

Chao CHENG

PERSONAL INFORMATION

Postdoctoral Researcher

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EDUCATION

University of Graz, Austria

Ph.D. (Visiting student), Advised by Prof. Christoph Hauzenberger
Structural Geology, Metamorphic Petrology

Graz, Austria
Jul. 2021 - Oct. 2022

Northwest University, China

Ph.D., Advised by Prof. Yunpeng Dong, Prof. Shengsi Sun
Structural Geology, GPA: 3.77

Xi'an, China
Sep. 2016 - Jul. 2022

Northwest University, China

B.S., Advised by Prof. Yunpeng Dong
Geology

Xi'an, China
Sep. 2012 - Jul. 2016

RESEARCH EXPERIENCE

- Research title: Metamorphic evolution and P-T-D-t constraints of the middle-lower crustal metamorphic rocks in the North Qinling Orogenic Belt, central China.**
Research Project supervised by Prof. Christoph Hauzenberger

Jul. 2021 - Oct. 2022
- Research title: Multi-scale structural analyses and deformation processes of the Qinling Complex in the North Qinling Orogenic Belt, central China.**
Research Project supervised by Prof. Yunpeng Dong, Prof. Shengsi Sun

Sep. 2019 - Jul. 2022
- Research title: Kinematics, mineral fabrics and deformational mechanism of the Taibai ductile shear zone, Qinling Orogenic Belt, central China.**
Research Project supervised by Prof. Yunpeng Dong, Prof. Shengsi Sun

Sep. 2016 - Jul. 2019

RESEARCH INTERESTS

- Regional geology, structural mapping and multi-scale structural analyses.**
 The ductile shear zone is a fundamental structure within the continental orogen formed as a result of strain localization and concentration. Deformation and rheological mechanism analyses of deformed rocks and representative ductile shear zones are the keys to reconstructing the detailed evolution of the orogenic process. These objectives can be achieved by detailed multi-scale structural analyses coupled with P-T estimation and geochronology analyses.
- Minerals crystallographic preferred orientations and nanoscale deformation mechanism.**
 Different dislocation creep or slip systems in minerals are activated under different deformation conditions. By measuring the fabrics or CPOs of deformed minerals, the active slip system during deformation can be determined, thereby inferring the temperature and pressure conditions. According to the SEM and EBSD techniques, the lattice scale deformation characteristics of typical deformed rock-forming minerals can be obtained.
- Metamorphic evolution and P-T-D-t path of middle-lower crustal deformed rocks.**
 Compared to the upper mantle, the middle-lower crust is characterized by complex lithology and structure. Combining the deformation processes with the metamorphism evolution analyses of middle-lower crustal deformed rocks within the typical orogenic belt is significant to explore the rheology, growth, and deformation localization of continental lithosphere.
- Multiple isotope geochronology and monazite petromineralogy.**
 According to the different closure temperatures, various of isotopic systems, such as U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$, can be used to constrain the timing of geological events. In addition to minerals like zircon, mica, feldspar, and amphibole, monazite is a REE-bearing phosphate that commonly contains radioactive elements of Th, U, and Pb and can be used as a geochronometer. The idea is to analyze the texture and chemical composition of monazite via EPMA or ICP-MS techniques and explore its relationships with other minerals in order to restore its evolutionary process and geological significance.

TECHNICAL EXPERTISE

Professional expertise:

- [1] Field geological mapping and multi-scale structural analyses;
- [2] Quantitative microtectonic techniques of EBSD mineral fabrics and kinematic vorticity analyses;
- [3] Multiple geochronology analyses (Zircon U–Pb; Mica/Feldspar/Amphibole $^{40}\text{Ar}/^{39}\text{Ar}$; Monazite U–Th–Pb dating);
- [4] Metamorphic facies pseudosections modelling, EPMA analyses and geothermobarometry calculations.

• **Software:** Adobe Illustrator; CorelDRAW; Origin; Stereonet; Channel5; Perple_X; Mathematica; Matlab; ArcGIS; Gplates

• **Language:** English; Chinese

SCHOLARLY METRICS

[Google Scholar](#) as per May 3, 2023

Citations: 331 | h-index: 7 | i10-index: 6

PUBLICATIONS

- [1] **Cheng, C.**, Sun, S.S., Dong, Y.P., Zhang, B., Guo, Z., (2022). Exhumation of plutons controlled by boundary faults: Insights from the kinematics, microfabric, and geochronology of the Taibai shear zone, Qinling Orogen, China. *Geological Society of America Bulletin*, <https://doi.org/10.1130/B36073.1>
- [2] **Cheng, C.**, Sun, S.S., Dong, Y.P., (2019). Fabrics and geochronology of the Taibai ductile shear zone: Implications for tectonic evolution of the Qinling Orogenic Belt, central China. *Journal of Asian Earth Sciences*, 177: 1–16. <https://doi.org/10.1016/j.jseaes.2019.03.004>
- [3] Duan, M.Y., Neubauer, F., Robl, J., Zhou, X.H., Liebl, M., Argentin, A.L., Dong, Y.P., **Cheng, C.**, Zhang, B., Boekhout, F., Gonzales, D.B., (2023). Northeastward expansion of the Tibetan Plateau: Topographic evidence from the North Qinling Mts.–Weihe Graben Coupling system, Central China. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 111612. <https://doi.org/10.1016/j.palaeo.2023.111612>
- [4] Sun, S.S., Dong, Y.P., **Cheng, C.**, He, D.F., Zhou, B., Liu, X.M., (2022). Mesozoic intracontinental ductile shearing along the Paleozoic Shangdan suture in the Qinling Orogen: constraints from deformation fabrics and geochronology. *Geological Society of America Bulletin*, 134: 2649–2666. <https://doi.org/10.1130/B36293.1>
- [5] Hui, B., Dong, Y.P., **Cheng, C.**, Long, X.P., Liu, X.M., Sun, S.S., Zhang, F.F., Varga, J., (2017). Zircon U–Pb chronology, Hf isotope analysis and whole-rock geochemistry for the Neoproterozoic–Paleoproterozoic Yudongzi complex, northwestern margin of the Yangtze craton, China. *Precambrian Research*, 301: 65–85. <https://doi.org/10.1016/j.precamres.2017.09.003>
- [6] Sun, S.S., Dong, Y.P., Sun, Y.L., **Cheng, C.**, Huang, X.X., Liu, X.M., (2019). Re–Os geochronology, O isotopes and mineral geochemistry of the Neoproterozoic Songshugou ultramafic massif in the Qinling Orogenic Belt, China. *Gondwana Research*, 70: 71–87. <https://doi.org/10.1016/j.gr.2018.12.016>
- [7] Sun, S.S., Dong, Y.P., He, D.F., **Cheng, C.**, Liu, X.M., (2019). Thickening and partial melting of the Northern Qinling Orogen, China: insights from zircon U–Pb geochronology and Hf isotopic composition of migmatites. *Journal of the Geological Society*, 176(6): 1218–1231. <https://doi.org/10.1144/jgs2019-030>
- [8] Sun, S.S., Dong, Y.P., Liu, X.M., He, D.F., **Cheng, C.**, (2019). Fabrics, geothermometry, and geochronology of the Songshugou ophiolite: Insights into the tectonic evolution of the Shangdan suture, Qinling orogen, China. *Lithosphere*, 11(6): 784–803. <https://doi.org/10.1130/L1032.1>
- [9] Dong, Y.P., Sun, S.S., Santosh, M., Zhao, J., Sun, J.P., He, D.F., Shi, X.H., Hui, B., **Cheng, C.**, Zhang, G.W., (2021). Central China Orogenic Belt and amalgamation of East Asian continents. *Gondwana Research*, 100: 131–194. <https://doi.org/10.1016/j.gr.2021.03.006>
- [10] Dong, Y.P., Sun, S.S., Santosh, M., Hui, B., Sun, J.P., Zhang, F.F., Cheng, B., Yang, Z., Shi, X.H., He, D.F., Yang, L., **Cheng, C.**, Liu, X.M., Zhou, X.H., Wang, W., Qi, N., (2022). Cross Orogenic Belts in Central China: Implications for the tectonic and paleogeographic evolution of the East Asian continental collage. *Gondwana Research*, 109: 18–88. <https://doi.org/10.1016/j.gr.2022.04.012>
- [11] Hui, B., Dong, Y.P., Zhang, F.F., Sun, S.S., Liu, X.M., **Cheng, C.**, He, D.F., (2018). Geochronology and geochemistry of ca. 2.48 Ga granitoid gneisses from the Yudongzi Complex in the north-western Yangtze Block, China. *Geological Journal*, 54(2): 879–896. <https://doi.org/10.1002/gj.3396>
- [12] Shi, X.H., Li, T.T., Pei, L.X., Wang, Q.T., Hui, B., **Cheng, C.**, (2020). Transient Fluvial Incision in the Central Segment of the Lancang River Orogenic Belt, Yunnan Province, SW China. *Acta Geologica Sinica*, 94(5): 1728–1730. <https://doi.org/10.1111/1755-6724.14589>

PARTICIPATED GRANTS

- Title:** Structural Geology **Jan. 2021 - Dec. 2023**
Funding: National Natural Science Foundation of China (NSFC) Outstanding Young Scientists Program
- Title:** Rheological characteristics and deformation processes of the basement metamorphic rocks in the North Qinling Orogenic Belt **Jan. 2018 - Dec. 2021**
Funding: National Natural Science Foundation of China (NSFC)
- Title:** Deformation microstructural characteristics of the Songshugou ultramafic rocks, Eastern Qinling Orogenic Belt **Jan. 2015 - Dec. 2016**
Funding: Special Scientific Research Project of Education Department of Shaanxi Province

HONORS AND AWARDS

- Eurasia-Pacific Uninet Project 2020 (OeAD-GmbH, MPC) Scholarship, Austria **Aug. 2022-Oct. 2022**
- International Exchange Program of Northwest University, China **May 2022-Jul. 2022**
- Ernst Mach Grant Eurasia-Pacific Uninet (OeAD-GmbH, BMBWF) Scholarship, Austria **Jul. 2021-Feb. 2022**
- The **2nd Prize** of the Academic Scholarship for Ph.D. Students of Northwest University, China **Oct. 2021**
- The **1st Prize** of the Academic Scholarship for Ph.D. Students of Northwest University, China **Oct. 2020**
- The **1st Prize** of the Academic Scholarship for Ph.D. Students of Northwest University, China **Oct. 2019**

ACADEMIC ACTIVITIES

- The EGU General Assembly 2022 (EGU 2022) **Vienna, Austria**
Oral presentation **May 2022**
- Chinese Society for Mineralogy, Petrology and Geochemistry, the 9th National Metamorphic Rocks Professional Committee 2021 Symposium **Xi'an, China**
Field excursion **Apr. 2021**
- Annual Meeting of Chinese Geoscience Union (CGU 2020) **Chongqing, China**
Oral presentation **Oct. 2020**
- International Association for Gondwana Research 2019 Convention & 16th International Conference on Gondwana to Asia **Kochi, Japan**
Oral presentation **Nov. 2019**
- Annual Meeting of Chinese Geoscience Union (CGU 2019) **Beijing, China**
Oral presentation **Oct. 2019**
- 5th Young Scientist Forum of Earth Science **Nanjing, China**
Oral presentation **Oct. 2018**
- International Association for Gondwana Research 2018 Convention & 15th International Conference on Gondwana to Asia **Xi'an, China**
Poster presentation **Sep. 2018**

REFEREES

- Dr. Yunpeng Dong** **Professor, Supervisor of Ph.D. Degree**
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 Northern Taibai Street 229, Xi'an 710069, China
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- Dr. Shengsi Sun** **Professor, Associate Supervisor of Ph.D. Degree**
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 Northern Taibai Street 229, Xi'an 710069, China
 Tel.: +86 29 88303028, Email: shsun@nwu.edu.cn
- Dr. Christoph Hauzenberger** **Professor, Supervisor in University of Graz**
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