

Patricia Martínez – Garzón, PhD

Engeldamm, 28
Berlin, 10179, Germany
Phone: +49 (0)331/288-28833

Email: patricia@gfz-potsdam.de
Born in Madrid, 21th November, 1986
Nationality: Spanish



1. EDUCATION

Since Jan 2018	Helmholtz-Centre Potsdam GFZ German Research Centre for Geosciences, Potsdam <ul style="list-style-type: none">• Young Group Leader of Helmholtz Young Investigators Group, GFZ section 4.2 Website: saidan.org
2014-2017 Postdoc	<ul style="list-style-type: none">• Postdoctoral Researcher within GFZ section 4.2 6-12/2014 in-house position since 1/2015 funded by the Helmholtz-Postdoc Programme
2011-2014 PhD	<ul style="list-style-type: none">• PhD in Geophysics/Seismology within GFZ section 4.2 (graduation at FU Berlin) 7/2011–6/2014 Dissertation title: Seismo-mechanical reservoir characterization from fluid-induced seismicity. Final grade: Magna Cum Laude Supervisor: Prof. Dr. Marco Bohnhoff
Sep 2018 – Jan 2019	University of Southern California, Los Angeles
Jan 2016 – Dec 2016	Visiting Research Scientist for 6-month as part of the Helmholtz Postdoc Programme Host: Prof. Yehuda Ben-Zion.
Sep – Nov 2013	University of Alberta, Edmonton Visiting student for 2 months as part of the Helmholtz-Alberta Initiative Host: Prof. Rick Chalaturnyk
2004 – 2011	Universidad Complutense, Madrid <ul style="list-style-type: none">• Master in Geophysics and Meteorology, 2010 – 2011 M.Sc. Dissertation title: Dynamic strains and induced seismicity at Itoiz dam, Spain. Supervisors: Dr. Miguel Angel Santoyo, Prof. Miguel Herraiz final grade: 9/10.• Degree in Fundamental Physics (five years degree), 2004 - 2010 Final grade: 7/10

2. TEACHING



Lecturing:

Free University of Berlin, Berlin, Germany

- Guest lectures as part of Applied Seismology class:
 - “The stress field: introduction and applications to natural and induced seismicity”, 2014/15/17
 - “Introduction to stress inversion using MSATSI”, 2014/15/17

<ul style="list-style-type: none"> - “Static stress changes and Coulomb stress transfer”. 2017 • Guest lecture as part of Geophysics seminar, 2014 <ul style="list-style-type: none"> - “Stress field variations from focal mechanics of induced seismicity at The Geysers geothermal field”
<p>University of Southern California, Los Angeles, USA</p> <ul style="list-style-type: none"> • Guest lecture: “The stress tensor inversion: details, advantages and assumptions”, Seminars of Geophysics, January 2016.
<p>University of Alberta, Edmonton, Canada</p> <ul style="list-style-type: none"> • Guest lecture: “Stress tensor determination: updates and applications to reservoir scale”, Seminars of Geophysics, September 2013.
<p>Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences</p> <ul style="list-style-type: none"> • Teacher and organizer of the workshop: “Static stress changes and Coulomb stress transfer: Basic concepts, relevant studies and introduction to Coulomb-3 software”. March 2017

Student co-supervision:

2015/16	<p>Stephan Bentz</p> <ul style="list-style-type: none"> • MSc Thesis (main supervisor Prof. J. Renner, Ruhr-University Bochum) Title: Analysis of source characteristics and spatio-temporal patterns of the large magnitude events at the Salton Sea Geothermal Field
Since 2016	<ul style="list-style-type: none"> • PhD (officially supervised by Prof. Bohnhoff) Title: Earthquake source characteristics and directivity at strike-slip faults
Since 2016	<p>Niloufar Abolfathian</p> <ul style="list-style-type: none"> • PhD Project (officially supervised by Prof. Ben-Zion). PhD preliminary title: Stress field characterization and source parameters of seismicity at the San Jacinto Fault Zone, southern California.
Since 2017	<p>Christopher Wollin</p> <ul style="list-style-type: none"> • PhD Project (officially supervised by Prof. Bohnhoff). PhD preliminary title: A new high-resolution catalog (2000-2017) for the seismicity at the Sea of Marmara, western Turkey.
Since 2017	<p>Maria Leonhardt</p> <ul style="list-style-type: none"> • PhD project (officially supervised by Prof. Bohnhoff). PhD preliminary title: Microseismicity from hydraulic fracturing employing different stimulation practices.
Since March 2018	<p>Amandine Amemoutou</p> <ul style="list-style-type: none"> • First PhD position within my Young Investigators Group SAIDAN. PhD preliminary title: The role of aseismic deformation in induced seismicity environments.

3. SELECTED INVITED TALKS



N	Year	University / Institute	Title of the invited talk
1	2013	Universidad Complutense, Madrid, Spain	Microseismic monitoring as tool for reservoir characterization: case studies related to CO ₂ storage and reservoir stimulation Host: Prof. Elisa Buforn Peiró
2	2013	University of Alberta, Edmonton, Canada	Stress tensor determination: Updates and applications to reservoir characterization Host: Prof. Mirko Van der Baan
3	2014	University of Bochum, Germany. Workshop on Geothermal Reservoir monitoring and characterization	Seismo-mechanical characterization of geothermal reservoirs: A case study from The Geysers geothermal field Host: Prof. Joerg Renner
4	2015	U.S Geological Survey (USGS), Science Seminars, Menlo Park, USA	Seismo-mechanical reservoir characterization at The Geysers geothermal field Host: Dr. Martin Schoenball, in the frame of Earthquake Science Centre Seminars
5	2016	University of Southern California, Los Angeles, USA	Reservoir characterization at The Geysers geothermal field: stress field, seismic hazard and fault (re)-activation Host: Prof. Yehuda Ben-Zion
6	2016	California Institute of Technology (CALTECH), Pasadena, USA	Reservoir characterization at The Geysers geothermal field: stress field, seismic hazard and fault (re)-activation Host: Prof. Egill Hauksson, in the frame of Caltech Seismological Seminars
7	2016	Lawrence Berkeley National Laboratory, Berkeley, USA	Reservoir characterization at The Geysers geothermal field: stress field, seismic hazard and fault (re)-activation Host: Dr. Corinne E. Layland-Bachmann
8	2017	Swiss Federal Institute of Technology (ETH), Zurich, Switzerland	Source-physics and fault mechanics of geothermal induced seismicity Host: Dr. Anne C. Obermann
9	2018	IS Terre, Grenoble, France	Crustal deformation in the Sea of Marmara region: observations from near-fault monitoring Host: Prof. Michel Campillo

4. THIRD-PARTY FUNDING



1	Helmholtz Postdoc Programme (3-year Postdoc Position 2015-2017) Role: Principal Investigator	Title: Earthquake Hazard due to reservoir stimulation: A geomechanical study linking hazard and induced seismicity.
2	Helmholtz Young Investigators Group (6-year Young Leader 2018 - 2023) Role: Principal Investigator www.saidan.org	Title: SAIDAN: Seismic and aseismic deformation in the brittle crust: Implications for anthropogenic and natural hazard.

3	Deutsche Forschungsgemeinschaft Normalverfahren (3-year PhD student) (in revision) Role: Principal Investigator	Title: Earthquake source characterization and directivity effects in relation to fault properties: Implications for their seismic hazard.
4	Deutsche Forschungsgemeinschaft ICDP Priority Programm (2-year postdoc position) (herewith submitted) Role: Principal Investigator	Title: Characterizing seismic hazard potential of the Armutlu Fault south of Istanbul based on deformation mechanisms, structural geology and fluid-rock interaction

5. AWARDS



N	Award	Date	Agency
1	Best poster Presentation Award	September 2013	3 rd HAI Science Forum, Alberta, Canada
2	Best Student Oral Presentation Award	May 2014	Annual Meeting of the Seismological Society of America (SSA), Anchorage, Alaska
3	Best Dissertation of the year at GFZ Potsdam	October 2014	Association of Friends and Sponsors of the GFZ, Potsdam, Germany

6. SOFTWARE DEVELOPMENT



Name	Description	Download at:
MSATSI	Stress inversion software package	http://www.gfz-potsdam.de/msatsi
HYBRIDMT	Moment tensor inversion using first motion polarities and refinement using the Hybrid technique	http://www.gfz-potsdam.de/en/hybridmt/

7. COMMUNITY SERVICE



Reviewer of scientific publications	Science Advances, Nature Geosciences, Earth and Plan. Sci. Lett., J. Geophys. Res., PAGEOPH, Geophys. Res. Lett., Geophys J. Int., Bull. Seism. Soc. Am, Annals of Geophysics Total: 44
Reviewer of scientific proposals	DOE U.S. Department of Energy, USA National Science Foundation, Joint Funding Association of Israel and China, Funding Association of the Czech Republic. Total: 5
Chair of scientific sessions	“Characterization of the stress field and stress drop for earthquake source physics and hazard assessment” at the Annual Meeting of the Seismological Society of America (2016, 2017), “Cross-scale studies of transient faulting in the brittle crust”, AGU Fall Meeting (2018)
Workshop Organizer	“Coupled fractured processes in geothermal reservoirs (COUFRAC), China, October 2018”



8. TRAINING COURSES ATTENDED

Sudelfeld, Munich, Germany (March 2012)	Munich Earthquake School of Sciences (MESS)	Focus was on signal processing using ObsPy tools, and estimation of earthquakes source characteristics.
Liebenberg, Berlin, Germany (April – November 2015)	“Führung Starten” (Starting Leadership, by Helmholtz Academy)	The workshop included three modules dealing with basics concepts of leadership theory, how to lead one self and small groups and understanding of complex organizations (In German).
GFZ, Potsdam, Germany (September 2015)	The Geocritical Crust Fluid Flow and Transport in Heterogeneous Rock	Imparted by Prof. Peter Leary and Prof. Peter Malin
Stanford online courses (2015)	Reservoir Geomechanics	Online lessons by Prof. Mark Zoback
Cargese School of Physics	Physics of slow earthquakes and earthquake clustering	The goal is to spend a week dedicated to long seminars about the basics of slow earthquakes, state-of the art knowledge and best tools to detect them.

9. LANGUAGES



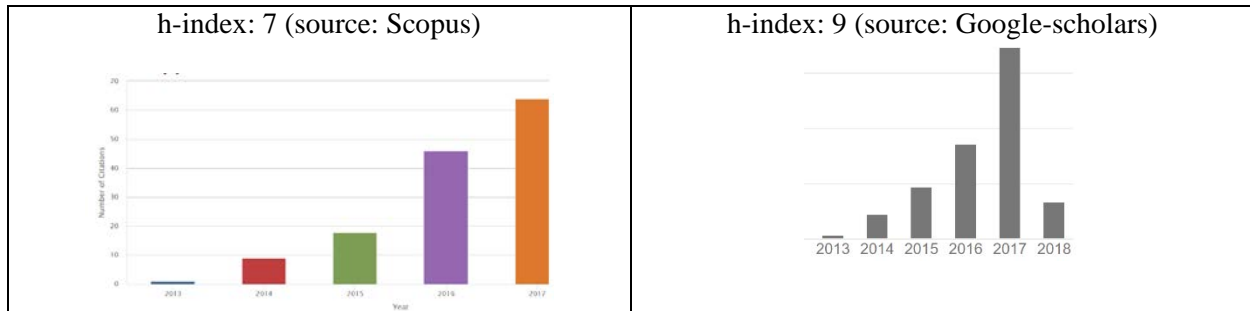
Spanish Native proficiency	English Professional proficiency
German Intermediate level (level B1)	Italian Intermediate level (level A2 finished)

10. APPLICATIONS TO PROFESORSHIPS

Year	University and Position	Final Outcome
2017	University of Potsdam W1 – Junior Professorship in General Geophysics	Number 3 of final decision

LIST OF PUBLICATIONS

Citation index:



Monographs:

1	P. Martínez-Garzón (2011). “Deformaciones dinámicas originadas por sismos en presas: Caso de la presa de Itoiz (Navarra)”. MSc Thesis (in Spanish).
2	P. Martínez-Garzón (2014). “Seismo-mechanical reservoir characterization from fluid-induced seismicity”. PhD Dissertation.

Publications in peer-review journals:

1	2013	Martínez-Garzón, P. , M. Bohnhoff, G. Kwiatek, and G. Dresen (2013). Stress tensor changes related to fluid injection at The Geysers geothermal field, California, <i>Geophys. Res. Lett.</i> 40, 2596–2601, doi 10.1002/grl.50438.
2	2013	G. Kwiatek, M. Bohnhoff, P. Martínez-Garzón , F. Bulut and G. Dresen (2013). High resolution reservoir characterization using induced seismicity and state of the art waveform processing techniques. <i>First Break</i> , volume 31, July 2013.
3	2013	Martínez-Garzón, P. , M. Bohnhoff, G. Kwiatek, G. Zambrano-Narváez, R. Chalaturnyk (2013). Microseismic monitoring of CO ₂ injection at the Penn West EOR Pilot, Canada: Implications for detection of wellbore leakage. <i>Sensors</i> , 2013 , 13 (9), 11522 - 11538; https://doi.org/10.3390/s130911522
4	2014	Martínez-Garzón, P. , G. Kwiatek, M. Ickrath and M. Bohnhoff (2014). MSATSI: A MATLAB package for stress inversion combining solid classic methodology, a new simplified user-handling and a visualization tool. <i>Seism. Res. Lett.</i> , 85, 4, doi:10.1785/0220130189
5	2014	Martínez-Garzón, P. , G. Kwiatek, M. Bohnhoff. H. Sone, G. Dresen and C. Hartline (2014). Spatiotemporal changes, faulting regimes and source parameters of induced seismicity: A case study from The Geysers geothermal field. <i>J. Geophys. Res. Solid Earth</i> , 119, doi:10.1002/2014JB011385.
6	2015	Ickrath, M., Bohnhoff, M., Dresen, Martínez-Garzón, P. , G., Bulut, F., Kwiatek., G. and Germer, O. (2015). Detailed analysis of spatiotemporal variations of the stress field orientation along the Izmit-Düzce rupture in NW Turkey from inversion of first motion polarity data. <i>Geophys. J. Int.</i> , 202(3), 2120–2132, doi:10.1093/gji/ggv273.
7	2015	Kwiatek, G., Martínez-Garzón, P. , Dresen, G., Bohnhoff, M., Sone, H. and Hartline C. (2015). Effects of long-term fluid injection on induced seismicity parameters and maximum magnitude in northwestern part of The Geysers geothermal field, <i>J. Geophys. Res. Solid Earth</i> , 2015JB012362, doi:10.1002/2015JB012362.

8	2015	Martínez-Garzón, P. , M. Bohnhoff, Y. Ben-Zion, and G. Dresen (2015), Scaling of maximum observed magnitudes with geometrical and stress properties of strike-slip faults, <i>Geophys. Res. Lett.</i> , 2015GL066478, doi:10.1002/2015GL066478.
9	2016	Bohnhoff, M., P. Martínez-Garzón , F. Bulut, E. Stierle, and Y. Ben-Zion (2016), Maximum earthquake magnitudes along different sections of the North Anatolian fault zone, <i>Tectonophysics</i> , 674, 147–165, doi:10.1016/j.tecto.2016.02.028.
10	2016	Kwiatek, G., P. Martínez-Garzón , and M. Bohnhoff (2016), HybridMT: A MATLAB/Shell Environment Package for Seismic Moment Tensor Inversion and Refinement, <i>Seismol. Res. Lett.</i> , doi:10.1785/0220150251.
11	2016	Santoyo M.A., P. Martínez-Garzón , A. García-Jerez and F. Luzón (2016). Surface Dynamic Deformation Estimates From Seismicity Near the Itoiz Reservoir, Northern Spain. 20: 1021. https://doi.org/10.1007/s10950-016-9578-4 .
12	2016	Martínez-Garzón, P. , V. Vavryčuk, G. Kwiatek, and M. Bohnhoff (2016), Sensitivity of stress inversion of focal mechanisms to pore pressure changes, <i>Geophys. Res. Lett.</i> , 2016GL070145, doi:10.1002/2016GL070145.
13	2016	Martínez-Garzón, P. , G. Kwiatek, M. Bohnhoff, and G. Dresen (2016), Impact of fluid injection on fracture reactivation at The Geysers geothermal field, <i>J. Geophys. Res. Solid Earth</i> , 121(10), 2016JB013137, doi:10.1002/2016JB013137.
14	2016	Martínez-Garzón, P. , Y. Ben-Zion, N. Abolfathian, G. Kwiatek, and M. Bohnhoff (2016), A refined methodology for stress inversions of earthquake focal mechanisms, <i>J. Geophys. Res. Solid Earth</i> , 2016JB013493, doi:10.1002/2016JB013493.
15	2017	Martínez-Garzón P. , Kwiatek, G., Bohnhoff, M. and Dresen, G. (2017), Volumetric components in the earthquake source related to fluid injection and stress state, <i>Geophys. Res. Lett.</i> , 44(2), 800–809, doi:10.1002/2016GL071963.
16	2017	Bohnhoff, M., Wollin, C., Domigall, D., Küperkoch, L., Martínez-Garzón, P. , Kwiatek, G., Dresen, G., Malin, P.E., 2017. Repeating Marmara Sea Earthquakes: Indication for fault creep. <i>Geophysical Journal International</i> 169, DOI: 10.1093/gji/ggx169
17	2017	Ziegler M.O., O. Heidbach, A. Zang, P. Martínez-Garzón , and M. Bohnhoff (2017), Estimation of the differential stress from the stress rotation angle in low permeable rock, <i>Geophys. Res. Lett.</i> , 44, doi: 10.1002/2017GL073598 .
18	2017	Raub, C., P. Martínez-Garzón , Grzegorz Kwiatek, Marco Bohnhoff, Georg Dresen , Variations of seismic b-value at different stages of the seismic cycle along the North Anatolian Fault Zone in northwestern Turkey, <i>Tectonophysics</i> (2017), doi: 10.1016/j.tecto.2017.05.028
19	2017	Staszek, M., B. Orlecka-Sikora, K. Leptokarpoulos, G. Kwiatek, and P. Martínez-Garzón (2017), Temporal static stress drop variations due to injection activity at The Geysers geothermal field, California, <i>Geophys. Res. Lett.</i> , 44, 7168–7176, doi: 10.1002/2017GL073929
20	2017	Leptokarpoulos, K., Staszek, M., Lasocki, S., Martínez-Garzón, P. , Kwiatek, G., Evolution of seismicity in relation to fluid injection in the North-Western part of The Geysers geothermal field, <i>Geophys. J. Int.</i> , Vol 212, Issue 2, 1 February 2018, Pages 1157-1166, https://doi.org/10.1093/gji/ggx481
21	2018	Bentz, S., Martínez-Garzón, P. , Kwiatek, G., Bohnhoff, M., & Renner, J. (2018). Sensitivity of Full Moment Tensors to Data Preprocessing and Inversion Parameters: A Case Study from the Salton Sea Geothermal Field Sensitivity of FMT to Data Preprocessing and Inversion Parameters: A Case Study from the SSGF. <i>Bulletin of the Seismological Society of America</i> , 108(2), 588–603. https://doi.org/10.1785/0120170203
22	2018	Martínez-Garzón, P. , Zaliapin, I., Ben-Zion, Y., Kwiatek, G., & Bohnhoff, M. (2018). Comparative Study of Earthquake Clustering in Relation to Hydraulic Activities at

		Geothermal Fields in California. <i>Journal of Geophysical Research: Solid Earth</i> , 0(0). https://doi.org/10.1029/2017JB014972
23	2018	Wollin, C., Bohnhoff, M., Martínez-Garzón, P. , Küperkoch, L., Raub, C., 2018. A unified earthquake catalogue for the Sea of Marmara Region, Turkey, based on automatized phase picking and travel-time inversion: seismotectonic implications. <i>Tectonophysics</i> . https://doi.org/10.1016/j.tecto.2018.05.020
24	2018	Kwiatek, G., Martínez-Garzón, P. , Plenkers, K., Leonhardt, M., Zang, A., von Specht, S., Dresen, G., Bohnhoff, M., 2018. Insights Into Complex Subdecimeter Fracturing Processes Occurring During a Water Injection Experiment at Depth in Äspö Hard Rock Laboratory, Sweden. <i>Journal of Geophysical Research: Solid Earth</i> 123, 6616–6635. https://doi.org/10.1029/2017JB014715
25	2018	Wollin, C., Bohnhoff, M., Vavryčuk, V., Martínez-Garzón, P. , 2018. Stress Inversion of Regional Seismicity in the Sea of Marmara Region, Turkey. <i>Pure and Applied Geophysics</i> . https://doi.org/10.1007/s00024-018-1971-1
26	2018	Malin, P.E., Bohnhoff, M., Blümle, F., Dresen, G., Martínez-Garzón, P. , Nurlu, M., Ceken, U., Kadrioglu, F.T., Kartal, R.F., Kilic, T., Yanik, K., 2018. Microearthquakes preceding a M4.2 Earthquake Offshore Istanbul. <i>Scientific Reports</i> 8, 16176. https://doi.org/10.1038/s41598-018-34563-9
27	2018	Abolfathian, N., Martínez-Garzón, P. , Ben-Zion, Y., 2018. Spatiotemporal Variations of Stress and Strain Parameters in the San Jacinto Fault Zone. <i>Pure Appl. Geophys</i> . https://doi.org/10.1007/s00024-018-2055-y
28	2019	Martínez-Garzón, P. , Bohnhoff, M., Mencin, D., Kwiatek, G., Dresen, G., Hodkinson, K., Nurlu, M., Kadrioglu, F. T., Kartal, R. F. Slow-slip along the eastern Sea of Marmara seismic gap offshore Istanbul in conjunction with enhanced seismic moment release Earth and Planetary Science Letters 510, 209–218. https://doi.org/10.1016/j.epsl.2019.01.001
29	2019	Hofmann, H., Zimmermann, G., Farkas, M., Huenges, E., Zang, A., Leonhardt, M., Kwiatek, G., Martínez-Garzón, P. , Bohnhoff, M., Min, K. B., Fokker, P., Westaway, R., Bethmann, F., Meier, P., Yoon, K. S., Choi, J. W., Lee, T. J., Kim, K. Y. First field application of cyclic soft stimulation at the Pohang Enhanced Geothermal System site in Korea. <i>Geophys J Int</i> 217, 926–949. https://doi.org/10.1093/gji/ggz058
30	2019	Blanke, A., Kwiatek, G., Martínez-Garzón, P. , Bohnhoff, M. Sensitivity and stability analysis of coda quality factors at The Geysers geothermal field, California (in press to <i>Bull. Seism. Soc. Am.</i>)
31	2019	Kwiatek, G., Saarno, T., Ader, T., Bluemle, F., Bohnhoff, M., Chendorain, M., Dresen, G., Heikkinen, P., Kukkonen, I., Leary, P., Leonhardt, M., Malin, P., Martínez-Garzón, P. , Passmore, K., Passmore, P., Valenzuela, S., Wollin, C. Controlling Fluid-Induced Seismicity during a 6.1-km-deep Geothermal Stimulation in Finland (in press to <i>Science Advances</i>)

Submitted articles:

32	(submitted in 2019)	Bentz S., Martínez-Garzón, P. , Kwiatek G., Dresen, G., Bohnhoff, M. Analysis of microseismicity framing $M_w > 2.5$ earthquakes at The Geysers geothermal field, California (submitted to <i>J. Geophys. Res.</i>)
33	(submitted in 2019)	Martínez-Garzón, P. , Heidbach, O., Bohnhoff, M. Contemporary stress and strain field in the Mediterranean from stress inversion of focal mechanisms, GPS data and shear-wave splitting (submitted to <i>Tectonophysics</i>)

Papers in late stage of preparation for peer-reviewed journals:

34	(to be submitted in 2019)	Rahner, R., Sone, H., Martínez-Garzón, P. , Kwiatek, G., Dresen, G. The contribution of poroelastic effects to the triggering of seismicity during fluid-injection – a 3D curve injection modelling approach (in prep for <i>Geophys. J. Int.</i>)
----	---------------------------	--

35	(to be submitted in 2019)	Kwiatek, G., Orlecka-Sickora, B., Martínez-Garzón, P. , Goebel, T., Dresen, G. Tracking local spatio-temporal microfracturing processes and stress field in laboratory stick-slip experiments
36	(to be submitted in 2019)	Abolfathian, N., Martínez-Garzón, P. , Ben-Zion, Y. Variations of stress parameters in South Central Transverse Ranges from inversion of focal mechanisms
37	(to be submitted in 2019)	Martínez-Garzón, P. , Ben-Zion, Y., Zaliapin, I., Bohnhoff, M. Earthquake clustering and earthquake repeaters in the Sea of Marmara: Implications for monitoring of earthquake nucleation

Thank you for considering my C.V

