

# Curriculum Vitae

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Miriam Christina Reiss

## Professional Address

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## Appointments

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- Since 08/2023      **Junior Professor** for Volcano Seismology, Gutenberg University Mainz,  
Department of Geosciences
- 12/2018-  
04/2023      **Research Scientist** at Goethe University Frankfurt, Department for Geosciences  
  
PI of the SEISVOL project: fine-scale 3D observations of seismicity and the  
attenuation structure of the Natron Rift; large-scale mantle flow along the East  
African Rift System  
On maternity leave: 12/2020-09/2021
- 06/2018-  
11/2018      **PostDoc** at Yale University, Department of Geology & Geophysics  
  
Most comprehensive study to date on lowermost mantle flow from differential SKS-  
SKKS splitting
- 08/2014 –  
04/2018      **Research Associate** at Goethe-University Frankfurt, Department for Geosciences  
  
Development of teleseismic shear-wave splitting software SplitRacer; Application  
and waveform modelling in Madagascar and the Andes
- 09/2012-  
10/2013      **Student assistant** at Goethe-University Frankfurt, Department for Geosciences  
  
Seismicity source studies and field work within the SIMON project

## Education

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- 08/2014 -  
10/2017      **Ph.D. Degree** in Geosciences (Seismology) at Goethe-University Frankfurt,  
Germany  
Title: “Probing the Earth’s Interior with Shear-Wave Splitting: Methodological  
Advances and Application in Different Tectonic Settings”
- 10/2007-  
10/2013      **Staatsexamen** (Master equivalent) in English and Physics at Goethe-University  
Frankfurt, Germany

## Research Grants

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- 2019 -2021 (Co-) **PI** of 3 research proposals within TeMaS (Terrestrial Magmatic Systems) initiative  
University of Mainz, Frankfurt & Heidelberg, ~**13k €**
- 12/2018-  
04/2023 **PI** of the SEISVOL project – Seismic and Infrasound Networks to study the volcano Oldoinyo Lengai  
3-year DFG (German Research Council) research grant, ~**375k €**, extended due to maternity leave

## Awards and Commissions of Trust

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- 2020 **Member/ Representative of Scientific personal** of the appointment committee for the Geodynamics professorship at Goethe University Frankfurt
- 10/2019-  
04/2023- **Representative of Scientific personal** at the board meetings of the Institute for Geosciences (“Direktorium”) and the structural committee (advises the board on future directions)
- 2019-2020 **Co-Convener** for “Anisotropy from crust to core: Observations, models and implications” at EGU Assembly
- 06/2018-  
11/2018 **PostDoc Scholarship** by the DAAD (German Academic Exchange Service) to work at Yale University, US. ~20k €
- 2017 - **Reviewer** for Earth and Planetary Science Letters, G-Cubed, Geophysical Research Letters, Physics of the Earth and Planetary Interiors, FrontiersIn Earth Science, Annals of Geophysics, Seismological Research Letters, Swiss National Science Foundation, Nature Communications
- 10/2011-  
09/2013 **„Deutschland Stipendium“**, Goethe-University Frankfurt  
Scholarship to excellent students, 300 € monthly
- 2010 **DAAD Scholarship** for two semesters to study at Victoria University of Wellington. New Zealand. Tuition fee and cost of living. ~25 k€

## Field Experience

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- 09/2022- **Field crew member of Eifel Large-N seismic network, Germany.** Building and maintaining seismic stations, data handling.
- 02/2019 –  
06/2020 **SEISVOL project leader**, Tanzania. Building and maintaining seismic and infrasound stations, data handling.
- 09/10 2018 **Field crew member SEISConn, USA.** Servicing seismic stations.
- 11/2015-  
10/2017 **Leader of field crew for Frankfurt stations of the Alp Array project, Germany.** Building and servicing seismic stations, data handling.
- 01 & 10/2016 **Field crew member for FoMAs project, Cape Verdes.** Servicing and building seismic stations.
- 04/2013 **Field crew member for the SELASOMA project, Madagascar.** Servicing and building seismic stations.

## Teaching Experience

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- Since 2023      **Teaching in BSc/MSc Geoscience degrees:** Introduction to Quantitative Geosciences, Data Analysis in Geoscience, Introduction to Geophysics
- Supervisor** for BSc (4) and MSc (1) students
- 2019-2020      **Teaching & Supervising** Earthquake Localization Techniques to several Bachelor/Master students
- 2017              **Co-Supervisor** for two students, one MSc thesis on shear wave splitting in the western Alps & one BSc thesis on the seismicity of southern Madagascar
- 10/2014-        **Instructor “Geophysical Field Lab”**, experiment refraction seismics  
10/2016

## Invited Talks

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### Conferences

- A volcanic system in a young magmatic rift segment from top to bottom: the world’s only active carbonatite volcano Oldoinyo Lengai. **Keynote**, Physics of Volcanoes, Hannover, Germany, 2023.
- An interconnected plumbing system in a complex volcanic rift setting, IAVCEI 2023, Rotorua, New Zealand.
- The nature of seismicity in a complex volcanic rift setting, EGU 2022, Vienna, Austria.

### Seminars

- Seismicity in a young magmatic rift segment, University of Cologne, Germany, 2022.
- Seismicity and complex volcanic plumbing in the magmatic Natron Rift, Tanzania Rift and Rifted Margins Seminar, 2021, online.
- Seismic anisotropy: how to decipher the Earth's interior with shear-wave splitting, Syracuse University, USA, 2018
- Seismic anisotropy of the lithosphere and asthenosphere beneath southern Madagascar from teleseismic shear wave splitting analysis and waveform modelling, SisVoc, Mexico, 2016.

## Scientific Papers

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- Ebinger, C.J., **Reiss, M.C.**, Bastow, I., & Karanja, M.M. (2023). Shallow sources of upper mantle seismic anisotropy in East Africa, *Earth and Planetary Science Letters*, Volume 625, <https://doi.org/10.1016/j.epsl.2023.118488>
- Reiss, M.C.**, Massimetti, F., Laizer, A.S., Campus, A., Rumpker, G., Kazimoto, E.O. (2023). Overview of sesimo-acoustic tremor at Oldoinyo Lengai, Tanzania: Shallow storage and eruptions of carbonatite melt. *Journal of Volcanology and Geothermal Research*. <https://doi.org/10.1016/j.jvolgeores.2023.107898>
- Rumpker, G., Kaviani, A., Link, F., **Reiss, M.C.** & Komeazi, A. (2022). Testing observables for teleseismic shear-wave splitting inversions: ambiguities of intensities, parameters, and waveforms. *Annals of Geophysics*. <https://doi.org/10.4401/ag-8870>
- Reiss, M.C.**, Muirhead, J.D., De Siena, L. (2022). The interconnected magmatic plumbing system of the Natron rift. *GRL*, <https://doi.org/10.1029/2022GL098922>.
- Link, F., **Reiss, M.C.**, & Rumpker, G. (2022). An automatized XKS-splitting procedure for large data sets: Extension package for SplitRacer and application to the USArray. *Computers & Geoscience*, Volume 158, <https://doi.org/10.1016/j.cageo.2021.104961>.

- Reiss, M.C.**, Muirhead, J.D., Laizer, A.S., Link, F., Kazimoto, E.O., Ebinger, C.J. & Rumpker, G. (2021). The impact of complex volcanic plumbing on the nature of seismicity in the developing magmatic Natron rift, Tanzania. *FrontiersIn Earth Science*, <https://doi.org/10.3389/feart.2020.609805>. .
- Muirhead, J.D., Fischer, T.P., Oliva, S.J.,..., **Reiss, M.C.**, et al. Displaced cratonic mantle concentrates deep carbon during continental rifting. *Nature* 582, 67–72 (2020). <https://doi.org/10.1038/s41586-020-2328-3>.
- Reiss, M.C.** & M. D. Long (2019). Lowermost mantle anisotropy beneath Africa from differential SKS-SKKS shear-wave splitting. *Journal Geophys. Res. Solid Earth*, 124, 8, 8540-8564. <https://doi.org/10.1029/2018JB017160>..
- Hetényi, G., Molinari, I., Clinton, J., Bokelmann, G., ..., **Reiss, M.C.**, et al. (2018). AlpArray Seismic Network Team, AlpArray OBS Cruise Crew, and AlpArray Working Group: The AlpArray Seismic Network: A Large-Scale European Experiment to Image the Alpine Orogen. *Survey of Geophysics*, 39, pages 1009–1033, <https://doi.org/10.1007/s10712-018-9472-4> .
- Reiss, M.C.**, Rumpker, G. & I. Wölbern (2018), Large-scale trench-normal mantle flow beneath central South America, *Earth and Planetary Science Letters*, 482, 115-125, <https://doi.org/10.1016/j.epsl.2017.11.002> .
- Reiss, M.C.** & G. Rumpker (2017), SplitRacer: MATLAB Code and GUI for Semiautomated Analysis and Interpretation of Teleseismic Shear-Wave Splitting. *Seismological Research Letters* 88 (2A), 392-409, <https://doi.org/10.1785/0220160191>.
- Reiss, M.C.**, Rumpker, G., Tilmann, F., Yuan, X., Giese, J. and E. J. Rindraharisaona (2016). Seismic anisotropy of the lithosphere and asthenosphere beneath southern Madagascar from teleseismic shear wave splitting analysis and waveform modeling. *Journal Geophys. Res. Solid Earth*, <https://doi.org/10.1002/2016JB013020>. Citations: 24

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#### Selected Conference Abstracts

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|---|--------------------------|--|
| AG Seismologie<br>Freiburg                              | 2023,                    | <b>Reiss, M.C.</b> , Massimetti, F., Laizer, A.S., Campus, A., Rumpker, G., Kazimoto, E.O. Shallow melt storage and carbonatite eruptions: Seismo-acoustic tremor at Oldoinyo Lengai volcano, Tanzania   |
| IAVCEI<br>Zealand                                       | 2023, New                | <b>M.C. Reiss</b> , J.D. Muirhead, A.S. Laizer, F. Link, E.O. Kazimoto, C.J. Ebinger, G. Rumpker. An interconnected plumbing system in a complex volcanic rift setting.<br><b>M.C. Reiss</b> , A.S. Laizer, E.O. Kazimoto, G. Rumpker. Volcanic Tremor at Oldoinyo Lengai volcano  |
| 101st<br>Luxembourgeoises<br>Géodynamique<br>Luxembourg | Journées<br>de<br>(JLG), | <b>M.C. Reiss</b> , J.D. Muirhead, A.S. Laizer, F. Link, E.O. Kazimoto, C.J. Ebinger, G. Rumpker. The complex plumbing system of the developing magmatic Natron Rift   |
| EGU 2022, Vienna, Austria                               |                          | <b>M.C. Reiss</b> , J.D. Muirhead, A.S. Laizer, F. Link, E.O. Kazimoto, C.J. Ebinger, G. Rumpker. The nature of seismicity in a complex volcanic rift setting<br><b>M.C. Reiss</b> , J.D. Muirhead, L. De Siena. The complex plumbing system of Oldoinyo Lengai seen by 3D attenuation tomography<br>G. Rumpker, A. Kaviani, A.S. Laizer, <b>M.C. Reiss</b> , E.O. Kazimoto, E.O. Seismic signals of crater instability at Oldoinyo Lengai volcano, Tanzania |
| Physics of Volcanoes 2022,<br>online                    |                          | <b>M.C. Reiss</b> , J.D. Muirhead, L. De Siena, A.S. Laizer, F. Link, E.O. Kazimoto, C.J. Ebinger, G. Rumpker. The complex volcanic plumbing of the developing magmatic Natron rift, Tanzania.   |
| AGU 2021, New Orleans,<br>USA                           |                          | C.J. Ebinger, S. Aber, E.L. Chambers, A. Steiner, <b>M.C. Reiss</b> , S.J.C. Oliva, A. Gase, F. Illsley-Kemp. Crustal growth in continental rifts and flood volcanic provinces   |

EGU 2021, online	Y. Zhang, L. De Siena, B. Kaus, <b>M.C. Reiss</b> , C. Castro, A. Spang, P. Hering, A. Junge, T. Baumann. Synthetic seismic modeling and inversion for the Oldoinyo Lengai volcanic complex C. Castro, <b>M.C. Reiss</b> , A. Spang, P. Hering, L. De Siena, A. Komeazi, Y. Zhang, G. Rumpker, B. Kaus, A. Junge. Chasing the Magma Chamber: MT meets Geodynamics and Seismology-A numerical case study of magmatic plumbing at Oldoinyo Lengai Volcano
EGU 2020, online	<b>M.C. Reiss</b> , L. De Siena, G Rumpker, E. Kazimoto. Imaging active magmatic systems at Oldoinyo Lengai volcano (Tanzania) via earthquake distribution and seismic scattering and absorption mapping
Physics of Volcanoes, 2020, Hamburg, Germany	<b>M.C. Reiss</b> , L. De Siena, G Rumpker, E. Kazimoto. Imaging active magmatic systems at Oldoinyo Lengai volcano (Tanzania) via earthquake distribution and seismic scattering and absorption mapping
AGU 2019, San Francisco, USA	<b>M.C. Reiss</b> , F. Link, G. Rumpker, E. Kazimoto. First results of the SEISVOL project: Seismicity at Oldoinyo Lengai volcano, Tanzania C.J. Ebinger, <b>M.C. Reiss</b> , ..., et al. Mantle contributions to magma and strain localization in rift zones
28th meeting ESC working group "Seismic phenomena associated with volcanic activity", 2019, Garachico, Spain	<b>M.C. Reiss</b> , F. Link, G. Rumpker, E. Kazimoto. First results of the SEISVOL project: Seismicity at Oldoinyo Lengai volcano, Tanzania
EGU 2019, Vienna, Austria	<b>M.C. Reiss</b> & M.D. Long. Lowermost mantle anisotropy beneath Africa imaged by SKS-SKKS differential splitting
AGU 2018, Washington D.C., USA	<b>M.C. Reiss</b> & M.D. Long. Lower mantle structure beneath Africa imaged by SKS-SKKS differential splitting and travel time delays
EGU 2018, Vienna, Austria	<b>M.C. Reiss</b> , G. Rumpker & I. Wölbern. Large-scale trench-perpendicular mantle flow beneath central South America <b>M.C. Reiss</b> , G. Rumpker, F. Tilmann. The seismicity of southern Madagascar from the temporary SELASOMA network
AGU 2017, New Orleans, USA	<b>M.C. Reiss</b> , G. Rumpker & I. Wölbern. Large-scale trench-perpendicular mantle flow beneath northern Chile <b>M.C. Reiss</b> & G. Rumpker. SplitRacer – a new Semi-Automatic Tool to Quantify And Interpret Teleseismic Shear-Wave Splitting.
EGU 2017, Vienna, Austria	<b>M.C. Reiss</b> , G. Rumpker & I. Wölbern. Complex seismic anisotropy beneath northern Chile <b>M.C. Reiss</b> & G. Rumpker. SplitRacer – a semi-automatic tool for the analysis and interpretation of teleseismic shear-wave splitting.
DGG 2017, Potsdam, Germany	<b>M.C. Reiss</b> , G. Rumpker & I. Wölbern. Complex seismic anisotropy beneath northern Chile <b>M.C. Reiss</b> & G. Rumpker. SplitRacer – a semi-automatic tool for the analysis and interpretation of teleseismic shear-wave splitting
AGU 2016, San Francisco, USA	Giese, J., Reiss, M.C., Rindraharisaona, E.J., Rumpker, G., Schreurs, G., Tilmann, F.J., Yuan, X. Brittle reactivation of inherited late Neoproterozoic/Cambrian lithospheric-scale structures during extension and break-up of Madagascar from Africa
DGG 2016, Münster, Germany	<b>M.C. Reiss</b> & G. Rumpker. Rapid and joint analysis of shear-wave splitting with application to the Swiss network
AGU 2015, San Francisco, USA	<b>M.C. Reiss</b> , G. Rumpker, F. Tilmann, X. Yuan, E.J. Rindraharisaona. Seismic anisotropy of the lithosphere-asthenosphere system beneath southern Madagascar

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EGU 2015, Vienna, Austria **M.C. Reiss**, G. Rumpker, F. Tilmann, X. Yuan, E.J. Rindraharisaona:  
Seismic anisotropy of the lithosphere-asthenosphere system beneath  
southern Madagascar

DGG 2015, Hannover, Germany **M.C. Reiss**, G. Rumpker, F. Tilmann, X. Yuan, E.J. Rindraharisaona:  
Seismische Anisotropie des Lithosphären-Asthenosphären-Systems im  
südlichen Madagaskar

IASPEI 2013, Goteborg, Sweden **M.Reiss**, M. Lindenfeld, G. Rumpker: Application of array methods to  
the monitoring of induced and natural seismicity in the northern Upper  
Rhine Graben