

Eurogranites 2012

Granites of the Erzgebirge (Germany)

First circular

Relation of magmatism to the metamorphic and tectonic evolution of the Variscan orogen

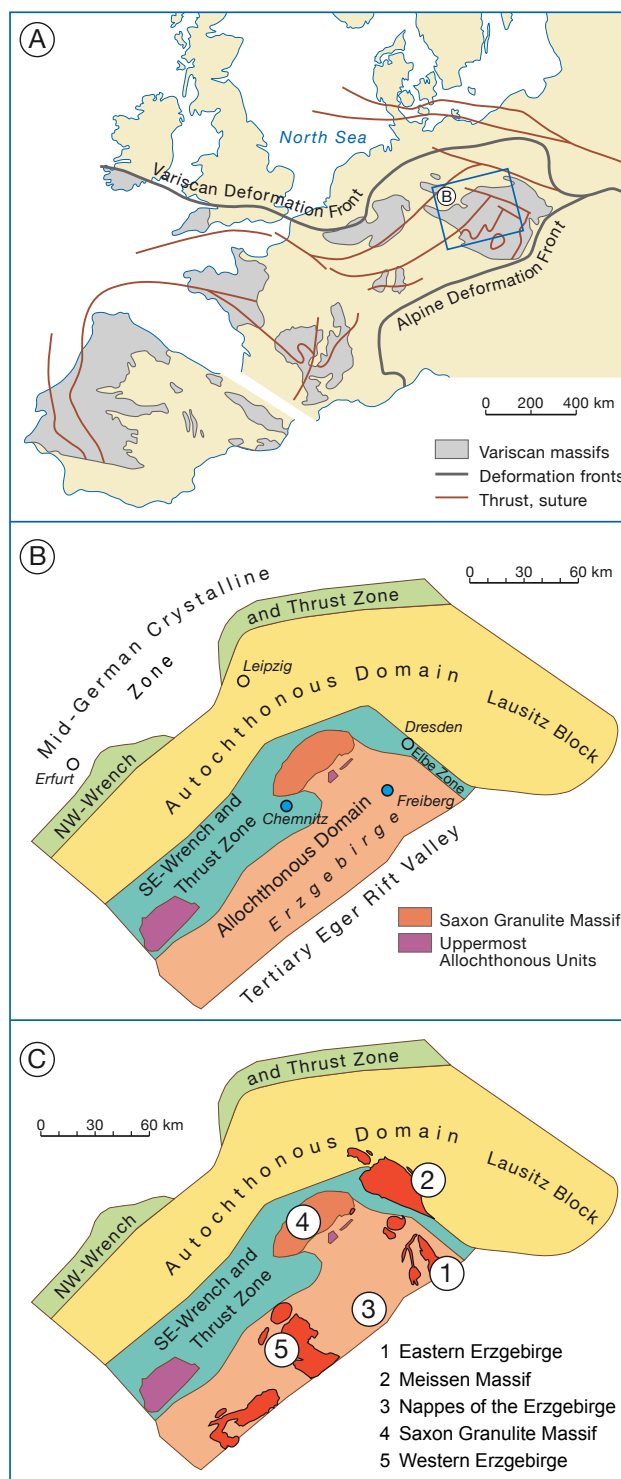
Oct. 7 - Oct. 13, 2012

The field workshop *Eurogranites 2012* will present the Variscan (Hercynian) granitic magmatism in the Erzgebirge (Saxony, Germany) – a classical metallogenetic province known for its granite-related Sn-W mineralization – and the tectonically related areas of the Elbe Fault Zone and the Saxon Granulite Massif. Granitic magmatism in the Erzgebirge is geochemically highly diverse including I-, S-, and A-type granites that co-occur in the same region and have been emplaced within a relatively short period of only a few 10 Ma in the Carboniferous.

The field workshop *Eurogranites 2012* will focus on the relation of different types of Late Palaeozoic granitic magmatism and the Variscan development of the Saxo-Thuringian Zone, i.e., (i) magmatism related to the nappe emplacement and exhumation of high-grade metamorphic crustal rocks, (ii) shallow-level magmatism post-dating the emplacement of the metamorphic nappes, and to a lesser extent (iii) felsic magmatism related to the post-Variscan reorganization of the stress field. NOTE, *Eurogranites 2012* will touch granite-related mineralizations only marginally, as this will be the focus of *Eurogranites 2013* (which will concentrate on granite-associated mineralization in the Erzgebirge and Cornwall, allowing for comparison of two major European ore provinces).

Geological setting of the Erzgebirge in the Variscan orogen. The Saxo-Thuringian Zone is structurally divided into three zones of contrasting Variscan overprint, i.e., an Autochthonous Domain with little or no Variscan overprint, an Allochthonous Domain with metamorphic nappes of contrasting P-T history (in part reaching UHT and UHP conditions), and a Wrench-and-Thrust Zone separating the Autochthonous and Allochthonous Domains. Variscan deformation in the Thrust-and-Wrench Zone allowed for the emplacement of rocks of the Allochthonous Domain from beneath the Bohemian Massif onto rocks of the Autochthonous Domain. The Erzgebirge and the Saxon Granulite Massif belong to the Allochthonous Domain. The Elbe Fault Zone is the structurally most distinct element of the Thrust-and-Wrench Zone.

Granitic magmatism related to the emplacement of the Variscan nappes. Emplacement of the nappes of the Erzgebirge and the Saxon Granulite Massif led to dextral strike-slip displacement along the deep-reaching Elbe Fault Zone between c. 340 Ma and 325 Ma. During these movements, the huge sigmoidal Meissen Pluton was emplaced. The complex includes a magmatic suite that starts with a diorite monzodiorite-monzonite suite and evolves



to increasingly stronger crustally influenced granites. A second group of granites related to nappe emplacement is exposed in the roof detachment of the Saxon Granulite Massif. Whereas the rocks of the Meissen Pluton carry an important mantle-derived component, the second group of granites represents crustal melts.

Granitic magmatism post-dating metamorphism in the Variscan nappes. The granites of the Erzgebirge are exposed along two zones, which are roughly parallel to the Elbe Fault Zone and strike at a high angle across the topographic trend, in the eastern and western Erzgebirge. They represent crustal melts and can be distinguished into five different types of magmatic suites that have been mostly emplaced between 327 and 318 Ma. The granites of the eastern Erzgebirge include a series of shallowly intruded I-, S-, and A-types granites. The most prominent feature of this magmatism is the Altenberg-Teplice complex, which includes volcanic and subvolcanic rocks and associated felsic dikes and highly evolved granite bodies of minor volume. The bulk of granites of the western Erzgebirge have been emplaced at a deeper level than those of the eastern Erzgebirge. Some of the western-Erzgebirge granites form larger composite plutons composed of texturally and geochemically distinct subintrusions. All these granites represent crustal melts and their large geochemical diversity within a small area reflects the lithological variability among the metamorphosed volcano-sedimentary rocks of the Variscan nappes that represent the granite source.

Felsic magmatism related to the post-Variscan reorganization of the stress field. With the erosion of the Variscan orogen and the westward migration of the focus of collisional activity, reorganization of the stress field resulted in the Saxo-Thuringian Zone in the formation of numerous graben structures and basins whose position was largely controlled by old deep-reaching fault zones. These basins with their volcanosedimentary fill and minor granitic intrusions developed mainly between 300 and 285 Ma. This magmatism also involved mantle sources. Subordinate magmatism in the deeply eroded Erzgebirge with minor granite intrusions and volcanic and subvolcanic rocks may be related to this reorganization of the stress field.

Metamorphic rocks of the Saxon Granulite Massif and the Erzgebirge. The exhumation path of the felsic and mafic UHT rocks of the Saxon Granulite Massif gets close to the dry granite solidus, whereas the felsic UHP rocks of the Erzgebirge locally carry microdiamonds. Key locations from both metamorphic areas are shown to high-light the relation between tectono-metamorphic development and granitic magmatism.

Conference fee

The fee of **720 Euro** per person includes accommodation, transportation, and meals during the fieldtrip (evening of Oct. 7 to morning of Oct. 13) and the Eurogranites 2012 guidebook.

Preliminary program

| Date | Geological Objective |
|------------------------------------|--|
| Sun-2012-10-07 (late afternoon) | Registration |
| Mon-2012-10-08 | Granites of the eastern Erzgebirge |
| Tues-2012-10-09 | Meissen pluton (Elbe Fault Zone) |
| Wed-2012-10-10 | HP and UHP rocks of the Erzgebirge; granite of Geyer |
| Thur-2012-10-11 | Saxon Granulite Massif; granite of Berbersdorf |
| Fri-2012-10-12 | Granites of the western Erzgebirge |
| Sat-2012-10-13 (morning) | Departure |

Notes:

- 1) Eurogranites 2012 starts in Freiberg and ends in Chemnitz (both Saxony). Both cities are easily reached by train from Dresden International Airport (DRS/EDDC) or Leipzig Halle Airport (LEJ/EDDP).
- 2) The excursion ends on Friday evening (about 5 p.m.); there will be a farewell-dinner at the Chemnitz Museum of Natural History, which hosts a spectacular petrified Permian forest. There is no program on Saturday.
- 3) Accommodation will be in hotels in Freiberg and Chemnitz, mostly in twin rooms (single rooms are available at extra cost).

Registration

Registration will be secured (on a first come – first serve basis) when the conference fee is received. There will be a maximum of 40 participants. Details about payment will be given in the **Second Circular** and on the web site www.gfz-potsdam.de/events/2012/eurogranites.

Deadlines

January 31, 2012: web site is active
 March 15, 2012: Second circular
 July 15, 2012: final registration and payment

Contact for registration and information

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