SEG Student Chapter Freiberg

Field Trip Report 2015-2016

SEG Student Chapter TU Bergakademie Freiberg

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Field Trips 2015

Field trip 1

Active Fluorite-Barite mine Niederschlag and Nickelhütte Aue (Erzgebirge) Saxony, Germany

Guide: Local guide
Date: 09/24/2015 and 10/08/2015
Participants: 6 (6 SC members) and 5 (4 SC members)
Schedule:

Start: 8.30 am
Stop 1 - Visit of the active fluorite-barite mine in Niederschlag
Stop 2 - Visit of the processing plant/facility "Nickelhütte Aue"
End: 4.00 pm

The fluorite-barite mine in Niederschlag opened in 2013. It is the first newly-opened producing operation in Saxony since 1990. Niederschlag mine provides a state-of-the-art underground processing facility: pre-crushing and pre-separation is done through sensor-based sorting by x-rays and air flow. It was an excellent opportunity to get insights in an active underground mine and its operations from extraction all the way through to shipping the product. The field trip was connected with a visit of the processing facility "Nickelhütte Aue", where the further processing takes place. In Niederschlag the maximum capacity of persons per mine entrance are restricted to six. That is why two separate mine visits took place, each 3.5 hours long. During the tours two different stopes at two levels of the mine have been visited. Participants had an excellent opportunity to learn something about fluorite-barite vein deposits, which are common in the Erzgebirge.

Figure 1: *Field trip participants at the entrance of the fluorite-mine Niederschlag (left) and inside the mine (right). Photos: Julian Kästner.*

Field trip 2

Visitor mine Pöhla, Erzgebirge, Saxony, Germany

Guide: Matthias Fischer (local guide)
Date: 10/16/2015
Participants: 12 (10 SC members)
Schedule:

Start: 6.30 am
Stop 1 - Visitor mine Pöhla
Stop 2 - Lunch in Boží Dar, CZ
End: 6.00 pm

The tin mine Pöhla in the Erzgebirge opened in 1967 and was closed in 1991. The Pöhla district consists of several skarn deposits. In this field trip participants visited the Sn-polymetallic Hämmerlein part, which consist of several packages of different skarn lithology intercalated in mica schists. This Sn-W skarn is associated with uranium, tin, tungsten, iron and silver. Various ore forming processes take place during the long history of genesis, and thus a wide range of varying ore minerals were created. Participants were allowed to visit Drive 2-4 and 2-6b, which are currently part of an exploration program. At the drives different types of skarn lithology including magnetite, chlorite and amphibolite units with some polymetallic sulfides like chalcopyrite, arsenopyrite and sphalerite are visible. During the journey another very impressive point was the occurrence of massive sphalerite veins in the mica schist host rock.

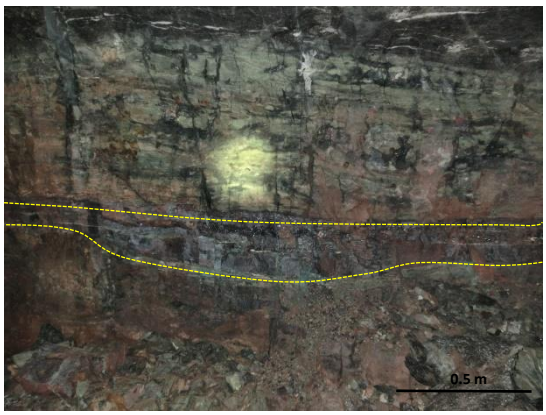

Figure 2: *Students at the visitor mine Pöhla with local guide (top). Sn-Fe Skarn mineralisation (highlighted in yellow) in amphibolite (left).*

Field Trips 2016

Field trip 1

Tectonic and structural setting of metamorphic units of the Erzgebirge, Saxony, Germany

Guides: M.Sc. Peter Hallas and M.Sc. Tobias Stephan (both TU Bergakademie Freiberg, Department of Geology, Division of Tectonophysics)
Date: 04/23/2016
Participants: 15 (12 SC members)
Schedule:

Start: 7.00 am
Stop 1 - Katzenstein (Pobershau): orthogneiss
Stop 2 - Neusorge (Pobershau): two-mica paragneiss, amphibolites, and lamprophyres
Stop 3 - Serpentinite quarry Zöblitz: garnet serpentinites, eclogites and amphibolites
Stop 4 - Kühberg (Annaberg-Buchholz): UHP rocks (kyanite gneiss, sericite schist)
Stop 5 - Fuchsstein (Geyer): mica schist
Stop 6 - Greifensteine (Geyer): granite
End: 05.00 pm

This single day field trip has been realized for the first time this year. It was arranged for the new undergraduate, master and PhD students to get a first insight into the complex geology of the metamorphic units of the Erzgebirge. Information about the tectonic environment and evolution of these units are very important to understand the variety and distribution of various Sn-W and polymetallic (Ag-Cu-Zn-Pb) mineralization within this area. In February 2016 the tour guides already held a lecture on 3D modelling of the Erzgebirge. During the tour, the participants got interesting insights into the mineral composition of the different metamorphic and magmatic rocks. The link between Variscan metamorphism, late Variscan granitic magmatism and their associated ore deposits was discussed at several locations.

Figure 3: *Students at the Katzenstein (Pobershau) while listening M.Sc. Peter Hallas.*

Field trip 2

Ni-Cu-PGE-bearing gabbroic dikes and gold panning in the Hohwald area, Saxony, Germany

Guides: M.Sc. Tom Járóka, M.Sc. Tobias Petermann (both TU Bergakademie Freiberg, Department of Mineralogy, Division of Economic Geology and Petrology)
Date: 05/28/2016
Participants: 10 (8 SC members)
Schedule:

Start: 7.00 am
Stop 1 - Fichtenberg/Oberottendorf quarry: geology of the Lusatian Block (granodioritic basement and gabbroic dike intrusions)
Stop 2 - Valtengrund quarry: gabbroic dike intrusion
Stop 3 - next to the quarry: gold panning at the small creek Goldflüsschen ("gold creek")
End: 6.00 pm

This field trip carried the participants towards the east of Saxony, where one of the biggest magmatic intrusions of central Europe is outcropping: the granodiorites of the Lusatian Block. This complex hosts numerous younger small-scale mafic intrusions, which are slightly enriched in magmatic Ni-Cu-PGE-bearing sulfides. On the first part of this field trip the participants learned about the regional geology of the Lusatian Block as well as about the determination of Ni-Cu ore minerals and gabbroic rocks. Furthermore, there was a focus on different types of magmatic sulfide mineralization (massive and disseminated ores). In the second part of the field trip Tobias Petermann, an experienced gold panner, showed the participants the technique of gold panning and finding the right locations for panning/washing in small creeks. This part was a good opportunity for students to broaden their horizons as they learned how to separate heavy minerals in the field.

Figure 4: *Participants at the Fichtenberg quarry (top) and while gold panning at the Goldflüsschen/gold creek (left, right).*

Field trip 3

Active K+S underground salt mine Bernburg and Wettelrode, Saxony-Anhalt, Germany

Guides: M.Sc. Dominique Dostal (K+S AG, esco european salt company), local guide
Date: 06/10/2016
Participants: 8 (8 SC members)
Schedule:

Start: 5.30 am
Stop 1 - K+S salt mine Bernburg
Stop 2 - Kupferschiefer-dump Zirkelschachthalde
Stop 3 - Kupferschiefer mine “Röhrigschacht” in Wettelrode, Harz
End: 8.00 pm

This single day field trip to one of the leading companies in producing salt and potash offered participants a chance to go underground in one of the most spectacular salt mines in Germany. The field trip was guided by Dominique Dostal, a former SEG SC member and student of the TU Bergakademie Freiberg. Key aspects of this tour were the salt stratigraphy of central Europe and their accompanying tectonic structures. Furthermore, participants had the unique chance to see the inside of a test cavern for gas storage. In the afternoon the participants collected minerals and fossils on a Kupferschiefer dump (Zirkelschachthalde) and visited the former Kupferschiefer (copper schist) mine “Röhrigschacht” in Wettelrode in the Mansfeld-Sangerhausen district. The Kupferschiefer played an important role in Germanys mining history and is still mined for copper and silver in Poland.

Figure 5: *Participants examine a cavern caused by drilling (top left) and the block cave mining area (left) in the salt mine Bernburg. Later, the participants had the chance to collect minerals and fossils on a Kupferschiefer dump (top right).*

Field trip 4

Bicycle tour around Freiberg, Saxony, Germany

Guide: M.Sc. Tom Járóka (TU Bergakademie Freiberg, Department of Mineralogy, Division of Economic Geology and Petrology)
Date: 07/16/2016
Participants: 10 (8 SC Members)
Schedule:

Start: 9.00 am
Stop 1 - Wasserturmstaße: place of first Ag-ore discovery in 1168
Stop 2 - Alte Elisabeth: historic shaft
Stop 3 - Reiche Zeche: research underground mine of the TU Bergakademie Freiberg
Stop 4 - Davidsschachthalde (dump): determining of polymetallic Pb-Zn-Ag minerals
Stop 5 - Ludwigsschachthalde (dump): determining of various gangue minerals (barite and quartz/chalcedony)
Stop 6 - St. Lorenz Gegentrum (Halsbrücke, dump): ore and gangue minerals (barite, fluorite)
Stop 7 - Halsbrücke: historic adits and water management of the Freiberg district
Stop 8 - Freiberg: Department of Mineralogy, summary of the field trip
End: 2.30 pm

This field trip has become a regular event for all undergraduate students and new master students of economic geology in Freiberg. The tour lead the group around Freiberg with many stops at various mining dumps and historic mining monuments. Aim of this field trip is to get a first geological and historical insight of the former mining districts of Freiberg and Halsbrücke. Participants were introduced to the different ore paragenesis of the polymetallic Pb-Zn-Ag veins and their associated gangue minerals.

Figure 6: *Students at the St. Lorenz Gegentrum (Halsbrücke, dump): finding ore minerals and gangue minerals.*

Upcoming field trip 5

Former salt mine Morsleben

Guide: Dipl-Chem. Evelyn Mrozek (DBE - Deutsche Gesellschaft zum Bau und Betrieb von Endlagern für Abfallstoffe mbH)
Date: 10/10/2016
Participants: 15 presumable
Schedule:

Start: 5.30 am
Stop 1- Introduction to the underground mine in Morsleben, talk, instruction 9 am
Stop 2 - Visit of the mine area 11 am - 1 pm
Stop 3 - Talk in the information building of the mining complex 2 pm - 3 pm
End: 6.00 pm

The field trip to the former salt underground mine in Morsleben is a regular excursion of the SEG Student Chapter Freiberg. The underground facility in Morsleben is located in Saxony-Anhalt (Germany) and is a former potash mine. It is now a repository for radioactive waste. The waste is stored in about 400 to 600 meters thick Zechstein (Permian) salt being deposited 260 million years ago in a large oceanic basin (Germanic Basin). The Germanic Basin was a very large region of sedimentation ranging from the west of England to the east of Poland during the Permian and Triassic. Several important commodities were deposited in this time. For example large economic salt, potash and copper shale occurrences in Germany and Poland. The structure of the Morsleben potash deposit and surrounding salt deposits is very complex due to active salt tectonics. Therefore, work for final closure and commissioning of the radioactive waste repository is not finished yet. The deposit of radioactive waste is an important topic in Germany and the DBE is a possible employer for geology students. Consequently, the annual field trip is a relevant must-do for undergraduate, master and PhD students.

Freiberg, September 30th, 2016 email: segfreiberg@gmail.com

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