

# Daniele A. Thallner

POSTDOCTORAL RESEARCH ASSOCIATE · DEPARTMENT OF GEOLOGICAL SCIENCES

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## Education

### University of Liverpool

Liverpool, UK

#### PHD IN ENVIRONMENTAL SCIENCES (GEOPHYSICS)

Class of 2022

- Thesis: A moment of weakness - the anomalous geomagnetic field in the Ediacaran period
- Advisor: Prof. Andrew J. Biggin

### University of Leoben

Leoben, Austria

#### MSc IN APPLIED GEOPHYSICS

Class of 2017

- Thesis: Palaeointensity of the geomagnetic field recorded in two multilevel archaeological sites in Austria
- Advisor: Dr. Elisabeth Schnepf

### University of Leoben

Leoben, Austria

#### BSc IN APPLIED GEOSCIENCES

Class of 2015

- Honors thesis advisor: Dr. Steiner-Luckabauer

## Professional Experience

2022-now	<b>Postdoctoral Research Associate</b> , University of Florida	Gainesville, USA
2016	<b>Graduate research Assistant</b> , GeoSphere	Vienna, Austria
2009-2015	<b>Undergraduate Research Assistant</b> , Dept. of Geophysics, University of Leoben	Leoben, Austria

## Publications

PUBLISHED - CITATIONS AS OF **12/13/2024**: GOOGLE SCHOLAR **283** , h-index: 9

### PEER-REVIEWED

- [11] Engbers, Y.A., **Thallner, D.**, Bono, R.K., Sprain, C.J., Murray, M., Bristol, K., Handford, B., Torsvik, T., and Biggin, A.J. (2024): A global paleosecular variation database for the Paleogene: stationary secular variation behavior since the Triassic?, *Geochemistry, Geophysics, Geosystems*, 25, <https://doi.org/10.1029/2023GC011203>
- [10] Dannberg, J., Gassmoeller, R., **Thallner, D.**, LaCombe, F., Sprain, C., (2024): Changes in core-mantle boundary heat flux patterns throughout the supercontinent cycle, *Geophysical Journal International*, <https://doi.org/10.1093/gji/ggae075>
- [9] **Thallner, D.**, Shcherbakova, V., Bakhmutov, V., Shcherbakov, V., Zhidkov, G., Poliachenko I., Biggin, A., 2022: New palaeodirections and palaeointensity data from extensive profiles through the Ediacaran section of the Volyn Basalt Province (NW Ukraine), *Geophysical Journal International*, 321, 474–492
- [8] van der Boon, A., Biggin, A., **Thallner, D.**, Hounslow, M., Bono, R., Nawrocki, J., Wójcik, K., Paszkowski, M., Königshof, P., de Backer, T., Kabanov, P., Gouwy, S., VandenBerg, R., (2022): A Persistent Non-uniformitarian Paleomagnetic Field in the Devonian? *Earth Science Reviews*, 231
- [7] Bono, R., Paterson, G., van der Boon, A., Engbers, Y., Grappone, M., Handford, B., Hawkins, L., Lloyd, S., Sprain, C., **Thallner, D.**, Biggin, A., (2022): The PINT database: A definitive compilation of absolute palaeomagnetic intensity determinations since 4 billion years ago, *Geophysical Journal International*, 229, 522–545
- [6] **Thallner, D.**, Biggin, A., McCausland, P., Fu, R., 2021: New palaeointensities from the Skinner Cove Formation, Newfoundland, suggest a changing state of the geomagnetic field at the Ediacaran-Cambrian transition. *Journal of Geophysical Research - Solid Earth*, 126
- [5] Lloyd, S., Paterson, G., **Thallner, D.**, Biggin, A., 2021: Improvements to the Shaw-type absolute palaeointensity method. *Frontiers in Earth Science*, 9, feart.2021.701863

- [4] **Thallner, D.**, Biggin, A., Halls, H., 2021: An extended period of extremely weak geomagnetic field suggested by palaeointensities from the Ediacaran Grenville Dykes (SE Canada), *Earth and Planetary Science Letters*, 568
- [3] Schnepf, E., **Thallner, D.**, Arneitz, P., Leonhardt, R., 2020: New archaeomagnetic secular variation data from Central Europe, II: intensities, *Physics of the Earth and Planetary Interiors*, 309
- [2] Shcherbakova, V., Bakhmutov, V., **Thallner, D.**, Shcherbakov, V., Zhidkov, G., Biggin, A., 2020: Ultra-low palaeointensities from East European Craton, Ukraine support a globally anomalous palaeomagnetic field in the Ediacaran, *Geophysical Journal International*, 220, 1928-1946.
- [1] Schnepf, E., **Thallner, D.**, Arneitz, P., Mauritsch, H., Scholger, R., Rolf, C., Leonhardt, R., 2020: New archaeomagnetic secular variation data from Central Europe. I: directions, *Geophysical Journal International*, 220, 1023-1044.

## TECHNICAL REPORTS

- [2] Kabanov, P., Abdi, W., Biggin, A., Bilot, I., van der Boon, A., Gouwy, S., Grasby, S., Minions, N., Percival, J., **Thallner, D.**, Twemlow, C., VandenBerg, R., 2023: Geological and geochemical data from Mackenzie corridor. Part XI: New geochemical, magnetic susceptibility, and X-ray diffraction data from the Horn River Group (Devonian) in cores and outcrops south of Norman Wells, Northwest Territories, Open File 8940, doi:10.4095/331201
- [1] Kabanov, P., VandenBerg, R., Gouwy, S., van der Boon, A., **Thallner, D.**, Biggin, A., 2019: Geological and geochemical data from Mackenzie corridor. Part X: reference sections of Middle-Upper Devonian strata at Prohibition Creek, Norman Range, Northwest Territories; Geological Survey of Canada, Open File 8648, doi:10.4095/321379

## IN REVIEW AND IN PREP

- Thallner, D.**, Paterson, G., Bishop, P., Holloway, A., Lloyd, S., *In Preparation*: New age constraints for a Scottish lime kiln from archaeomagnetic directions and intensities.
- Holliday, M., Sprain, C., Bristol, K., **Thallner, D.**, Cheong, H., *In Preparation*: Full vector paleomagnetism of clinkers in Powder Basin, Montana, USA.
- Thallner D.**, Dannberg J., Gassmoeller R., Bono R., Davies, C., Biggin, A., Maduri, D., Sprain S., *In Preparation*: The influence of small scale heat-flux patterns at the core-mantle boundary on the geodynamo.

## Awards, Fellowships, & Grants

2024	"Exploring geomagnetic spikes in archaeomagnetic records of the last 4000 years in Florida", NSF EAR Geophysics (rejected, in prep for resubmission)	\$474,028
2022	Geomagnetism, Paleomagnetism, and Electromagnetism Section Postdoc grant, American Geophysical Union	\$ 615
2022	Magnetic interactions 2022 - Best poster Award, University of St. Andrews, UK	
2017	Travel grant, University of Minnesota Institute of Rock Magnetism	\$ 250
2016	AAPG Imperial Barrel Award, Finalist	

## Presentations

\* presenting author; + mentored undergraduate; \* included travel grant

## INVITED TALKS

- [6] *The Influence of Mantle Convection on Earth's Geomagnetic Field Observables*. Computational Infrastructure for Geodynamics 2024 webinar series. (online) UC Davis, CA, USA. April 2024.
- [5] *Coupling Mantle Convection and Geodynamo Simulations to Understand the Influence of Mantle Dynamics on the Generation of Earth's Magnetic Field Throughout the Plate Tectonic Cycle*. \* MagIC Workshop 2023 - Scripps Institution of Oceanography, UCSD, La Jolla, CA, USA. March 2023.
- [4] *The anomalous geomagnetic field at the Ediacaran-Cambrian transition – how much do we really know?*\* CEED Seminar Series - University of Oslo, Oslo, Norway. November 2022.
- [3] *Evaluating the anomalous palaeomagnetic field behavior at a critical time of Earth's evolution - the Ediacaran period (635-538 Ma)*. Geological Sciences Seminar Series, University of Florida, Gainesville, FL, USA. January 2022.

- [2] *Evaluating anomalous palaeomagnetic field behaviour in the Ediacaran with new palaeointensity data from Laurentia*. GAC-MAC Annual Meeting. (online) Western University, London, ON, Canada. November 2021.
- [1] *The anomalous palaeomagnetic field in the Ediacaran*. 25<sup>th</sup> International Conference on Geomagnetism, Paleomagnetism and Rock Magnetism. Russian Academy of Sciences, Moscow, Russia. October 2019.

## CONFERENCE PRESENTATIONS

- [16] **Thallner D.**, Sprain S., Dannberg J., Gassmoeller R., Bono, R., Davies C., Meduri D., Biggin A.: The effect of spatially heterogeneous core-mantle boundary heat flux pattern variations on paleomagnetic observables, AGU Fall Meeting, 9-13 December 2024, Washington DC, USA
- [15] **Thallner D.**, Sprain S., Dannberg J., Gassmoeller R., Bono, R., Davies C., Meduri D., Biggin A.: The Influence of Spatially Heterogeneous Core-Mantle Boundary Heat Flux on Earth's Geodynamo, Magnetic Interactions, 4-5 January 2023, Leeds, UK
- [14] **Thallner D.**, Sprain S., Dannberg J., Gassmoeller R., Bono, R., Davies C., Meduri D., Biggin A.: The Influence of Spatially Heterogeneous Core-Mantle Boundary Heat Flux on Earth's Geodynamo, AGU Fall Meeting, 11-16 December 2023, San Francisco, USA
- [13] **Thallner D.**, Sprain S., Dannberg J., Gassmoeller R., Davies C., Meduri D., Biggin A., Ritchie C.<sup>+</sup>, LaCombe F.<sup>+</sup>, Bono R., Engbers Y.: Quantifying the Influence of Mantle Convection on Extreme Anomalies in long-term Geomagnetic Field Behavior, Magnetic Interactions, 5-6 January 2023, Cambridge, UK
- [12] **Thallner D.**, Sprain S., Dannberg J., Gassmoeller R., Davies C., Meduri D., Biggin A., Ritchie C.<sup>+</sup>, LaCombe F.<sup>+</sup>, Bono R., Engbers Y.: Quantifying the Influence of Mantle Convection on Extreme Anomalies in long-term Geomagnetic Field Behavior, AGU Fall Meeting, 11-16 December 2022, Chicago, USA
- [11] LaCombe, F.<sup>+</sup>, Dannberg, J., Gassmoeller, R., Sprain, C., **Thallner, D.**: Changing Patterns in Core-Mantle Boundary Heat Flux Throughout the Past Billion Years of Earth's History, AGU Fall Meeting, 11-16 December 2022, Chicago, USA
- [10] Ritchie, C.<sup>+</sup>, **Thallner, D.**, Sprain, D., Dannberg, J., Gassmoeller, R., Davies, C., Meduri, D., Biggin, A., LaCombe, F., Bono, R., Engbers, Y.: Can Paleomagnetism Be Used to Distinguish Between Changes in Core Structure and Mantle Convection?, AGU Fall Meeting, 11-16 December 2022, Chicago, USA
- [9] **Thallner D.**, Biggin A., Hill M., Halls H., McCausland P.J.A., Shcherbakova V., Shcherbakov V., Bakhmutov V.: When did the inner core form? Insights from the characterisation of the geomagnetic field in the Ediacaran period (538-635 Ma), Magnetic Interactions, (online) 6-7 January 2022, St. Andrews, UK
- [8] **Thallner D.**, Biggin A., Hill M., Halls H., McCausland P.J.A., Shcherbakova V., Shcherbakov V., Bakhmutov V.: Evaluating the anomalous palaeomagnetic field behaviour at a critical time of Earth's evolution - the Ediacaran period (538-635 Ma), UK SEDI, 12 November 2021, London, UK
- [7] **Thallner D.**, Biggin A., Hill M., Halls H., McCausland P.J.A., Shcherbakova V., Shcherbakov V., Bakhmutov V.: Evaluating the anomalous palaeomagnetic field behaviour in the Ediacaran with new palaeointensity data from Laurentia and Baltica, Magnetic Interactions, (online) 7-8 January 2021, St. Andrews, UK
- [6] **Thallner D.**, Biggin A., Halls H.: Extremely low geomagnetic field strength recorded in the Ediacaran Grenville Dykes., AGU Fall meeting 2020, Online, 1-17 December 2020, GP008-0007
- [5] **Thallner D.**, Biggin A., Hill M., Halls H., McCausland P.J.A., Shcherbakova V., Shcherbakov V., Bakhmutov V.: Evaluating the anomalous palaeomagnetic field behaviour in the Ediacaran with new palaeointensity data from Laurentia and Baltica, EGU20, Online, 4-8 May 2020, EMRP3.5-D1277, DOI: 10.5194/egusphere-egu2020-9121
- [4] **Thallner D.**, Biggin A., Hill M., Halls H., McCausland P.J.A., Shcherbakova V., Shcherbakov V., Bakhmutov V.: The anomalous palaeomagnetic field in the Ediacaran. Ultra-low palaeointensities from Laurentia and Baltica, Magnetic Interactions, 3-4 January 2020, Southampton, UK
- [3] Sprain<sup>\*</sup>, C., Lamers, R., Feinberg, J., Hurst, E., Biggin, A., Bono, R., **Thallner, D.**, Paterson, A.: Paleomagnetic Characterization of North American Clinker Deposits: Reliable Full Vector Recorders for the Quaternary, AGU Fall meeting 2019, 9-13 December 2019, San Francisco, USA
- [2] **Thallner, D.**, Biggin, A., Hill, M.: What on Earth was the geomagnetic field doing just before the Cambrian explosion of life?, British Geophysical Association's PGRiP, 13-14 September 2018, Cardiff, UK
- [1] **Thallner, D.**, Biggin, A., Hill, M.: What on Earth was the geomagnetic field doing just before the Cambrian explosion of life?, Magnetic Interactions, January 2017, Oxford, UK

## Teaching Experience

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University of Florida, Gainesville, FL, USA

- 2023, 2024 **GLY4450/5455 Introduction to Geophysics**, Instructor of record
- 2022, 2023 **GLY2030C Environmental/Engineering Geology**, Instructor of record
- 2022 **GLY4930/6932 Introduction to simulation for Earth Scientists**, Instructor

University of Liverpool, Liverpool, Merseyside, UK

- 2019, 2020 **ENVS300/400 Geophysical Project**, Course Assistant
- 2018 **ENVS598 Global Geophysics and Geodynamics**, Teaching Assistant
- 2018 **ENVS562 Geophysics Field School**, Teaching Assistant
- 2017 **ENVS343 Signal Processing and Seismic Analysis**, Teaching Assistant

University of Leoben, Leoben, Styria, Austria

- 2011-2016 **170.021 Numerical Methods 1**, Teaching Assistant
- 2011-2016 **150.002 Algorithms and Programming**, Teaching Assistant

## Mentoring

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University of Florida, Gainesville, FL, USA

- 2021-2024 **Katie Bristol**, Graduate student mentor
- 2021-2024 **Mckenna Holliday**, Graduate student mentor
- 2021-2024 **Hee Jun Cheong**, Graduate student mentor
- 2021-2023 **Chloe Ritchie**, Undergraduate Research Assistant co-supervisor
- 2021-2023 **Frederick LaCombe**, Undergraduate Research Assistant co-supervisor

University of Liverpool, Liverpool, Merseyside, UK

- 2019 **Anna Holloway**, Senior thesis co-supervisor
- 2019 **Essa Jamal Alhussaini**, Senior thesis co-supervisor
- 2019 **Salim Al Rashidi**, Senior thesis co-supervisor

## Service and Outreach

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- 2024 **NSF EAR Geophysics**, Panel member
- 2023 **AGU Fall meeting 2024**, GP011: Interfacing Paleomagnetism and Geodynamo Modelling: Insights, Observations and Applications, Session convener
- 2022-2024 **AGU Outstanding Student Presentation Award**, GPE section, Volunteer Judge
- 2019-2024 **MagNetZ online seminar series**, Organisation team member
- 2021-2023 **Tectonic TailGators**, UF Geology department gameday tailgate organizer
- 2021-2024 **Can you dig it? - Florida Museum of Natural History**, Volunteer Exhibitor
- 2021-2024 **TESI Scientist in Every Florida School (SEFS)**, Guest Lecturer
- 2019-2020 **Royal Society Summer Science Exhibition**, Volunteer Exhibitor
- 2015 **Austrian Refugee Coordination**, Volunteer language teacher (German/English)

Career Development:

- 2023 **Demystifying the NSF Proposal Writing Process**, University of Florida
- 2019 **Internal Earth doctoral training course**, École de Physique des Houches
- 2019 **Writing Research Grant Applications**, Parker Derrington Ltd
- 2018 **Summer School in Rock Magnetism**, University of Minnesota Institute of Rock Magnetism
- 2012 **Drilling and blasting operations field course**, University of Leoben

## Peer Review:

- 2022,2024 **Nature Communications**, reviewer
- 2024 **Gondwana Research**, reviewer
- 2024 **Physics of the Earth and Planetary Interiors**, reviewer
- 2023 **Frontiers in Earth Science**, reviewer
- 2022 **Problems of Geocosmos**, reviewer

## Professional Memberships

- 2019-2024 **American Geophysical Union**, GPE section member
- 2019-2021 **European Geosciences Union**, member
- 2017-2021 **Royal Astronomical Society**, fellow

## Field Experience

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2024	<b>Shenandoah National Park, Virginia, USA</b> , Paleomagnetic sampling	<i>2 weeks</i>
2023	<b>Badlands, Montana, USA</b> , Magnetostratigraphic sampling	<i>2 weeks</i>
2019	<b>Mackenzie Valley, Canada</b> , Magnetostratigraphic sampling	<i>2 weeks</i>
2018	<b>Custer National Forest - Ashland, USA</b> , Paleomagnetic sampling	<i>2 weeks</i>
2018	<b>Volyn Oblast, Ukraine</b> , Paleomagnetic sampling	<i>2 weeks</i>
2017	<b>Quebec, Canada</b> , Paleomagnetic sampling	<i>2 weeks</i>
2017	<b>Styria, Austria</b> , GPR exploration (fieldwork leader)	<i>3 days</i>
2016	<b>Basel, Switzerland</b> , Seismic exploration	<i>3 weeks</i>
2015	<b>Thunau, Austria</b> , Archaeomagnetic sampling (fieldwork leader)	<i>3 days</i>
2013	<b>Bavaria, Germany</b> , Archaeomagnetic sampling	<i>3 days</i>
2013	<b>Eskişehir, Turkey</b> , Geomagnetic exploration	<i>4 weeks</i>