

Curriculum Vitae_Dr. Shuyun CAO - CV

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ACADEMIC BACKGROUND

Professional experience

- ◆ 07/2011- : Postdoctoral Fellow at the University of Salzburg within the Austrian Science Fund (FWF)-Lise Meitner position project. Project leader
- ◆ 09/2011-02/2012: Parental leave
- ◆ 11/2010-07/2011: Research fellowship at the University of Göttingen, Germany
- ◆ 12/2007-06/2010: Lab assistant work on X-ray texture goniometry in Göttingen University
- ◆ 04/2006-09/2007: Lab assistant work on OM, SEM/EBSD/EDX in China University of Geosciences (Beijing)
- ◆ 08/2002-09/2005: Lecturer. No. 2 Middle School of Zhuzhou Hunan. Teaching and Research

Education

- ◆ 10/2007-11/2010: Ph.D. in Geology, Geosciences Centre, University of Göttingen, Germany
Thesis title: “Cenozoic tectonic deformation, thermochronology and exhumation of the Diancang Shan metamorphic massif along Ailao Shan-Red River shear zone, southeastern Tibet, China” (Dr. Bernd Leiss, Prof. Junlai Liu, Prof. Dr. Bernt T. Hansen)
- ◆ 01/2005-06/2007: M.S. in Geology, College of the Earth Sciences and Resources, University of Geosciences (Beijing), China. Thesis title: “Microstructures and deformation mechanisms of high temperature mylonites in Diancang Shan, Western Yunnan. Master thesis. China University of Geosciences. (Prof. Junlai Liu)
- ◆ 1998.09-2002.07: B.S. in Geography, College of Resource and Environment Science, Hunan, Normal University, China.

Research statement

My research interests/ activity at present are mainly related to the following topics:

- ★ Deformational micro- and submicrostructures and textures of main rock-forming minerals and recrystallization mechanisms;
- ★ Structure and rheology of crustal-scale fault zones; deformation processes of strike-slip shear zones; recrystallization of mylonitic rocks during extensional faulting;
- ★ Metamorphism and exhumation processes of the high-grade metamorphic complexes respectively of metamorphic core complexes and geochronology;
- ★ Metamorphic core complexes.

I pursue my research interests through a combination of field investigation and analytical research.

My analytical research primarily involves structure, microstructures (OM), sub-microstructures (TEM), textures (SEM/EBSD, x-ray texture goniometry), thermochronology (Ar/Ar, SHRIMP & ICP-MS) and geothermometry (e.g., amphibolite and chlorite). This have led me to establish multidisciplinary collaboration and to work in major structural settings (strike-slip shear zones, fault zones and metamorphic core complexes) and on deformed rocks affected by a broad range of meso- and microstructural deformation, deformation temperature conditions and ages, in order to fully understand and quantify the dynamics of geological processes.

Education, Honors and Awards from 2005-2010

- 2011-2013: Lise-Meitner fellowship of the Austrian Science Fund
- 2007-2011: China Government research fellowship for Ph.D. study in Göttingen University
- 2007: Excellence Rank in M.Sc. degree of China University of Geosciences.
- 2007: Excellence Master Degree Thesis Award in China University of Geosciences
- 2006: SinoPec Company Award in SinoPec Company
- 2006: The First Award for the 13th China University of Geosciences postgraduate academic Symposium
- 2005: Excellence Award of postgraduate in China University of Geosciences;

Awarded or participation on some scientific projects, 2006-2010

➤ **Awarded projects:**

- **2011.7-2013.12:** the Austrian Science Fund (FWF)-Lise Meitner position project“Exhumation mechanisms of metamorphic core complexes: a test of some kinematic models”. To **CAO, S.Y.**
- **2010-2011:** Fundamental Research Funds for the Central Universities, China (Grant no. GPMR2009PY01) to **CAO, S.Y.**
- **2009.01-2010.12.** State Key Laboratory of Geological Processes and Mineral Resources (GPMR) China University of Geosciences. Grant no. GPMR200837 to **CAO, S.Y.**
- **2006.01-2008.12.** State Key Laboratory of Geological Processes and Mineral Resources (GPMR) China University of Geosciences. Grant No. GPMR200637 to **CAO, S.Y.** and Guan, H.M.

➤ **Cooperation application and participation on projects:**

- 2009.01-2011.12. National Natural Science Foundation, Grant No. 40872139. – Liu, J.L., **Cao, S.Y.**, Hu, L., Zhang, H.Y., Chen, M.Y..
- 2008.01-2010.12. National Natural Science Foundation, Grant No. 40772133. – Hu, L., Liu, J.L., **Cao, S.Y.**, J. M..

➤ **Main participation on projects:**

- 2005 - 2010: Geological Survey of China Projects, Grant no. 1212010661311 to Liu, J.L.
- 2003–2007: the Major State Basic Research Development Program of China (973 program), Grant No. 2002CB412607 to Liu, J.L.
- 2007–2009: Loftahammar-Linköping Deformation Zone, SE, Sweden. – Hansen, B., Vollbrecht, A., Leiss, B., Tanner, D.C., **Cao, S.Y.**
- 2008: The Project of Mont-Terri. –Leiss, B., Hansen, B., Vollbrecht, A., Wemmer, J., **Cao, S.Y.**

List of peer-reviewed full publications from 2006-2013

2013

CAO, S.Y., Neubauer, F., Bernroider, M., Liu, J.L., 2013. The lateral boundary of a metamorphic core complex: the Moutsounas shear zone on Naxos, Cyclades, Greece. *Journal of Structural Geology*. (accepted)

CAO, S.Y., Neubauer, F., Bernroider, M., Liu, J.L., Genser, J., 2013. Structures, microfabrics and textures of the Cordilleran-type Rechnitz metamorphic core complex, Eastern Alps. *Tectonophysics*, <http://dx.doi.org/10.1016/j.tecto.2013.06.025>. (In Press)

2012

Liu, J.L., Tang, Y., Tran, M.T., **Cao, S.Y.**, Li, Zh., Zhang, Z.C., Zhao, Z.D., Chen, W., 2012. The nature of the Ailao Shan-Red River (ASRR) shear zone: Constrains from structural, microstructural and fabric analyses of metamorphic rocks from the Diancang Shan, Ailao Shan and Day Nui Con Voi massifs. *Journal of Asian Earth Sciences*, 47: 231-251.

2011

Cao, S.Y., Liu, J.L., Leiss, B., Neubauer, F., Genser, J., Zhao, C.Q., 2011. Oligo-Miocene shearing along the Ailao Shan-Red River shear zone: constraints from structural analysis and zircon U-Pb geochronology of magmatic rocks in the Diancang Shan massif, SE Tibet, China. *Gondwana Research* 19, 975-993. DOI: 10.1016/j.gr.2010.10.006.

Cao, S.Y., Liu, J.L., Leiss, B., Vollbrecht, A., Genser, J., Neubauer, F., Zhao, C.Q., 2011. Initiation of left-lateral deformation along the Ailao Shan-Red River shear zone: new microstructural, textural and geochronological constraints from the Diancang Shan metamorphic massif, SW Yunnan, China. *International Geology Review* 54 (3), 348-367. DOI:10.1080/00206814.2010.543789.

Cao, S.Y., Neubauer, F., Liu, J.L., Genser, J., Leiss, B., 2011. Exhumation of the Diancang Shan metamorphic complex along the Ailao Shan-Red River belt, Yunnan, southwestern, China: evidence from ⁴⁰Ar/³⁹Ar thermochronology. *Journal of Asia Earth Science* 42, 525-550.

2010

Cao, S.Y., Liu, J.L., Leiss, B., 2010. Orientation-related deformation mechanisms of naturally deformed in amphibolite mylonite from the Diancang Shan, SW, Yunnan, China. *Journal of Structural Geology* 32, 606-622.

Cao, S.Y., Liu, J.L., Leiss, B., Zhao, C.Q., 2010. New zircon U-Pb geochronology from the post-kinematic granitic plutons in the Diancang Shan metamorphic massif along the Ailao Shan-Red River shear zone and its geological implications. *Acta Geologica Sinica* 84, 801-840.

Ni, J.L. Liu, J.L., Liu Y.X., Du, Y.M., Wang, Z.M., Han., Z.Z., **Cao, S.Y.**, 2011. Style of deep faulting and its control on the Paleogene basin evolved into the western Huimin depression, Eastern China. *Journal of China University of Petroleum* 35, 1-8.

Liu, J.L., Tang, Y., Xia, H.R., Guo, Q, Tran, M.D., **Cao, S.Y.**, Wu, H.J., Wu, W.B., Zhang, Z.C., Zhao, Z.D., 2010. High Temperature Strain Structures and Quartz C-Axis Fabrics from Mylonitic Rocks in the Ailaoshan-Red River Shear Zone, Yunnan, and Their Tectonic Implication. *Acta Geologica Sinica* 84, 1377-1390.

2009

Cao, S.Y., Liu, J.L., Leiss, B., 2009. Deformation microstructures and textures, and regional tectonic significance of high- temperature shearing of the Diancang Shan Complex, Yunnan, China. *Trabajos de Geología* 29, 147-155.

Cao, S.Y., Liu, J.L., Leiss, B., Vollbrecht, A., Zou, Y.X., Zhao, c.q., 2009. Timing of initiation of left-lateral shearing along the Ailao Shan-Red River shear zone: Microstructural, texture and thermochronological evidences from high temperature mylonites in Diancang Shan, SW China. *Acta Geologica Sinica*, 83(10):54-61.

2008

Ji, M., Hu, L., Liu, J.L., **Cao, S.Y.**, 2008. Dynamic recrystallization and metamorphic conditions of main rock-forming mineal. *Earth Science Frontiers*, 15(3): 226-233.

Liu, J.L., Wang, A.J., **Cao, S.Y.**, Zou, Y.X., Tang, Y., Chen, Y., 2008. Geochronology and tectonic implication of migmatites from Diancangshan, Western Yunnan, China. *Acta Petrologica Sinica*, 24(3): 413-420.

Liu, J.L., **Cao, S.Y.**, Zou, Y.X., 2008. EBSD analysis of rock fabrics and its application. *Geological Bulletin of China*, 27(10): 1638-1645.

2007

Cao, S.Y., Liu, J.L., Hu, L., 2007. Micro- and submicrostructural evidence for hightemperature brittle-ductile transition deformation of hornblende: Case study of high-grade mylonites from Diancangshan, western Yunnan. *Science in China, Series D: Earth Sciences* 10(50): 1459-1470.

Cao, S.Y., Liu, J.L., Hu, L., 2007. Micro- and submicrostructural evidence for high-temperature brittle-ductile transition deformation of hornblende: Case study of high-grade mylonites from Diancangshan, western Yunnan. *Science in China, Series D: Earth Sciences*, 37(8): 1004-1013.

Liu, J.L., **Cao, S.Y.**, Zhai, Y.F., Song, Z.J., Wang, A.J., Xiu, Q.Y., Cao, L., Guan, Y., 2007. Rotation of Crustal Blocks as an Explanation of Oligo-Miocene Extension in Southeastern Tibet—Evidenced by the Diancangshan and Nearby Metamorphic Core Complexes. *Earth Science Frontiers*, 14(4): 40-48

2006

Cao, S.Y., Liu, J.L., 2006. Modern techniques for the analysis of rock microstructures and fabrics: EBSD and its application. *Advances in Earth Science*, 21 (10): 1091-1096. (In Chinese and English abstract).

Liu, J.L., Guan, H.M., J, M., **Cao, S.Y.**, Hu, L., 2006. The Liaonan metamorphic core momplex: Constitution, structure and evolution. *Acta Geologica Sinica*, 80(4): 502-513.

Liu, J.L., Song, Z.J., **Cao, S.Y.**, et al., 2006. Dynamic setting and processes of tectonic and magmatic evolution of the oblique collision zone between Indian and Eurasian plates: exemplified by the tectonic evolution of the Three River region, eastern Tibet. *Acta Petrologica Sinica*, 22 (4): 775-786.

Thesis publications:

Cao, S.Y., 2010. Cenozoic tectonic deformation, thermochronology and exhumation of the Diancang Shan metamorphic massif along Ailao Shan-Red River shear zone, southeastern Tibet, China. Ph.D thesis. Goettingen University.

Cao, S.Y., 2007. Microstructures and deformation mechanisms of high temperature mylonites in Diancang Shan, Western Yunnan. Master thesis. China University of Geosciences.

Book co-edited:

Hu, L., Liu, J.L., Ji, M., **Cao, S.Y.**, Zhang, H.Y., Zhao, Z.Y., 2010. “Collective Drawings of Deformation Microsturcture”. Geology publishing company in China. P. 1-166.

Conference presentations latest several years

2013

- CAO, S.Y.** NEUBAUER, F., 2013. Geodynamic and structural controls on the exhumation of Cenozoic metamorphic core complexes: Application to the Alpine-Carpathian-Hellenic orogenic belt. 11th workshop of Alpine Geological Studies 2013. Schladming, Austria.
- CAO, S.Y.**, NEUBAUER, F., BERNROIDER, M. & GENSER, J., 2013. Temperature, microfabrics and mineral assemblages of low-grade shear zone: signification for deformation and rheology at the ductile-brittle transition. 18th International Conference on Deformation Mechanisms, Rheology & Tectonics DRT 2013 Leuven, Belgium. NEUBAUER, F., **CAO, S.Y.**, Structure and structural evolution of the Rechnitz window and adjacent units, Eastern Alps: changing Neogene extension directions due to motion around a foreland promontory. Geophysical Research Abstracts Vol. 15, EGU2013-6220, EGU General Assembly 2013, Vienna, Austria.
- CAO, S.Y.**, NEUBAUER, F., BERNROIDER, M. & GENSER, J., 2013. Taking the temperature of low-grade and very low-grade ductile fabrics: equilibrium and disequilibrium mineral assemblages. Geophysical Research Abstracts Vol. 15, EGU2013-4238, EGU General Assembly 2013, Vienna, Austria.
- CAO, S.Y.**, NEUBAUER, F., BERNROIDER, M., LIU, J.L., ., GENSER, J., 2013. A Cordilleran-type metamorphic core complex: Rechnitz window, Eastern Alps. Geophysical Research Abstracts Vol. 15, EGU2013-4162-1, EGU General Assembly 2013, Vienna, Austria.

2012

- CAO, S.Y.**, NEUBAUER, F., GENSER, J., BERNROIDER, M. & LIU, J.L., 2012. Constraints on progressive deformation from structural, microstructural and microfabric analysis of metamorphic rocks from the Rechnitz metamorphic core complex, Eastern Alps. PANGEO, Austria.
- CAO, S.Y.**, NEUBAUER, F., LIU, J.L., & GENSER, J. 2012. Diancang Shan metamorphic core complex along Ailao Shan-Red River (ASRR), SW Yunnan China: structural, thermochronological, microstructural and textural analysis and its implications for tectonic exhumation. PANGEO, Austria.
- CAO, S.Y.**, NEUBAUER, F., 2012. The lateral boundary of a metamorphic core complex: the Moutsounas shear zone on Naxos, Cyclades, Greece. Vol. 14, EGU2012-7573. EGU General Assembly, Vienna, Austria.
- CAO, S.Y.**, NEUBAUER, F., LIU, J.L., GENSER, J., 2012. Microfabrics and textures of the Rechnitz window, Eastern Alps. Vol. 14, EGU2012-7378, 2012, EGU General Assembly, Vienna, Austria.
- NEUBAUER, F., **CAO, S.Y.**, 2012. The brittle stage of the exhumation of a metamorphic core complex: Naxos, Cyclades, Greece and some general rules. Vol. 14, EGU2012-3897, EGU General Assembly, Vienna, Austria.

2010

- Cao, S.Y.**, Leiss, B., Liu, J.L., 2010. Calcite texture development: a-axis fibre texture types of marbles from the Diancang Shan complex along the Ailao Shan-Red River shear zone, SE Tibet, China. TSK^{13th}, Germany.
- Cao, S.Y.**, Liu, J.L., Leiss, B., 2010. New zircon U-Pb geochronology from pre-, syn- and post-kinematic granitic plutons: constraints on the timing of shearing along the Ailao Shan-Red River (ASRR) shear zone in the Diancang Shan (DCS) massif. TSK^{13th}, Germany.

2009

- Cao, S.Y.**, Liu, J.L., Leiss, B., Zhao, C.Q., 2009. New insights into the timing of left-lateral shearing along the Ailao Shan-Red River (ASRR) shear zone, SW of Yunnan, China--- constraints from textural and thermogeochronological analyses of tectonites from Diancang shan. P: 99. National Symposium on Petrology and Geodynamics, China.
- Cao, S.Y.**, A. Vollbrecht, B. Leiss, J. Liu, A.M. Kerkhof, 2009. Microstructural and textural evidences for mechanisms of grainsize reduction during syn-kinematic K-, Na- and Si-metasomatism in mylonites from the Paleoproterozoic granitic mylonites in the Loftahammar-Linköping Deformation Zone (SE-Sweden). Geophysical Research Abstracts, Vol. 11, EGU2009-12342, Vienna, Austria.
- Cao, S.Y.**, Liu, J.L., Leiss, B., Neubauer, F., Genser, J., 2009. Timing of initiation of left-lateral shearing along the Ailao Shan-Red River Shear Zone: microstructural and geochronological constraints from high temperature mylonites in Diancang Shan, SW China. Geophysical Research Abstracts, Vol. 11, EGU2009-8773-2, Vienna, Austria.
- Pennacchioni, G., Menegon, L., Leiss, B., **Cao, S.Y.**, Heilbronner, R., 2009. Rapid development of crystallographic preferred orientation compared to sluggish development of deformation microstructure in natural quartz veins during progressive simple shear at $T > 500^{\circ}\text{C}$. Geophysical Research Abstracts, Vol. 11, EGU2009-8139, Vienna, Austria.

2008

- Cao, S.Y.**, Leiss, B., Vollbrecht, A. Kerkhof, A.M., 2008. Structural and textural evidence for syn- to post-deformational K-, Na-, Si-metasomatism in Proterozoic mylonites from the Loftahammar-Linköping Deformation Zone (SE-Sweden). P: 428-430. National Tectonic and structure 4th conference, China.
- Cao, S.Y.**, Liu, J.L., Leiss, B., 2008. Structural geology and geochronological constraints on the structural evolution of Diancang Shan metamorphic complex, Yunan, China. P: 49-51. National Tectonic and structure 4th conference, China.
- Cao, S.Y.**, Leiss, B., October 2008. EBSD, X-Ray Texture Goniometry and Neutron Texture Goniometry analysis of rock fabrics and its application. (workshop). National Tectonic and structure 4th conference, China.
- Liu, J.L., **Cao, S.Y.**, 2008. EBSD analysis of rock fabrics and its application. Workshop before of National Tectonic and structure 4th conference, October, Beijing, China. (workshop). National Tectonic and structure 4th conference, China.
- Liu, J.L., **Cao, S.Y.**, Song, Z.J., Zou, Y.X., Zhai, Y.F., 2008. Mineral lattice preferred orientation and brittle-ductile deformation in mylonitic rocks. National Tectonic and structure 4th conference, October, Beijing, China. P: 441-442. National Tectonic and structure 4th conference, China.
- Hu, L., Ji, M., Liu, J.L., **Cao, S.Y.**, Zhang, H.Y., Zhao, Z.Y., 2008. Deformation Microstructure? . National Tectonic and structure 4th conference, October, Beijing, China. P: 435-436. National Tectonic and structure 4th conference, China.
- Cao, S.Y.**, Leiss, B., Liu, J.L., 2008. Structural geology of and geochronological constraints on the Diancang Shan metamorphic complex in China. P: 18-19. International Gondwana 13th conference.
- Cao, S.Y.**, Liu, J.L., Leiss, B., 2008. Deformation Microstructures and textures, and regional tectonic significance of high- temperature shearing of the Diancang Shan Complex, Yunnan, China. P: 241-246. International meeting of Yong Researches in Structural Geology and Tectonics

(YORSGET), Oviedo, Spain.

Cao, S.Y., Liu, J.L., Leiss, B., 2008. New evidences of dynamic recrystallization of hornblende in mylonites of lower amphibolite facies from Diancangshan along the Red river-Ailao Shan shear zone, SW Yunnan, China. TSK^{12th}, Germany.

2007

Cao, S.Y., 2007. Workshop on future application of Neutron Texture and powder diffraction in the Geosciences-FRM-II. Munich, Germany.

2006

Cao, S.Y., Liu, J.L., Hu, L., December. 2006. Twinning nucleation recrystallization (TNR): an important mechanism of dynamic recrystallization of hornblende in the brittle-ductile transition. The 13th postgraduate student learning reports in China University of Geosciences, Beijing, China.

Cao, S.Y., Liu, J.L., Hu, L., 2006. Twinning nucleation recrystallization (TNR): an important mechanism of dynamic of hornblende in the brittle-ductile transition. The 8th symposium on microstructures and fabrics. Guilin, China.

Cao, S.Y., Liu, J.L., October 2006. Micro- and submicro-structural evidences for deformation of hornblende in brittle-ductile transition-Case study of high metamorphic shear mylonites from Diancang Shan, western Yunnan. Continental tectonics, mineral resources and environment 7th conference. Beijing, China.