

CONSTANZA RODRIGUEZ PICEDA

• Postdoctoral fellow in geocomputing and earthquake hazard •

PERSONAL PROFILE

I am a geoscientist with a research focus ranging from the impact of complex fault networks on earthquake processes to the relationship between lithospheric structure and observed seismic deformation. My work spans multiple scales, from simulating seismic cycles in faults to exploring the thermal and rheological aspects of the lithosphere through data driven numerical modelling. I am interested in understanding the connection between lithospheric structure, complex fault geometries, and present-day deformation and the application of these models in seismic geohazard.

EDUCATION

- 2018-2022** **PhD in Geophysics** at University of Potsdam (Germany)
Advisors: Manfred Strecker and Magdalena Scheck-Wenderoth (Grade *summa cum laude*). PhD Defense date: 29 April 2022
- 2011-2017** **Degree in Geological Science** at University of Buenos Aires, Argentina (Grade 8.9/10)

PROFESSIONAL APPOINTMENTS

- 2022-present** **Postdoctoral researcher** at University of Plymouth (United Kingdom)
• Build numerical models to investigate the role of fault networks with complex geometries in earthquake cycles
• Contribute to development of numerical code of earthquake cycles QDYN (FORTRAN/python/MATLAB)
• Conducted field work in Central Appenines (Italy) to survey active faults
- 2022-present** **Teaching assistant** at University of Plymouth (United Kingdom)
• Demonstrator in undergraduate-student field trips to the South-West of England
• Lecture and practical on geophysical methods of plate tectonics and earthquake location in the Bsc course 'Life and Death of an Ocean'
- 2022** **Visiting researcher** at Geoazur (France)
- 2018-2022** **Graduate student researcher** at University of Potsdam (Germany)
• Conducted research in Geophysics to understand the link between the thermal and rheological state of the lithosphere and present-day deformation processes in the southern Central Andes
• Performed integration of geological and geophysical data into 3D subsurface models
• Carried out gravity-based, thermal and rheological modelling
• Publish findings in peer-reviewed journals and professional society meetings

- 2021** **Teaching assistant** at University of Potsdam (Germany)
 • Assisted in the Msc course 'Neotectonics and Geodynamics'
- 2016-2017** **Student field assistant** at University of Buenos Aires (Argentina)
 • Carried out geological and paleomagnetic surveys
 • Sample processing using different paleomagnetic techniques (MSA, AF, HT, IRM)

SCIENTIFIC BACKGROUND

• PUBLICATIONS IN REFEREED JOURNALS

- Under review** **Rodriguez Piceda, C.**, Mildon, Z., van den Ende, M., Andrews, B., and Ampuero, J. P. Normal fault interactions in seismic cycles and the impact of fault network geometry. *Submitted to Journal of Geophysical Research: Solid Earth*
- 2023** Pons M., **Rodriguez Piceda, C.**, Sobolev S., Scheck-Wenderoth, M., & Strecker, M. Localization of deformation in a non-collisional subduction orogen: the roles of dip geometry and plate strength on the evolution of the broken Andean foreland, Sierras Pampeanas, Argentina. *Tectonics*
- 2023** **Rodriguez Piceda, C.**, Gao, Y., Cacace M., Scheck-Wenderoth, M., Bott, J., Tilmann, F., & Strecker M., The role of mantle hydration and flexure on slab seismicity in the southern Central Andes. *Nature Communications Earth and Environment*
- 2022** **Rodriguez Piceda, C.**, Scheck-Wenderoth, M., Cacace M., Bott, J., & Strecker M., Long-term lithospheric strength and intraplate seismicity in the southern Central Andes (29°S-39°S). *Geochemistry, Geophysics, Geosystems*
- 2022** **Rodriguez Piceda, C.**, Scheck-Wenderoth, M., Bott, J., Cacace, M., Gomez Dacal, M.L., Pons, M., Prezzi, C.B. & Strecker M., Controlling factors of an oceanic-continental subduction zone: the southern Central Andes. *Lithosphere*
- 2021** Barrionuevo, M., Liu, S., Mescua J., Yagupsky D., Quinteros, J., Giambiagi L., Sobolev, V., Strecker, M., **Rodriguez Piceda C.**, The influence of variations in crustal composition and lithospheric strength on the evolution of the Southern Central Andean deformation: Insights from geodynamic models. *International Journal of Earth Sciences*
- 2021** **Rodriguez Piceda, C.**, Scheck-Wenderoth, M., Gomez Dacal, M.L., Bott, J., Prezzi, C.B. & Strecker M., Lithospheric density structure of the southern Central Andes constrained by 3D data-integrative gravity modelling. *International Journal of Earth Sciences*
- 2020** Franceschinis, P. R., Escayola, M. P., Rapalini, A. E., **Rodriguez Piceda, C.**, Age constraints on the Cambrian Mesón Group (NW Argentina) based on detrital zircons U-Pb geochronology and magnetic polarity bias. *Journal of South American Earth Sciences*
- 2020** Franceschinis, P. R., Fazzito, S., Rapalini, A. E., Escayola, M. P., Geuna, S., **Rodriguez Piceda, C.** Permian remagnetization of the Early Cambrian Guachos Formation, Eastern Cordillera, Argentina. *Journal of South American Earth Sciences*

- 2020** Franceschinis, P.R., Rapalini, A.E., Escayola, M.P. & **Rodriguez Piceda, C.** Paleogeographic and tectonic evolution of the Pampia Terrane in the Cambrian: New paleomagnetic constraints. *Tectonophysics*
- 2018** **Rodriguez Piceda, C.**, Franceschinis, P., Escayola, M., & Rapalini, A. Paleomagnetismo del Grupo Santa Victoria en la sierra de Mojotoro, Salta: aportes a la reconstrucción paleogeográfica de Pampia en el Paleozoico temprano. *Revista de la Asociación Geológica Argentina*

• **OTHER PUBLICATIONS (SCIENTIFIC CONFERENCES, DATA PUBLICATIONS)**

- 2025** **Rodriguez Piceda, C.**, Mildon, Z., Ende, M. van den, Ampuero, J. P., and Andrews, B. *3D seismic cycle models of two normal faults* [dataset]. Zenodo
- 2024** **Rodriguez Piceda C.**, Mildon Z., Yin Y., Andrews B., Sgambato C., van den Ende M., Ampuero J.P., *Simulating normal fault interactions during complex seismic sequences in the southern Apennines* [conference-abstract], EGU 2024 General Assembly
- 2024** **Rodriguez Piceda, C.**, Mildon, Z. K., Yin, Y., Andrews, B. J., Sgambato, C., Ende, M. van den, and Ampuero, J. P. *How normal fault interactions impact the generation of complex seismic sequences in the southern Apennines* [conference-abstract], Cargèse international workshop on earthquakes, Cargese (France).
- 2024** **Rodriguez Piceda, C.**, Scheck-Wenderoth, M., Cacace, M., Bott, J., Gao, Y.-J., Tilmann, F., and Strecker, M. *Contributions of lithospheric strength, mantle hydration and slab flexure to seismic localization in the southern Central Andes* [conference-abstract]. IPOC workshop. Potsdam (Germany)
- 2024** **Rodriguez Piceda, C.**, Scheck-Wenderoth, M., Cacace, M., Bott, J., Gao, Y.-J., Tilmann, F., and Strecker, M. *The fingerprints of lithospheric strength in the seismicity patterns of the southern Central Andes* [conference-abstract]. In: VI Coloquio sobre Señales Geofísicas de Terremotos y Volcanes. Concepcion (Chile).
- 2024** Mildon Z., Andrews B., **Rodriguez Piceda C.**, Diercks M. *Insights into fault behaviour and seismic hazard from studying active and inactive faults over a range of timescales* [conference-abstract], EGU 2024 General Assembly
- 2024** Andrews B., Mildon Z., Diercks M., Mitchell S., Roberts G., **Rodriguez Piceda C.**, Robertson .. *Using fracture-scarp lineations as kinematic indicators on active normal fault scarps* [conference-abstract], EGU 2024 General Assembly
- 2023** **Rodriguez Piceda, C.**, Mildon, Z., van den Ende, M., and Ampuero, J. P. *The effects of 3D normal fault interactions in seismic cycles* [conference-abstract], EGU 2023 General Assembly
- 2023** **Rodriguez Piceda, C.** "From lithospheric- to crustal scale: the effect of geological variability on seismicity". CRES Seminar Series, Plymouth (UK) [seminar-series].
- 2023** **Rodriguez Piceda, C.**, Mildon, Z., Ende, M. van den, and Ampuero, J. P. The effects of 3D normal fault interactions in seismic cycles. [conference abstract] CRES Conference, Plymouth (UK)

- 2023** **Rodriguez Picada, C.**, Mildon, Z., van den Ende, M., and Ampuero, J. P: *Fault network geometry induces complex seismic sequences in normal faults*. [conference-abstract]. ICTP Workshop on Mechanics of the Earthquake Cycle
- 2023** Pons, M., **Rodriguez Picada, C.**, Sobolev, S. V., Scheck-Wenderoth, M., and Strecker, M. R.: *Understanding the role of structural inheritance and flat slab geometry in Central Andes* [conference-abstract], EGU 2023 General Assembly
- 2023** Pons, M., **Rodriguez Picada, C.**, Sobolev, S., Scheck-Wenderoth, M., and Strecker, M. R. *3D geodynamic data-driven model of the Southern Central Andes*. GFZ data services [dataset]
- 2022** **Rodriguez Picada C.** *Thermomechanical state of the southern Central Andes : implications for active deformation patterns in the transition from flat to steep subduction* [dissertation for PhD degree], University of Potsdam
- 2022** **Rodriguez Picada, C.**, Gao, Y., Cacace M., Scheck-Wenderoth, M., Bott, J., Tilmann, F., & Strecker M., Contributions of lithospheric structure, mantle hydration and slab flexure in seismic localization in the southern Central Andes [conference-abstract], PATADays 2022
- 2021** Götze, H.J., Bott, J., Gomez Dacal, M.L., Gomez Garcia A., **Rodriguez Picada, C.**, Meeßen, C., Plonka, C., Spooner, C., Scheck-Wenderoth, M., Schmidt S. & Anikiev, D., *Interdisciplinary data-constrained 3-D potential field modelling with IGMAS+* [conference-abstract], DGG 2021
- 2021** Anikiev, D., Götze, H.J., Bott, J., Gómez-García, À., Gomez Dacal, M. L., Meeßen, C., Spooner, C., **Rodriguez Picada, C.**, Plonka, C., Schmidt, S., Scheck-Wenderoth, M. *Interdisciplinary data-constrained 3-D potential field modelling with IGMAS+* [conference-abstract], EGU 2021 General Assembly
- 2021** **Rodriguez Picada, C.**, Scheck-Wenderoth, M., Bott, J., Gomez Dacal, M.L., Pons, M., Prezzi, C.B. & Strecker M., *Unravelling the thermal state of the southern Central Andes and its controlling factors* [conference-abstract], EGU 2021
- 2020** **Rodriguez Picada, C.**, Scheck-Wenderoth, M., Gomez Dacal, M.L., Bott, J., Prezzi, C.B. & Strecker M., *Lithospheric density structure of the Southern Central Andes and their forelands constrained by 3D gravity modelling* [conference-abstract], EGU 2020 General Assembly
- 2020** Schmidt S., Anikiev, D., Götze, H.J., Gomez Garcia A., Gomez Dacal, M.L., Meeßen, C., Plonka, C., **Rodriguez Picada, C.**, Spooner, C. & Scheck-Wenderoth, M., *IGMAS+ – a tool for interdisciplinary 3D potential field modelling of complex geological structures* [conference-abstract], EGU 2020 General Assembly
- 2020** **Rodriguez Picada, C.**, Scheck-Wenderoth, M., Gomez Dacal, M.L., Bott, J., Prezzi, C.B. & Strecker M., *Lithospheric-scale 3D model of the Southern Central Andes* [dataset], GFZ data services
- 2019** **Rodriguez Picada, C.**, Scheck-Wenderoth, M., Gomez Dacal, M.L., Bott, J., Prezzi, C.B. & Strecker M., *Lithospheric-scale 3D configuration of the Southern Central Andes* [conference-abstract], 5th International Young Earth Scientists (YES) Congress, Berlin, Germany
- 2019** **Rodriguez Picada, C.**, Scheck-Wenderoth, M., Gomez Dacal, M.L., Bott, J., Prezzi, C.B. & Strecker M., *Insights on the lithospheric density structure of the Southern Central Andes and their foreland* [conference-abstract], 25th Latin-American Colloquium (LAC), Hamburg, Germany

2018 **Rodriguez Piceda, C.**, *Geología y paleomagnetismo del Grupo Santa Victoria en la Sierra de Mojotoro, provincia de Salta (Geology and paleomagnetism of Santa Victoria Group in the Mojotoro range, Salta Province)*, University of Buenos Aires [dissertation for degree]

GRANTS

2024 **ARIES Summer Research Experience Placement** grant to supervise a Msc Student for six weeks at University of Plymouth (£4200)

AWARDS AND SCHOLARSHIPS

2012-2017 **Roberto Rocca Foundation Scholarship** for new Engineering and Geoscience undergraduate students with high academic degrees

2016 **Santander Iberoamérica Scholarship** for students with high academic degrees to carry out an academic exchange in the National Autonomous University of Mexico (USD 1500)

2015 **First mention** in poster competition meeting of Geology and Paleontology students, University of Buenos Aires, Buenos Aires, Argentina

SUPERVISING

2024 **ARIES Summer Research Experience Placement** supervising a Msc Student for six weeks at University of Plymouth

INVITED TALKS AND SEMINARS

2024 **VI Colloquium on Geophysical Signatures of Earthquakes and Volcanoes** , Concepcion, Chile. Invited keynote speaker

2024 **IRN - Andes Frensz online seminar series.** Invited speaker

SERVICES TO THE SCIENTIFIC COMMUNITY

PEER REVIEW

- Nature communications Earth and Environment
- Tectonics
- Geophysical Research Letters
- Tectonophysics
- International Journal of Earth Sciences

SESSION ORGANIZATION AND CHAIRING

2024 **EGU GA Integrated approaches to seismotectonic studies**

IT SKILLS

Python, Fortran (notions), MATLAB (notions), linux and bash scripting, git, High Performance Computing (SLURM), reservoir software (Petrel), data analysis software (Paraview), Finite Element Method software (GOLEM, LYNX), boundary element method software (QDYN), forward gravity modelling software (IGMAS+), Geographic Information Systems (QGIS, Global Mapper, ArcGIS), design tools (Adobe Illustrator, Inkscape)

LANGUAGES

Spanish Native

English Professional

German Intermediate (B1), University of Potsdam, Germany

French Beginner (A2)

OUTREACH

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| 2023-present | Chief co-editor EGU Geodynamics blog <ul style="list-style-type: none">• Manage team of 15 editors, columnists and illustrators• Edit and write weekly blog posts related to Geodynamics and Academia |
| 2023-present | Science Demonstrator in Plymouth University, UK <ul style="list-style-type: none">• Demonstrations to Secondary School students about earthquake science• Demonstrator and field trip assistant in Girls into Geoscience initiative |
| 2016-2018 | Science Communicator in Centro Cultural de la Ciencia, Buenos Aires, Argentina <ul style="list-style-type: none">• Organized lectures, guided tours and workshops addressed to students and public in general in an interactive science museum• Had weekly training about didactics and science popularization |
| 2015-2018 | Science communicator in University of Buenos Aires Argentina
Lecture on climate change, Sedimentology and Geophysics addressed to middle-school students in outreach events organized by the university |
| 2017 | Mentor in the 'Science Challenge' Hackathon, Buenos Aires, Argentina <ul style="list-style-type: none">• Mentored senior-school students which were asked to make a project related with space sciences |
| 2014-2015 | Science Communicator in Tecnópolis, Buenos Aires, Argentina <ul style="list-style-type: none">• Organized guided tours in science theme park |
| 2013-2015 | Volunteering. Tuition for senior school and university students in disadvantaged neighborhoods organized by the University Torcuato Di Tella, Buenos Aires, Argentina |

TRAINING

ATTENDED WORKSHOPS AND COURSES

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| 2024 | Cargèse international workshop on earthquakes , Cargèse, France |
| 2023 | Workshop on mechanics of the earthquake cycle , ICTP, Trieste, Italy |

2022	COMET OpenQuake Workshop , University of Oxford, Oxford, United Kingdom
2021	MATLAB recipes for Earth Sciences , University of Potsdam, Potsdam, Germany
2020	Tectonics modelling tutorial with ASPECT, Computational Infrastructure for Geodynamics (CIG)
2019	Solid Earth Summer School University of Grenoble, Barcelonette, France
2019	DeArGeoNet - LIDAR field methods and digital data analysis , University of Potsdam, Buenos Aires, Argentina
2018	Educational Problems , University of Buenos Aires, Buenos Aires, Argentina
2018	Magnetic fabric of natural materials , University of Buenos Aires, Buenos Aires, Argentina
2017	3GEO Hazard & risk analysis , CITEDEF and University of Potsdam, Buenos Aires Argentina
2015	Core analysis , YPF Foundation, Buenos Aires Argentina

ATTENDED FIELD COURSES

2019	IRTG StRATEGy, NW Argentina: geomorphology and neotectonics in the Andes
2015	Neuquén Basin, Argentina: mapping, seismic and log data analysis
2015	Martín García Island, Argentina: Geophysical Prospection
2015	San Juan, Argentina: Tectonics
2013	Tandil, Argentina: mapping
2014	Neuquén Basin, Argentina: mineralogy, paleontology and structural geology
2012	Mendoza, Argentina: sedimentology and petrology