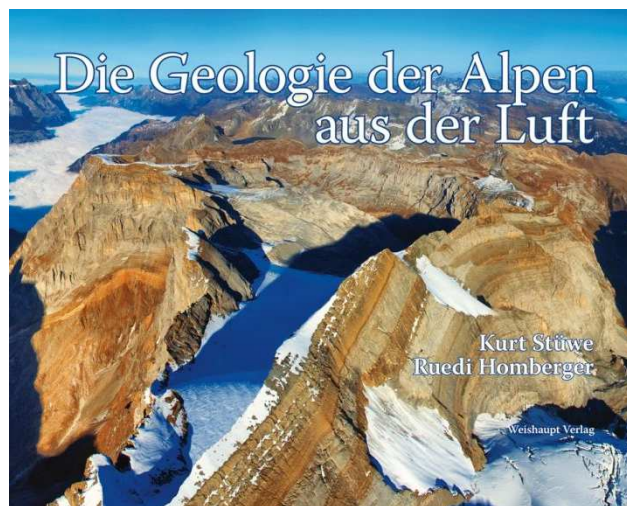




# GEODYNAMICS @ GRAZ

(Working Group Stüwe)

## Annual Report 2011



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<http://wegener.uni-graz.at>  
<http://www.alpengeologie.org>

## 1. GROUP MEMBERS

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### Kurt Stüwe

*Interests:* Tectonics, geodynamics, petrology, geomorphology  
*Funded by:* Department staff; kurt.stuewe@uni-graz.at

### Andreas Wölfler **(full time Postdoc 1.1.11 - 31.12.11; paternity leave since July 2011)**

*Interests:* Neotectonics, Low-T Geochronology  
*Funded by:* ESF FWF project I-152; andreas.woelfler@uni-graz.at

### Tamer Abu-Alam **(full time Postdoc 3.1.11 – 31.12.11)**

*Interest:* Metamorphic Geology of the Arabian-Nubian Shield  
*Funded by:* FWF P22351-N22 <May, “Geol of Sudan” >May); tamer.abu-alam@uni-graz.at

### Jörg Robl **(full time Postdoc 1.8.11 – 31.12.11)**

*Interest:* Numerical Modelling, remote sensing  
*Funded by:* Geology of Sudan (industry funded); joerg.robl@uni-graz.at

### Stefan Hergarten **(75% Postdoc 1.7.11 – 31.12.11)**

*Interest:* Geodynamics, numerical modelling  
*Funded by:* ESF FWF project I-152; stefan.hergarten@uni-graz.at

### Nicolas Legrain **(PhD student 1.1.11 – 31.12.11)**

*Interest:* Neotectonics, low-T geochron, Eastern Alps  
*Funded by:* ESF FWF project I-152; nicolas.legrain@uni-graz.at

### Angela Oswald **(PhD student 1.1.11 – 31.12.11)**

*Interest:* Neotectonics, low-T geochron, Sinai  
*Funded by:* FWF project P22351-N22; angela.oswald@uni-graz.at

### Mahmoud Hassan **(PhD student 12.1.11 – 11.7.11)**

*Interest:* Metamorphic Geology of Sinai  
*Funded by:* self supported by PAROWN Austria-Egypt; mahmoud.hassan@uni-graz.at

### Hassan Abbas **(MSc student 1.1.11 – 28.5.11)**

*Interest:* Structural geology of Eastern desert, Egypt  
*Funded by:* self supported by PAROWN Austria-Egypt

### Gustav Hanke **(MSc student 1.1.11 – 31.12.11)**

*Interest:* Neotectonics, low-T geochronology, Sinai  
*Funded by:* supported by FWF Forschungsbeihilfe Najd Fault System project

### Florian Dertnig **(Bachelor thesis completed in 2011)**

*Interest:* Structural geology, Hochschwab

## 2. RESEARCH PROJECTS WITH FUNDING IN 2011

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- TOPOALPS: 4D kinematics of the Neogene Eastern Alps

**Funding Institution:** ESF / FWF Project I-152 (PI Stüwe)

**Covered time:** 1.1.2011 - 31.12.2011

**Total Funding:** € 333.500 ( ~ € 100.000 in 2011)

**Activity:** PhD Legrain, Postdoc Wölfler, Hergarten; analytical work

- Exhumation Mechanisms of the Najd Fault System

**Funding Institution:** FWF Project P22351 (PI Stüwe)

**Covered time:** 1.1.2011 - 31.12.2011

**Total Funding:** € 333.500 ( ~ € 100.000 in 2010)

**Activity:** PhD Angela Oswald, Postdoc, Abu-Alam, MSc Hanke

- Geology of Sudan

**Funding Institution:** industry funded (SPmining Madrid)

**Covered time:** 1.5.2011 - 31.12.2011

**Total Funding:** € 200.000 spent in 2011

**Activity:** Landsat remote sensing, geological mapping geochron in Sudan and Chad

### 3. SCIENTIFIC PUBLICATIONS

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#### Articles in refereed journals:

- Abu-Alam, T. S., Stüwe, K., (2011). Polyphase strain caps. *Mineralogy and Petrology*, vol. 101, pp. 1-19. DOI: 10.1007/s00710-010-0141-7.
- Bruand, E., Gasser, D., Bonnand, P., Stüwe, K., (2011). The petrology and geochemistry of a metabasite belt along the southern margin of Alaska. *Lithos*, vol. 127, p. 282-297. DOI: 10.1016/j.lithos.2011.07.026.
- Gasser, D., Bruand, E., Stüwe, K., Foster, D., Schuster, R., Fügenschuh, B., Pavlis, T., (2011). Formation of a metamorphic complex along an obliquely convergent margin: Structural and thermochronological evolution of the Chugach Metamorphic Complex, southern Alaska. *Tectonics*, vol. 30, pp. 1-25. DOI: 10.1029/2010TC002776.
- Kurz, W., Wölfler, A., Rabitsch, R., Genser, J., (2011). Polyphase movement on the Lavanttal Faut Zone (Eastern Alps): reconciling the evidence from different geochronological indicators. *Swiss Journal of Geosciences*, 104, p. 323-343. DOI: 10.1007/s00015-011-0068-y.
- Wagner, T., (2011). Datierung fluviatiler Höhlensedimente mittels kosmogener Nuklide am Beispiel des Grazer Berglandes. *Die Höhle*, Jg./Vol. 62, Heft/Nr. 1-4.
- Wagner, T., Fritz, H., Stüwe, K., Nestroy, O., Rodnigh, H., Hellstrom, J., Benischke, R., (2011). Correlations of cave levels, stream terraces and planation surfaces along the River Mur – Timing of landscape evolution along the eastern margin of the Alps. *Geomorphology*, vol. 134, p. 62–78. DOI: 10.1016/j.geomorph.2011.04.024.
- Wölfler, A., Kurz, W., Fritz, H., Stüwe, K., (2011). Lateral extrusion in the Eastern Alps revisited: refining the model by thermochronological, sedimentary and seismic data. *Tectonics*, Vol. 30, pp. 15. DOI: 10.1029/2010TC002782.

#### Abstracts and conference presentations with publication year 2011:

##### EGU-POSTERS:

- Abu-Alam, T. S., Stüwe, K., Kadi, K., (2011). Pan-African exhumation mechanisms. *Geophysical Research Abstracts*, vol. 13, EGU2011-10307, EGU General Assembly 2011, Vienna, Austria. (poster)
- Eberlei, T., White, R., Johnson, T., Stüwe, K., Roffeis, C., (2011). High-precision geobarometry across the Plattengneiss shear zone in the Koralpe, Eastern Alps, Austria. *Geophysical Research Abstracts*, vol. 13, EGU2011-690-1, EGU General Assembly 2011, Vienna, Austria. (poster)
- Hamdy, M., Lebda, E., Abu-Alam, T. S., (2011). Thermodynamic constraints on metamorphism of ultramafic rocks from different tectonic settings at Gebel Arais and Gebel Malo Grim, Eastern Desert, Egypt. *Geophysical Research Abstracts*, vol. 13, EGU2011-10364, EGU General Assembly 2011, Vienna, Austria. (poster)
- Liang, W., Zhang, G., Bai, Y., Stüwe, K., (2011). Emplacement mechanism of Mishuling Pluton: Implications for the Late Indosinian Tectonic Evolution of Qinling Orogen. *Geophysical Research Abstracts*, vol. 13, EGU2011-7441-1, EGU General Assembly 2011, Vienna, Austria. (poster)

- Oswald, A., Stüwe, K., (2011). Analysis of Channel Profiles as an Indicator for Uplift in Sinai, Egypt. Geophysical Research Abstracts, vol. 13, EGU2011-8290, EGU General Assembly 2011, Vienna, Austria. (poster)
- Stüwe, K., Homberger, R., (2011). The Geology of the Alps from the Air. Geophysical Research Abstracts, vol. 13, EGU2011-8639, EGU General Assembly 2011, Vienna, Austria. (poster)
- Wölfler, A., Stüwe, K., Legrain, N., Fritz, H., (2011). Neogene denudation rates in the Eastern Alps as determined by low temperature thermochronology. Geophysical Research Abstracts, vol. 13, EGU2011-10101, EGU General Assembly 2011, Vienna, Austria. (poster)

#### EGU-TALKS:

- Legrain, N., Stüwe, K., Dixon, J. L., von Blanckenburg, F., Kubik, P., (2011). Large scale, small amplitude, post-Miocene surface uplift in the non-glaciated Eastern Alps: river profiles analysis and cosmogenic-derived  $^{10}\text{Be}$  denudation rates. Geophysical Research Abstracts, vol. 13, EGU2011-10708, EGU General Assembly 2011, Vienna, Austria. (talk)
- Stüwe, K., Legrain, N., Wölfler, A., Dunkl, I., Ehlers, T., (2011). New U-He ages from the Eastern Alps. Geophysical Research Abstracts, vol. 13, EGU2011-8617, EGU General Assembly 2011, Vienna, Austria. (talk)
- Wölfler, A., Kurz, W., Fritz, H., Stüwe, K., (2011). Lateral Extrusion in the Eastern Alps. Time constraints and plate tectonic control during Oligocene to Miocene times. Geophysical Research Abstracts, vol. 13, EGU2011-10128, EGU General Assembly 2011, Vienna, Austria. (talk)

#### OTHER CONFERENCE CONTRIBUTIONS:

- Bruand, E., Gasser, D., Stüwe, K., (2011). Fate of an Eocene HT metamorphic complex in a forearc location. Mineralogical Magazine, vol. 75 (3), Goldschmidt Conference, Prague, Czech Republic. (talk)
- Gasser, D., Bruand, E., Rubatto, D., Stüwe, K., (2011). The behaviour of monazite: a petrological, trace element and SHRIMP U-Pb study of greenschist facies phyllites to anatactic gneisses, Chugach Metamorphic Complex, Alaska. Swiss Geoscience Meeting, Zurich, Switzerland. (talk)
- Hergarten, S., Stüwe, K., (2011). Are there differences in the topographic characteristics of the Eastern and Western Alps? Abstract volume of the 7<sup>th</sup> TOPO-EUROPE Workshop, October 6-9 2011, Davos, Switzerland. (talk)
- Stüwe, K., Ehlers, K., Reynolds, J., (2011). Tectonic background to the economic potential of the Arabian-Nubian shield. Port Sudan Geo-Congress, October 9-10 2011, Port Sudan, Sudan.
- Stüwe, K., Legrain, N., Wölfler, A., Wagner, T., Hergarten, S., (2011). Young Uplift at the Eastern end of the Alps: Evidence and tectonic implications for the Alps-Pannonian Basin transition zone. Geological/Geophysical Meeting in Sopron, Hungary. (talk)

#### Books:

- Abu-Alam, T. S., (2011). Thermodynamic applications to geological problems: From microscopic to orogenic scale. VDM Verlag, 148 p. ISBN: 978-3-639-37819-1.
- Stüwe, K., Homberger, R., (2011). Geologie der Alpen aus der Luft. Weishaupt Verlag, 285 p. ISBN: 978-3-7059-0314-2. (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> edition in 2011)

## Public Relations Articles, talks and activities:

- Buchpräsentation “Geologie der Alpen aus der Luft”. Naturhistorisches Museum Wien, 10.02.2011.
- Buchpräsentation “Geologie der Alpen aus der Luft”. Gewächshäuser im Botanischen Garten der KFU Graz, 11.02.2011.
- Stüwe, K., Ehlers, K., Reynolds, J., (2011). Tectonic background to the economic potential of the Arabian-Nubian shield. Abstract in the Sudan Vision, an independent daily, Vol. 10, issue no. 2463, p. 4, October 8 2011.
- Stüwe, K., (2011). Geologie der Alpen aus der Luft Talk at Jahreshauptversammlung der ÖGG Wien 19.5.2011
- Stüwe, K., (2011). Geologie der Alpen aus der Luft Talk at Jahreshauptversammlung der Biologie Lehrer Oberösterreich, Gmunden 10.11.2011
- Gasser, D., (2011). Evolution of a metamorphic complex in space and time: A case study from the Chugach Metamorphic Complex, southern Alaska. Invited seminar talk, Department of Geology, University of Tromso, Norway. (talk)

## 4. TEACHING AND EDITING ACTIVITIES

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### EDITORIAL RESPONSIBILITIES

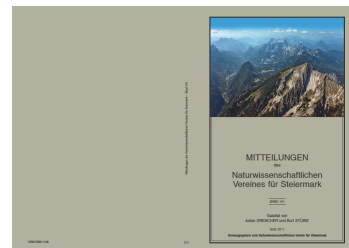
- Lecture Notes in Earth Science (Springer) (Chief Editor)
- Mitteil. des Naturwiss. Vereins für Steiermark (Editor: Earth Sci.)
- Mineralogy & Petrology (Associate Handling Editor)

### EDITORIAL BOARD MEMBERSHIPS

- Journal of Metamorphic Geology (editorial board member)
- Journal of the Virtual Explorer (editorial board member)
- Journal of Asian Earth Science (editorial board member)
- Austrian Journal of Earth Science (editorial board member)

### EDITED JOURNAL VOLUME

- Drescher A., and Stüwe K., 2011 (eds.) Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark, vol., 141, 272 p.



### UNDERGRADUATE TEACHING

(only regular weekly course lecturing listed)

*Einführende Exkursionen (2 days)*  
*Kristallingeologie (3 hours a week)*  
*Lithosphärenprozesse (2 hours a week)*  
*Geodynamics (1 hour a week)*  
*Neotektonik (2 hours a week)*  
*UZAG field workshop*

### FIELD WORK

- Saudi Arabia (Stüwe with Abu alam) 18.2.-28.2.
- Sinai (Stuewe with Abu alam, Oswald and Hanke) 8.5.-14.5.
- Sudan (Stüwe with Abu Alam 12.11. – 10.12.2011)