Dr Tobias Stephan

Postdoctoral associate Lakehead University Department of Geology Thunder Bay, ON, Canada

Email: tstephan@lakeheadu.ca

Website: https://tobiasstephan1.wixsite.com/tobi

ORCID: 0000-0002-9290-014X

1 EDUCATION

2019/03 **Doctor of Philosophy (PhD)** in "Geology"

Technische Universität Bergakademie Freiberg, Germany

Thesis: "Paleogeographic and Structural Control on the Arcuate Variscan Belt"

• Supervisors: Dr Uwe Kroner (Technische Universität Bergakademie Freiberg) and Prof Dr Rolf L. Romer (Geoforschungszentrum Potsdam)

2013/09 Master of Science (MSc) in "Geosciences" (major: Tectonics and Geochronology)

Technische Universität Bergakademie Freiberg, Germany

• Thesis: "Variscan Tectonics of the Schwarzburg unit (Central European Variscides): From a transform plate boundary zone to an orogenic wedge"

• Supervisor: Dr Uwe Kroner (Technische Universität Bergakademie Freiberg)

2010/09 **Bachelor of Science (BSc)** in "Geology and Mineralogy"

Technische Universität Bergakademie Freiberg, Germany

• Thesis: "Structural geology and sedimentology of the Tanne Greywacke Zone, Harz Mts., Germany"

• Supervisor: Dr Uwe Kroner (Technische Universität Bergakademie Freiberg)

2 PROFESSIONAL EXPERIENCE

2024/09-2024/12 **Sessional teacher**

Lakehead University, Department of Geology, Thunder Bay, ON, Canada

since 2023/04 Postdoctoral associate

Lakehead University, Department of Geology, Thunder Bay, ON, Canada

Project: NSERC Alliance Grant — "Structure, petrology, geochemistry, and geochronology of

the Moss Lake Au deposit, Northern Ontario, Canada"

Advisors: Dr Noah J. Phillips, Dr Peter Hollings

2020/12–2022/11 Postdoctoral associate (DFG Research Fellow)

University of Calgary, Geo- and Thermochronology Research Group, Department of Geoscience,

Calgary, AB, Canada

Project: DFG Research Fellowship — "Developing a statistical approach to analyze large paired

geo-thermochronological datasets with an application to the Canadian Cordilleras"

Advisor: Dr Eva Enkelmann

2020/03-2020/11 Postdoctoral associate

Friedrich-Alexander-Universität Erlangen-Nürnberg, Geozentrum Nordbayern, Erlangen, Germany Project: LfU Bayern & ERDF — "Integrated geophysical-structural-kinematic analysis of the

fault patterns in Northern Bavaria"

Advisors: Dr Daniel Koehn, Dr Harald Stollhofen

2019/09-2019/12 Teaching assistant

Technische Universität Bergakademie Freiberg, Institute for Computer Sciences, Freiberg, Germany

2014–2018 Research assistant

Technische Universität Bergakademie Freiberg, Institute for Geology

Project: BMBF ZIM — "Developing a method for three dimensional forecasting of covered mineral deposits on the example of the Erzgebirge", BMBF r4 — "Granite related mineralization of strategic metals (GEM) – conditions of mineralization and search criteria for hidden ore

bodies"

2014/01-2014/06 Geologist

Beak Consultants GmbH (Germany/Tanzania)

Field work in Tanzania, compilation for metallogenic database of Tanzania, GIS training to the

staff of the Geological Survey of Tanzania, Dodoma, Tanzania

2009–2013 Lab assistant

Technische Universität Bergakademie Freiberg, Institute for Geology

Rock processing and mineral separation for geochronological analyses (Ar-Ar, fission track, U-

Pb)

2011/07–2011/09 Teaching and research assistant (IAESTE student exchange)

Mongolian University of Science and Technology, Ulaanbaator, Mongolia

Field work in ophiolitic sequences of Western Mongolia

2007/05-2007/06 **Student internship**

GFZ German Research Center for Geosciences Potsdam, Department for Geomagnetism, Potsdam,

Germany

Contribution to the IGRF Declination Calculator, an online software for estimating the magnetic field declination, inclination, and intensity for any location on Earth and times since 1990

3 TEACHING EXPERIENCE

2024/09–2024/12 Structural Geology

Lakehead University, Department of Geology, Thunder Bay, ON, Canada

Course level: undergraduate | number of students: 20 | lecture hours per week: 5

2023/10 Short course: "Plate motion and deformation of the lithosphere" (1 week)

Department of Geology, Technische Universität Bergakademie Freiberg, Germany Course level:

postgraduate-graduate | number of students: 20 | lecture hours per week: 20

2022/09 Short course "Programming with R — A Beginners' Guide for Geoscientists" (1 week)

University of Calgary, Department of Geoscience, Calgary, AB, Canada

Course level: graduate | number of students: 8 | lecture hours per week: 12

2022/01 Guest lecture: "Structural geology"

University of Calgary, Department of Geoscience, Calgary, AB, Canada

Course level: undergraduate | number of students: 23 | lecture hours per week: 1

2019/09–2019/12 3D Modeling in Earth Sciences

Institute for Computer Sciences, Technische Universität Bergakademie Freiberg, Germany Course level: undergraduate | number of students: 20 | lecture hours per week: 4

2017/10–2018/03 "Specific Topics of Applied Geomodelling"

Department of Geophysics and Geoinformatics, Technische Universität Bergakademie Freiberg,

Germany

Course level: undergraduate | number of students: 20 | lecture hours per week: 2

2015–2018 Teaching assistant for field course "Strucutral Geology"

Department of Geology, Technische Universität Bergakademie Freiberg, Germany

2014/01–2014/05 Digital maps and GIS courses

Geological Survey of Tanzania, Dodoma, Tanzania

2011/07-2011/09 Teaching and field work assistant during geological mapping courses in Khangai Mnts., Mongolia

Mongolian University of Science and Technology, Ulaanbaator, Mongolia

Course level: undergraduate | number of students: 40

4 STUDENT MENTORSHIP

Graduate Perez, A., "Petrology and Geochemistry of the western Shebandowan Greenstone Belt (Superior

Province, Northern Ontario, Canada)"

Started: 2023/04, Lakehead University, Thunder Bay

Nwakanma, M., "Alteration and mineral paragenesis of the Moss Lake gold deposit (She-

bandowan Greenstone Belt, Superior Province, Northern Ontario, Canada)"

Started: 2023/04, Lakehead University, Thunder Bay

Müller, F., "Tectonic 3D model of the Berga Antiform, Saxothuringian Zone, Germany"

Completed: 2018/04/30, Technische Universität Bergakademie Freiberg

Undergraduate Tiitto, H. "Anatomy of an Archean terrane boundary: Structural analysis of the boundary

between the Quetico and Wawa Subprovinces (Superior Province)"

Started: 2023/08, Lakehead University, Thunder Bay

Unger, A., "Tectonics of low-grade metasedimentary rocks of the Vogtland near Klingenthal"

Completed: 2016/11/21, Technische Universität Bergakademie Freiberg

Miebach, I., "Geology of the Ollo de Sapo formation of Iberia — A compilation of tectonic,

geochronological, and geochemical data"

Completed: 2017/07/20, Technische Universität Bergakademie Freiberg

Hartmann, C., "Variscan tectonics of Devonian synorogenic sediments in Northwestern Corn-

wall / UK"

Completed: 2017/12/19, Technische Universität Bergakademie Freiberg

Lippke, H., "Geology of Cornwall"

Completed: 2018/03/12, Technische Universität Bergakademie Freiberg

Roethe, R., "Structural geology and petrography of the Eibenstock granite" Completed: 2014/09/25, *Technische Universität Bergakademie Freiberg*

5 ADDITIONAL TRAINING

2021–2022 Organization of the weekly *Thermochronology Seminar* at the University of Calgary

2018 Organization and field trip co-leader, Variscan tectonics of Cornwall, SE Britain

2016 Organization of the international workshop Late Paleozoic tectonic and magmatic evolution of the

Erzgebirge Complex, Germany, assistant and field trip co-leader

6 PUBLICATIONS

6.1 Peer-reviewed articles

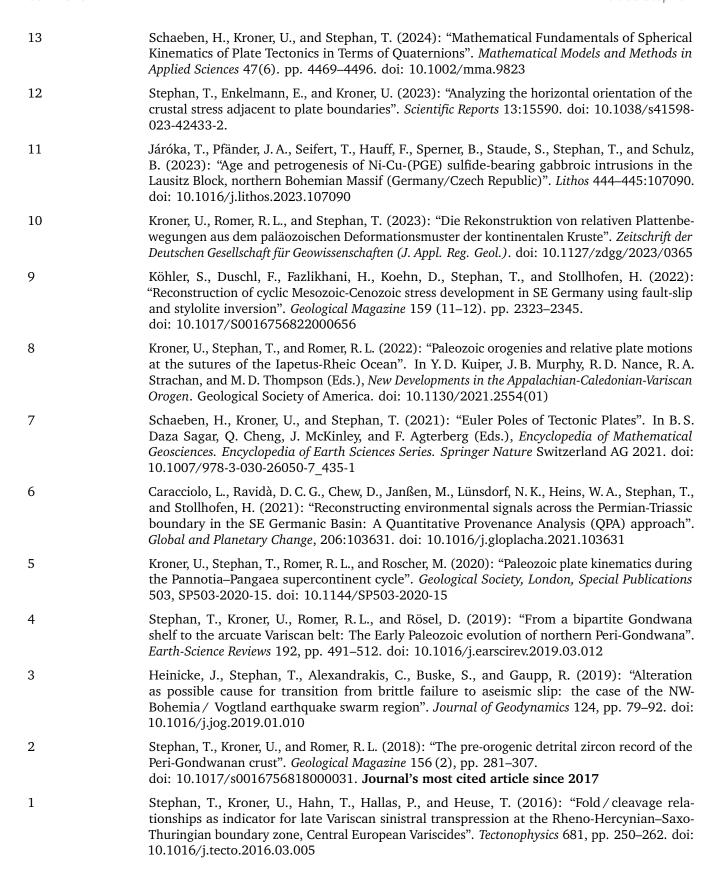
total times cited: $240^* (344^{\dagger})$ h-index: $5^* (7^{\dagger})$

- Stephan, T, and Enkelmann, E. (subm.): "All Aligned on the Western Front of North America?

Analyzing the Stress Field in the Northern Cordillera". submitted to Tectonics in July 2024.

^{*}Web of Science

[†]Google Scholar



6.2 Conference proceedings

37	Stephan, T. (2024): Testing the link between plate boundary obliquity and interplate deformation. <i>GSA 2024</i> , Anaheim, CA, USA
36	Enkelmann, E. and Stephan, T. (2024): Unveiling the Northern Cordilleran Puzzle: From the St. Elias to the Mackenzie Mountains. <i>GSA 2024</i> , Anaheim, CA, USA
35	Kroner, U. and Stephan, T. (2024): Kossmat's zonation of the Central European basement in the light of the current knowledge. <i>GeoSaxonia 2024</i> , Dresden, Germany
34	Tiitto, H., Stephan, T., and Phillips, N. J. (2024): Anatomy of an Archean terrane boundary: Structural analysis of the boundary between the Quetico and Wawa Subprovinces (Superior Province). <i>GAC-MAC 2024</i> , Brandon, MN
33	Stephan, T., Perez, A., Nwakanma, M., Phillips, N. J., Hollings, P. N., and Flindell, P. (2024): Chemical and structural constraints of shear-zone hosted gold mineralization from the Archean Shebandowan Greenstone Belt (Superior Craton, NW Ontario). <i>GAC-MAC 2024</i> , Brandon, MN
32	Stephan, T. (2024): Structural control of Gold Mineralization in the Archean Shebandowan Greenstone Belt (Superior Craton, NW Ontario). <i>Ontario Prospectors Exploration Showcase "Exploration finds Mines!"</i> , Thunder Bay, ON
31	Kroner, U., and Stephan, T. (2024): The Rocky Mountain Trench — the surface expression of a Late Devonian lithospheric scale strike-slip zone? <i>48th Cordilleran Tectonics Workshop</i> , Calgary, AB
30	Stephan, T., and Enkelmann, E. (2024): All aligned on the western front of North America? — Present-day deformation in the diffuse plate boundary zone of Alaska-Canadian Cordillera. <i>48th Cordilleran Tectonics Workshop</i> , Calgary, AB
29	Kroner, U., and Stephan, T. (2024): Initial Collision of Gondwana Promontories with Forming Laurasia — The Orogenic Record of Western Pangea in the Devonian. <i>Tectonics, Structural Geology and Crystalline Geology (TSK 20)</i> , Freiburg, GER
28	Kroner, U., Stephan, T., and Nagel, T. (2023): The Ellesmerian orogeny of Laurussia — A far-field effect of the late Devonian collision of Gondwana with North America. <i>GeoBerlin 2023</i> , Berlin, GER
27	Stephan, T., Perez, A., Phillips, N. J., Hollings, P. N., and Flindell, P. (2023): Structural control on gold mineralization in the Archean Shebandowan Greenstone Belt (Superior Craton, NW Ontario, Canada). <i>AGU 2023</i> , San Francisco, CA
26	Stephan, T., Enkelmann, E. (2023): Identifying stress anomalies in Alaska and the Canadian Cordillera using the spherical and statistical analysis of horizontal stress. <i>AGU 2023</i> , San Francisco, CA
25	Kroner, U., Stephan, T., Nagel, T. (2023): The Ellesmerian orogeny of Laurussia — A far-field effect of the late Devonian collision of Gondwana with North America. <i>GeoBerlin 2023</i> , Berlin, GER
24	Köhler, S., Duschl, F., Fazlikhani, H., Koehn, D., Stephan, T., and Stollhofen, H. (2023). Zooming into the transition between thrusting and strike-slip in an intra-continental compressional setting, <i>EGU General Assembly 2023</i> , Vienna, AT. doi: 10.5194/egusphere-egu23-13457
23	Stephan, T. and Enkelmann, E. (2022). What stresses the Canadian Cordillera? — Statistical analysis of the first-order intraplate stress field of western Canada, <i>2022 Canadian Tectonics Group Workshop</i> , 1 April 2022, virtual
22	Stephan, T. and Enkelmann, E. (2022). Statistical analysis of the first-order intraplate stress field of Alaska and the Canadian Cordillera, <i>EON-ROSE Scientific Workshop Series</i> , 25–28 April 2022, Nanaimo, BC, Canada
21	Schaeben, H., Kroner, U., and Stephan, T. (2022): Absolute and relative motion of three tectonic plates assuming two fixed Euler poles: I. Rotation of plates in terms of quaternions. <i>21st annual</i>

	conference of the International Association for Mathematical Geosciences (IAMG2022), 29 August $-$ 3 September 2022, Nancy, France
20	Schaeben, H., Kroner, U., and Stephan, T. (2022): Absolute and relative motion of three tectonic plates assuming two fixed Euler poles: II. Applications. <i>21st annual conference of the International Association for Mathematical Geosciences (IAMG2022)</i> , 29 August – 3 September 2022, Nancy, France
19	Kroner, U., Nagel, T., Stephan, T., and Romer, R. L. (2022): Late Devonian – Early Carboniferous Peri-Laurentian orogenies and the position of Mexican terranes. <i>2022 GAC-MAC-IAH-CNC-CSPG Joint Meeting</i> , Halifax, NS, Canada
18	Stephan, T., Kroner, U., Köhler, S., Koehn, D., Bauer, W., and Stollhofen, H. (2021). Lithospheric-scale anisotropies control first-order stress orientation during Cretaceous-Cenozoic plate kinematics in Western-Central Europe, <i>EGU General Assembly 2021</i> , online, 19–30 Apr 2021, EGU21-106. doi: 10.5194/egusphere-egu21-106
17	Duschl, F., Stephan, T., Köhler, S., Koehn, D., Stollhofen, H., and Drews, M. (2021). Compiling and correlating paleostress fields across Central Europe — A paleostress chart for northern Bavaria and adjacent areas. <i>EGU General Assembly 2021</i> , online, 19–30 Apr 2021, EGU21-106. doi: 10.5194/egusphere-egu21-10098
16	Kroner, U., Hallas, P., Stephan, T., and Romer, R. L. (2019): Superimposed structures during prolonged plate convergence — examples from the Central European Variscides. <i>GSA Annual Meeting</i> , Phoenix, Arizona, USA
15	Stephan, T., Kroner U., and Romer, R. L. (2018): The bipartite Early Paleozoic Gondwana shelf: paleogeographic control on the Sn-W mineralization along the Variscan-Appalachian orogenic belt. <i>GSA 2018</i> , Indianapolis, Indiana, USA
14	Stephan, T., Kroner U., and Romer, R. L. (2018): Multi-sample comparison of detrital zircon age spectra of Lower Paleozoic units from the Variscan-Appalachian orogenic belt. <i>GSA 2018</i> , Indianapolis, Indiana, USA
13	Stephan, T., Kroner U., and Romer, R. L. (2018): Sediment provenance control on the distribution of magmatic tin-tungsten mineralization — the Palaeozoic evolution of the northern Peri-Gondwana shelf. <i>Resources for Future Generations</i> — <i>RFG2018</i> , Vancouver, BC, Canada
12	Kroner, U., Stephan, T., and Romer, R. L. (2018): The architecture of the Variscan orogen – structural control of late and postorogenic Sn/W deposits. <i>Resources for Future Generations</i> — <i>RFG2018</i> , Vancouver, BC, Canada
11	Stephan, T., Kroner U., Romer, R. L., and Rösel, D., (2018): Early Palaeozoic evolution of the northern Peri-Gondwana shelf — reconsidering the sedimentary, magmatic and the tectonometamorphic record. <i>17th TSK</i> , Jena, Germany
10	Stephan, T., Hallas, P., Kirsch, M., Kroner, U., and Buske, S. (2018): Crustal-scale 3D modeling of the Allochthonous Domain of the Erzgebirge-Vogtland-Fichtelgebirge area, Saxo-Thuringian Zone. <i>17th TSK</i> , Jena, Germany
9	Heinecke, J., Alexandrakis, C., Stephan, T., and Buske, S. (2018): Die Triggerung der NW-Böhmischen Schwarmbeben: eine Diskussion zu den möglichen Ursachen. 78. Jahrestagung der Deutschen Geophysikalischen Gesellschaftät, Leoben, Austria
8	Stephan, T., Kroner, U., and Romer, R.L. (2017): Reconstruction of Early Palaeozoic Peri-Gondawna: insights from statistical analysis of the detrital zircon record. <i>GEOBremen2017</i> , Bremen, Germany
7	Stephan, T. and Kroner, U. (2017): The pre-orogenic detrital zircon record of the Variscan orogen: preliminary results. <i>EGU2017</i> , Vienna, Austria
6	Stephan, T., Kroner, U., and Hallas, P. (2016): Tectonic framework of Sn-W enriched magmatism: Examples from NW Iberia and SW England. <i>Erzgebirge Workshop</i> , Freiberg, Germany

5 Hallas, P., Stephan, T., Kirsch, M., and Kroner, U. (2016): The exhumation channel of the Erzgebirge: From heat advection to the emplacement of Sn-W enriched granites. Erzgebirge Workshop, Freiberg, Germany Stephan, T., Hallas, P., Kroner, U., and Buske, S. (2015): Crustal-scale 3D modelling of the 4 Allochthonous Domain of the Saxo-Thuringian Zone: constraints from the high-resolution 2D seismic profiles. Variscan 2015, Rennes, France 3 Stephan, T., Hallas, P., and Kroner, U. (2015): 3D modelling of the Variscan granites in the Erzgebirge-Vogtland-Fichtelgebirge area. CETEG2015, Kadaň, Czech Republic 2 Stephan, T., Kroner, U., Hahn, T., Hallas, P., and Heuse, T. (2014): Fold / Cleavage Relationships as Indicator for Sinistral Transpression in the Rheno-Hercynian-Saxo-Thuringian Boundary Zone, Central European Variscides. 15th TSK, Potsdam, Germany 1 Stephan, T. and Kroner, U. (2013): Variscan Tectonics of the Schwarzburg Unit (Saxo-Thuringian Zone): from a Transform Plate Boundary Zone to an Orogenic Wedge. GEOPilsen2013, Plzeň, Czech Republic

6.3 Other academic articles

Book

Legler, C., Barth, A., Knobloch, A., Mruma, A. H., Myumbilwa Y., Magigita, M., Msechu, M., Ngole, T., Stanek, K. P., Boniface, N., Kagya, M., Manya, S., Berndt, T., Stahl, M., Gebremichael, M., Dickmayer, E., Repper, C., Falk, D., and Stephan, T. (2015): "Explanatory Notes for the Minerogenic Map of Tanzania 1:1,5 M.", *Geological Survey of Tanzania*. ISBN: 978-9987-477-94-

7 INVITED PRESENTATIONS

2022/10/18 Lakehead University, Geology Seminar Series
 2022/05/11 Geological Survey Canada, McConnell Club Talks

8 SOFTWARE DEVELOPMENTS

tectonicr Free and open-source R package for modeling and analyzing the direction of the maximum

horizontal stress using relative plate motion (doi: 10.5281/zenodo.8372508).

Package website: https://tobiste.github.io/tectonicr/ Download: https://CRAN.R-project.org/package=tectonicr

structr Free and open-source R package for analyzing and visualizing orientation data for structural

geology. https://github.com/tobiste/structr

ptrotR Free and open-source R package for plate motion reconstruction. https://github.com/

tobiste/ptrotR

laftr Free and open-source R package to calculate the ages from LA-ICP-MS based fission track dating

using the zeta approach. https://github.com/tobiste/laftr

euler Free and open-source R package for describing plate motion in terms of quaternions.

https://github.com/tobiste/euler

euler.reco Free and open-source R package. Provides algorithms to find and evaluate the Euler pole

solution describing the orientation of geological structures.

https://github.com/tobiste/euler.reco

9 FUNDING, GRANTS, AND AWARDS

Grants 2020–2022 DFG Research Fellowship (85 000€) — German Research Foundation (DFG)

2016 Travel grant (750€) — Centre of Advanced Study and Research Freiberg
2013 Travel grant (500€) — TU Bergakademie Freiberg Association of Friends

2009 IAESTE Internship stipend — International Association for the Exchange of Students for

Technical Experience (IAESTE)

Awards Poster award at CETEG2015, Kadaň, Czech Republic, 2014

10 PROFESSIONAL SERVICES AND FELLOWSHIPS

Memberships The Geological Association of Canada (GAC), Canadian Tectonics Group (CTG)

Reviewer for journals Geology, Gondwana Research, Terra Nova, Geological Society of America, Proceedings of the Geologists' Association, Basin Research, Lithosphere

11 VOLUNTEER AND EXTRACURRICULAR ACTIVITIES

Committee board of the Jack Henderson Best PhD Thesis Award from the Canadian Tectonics Group of the GAC (2023, 2024)

Talaria Summer Institute (TSI) — a free summer STEM research mentorship program for female and genderqueer students (July 2022)

"MINT-Camp Future Skills" — Outreach program to high school students: I taught and demonstrated 3D modelling, visualization and applications in geosciences.

International Association for the Exchange of Students for Technical Experience (IAESTE), local committee Freiberg: I mentored international student during their stay as an intern/exchange student (2010–2013)

July 30, 2024