are formed, the secrets of plate tectonics, more interactive concept. Subsequently, we continued with an excursion to the Harrachov glass factory, which is the oldest functioning glasswork in the world and has been in operation since 1712. We took a guided tour of the glasswork itself, where we saw the process operation, the historic glass grinding plant as well as historic machinery and technology. Afterwards we visited the mining museum in Harrachov, which also included a tour of a stope that was historically used for the mining of the Harrachov vein-type deposit. The main vein filling consisted of fluorite, barite, galena, and quartz. We ended the day at the Horní Rokytnice locality, where an oxidation zone with the occurrence of supergene mineralization was captured during the excavation of several exploratory shafts. Stratiform polymetallic sulphide mineralization can be seen here, bound to dolomitic marbles, quartzites, erlanes, etc. Regarding mineralogy, we found mainly secondary Cu mineralization such as malachite, azurite, chrysocolla and cerussite.

On Friday, we were treated to a wonderful tour of Obří důl in the Giant mountains, for which we are very grateful to RN Dr. Vlastimil Pilous, who worked for 27 years as a geomorphologist at the Krkonoše National Park Administration in Vrchlabí. Not only did he take us to places we wouldn't have seen during a normal visit, but

he also accompanied the entire tour with an engaging explanation. It almost seemed like he knew every stone we had stumbled upon. We learned a lot about the various geomorphological formations that shape the face of today's Giant Mountains, for example the formations left behind by glaciers are very prominent. Another distinctive element that defines the appearance of the Giant Mountains is their complex geological structure. For example, metamorphic rocks that were in contact with a granitic intrusion (dated about 312 million years ago) gained greater resistance through thermal alteration and thus form the highest peaks of the Giant Mountains. As a complement to the excursion in the Obří důl, RNDr. Vlastimil Pilous went with us to the remains of gold mining in Bárt's forest near the golden stream, which are mysterious to many. Mysterious for the reason that mining at the time (16th century) had to be done manually (hoe, pickaxe,...) and still reached immense dimensions. Since the location was located near a gold stream, we had the opportunity to try panning for gold. We ended the day with a visit to the rock defile near Vrchlabí, the Permian sediments of the Vrchlabí Formation. In the first part of the section, dark gray clays and siltstones were visible, containing abundant fossil remains of flora and fauna (coprolites are often found). In the second part of the section, the lower part of the Vrchlabí Formation was visible, where red-brown siltstones prevailed near the overburden, which slowly transitioned into fine-grained sandstones. In addition to fossils, we also found anthraxolite, condensate of organic matter leached from organic rich rocks, through the cracks which hydrothermal solutions penetrated to the surface.

After a good rest at the accommodation, the next day's morning program was richly filled with a visit of the Žacléř mining museum, which was created on the territory of the former Jan Šverma coal mine. The first mention of coal mining in the Žacléř region dates back to 1570, however, coal mining on an industrial scale dates back to the thirties of the 20th century, until 1992, when deep mining was

stopped due to the unprofitability of mining. During that time, over 26 million tons of coal were mined here, but another 75 million tons remains underground. Surface mining began in 1998, during which around 330,000 tons were mined and many paleontological finds were discovered thanks to it (*Lepidodendron laricinum*, *Sigillaria rugosa*, ...). The whole experience was enhanced by the fact that our guide himself used to work in the mine and was able to outline the functioning of the entire complex in detail.

Considering how close we were to the Polish border, we decided to visit the location on the Polish side as well. So, we contacted the SGA Baltic Student Chapter and with their help we arrived at a location near the town of Kowary - Czarnewo. Polymetallic vein ore rich in minerals containing As were mined here periodically from the first half of the 18th century until 1925. On one of the adjacent heaps, we were able to find arsenopyrite, calcite, galena, and chalcopyrite. Happy with the catches we found, we set off on our way back to Prague.

The whole excursion would not have taken place without the permission and helpfulness of KRNAP. At this point we would like to thank them very much for the unique opportunity to visit normally inaccessible areas.



Galena found in Czarnewo

SGA Prague chapter fieldtrip to Slovakia, Slanské a Zemplinské Vrchy

From the 24th to 28th of April in 2024, the SGA Student Chapter Prague went to the Slanské and Zemplinské Vrchy mountains in eastern Slovakia. Locals and chapter members Jakub Repaský and Ondrej Ondič took charge of the field trip. During these days, we tried to familiarize ourselves with the geology of the area, with an emphasis on the main mineral deposits. Stanislav Levendovský, the chief mineralogist from the East Slovak Museum in Košice, and Radoslav Grega, a local expert, provided the participants with expert interpretation. Organizers Ondrej Ondič and Jakub Repaský provided additional explanation.

The Slanské Vrchy Mountains are a tertiary volcanic mountain range. It is a chain of stratovolcanoes stretching in the north-south direction from the city of Prešov in Slovakia to the town of Tokaj in Hungary. The mountain range's highest peak reaches a height of 1092 m.a.s.l. The local forests are deciduous, consisting mainly of beech. Stratovolcanoes began to form in the lower Miocene at the important tectonic boundary between the units of the Western Carpathians and the hard-to-classify units in the East. Volcanic activity does not exceed the Tertiary. Deep faults served as a pathway to the surface for the originally basaltic magma, which changed its composition to andesitic along the way up by melting crustal rocks. The volcanism occurred in a sea of varying depths, leaving behind various sediments, including salt, that used to be mined in the town of Prešov.

Immediately after our arrival, we visited the deposit of polymetallic ores near the village of Zlatá Baňa. It is Slovakia's third most abundant mineralogical locality (Ďuďa & Ozdín, 2012). The deposit is located in the Zlatobanský stratovolcano's caldera, the largest in the Slanské vrchy. The area is characterized by various types of andesites with intrusions of diorite porphyry.



Members of SGA Prague student chapter near Dubník mine

Polymetallic (Mo-Cu-Pb-Zn-Ag) and antimony mineralization arose thanks to hydrothermal activity in the final phase of volcanism. Since the 18th century, the main target of mining has been 0.1-2 m thick antimonite dikes. We found decent samples of antimonite, amethyst and arsenopyrite during our visit.



Antimony, Zlatá Baňa

The most attractive stop among the trip attendees was the world's oldest precious opal mine in Dubník. In fact, it is a large area consisting of several separate mining sites with tunnel systems and heaps, of which we visited three of the most important. Due to the post-magmatic hydrothermal activity, precious Opals are found in andesite lava flows and pyroclastics. In addition, cinnabarite was mined at the site as an ore of mercury.

We managed to find several varieties of opal. The most likely to be seen from the varieties was the milky opal, but glassy opal, precious opal and hyalite were relatively easy to find too. Dubník opals adorn the British crown jewels and are part of the French royal treasure.



Precious Opal, Dubník

In the southern part of the Slovak half of the mountain range, we visited a chalcedony outcrop near the village of Byšta. The occurrence of chalcedony is linked to brecciated and silicified bodies of tertiary rhyolites and andesites. In the past, galena-chalcopyrite-pyrite mineralization was discovered by drilling but it was never further explored and mined. We were pleased with the abundant samples of beautiful chalcedony cavities of various colours, from white to purple and blue.

A few kilometres east of Slanské vrchy mountains, the hills of a mysterious geological unit, Zemplinikum, of unknown tectonic origin, rise from the lowland. The unit comprises of the Proterozoic basement formed by gneisses, amphibolites, and sedimentary cover of the Carboniferous, Permian and Triassic ages. Sedimentary rocks of the younger Paleozoic age show that the unit is a remnant of an intermountain lowland area with rivers, lakes and swamps. Coal seams in the Upper Carboniferous rocks were experimentally mined in the past. Near the village of Velká Trňa, there is a large heap left, where we managed to find samples of anthracite, as well as fossils of the Carboniferous flora, specifically the stems of the horsetail Calamites and twigs with the leaves of the horsetail Sphenophyllum.

During the field trip, we also visited the geological exhibition in the East Slovak Museum in Košice and the geological collections of the Mining Faculty of the Technical University in Košice. These visits helped us to understand the geology of eastern Slovakia and the Western Carpathians in a broader picture. We were also able to look at very aesthetic historical samples from the places we visited in the previous days. We would like to thank Stanislav Levendovský for his great company and lectures in the museum and field. We would also like to thank Radoslav Grega, who kindly showed us his collections and shared his rich knowledge in the field with us.



Calamites, Velká Trňa



Antracite, Velká Trňa



SGA Prague chapter members listening intently to a lecture in the field



SGA Student Chapter Turkiye, 2024

Lectures by Prof. Dr. David Holwell from the University of Leicester.

Fatih Ozbaz, Istanbul University Cerrahpaşa

The SGA Turkiye Student Chapter was established in 2017 with the aim of fostering a collaborative environment for students interested in the field of economic geology. Our organization continues to grow and evolve, providing valuable opportunities for students to engage with leading experts and advance their understanding of geosciences. This year, we had the privilege of hosting an event on October 10th at Istanbul University Cerrahpaşa (Istanbul, Turkiye), featuring two insightful lectures by Prof. Dr. David Holwell from the University of Leicester.

The event was meticulously planned to ensure a comprehensive learning experience for all attendees. Prof. Dr. David Holwell delivered two compelling lectures titled "Tracing Metal Fluxing Through the Lithosphere from Magmatic Sulfide Through Porphyry to Epithermal" and "Unconventional Magmatic Sulfide Systems: Looking Outside of the Box for the Next New Ni-Cu-PGE Discovery." These lectures, held in the morning and afternoon sessions, spanned the entire day and provided a deep dive into critical topics in the field of economic geology.

The event was well-attended, drawing approximately 40 participants, including undergraduate and graduate students, faculty members from various universities across Turkiye, and representatives from private firms in the mining sector. The diverse audience underscored the broad interest and relevance of the topics covered. Participants benefiting greatly from Prof. Dr. Holwell's expertise and insights.

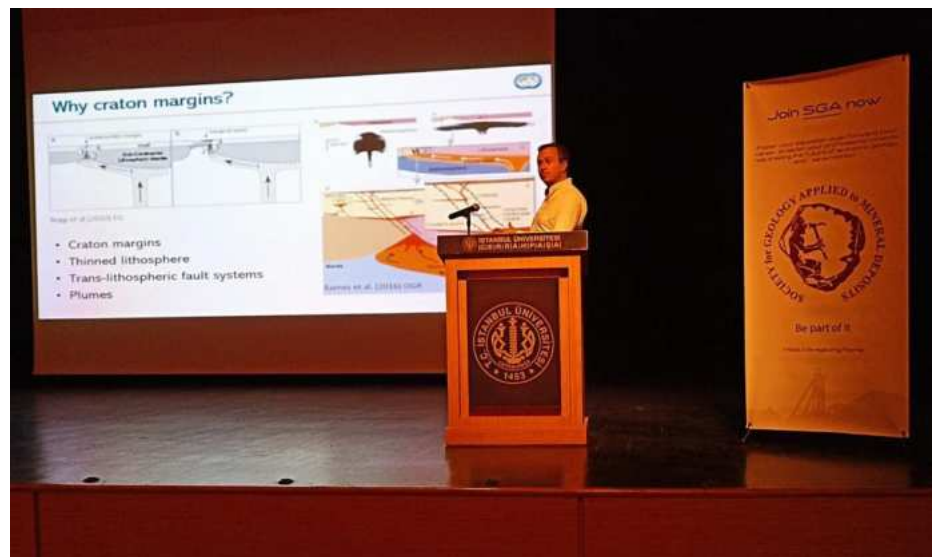
Feedback from the attendees was overwhelmingly positive. Many participants expressed their gratitude for the opportunity to attend such informative and engaging lectures. They appreciated the depth of knowledge shared and the clarity with which complex concepts were explained. The interactive nature of the sessions allowed for meaningful exchanges, further enhancing the

learning experience.

On behalf of the students and the SGA Turkiye Student Chapter, we extend our heartfelt thanks to Prof. Dr. David Holwell for generously sharing his time and knowledge. His lectures have significantly enriched our understanding

of metal fluxing and magmatic sulfide systems.

Additionally, we express our deep gratitude to Prof. Dr. Gülcan Bozkaya (President of SGA Turkiye) and the SGA board for their crucial role in the success of this event.



Professor David Holwell presentation to the SGA Turkish Chapter



Attendees at the presentation of David Holwell

SGA Student Chapter Erlangen: Field Trip to Slovakia

Julia Wenske and Jakob Machleidt

GeoZentrum Nordbayern, Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg, 91054 Erlangen, Germany

From August 11th to 17th, a group of 12 enthusiastic students from the SGA Student Chapter Erlangen, ranging from first-year students to PhD candidates, embarked on a geological field trip to Slovakia. Our journey was filled with enriching experiences, from exploring historic and active mines to forging new friendships with fellow geology students.

Our adventure began in the city of Bratislava, where we were warmly welcomed by local geology students from the University of Bratislava. The evening kicked off with a delightful meet-and-greet dinner in the heart of the Old Town.

The next three days took us deep into Slovakia's mining history as we ventured to the Banská Štiavnica region. We visited perlite and bentonite operations, where we learned about the extraction and processing of these industrial minerals. The highlight of the whole week was undoubtedly the visit of the active underground Rozália Gold Mine. Descending into the depths, we experienced firsthand the tough conditions under which the miners work. The visit provided us with many insights on the formation of the epithermal gold deposit, enriching our knowledge of geological processes, mining and exploration techniques.

Our journey continued with a visit to the historical Coin Museum in Kremnica and the exploration of the active magnesite mine SWZ in Jelšava. Here, we learned about the mining and use of magnesite, a key mineral for various industrial applications. We also enjoyed the beautiful nature and geology of the Lower Tatra Mountains before we headed back to Germany. We made a cultural stop in the picturesque city of Prague. Here, we met with the SGA student chapter at the Charles University, visited the Natural History

Museum together and built connections that will last well beyond this field trip.

This field trip, though not the only event, has really been the highlight of this year's activity of our student chapter in Erlangen. With many new members who joined our chapter we look forward to many future events and

field trips already in the making. We warmly thank Peter Kodera and Diago Delgado from the University of Bratislava, whose guidance and organization ensured a smooth field trip for all. Our gratitude also goes out to the Slovakian students and locals for their warm hospitality, making this excursion a truly memorable one.



Group photo of field trip participants from Erlangen and Bratislava

SGA Chapter UIS-Bucaramanga Colombia

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FIELD TRIPS

Soto Norte Project (after Dr. Stewart Redwood's short talk)

During 2023 the student chapter organized field trips to different mineral provinces in the Colombian Vetas and California Mining District from April 20, 2023. Eleven of our members participated in this field trip complementary to the course taught by the geologist Dr. Stewart Redwood, where the students had the privilege of visiting the facilities of MINESEA company which holds the Multi-million Au-Ag Soto Norte project, in the municipality of California (Santander). The Vetas-California district is located 35 km NE of the city of Bucaramanga, the district consists of two principal mineralized trends; (1) La Baja - La Alta and (2) Vetas, located some 10 km to the SE of California. The Au-Ag deposits of the Vetas-California district have been exploited since pre-Colombian and early colonial times.

Payande Skarn (July 30 to August 2, 2023)

During the field trip, the geologist Nicolas Tique and 23 members of the SGA UIS Student Chapter visited the eastern flank of the Colombian Central Cordillera on the limits of Payandé, Tolima. In this area, outcrop plutonic and subvolcanic igneous rocks, which are intruding fossiliferous limestones of the Payandé Formation of Late Triassic age, part of the igneous complex of the basement of the Upper Magdalena Valley (UMV) and, according to previous studies, mostly correspond to acidic and intermediate plutonic rocks and to a lesser extent to basic rocks, which have been designated as the Payandé Stock (Quiceno et al., 2016).

The Cu skarn-type mineralization is one of the most important in the country, being among the least known and studied. The mineralized body has an elongated shape in the N-S direction, including both endoskarn and exoskarn zones. The Payandé Stock presents $\text{Fe}_2\text{O}_3/(\text{Fe}_2\text{O}_3+\text{FeO})$ values close to 0.5 (Quiceno et al., 2016). The significant presence of magnetite and hematite, especially in specular form, along with a higher proportion of garnet compared to pyroxenes, as well as the combination of minerals present, are typical signs of a Cu skarn-type deposit. These characteristics suggest an oxidized environment and the formation of mineralization at shallow levels (Meinert et al., 2005). The mineralization is composed of iron oxides (magnetite and specular hematite), sulfides (chalcopyrite, bornite, covellite, cubanite, and chalcocite), secondary carbonate minerals (malachite and azurite), and gangue minerals (garnet, calcite, chlorite, wollastonite, pyroxenes, tremolite-actinolite, and quartz).

Mutiscua-Pamplona-Tona Field trip (November 25 to November 26, 2023)

Fifteen members participated in this field trip. With the participation of members of the chapter who are in their first semester of geology at the Universidad Industrial de Santander (UIS), this field trip was developed with the main objective that members acquire fundamental skills required in the field such as: to know how and what kind of data are noted in a field notebook, recognise the different characteristics that define the type of rock observed (especially metamorphic and igneous rocks), identify the geoforms that different types of rock generate in the landscape, identification of different minerals in hand samples and their association to

geological processes. This field trip was complemented with a talk to the members who would attend, reviewing concepts and introducing geological terms and processes necessary to understand and be able to develop the established objectives.

SGA UIS-Bucaramanga & SGA UNAL-Bogota field trip (January 18 to January 25, 2024).

At the beginning of 2024, the SGA Colombian Chapters worked together to develop an eight-day field trip, Orogenic-Porphyry Au, Cu, and Ag Deposits in Tolima and Caldas, to explore the mineral deposits and regional geology of the Central Cordillera in the Colombian Andes with 15 members of each chapter. On the first day, the members visited the Medina waterfalls, located in the municipality of Mariquita, department of Tolima. In this location, outcropping rocks summarize the geology of the Central Cordillera, where the active margin of subduction produces metamorphic complexes and intrusive bodies, being the geological context to form the Orogenic-Porphyry-Hydrothermal mineral deposits and the volcanoes. Members observed muscovite and graphitic schists showing deformational events (foliation and crenulation). During the field activities, the aim was to find the contact aureole generated by the epizonal intrusion of the Mariquita granodiorite into the schists of the Cajamarca complex.

On the second day, the members visited the municipality of Casabianca, Tolima department. We observed geological structures known as „Carros de Piedra“. These are columnar disjunctions of andesitic composition. They form in sites of lava and pyroclastic flows. Upon reaching the surface, these flows cool and develop fractures due to contraction stresses propagating from the exterior towards the interior of the



Activities carried out during the field trip. Observation of drill core and local geology.



Visit to the Payande skarn in Tolima, Colombia.



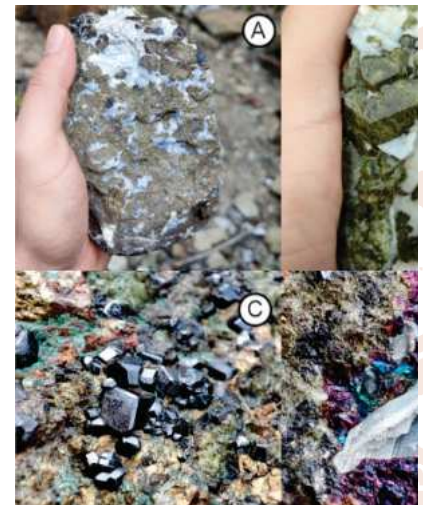
Mineralization observed underground in the Orogenic gold deposit.



Ore minerals observed on the introductory field trip.



Evidence of different magmatic compositions.



Mineralogy of the Payande skarn deposit.

solidifying magma bodies (DeGraff & Aydin, 1987). Geology of mineral deposits in Colombia, Ecuador and Panama.

On the third day, the members visited the operations of the El Gran Porvenir gold mine, located in the municipality of El Líbano, Tolima department. The mineralization consists of quartz veins containing sulphides such as galena, sphalerite, chalcopyrite, and pyrrhotite. These veins are hosted within the graphitic schists of the Cajamarca Complex. Several authors, including Diana Lucía Angée Moreno in her 2022 master's thesis, have classified the El Gran Porvenir mine as an orogenic gold deposit. This visit was highly beneficial, allowing us to observe the entire process, from ore extraction in the mine tunnels to mineral recovery in the processing plant. It also provided a unique opportunity to connect academia with industry.

On the fourth day, the members visited the Lagunillas River, well known for the great tragedy of Armero that occurred in 1985, as the great lahar descended through its channel. At that same location, we discussed risk prevention and listened to the testimonies of the community itself. Afterwards, a long hike to the Pirañas crater, a parasitic cone related to the eruptions prior to the formation of the Nevado del Ruiz volcano. The students observed the lithological structures, the volcanic deposits and their outcropping volcanic structures.

On the fifth day, members carried out a geological pedagogy activity in the central park of the municipality of Supía, in the department of Caldas. Geological samples of minerals, rocks, and fossils were used, and materials such as scale tectonic models and small trivia games from the SGA-UIS and SGA-UNAL chapters. The activity allowed the community in general, especially children, to learn about the geosciences. It was also a valuable opportunity to connect with the community of Supía, which is traditionally close to mining activity.

On the sixth day, the facilities of the mining company Collective Mining were visited. There, the group learned about the mining projects that the company manages. They also received a talk about porphyry gold deposits, and then participated in a core logging workshop where they observed cores from the Guayabales project. During the workshop, they learned to identify minerals and alterations, and then created a geological model.

On the seventh and final day of the field trip, a visit to the mines in the municipality of Marmato was conducted. This holds great importance as it is in one of Colombia's main gold-copper belts, the Middle Cauca Belt. Here, we were able to explore the different mines, identify the various types of mineralization present in each tunnel, and associate them with a mineral deposit of hybrid type between a gold porphyry and a gold deposit hosted in reduced intrusion. The process of gold treatment and recovery was observed.

SHORT COURSES AND WORKSHOPS

Metamorphic rocks workshop by Leonardo Palmera (February 19th, 2023):

Thanks to the collection of rocks gathered on different field trips and donated by our members, the SGA UIS chapter has a wide variety of rocks and minerals. This has allowed us to carry out a practical workshop aimed at first year students and those who have doubts about the identification of metamorphic rocks and minerals. With the participation of Professor Leonardo Palmera and the members of the board of directors, a brief class was held in which the concepts of the Metamorphic Petrology subject were reviewed, addressing and resolving all doubts and clarifying its basic concepts.

Geology of mineral deposits in Colombia, Ecuador and Panama by Stewart Redwood Workshops (April 19th, 2023).

Dr. Redwood delivered a presentation on the geology of mineral deposits in Colombia, Ecuador, and Panama. Stewart Redwood explained the key points to understanding the configuration of some of these deposits in each country, drawing on his extensive field experience. The presentation also included a brief description of each of the main deposits in these three countries, covering the key concepts of each deposit, its evolution over geological time, mineralization, trapping, fluids in which it is transported, and locations where these types of deposits have been found in each country.

Geofair of Investigation groups and Chapters of the UIS School of Geology (April 23rd, 2023):

To start the first semester of the 2023 academic year, the School of Geology at the Universidad Industrial de Santander held its annual Seedbeds and Student Chapters Fair. The purpose is to showcase the research groups focused on various branches of geology within our faculty. The SGA Student Chapter participated in the event with a stand, where we presented posters of our activities carried out during 2021 and 2022, as well as our upcoming proposals for the year. We also exhibited the different conferences, courses, and field trips that we have organized.

Deep learning applications in mineral exploration by Ana Mantilla (Sep 23rd – 30th, 2023):

A two-session workshop led by geologist Ana Mantilla focused on the application of fundamental deep learning concepts to enhance the interpretation of geological data for identifying areas suitable for mineral exploration. Geological and geochemical data obtained from the United States Geological Survey (USGS) database were utilized. Tools such as QGIS, ArcMap, and a Python programming environment in Colab were employed to generate a map visualizing areas with potential for mineral deposit identification.



Interior of the Pirana crater and the Laguna river, site of the Armero lahar disaster.



Geo-education activities in Supia, Caldas.



SGA UIS Chapter at the Geoferia at the UIS.



Visit to the facilities of the artisanal mining project in Marmato.



Practical experience of differing activities related with drillcores.

Geoferia of Investigation groups and Chapters of the UIS School of Geology (November 8th, 2023):

Before the second semester of the academic year 2023, an academic fair showcasing seedlings and student chapters of the School of Geology at the Universidad Industrial de Santander took place. The aim was to showcase the research groups focused on various branches of geology within our faculty. The SGA student chapter participated in this event with a booth, where we presented our activities conducted during 2022 and up to the present time in 2023 through posters. We displayed various conferences, courses, and field trips undertaken.

Workshop on Rocks and Minerals Introductory Pre-Field Trip, (November 24th, 2023):

With the aim of supporting newer members, the board of directors organized a hands-on workshop on rocks and minerals belonging to the chapter's collection. During this event, basic mineralogy concepts were explained, as well as characteristics of igneous and metamorphic rocks and mineral deposits. The objective was to provide participants with comprehensive knowledge to acquire a prior geological understanding of what they observed during the field trip to the municipalities of Pamplona, Tona and Mutiscua in the department of Norte de Santander.

National and International Speakers

Evaporite deposits as strategic resources. Local approach (Mesa de Los Santos, Santander - February 10th, 2023)

A scholarly talk was conducted led by Geologist Aldo Julian Molano, focusing on evaporitic deposits from a general perspective. Throughout the lecture, various aspects were addressed including general features, genetic processes, sedimentary environments,

and chemical characteristics among other topics. Additionally, practical applications of these deposits were explored, with notable examples and local uses, particularly in the municipality of Los Santos (Santander). Special emphasis was placed on gypsum deposits in the area, as well as evaporitic deposits associated with Lower Cretaceous sedimentary rocks, and their significance in the agro-industry sector

Lecture series: Payandé skarn from generalities to deposit genesis. (5th-12th-19th-26th-May, 2023).

In preparation for the field trip to the Payandé skarn, geologist Julián Medina gave four instructive lectures on the general geology of skarn deposits, the formation of the deposit, the associated magmatism, the mineralogy present and the specific characteristics of skarn deposits. Likewise, within these conferences we studied the regional and local geology of the Payandé Skarn, where the associated igneous bodies are located, such as the Payandé stock and the capping rock (Payandé limestones), as well as the ages of these units, their geological environments, chemistry, among other relevant aspects. This previous training allowed us to approach the field trip with a deep understanding of the Payandé skarn, which led us to be prepared to observe and recognise its geological characteristics in a simpler way and understand its genesis and history.

Porphyry-Type Mineralization and Some Prospects in the Cauca Canyon (October 27th, 2023).

A conference was held on porphyry deposits in our country, specifically in the Cauca Canyon belt, with the aim of preparing for the field trip to the localities of Supía and Marmato. In the conference, the geologist Timoleón Garzón taught us to identify the different alterations produced by this type of deposits, their formation

environment as well as to identify different types of veins indicative of these alterations and to associate them to mineralization zones. We learned some generalities about Cu and Au porphyry prospects such as the La Colosa porphyry and the Nuevo Chiquiro porphyry, as well as understanding why Colombia is a country so rich in these types of deposits.

Geology, Mineralogy and Microthermometry of the Vetiform Gold Deposit in "El Gran Porvenir del Líbano-Tolima" (November 2, 2023).

In order to prepare the members for the departure together with the SGA-UNAL, in which they visited the El Gran Porvenir project in Tolima, a conference was held by geologist Sebastian Duran who conducted his undergraduate thesis at this mine. He shared his research, methodology, questions that arose in the midst of it, and the results of this same research with us, while he also discussed the geology and mineralogy of the deposit.

The San Diego - Cerro Machín volcano-tectonic province (December 5, 2023).

This conference was held in order to understand the volcano-tectonic province of San Diego and Cerro Machín, in which the geology lecturer Dayana Schonwalder spoke to us about the results she obtained from her doctoral research in Manizales regarding the relationship between the composition of volcanic products and tectonic deformation, as well as the conditions of crystallization and radiometric dating carried out in this area. During this talk, she discussed the context of this province, stress state, compositional characteristics, volcanic activities during different geological periods, and her inquiries regarding the composition and tectonics of the province.

Did your gold deposit form below 3 km? If so, then it is not intrusion-related (December 13, 2023).

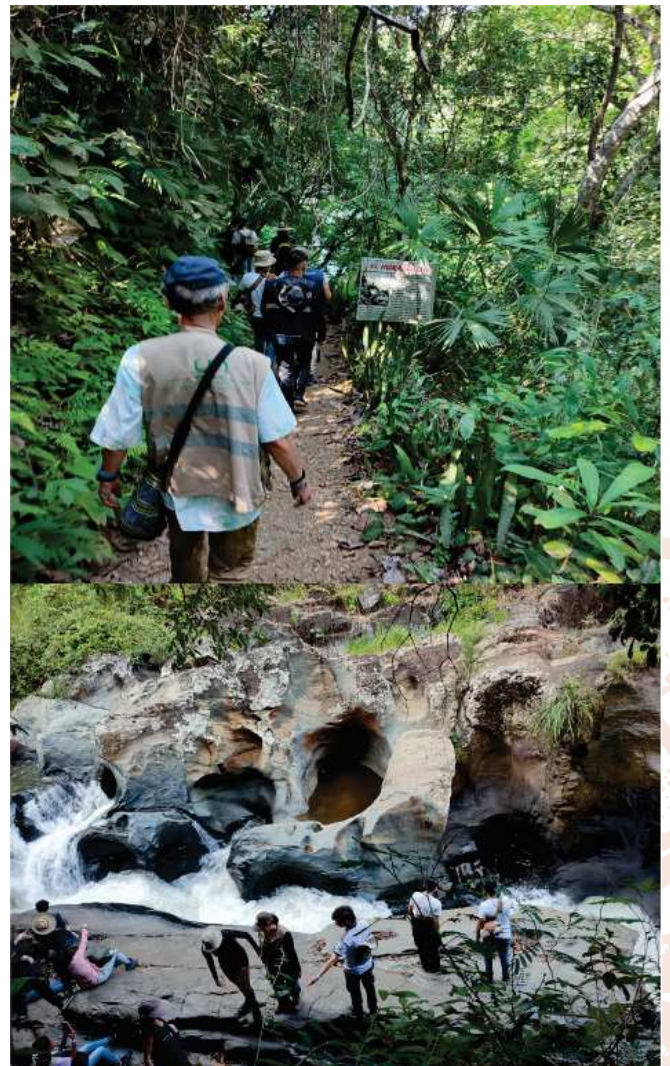
We had the pleasure of hosting in our series of preparatory conferences for the field trip, in collaboration with SGA-UNAL, the geologist Dr. Richard Goldfarb delivering a presentation on orogenic gold and intrusion-related deposits, being one of the leading experts in this type of deposits. Richard told us how these are related and the characteristics of each, exposing different cases where we can often confuse them; however, he provided us with different tools in this lecture with which we will be able to learn to differentiate them and expand our knowledge about them.



Mineral deposits of Colombia, Ecuador and Panama. Attendees of the course with Stewart Redwood.



Examples of rocks and minerals for the new students.



UIS and UNAL Chapter members visiting La Esperanza mining project in Marmato, Caldas.

SGA Peru Student Chapter Activities 2023

SGA Peru Student Chapter leaders 2023

Contact information: Fiorela Maxi Casa, a20167424@pucp.edu.pe

With great pleasure, we present an overview of the activities conducted by the SGA Peru Student Chapter throughout 2023. It was undoubtedly a prolific year, and we take pride in our accomplishments and the resulting benefits for the Peruvian student community.

During 2023, the activities and events held were focused primarily on:

The organization of a workshop and nine virtual or hybrid conferences by local and international speakers within the framework of the Mineral Deposits Digital Platform (PDYM).

The 5th Annual Meeting of the Student Chapter of the SGA in Peru.

Talks and workshops

As part of the SGA Peru Student Chapter, nine talks were organized within the framework of the Mineral Deposits Digital Platform (PDYM), an initiative of our student chapter created in 2020. SGA Student Chapter keeps records on the conferences that are periodically consulted by students and professionals from the industry.

María A. Rodríguez- Mustafa The Mina Justa Iron Oxide Coppel-Gold (IO-CG) Deposit 02/21/2023

Jean Paul Bueno Carreon Geology, mineralization and alteration of the Cerro Lindo deposit. 03/23/2023

Giovanni Pedemonte Critical elements in sphalerite: the case of the Santander Zn-Pb (-Ag) distal skarn, central Peru. 04/21/2023

David Cooke Understanding ore forming processes to lead to a discovery 05/04/2023

Cyril Chelle-Michou What is the control of mineral deposits size? 05/09/2023

Massimo Chiaradia Magma evolution processes control the formation of porphyry Cu-Au deposits in thin and thick arcs. 05/09/2023

José Piquer Advancements in understanding tectonomagmatic controls

and distal footprints in porphyry-type deposits. 6-22-2023

Lluís Fontboté The term "Cordilleran polymetallic deposits" and its relationship with the term CRD 08/16/2023

Victor Torres Pacheco Soledad Project ore deposit: discovery and progress in understanding tourmaline breccias with Cu-Au-Ag. 09/07/2023

Furthermore, on October 13, 2023, a hybrid-format workshop was conducted at the Pontifical Catholic University of Peru (PUCP) led by Dr. Douglas Kirwin, titled. "Breccias: textural description, classification, genetic implications, and their use in the exploration of mineral deposits." The workshop included various talks and practices on the description of hand samples.

The 5th National Meeting of the SGA Student Chapter in Peru took place on November 24, 2023, at the Assembly Hall of the National University of San Antonio Abad del Cusco (UNSAAC) and had the participation of 17 students representing nine of the eleven universities that make up our chapter.

In addition to a presentation of the results of the 2023 management, general guidelines were established for the 2024 period. The election of 2024 Chapter authorities was carried out at the meeting. Additionally, we had the opportunity to enjoy the keynote lecture delivered by Luis Ayala titled "Structural Geology in the Study of Porphyries".

As an activity associated with the National Meeting, on November 25, we visited the Constancia mine, a copper and molybdenum porphyry located at an altitude of 4,100 meters in the Chilioroya District (Chumbivilcas Department, Cusco). The SGA team had the chance to visit the open-pit mine and the core shack where geologists from Hudbay explained the lithology and alteration of the deposit using geological maps of the mine and selected samples of drill cores.

Now is time for the transition of responsibilities to a fresh group of students. We are sure they will surpass our expectations. Our best wishes to them. Proud to have been student members of the SGA



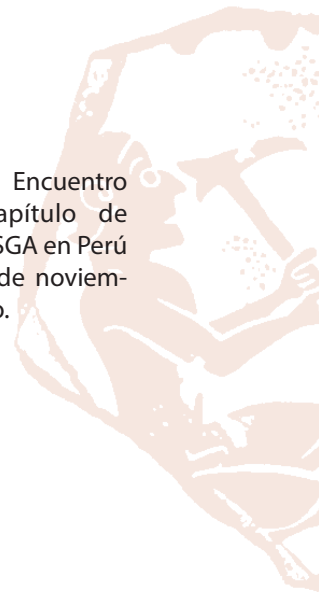
"Breccias: textural description, classification, genetic implications, and their use in the exploration of mineral deposits" presented by Dr. Douglas Kirwin.



Fotografías de la visita guiada a la mina Constancia ubicada en Cusco, el 25 de noviembre de 2023.



Fotografías del V Encuentro Nacional del Capítulo de Estudiantes de la SGA en Perú celebrado en 24 de noviembre 2023 en Cusco.



SGA Student Chapter Contacts 2024

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SGA membership forms can also be downloaded in 5 different languages from the home page of our website www.e-sga.org

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

APPLICATION FORM FOR NEW MEMBERS

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

- Note that incomplete forms and those that are not legible will NOT be processed! -

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Select your Membership Dues*

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- 300.00 EUR Corporate Member (includes 3 printed copies of Mineralium Deposita) (for industry only, no academic)

Applications until September 30th will be processed for the current year. From October 1st membership starts with the following year.

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- I want to donate _____ EUR to the SGA Educational Fund and
 - agree that my (or company) name as donor will be published in SGA media/conferences
 - wish to remain anonymous

* I agree to the SGA data privacy policy as published at <https://e-sga.org/contact-us/data-privacy-policy>

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(If you do not intend to pay by credit card, please make a note here and an invoice will be issued after acceptance of your application)

Sponsor (SGA member):			
Name	Place	Date	Signature
_____	_____	_____	_____

Send the membership application form to:
Dr. Jan Palouš, SGA Executive Secretary, Czech Geological Survey, Mládkův 131/3, CZ-118 21 Praha 1, CZECH REPUBLIC
Phone: ++(420)-2-51005306, Fax: ++(420)-2-51010748, e-mail: sga@geology.cz

Please note that bank charges will not be covered by SGA.
Version June 2018