

# Yara Lorena Rossi

POSTDOCTORAL RESEARCHER ON GAB3.0 PROJECT

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## Education

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### ETH Zürich

Switzerland

#### DOCTOR OF SCIENCE

Apr. 2019 - Jul. 2023

- Thesis: Next Generation Monitoring of Strong Ground Motions and Structural Vibrations - Combining Accelerometer, GNSS and Rotation Sensors
- Advisors: Prof. em. Markus Rothacher, Dr. John Clinton, Prof. Eleni Chatzi.
- External committee and Chair: Prof. Diego Melgar Moctezuma, Dr. Philippe Guéguen and Prof. Konrad Schindler.

### ETH Zürich

Switzerland

#### MSc IN EARTH SCIENCES

Sept. 2016 - Dec. 2018

- Thesis: Assessment of Approaches for Combining GNSS and Seismic Data with an industrial Robot
- Advisors: Prof. em. Markus Rothacher, Dr. John Clinton

### ETH Zürich

Switzerland

#### BSc IN EARTH SCIENCES

Sept. 2012 - Sept. 2015

- Thesis: Modelling of the magnetic field in the 19th and 21st century using data from the model gufm1 and the Swarm satellites
- Advisor: Prof. Andrew Jackson

## Professional Experience

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**Postdoc**, with J. Wassermann @ Ludwig-Maximilians-Universität München, Germany

7 - now, 2025  
*Induced seismicity for geothermal projects in Munich. Development of a traffic light system for induced earthquakes within the project GAB3.0. Earthquake forecasting using ETAS; modelling of PGV for soil structure interaction; usability of DAS for PGV maps; estimating in situ stress orientation with 6DoF measurements.*

**SNSF Postdoc.Mobility Fellow**, with F. Bernauer @ Ludwig-Maximilians-Universität München, Germany

1. Continue on quantify nonlinear soil behavior via permanent tilt during the 2011 Tohoku Mw 9.1 earthquake. 2.

1 - 6, 2025  
*Exploring high-quality 6C data sets using Beam Rotation Sensors (BRS) from the LIGO facilities, to understand rotation-translation relationship from teleseismic and local events. 3. Using 6C to enhance structural monitoring of bridges and buildings.*

**SNSF Postdoc.Mobility Fellow**, with D. Melgar @ University of Oregon, USA

3 - 12, 2024  
*Quantify nonlinear soil behavior via permanent tilt during the 2011 Tohoku Mw 9.1 earthquake by comparing tiltmeter observations and accelerometer-derived baseline offsets with subsurface parameters.*

**SNSF Postdoc.Mobility Fellow**, with F. Bernauer @ Ludwig-Maximilians-Universität München, Germany

1 - 3, 2024  
*Quantify and correct rotation-induced errors on rotation sensors and accelerometers using near-field recordings of large events (e.g., Kilauea eruptions, 2018; Mw 7.4 Hualien earthquake, 2024)*

**PostDoc - 6C Structural Monitoring**, with P. Guéguen @ ISTerre, Université Grenoble Alpes, France

9 - 12, 2023  
*Extracting mode shape properties of TAIPEI 101 in Taiwan using 3C rotation and 3C translation data; rotation correction of accelerometer, extracting shear vs bending from 6C mode shapes, center of torsion analysis and evaluation of the variations due to environmental and operational changes.*

2022 - 2023  
**Doctoral student**, Swiss Seismological Service, ETH Zürich

2022  
**Visiting Researcher with Prof. Diego Melgar**, Department of Earth Sciences, University of Oregon, USA

2019 - 2022  
**Doctoral student**, Dept. of Civil, Environmental and Geomatic Engineering, ETH Zürich, Switzerland

2016 - 2019  
**University Research Assistant**, Department of Earth Sciences, ETH Zürich, Switzerland

2016  
**Internship / Assistant Project Manager**, Geotechnisches Institut AG, Switzerland

2015  
**University Research Assistant**, Federal Office of Topography - swisstopo, Switzerland

2015  
**University Research Assistant**, Department of Earth Sciences, ETH Zürich, Switzerland

## Digital Experience

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**Programming:** Matlab, Python, GIT, LaTeX

**Seismology:** Obspy, SW4, Mudpy, EDGRN/EDCMP, Kalman Filter, Grafnav (GNSS processing), 6C analysis

**Structural Monitoring:** Stochastic Subspace Identification, 6C analysis

## Field and Experimental Experience

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2024	<b>Instrument deployment</b> , large scale nodal array deployment at Kīlauea Hawai‘i, including helicopter deployment.	USA
2021-2022	<b>Structural Monitoring</b> , instrument deployment and monitoring of the Prime Tower in Zurich with GNSS, acceleration sensors and rotational sensors.	CH
2021/2022	<b>GNSS deployment</b> , GNSS deployment on frozen lake in St. Moritz, Switzerland.	CH
2021	<b>Instrument deployment</b> , large scale nodal array deployment in Iceland.	IS
2018-2022	<b>Robotic Experiment</b> , performing seismic experiments on a six-axis robot arm	CH
2016-2018	<b>Field Campaign</b> , alpine field mapping, active seismic experiments, GPR measurements, glacier field course. Master Studies.	CH, IT
2016	<b>Geotechnical Fieldwork</b> , hydrological clarification, contaminated sites, geotechnical and geological clarification and ground water protection. Geotechnisches Institut AG.	CH
2012-2015	<b>Geological Excursions</b> , field mapping, structural analysis. Bachelor Studies.	CH, DE, IT

## Publications

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### PUBLISHED

- Rossi, Y.**, Bernauer, F., Guattari, F., Lin, C.-J.. 2025. Quantifying Rotation-Induced Errors in Near-Field Seismic Recordings: Assessing Impact on Rotation and Acceleration Measurements. *Seismica*, 4(1).
- Rossi, Y.**, Tatsis, K., Hohensinn, R., Clinton, J., Chatzi, E., Rothacher, M.. 2024. Unscented Kalman filter-based fusion of GNSS, Accelerometer and Rotation Sensors for Motion Tracking. *Journal of Structural Engineering*, 150(7): 05024002.
- Rossi, Y.**, Tatsis, K., Clinton, J., Chatzi, E., Rothacher, M.. 2023. A new paradigm for structural characterisation - including rotational measurements at a single site. *Bulletin of the Seismological Society of America*, 113 (6): 2249–2274.
- Hohensinn, R., Stauffer, R., Glaner, M.F., Herrera Pinzón, I.D., Vuadens, E.; **Rossi, Y.**, Clinton, J., Rothacher, M. 2022. Low-Cost GNSS and Real-Time PPP: Assessing the Precision of the u-blox ZED-F9P for Kinematic Monitoring Applications. *remote sensing*, 22(14): 5100.
- Rossi, Y.**, Tatsis, K., Awadaljeed, M., Arbogast, K., Chatzi, E., Rothacher, M., Clinton, J. 2021. Kalman Filter-Based Fusion of Collocated Acceleration, GNSS and Rotation Data for 6C Motion Tracking. *Sensors*, 21(4): 1543.
- Bernauer, F., ..., **Rossi, Y.** et al. 2021. Rotation, Strain, and Translation Sensors Performance Tests with Active Seismic Sources. *Sensors*, 21(1): 264.

### UNDER REVIEW

- Rossi, Y.**, Guéguen, P., Bernauer, F., Chen, K.H., Lin, C.-J., Ku, C.-S., Chen, Y.. On the use of 6C seismic station for bending-to-shear and torsional building response assessment. in review @ *Engineering Structures*.

### IN PREPARATION

- Rossi, Y.**, Melgar, D., Bernauer, F., Bonilla, F.. The amplitude of static tilt and its impact on GNSS and strong motion data: an example of the Mw 9.1 Tohoku 2011 earthquake. planned *Journal of Geophysical Research: Solid Earth*
- Bodin, P., **Rossi, Y.**, Apple, S., Ross, M., Gundlach, J., Brotzer, A. Introducing the Beam Rotation Sensor for seismic applications. planned *Seismological Research Letters*.
- Rossi, Y.**, Reuland, Y., Tatsis, K., Clinton, J., Chatzi, E., Rothacher, M.. Wandering of frequencies over 1 year from a 6C-station on Prime Tower, Zurich. planned *Bulletin of the Seismological Society of America*.

## Awards, Fellowships, & Grants

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in prep.	2026	<b>Cylindrical Rotation Sensor development</b> , NSF MRI, as Co-PI	ca \$1'000,000
subm.	2025	<b>The BRS Treasure</b> , USGS, as collaborator	\$ 265,000
	2023	<b>Postdoc.Mobility Fellowship Grant</b> , Swiss National Science Foundation	\$ 114,600
	2022	<b>Outstanding Student Presentation Award (OSPA)</b> , AGU, Chicago, USA	\$ 200
	2019	<b>Best Presentation Award</b> , 7th International Galileo Science Colloquium, Zurich, CH	
	2019	<b>Graduate Research Fellowship</b> , Swiss National Science Foundation	\$ 220,000
	2019	<b>blueSeis-3A Rotational Sensor</b> , Swiss National Science Foundation	\$ 46,000

## Presentations

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### INVITED TALKS

- Summer 2025. *Enhancing structural monitoring through 6C measurement techniques*. Invited talk: 7th Meeting of the IWGoRS, Opole, Poland.
- Summer 2024. *Enhancing structural monitoring through 6C measurement techniques*. Invited talk: Geophysical Seminar at University of Hamburg, Hamburg, Germany.
- Winter 2023. *Monitoring of strong ground motions and structural vibrations: combining accelerometer, GNSS and rotation sensors*. Invited talk: PostDoc Seminar at ISTerre, Grenoble, France.
- Winter 2022. *Next Generation Monitoring Station: combining accelerometer, GNSS and rotational sensor for strong ground motion*. Invited talk: Geophysical Seminar at Ludwig-Maximilians-Universität München, Germany.
- Winter 2021. *Long-term monitoring, mode characterization and 6 component (6C) sensor fusion using accelerometer, high-rate GNSS and rotational measurements*. Invited talk: AGU 2021, New Orleans, USA.
- Autumn 2019. *Next Generation Monitoring Station: Combining accelerometer, GNSS and rotational sensor for strong ground motions*. Invited Talk: SED Coffee hour, ETH Zürich.

### CONTRIBUTED PRESENTATIONS

- Rossi, Y.**, Bernauer, F., Guattari, F., Lin, C.J.. 2025. Data curation and quality assessment of novel ground rotation sensor data at LIGO sites in the USA. Poster Presentation: 7th Meeting of the IWGoRS, Opole, Poland.
- Rossi, Y.**, Bernauer, F., Guattari, F., Lin, C.J.. 2025. Quantifying Rotation-Induced Errors in Near-Field Seismic Recordings. Poster Presentation: EGU, Vienna, Austria.
- Rossi, Y.**, Bernauer, F., Guattari, F., Lin, C.J.. 2024. Sensor Corrections for Multi-Component Monitoring of Seismic Translation and Rotation. Oral Presentation: SSA, Anchorage, USA.
- Rossi, Y.**, Tatsis, K., Reuland, Y., Clinton, J., Chatzi, E., Rothacher, M. 2023. Variations of the system properties of a high-rise building over 1 year using a single station 6C approach. Poster Presentation: EGU, Vienna, Austria.
- Rossi, Y.**, Tatsis, K., Clinton, J., Chatzi, E., Rothacher, M. 2022. Variations of the system properties of a high-rise building over 1 year using a single station 6C approach. Poster Presentation: AGU, Chicago, Illinois, USA.
- Rossi, Y.**, Tatsis, K., Clinton, J., Chatzi, E., Rothacher, M. 2022. Can we use only one 6C-station to perform deep characterisation of a building? . Poster Presentation: 6th Meeting of the IWGoRS, Paris, France.
- Rossi, Y.**, Clinton, J., Chatzi, E., Schmelzbach, C., Rothacher, M. 2022. System identification of a high-rise building: a comparison between a single station measuring translations and rotations, and a traditional array approach. Oral Presentation: EGU, Online.
- Rossi, Y.**, Hohensinn, R., Tatsis, K., Clinton, J., Chatzi, E., Rothacher, M. 2022. Demonstrating a Kalman Filter Fusion of Acceleration, GNSS and Rotational Sensors Using a Flexible Foot Bridge. Oral Presentation: SSA, Bellevue, Washington, USA.
- Rossi, Y.**, Rothacher, M., Clinton, J., Chatzi, E., Schmelzbach, C. 2021. Long-term monitoring, mode characterization and 6 component (6C) sensor fusion using accelerometer, high-rate GNSS and rotational measurements. Invited Talk: AGU, New Orleans, Louisiana, USA.
- Rossi, Y.**, Tatsis, K., Arbogast, K., Awadaljeed, M., Chatzi, E., Rothacher, M., Clinton, J. 2020. Assessing a 6C Kalman filter using experimental datasets from an industrial robot. Poster: AGU, Online.
- Rossi, Y.**, Tatsis, K., Arbogast, K., Awadaljeed, M., Chatzi, E., Rothacher, M., Clinton, J. 2020. Assessing a 6C Kalman filter using experimental datasets from an industrial robot. Online Oral Presentation: Swiss Geoscience Meeting.
- Rossi, Y.**, Rothacher, M., Clinton, J., Schmelzbach, C. 2019. Testing accelerometer, GNSS and rotation sensors for strong ground motions on an industrial robot arm. Oral presentation: 5th Meeting of the IWGoRS, Sun Moon Lake, Taiwan.
- Rossi, Y.**, Rothacher, M., Clinton, J. 2019. The combination of accelerometers and GNSS sensors for strong ground motions and its validation with an industrial robot arm. Oral presentation: 7th International Galileo Science Colloquium, ETH Zurich, Zurich, Switzerland.

## Teaching Experience

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2025	<b>Skience "Urban Seismology" - Structural Monitoring</b> , Invited Lecturer	LMU Munich
2021, 2020	<b>Satellite Geodesy</b> , Teaching Assistant	ETH Zürich
2021, 2020	<b>Physical Geodesy</b> , Teaching Assistant	ETH Zürich
2019	<b>Higher Geodesy</b> , Teaching Assistant	ETH Zürich

## Co-Supervision

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- 2025 **Anna Fröhlich**, Master Student, Ludwig-Maximilians-Universität München
- 2024/2025 **Angelin Binny**, Master Student, Ludwig-Maximilians-Universität München
- 2021 **Josianne Fandré**, Master Student, ETH Zürich
- 2019 **Mudathir Awadaljeed and Konstantin Arbogast**, Master Students, ETH Zürich

## Outreach & Professional Development

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### SERVICE AND OUTREACH

- 2021 **Booth at Scientifica making research at ETH accessible for the public**, Organizer *ETH Zürich*
- 2021 **Booth and workshop for highschool students at Day of Geomatics**, Organizer *Leica*
- 2019 **Booth for highschool students at Day of Geomatics**, Organizer *Aarau, CH*

### DEVELOPMENT

- Selected for LMU Mentoring Program** (2025), part of LMU's "Exzellenzinitiative"; supports outstanding PostDocs with career mentoring and funding, aiming to foster academic advancement toward professorship.
- Skience: Winter School on Urban Seismology by LMU** (2025), lectures and hands-on workshop from experts on ambient noise and 6C structural monitoring.
- Skience: Winter School on 6C for Volcano Monitoring by LMU** (2024), lectures and hands-on workshop from experts on ambient noise and 6C monitoring in volcanic settings.
- Summer School on Earthquake Mechanics by ETHZ** (2022), lectures from experts and poster sessions of students on the topic of mechanics of earthquakes and aseismic slip.
- Research Data Management Summer School by ETHZ** (2021), best practice in data curation, writing data management proposals as well as GIT lectures.
- Fix the Leaky Pipeline Peer Mentoring by ETHZ** (2021), 12 PhD's and PostDocs mentoring each other, while being supported by coaches and senior mentors with a focus on career planning, networking and assertiveness.
- The Art of Scientific Writing by Artesc** (2020), learn how to write exciting introductions, compose clear lines in an article, and write great sentences and paragraphs.

### PROFESSIONAL SERVICE

- Co-convener of Session: Observing Wave Field Gradients in Seismology: Applications, Instrumentation, and Theory, American Geophysical Union (AGU) 2022, 2023
- Co-convener of Session: Direct observation of seismic wavefield gradients – a new approach to seismic experiments, European Geosciences Union (EGU) 2023, 2026
- Co-convener of Session: Earthquake Ground Motions and Structural Response: Emerging Tools and Applications (SSA) 2026
- Reviewer: PLOS One, Journal of Seismology, Mechanical Systems and Signal Processing, Seismica, AIP Advances, Springer - GPS Solutions, BSSA

### LANGUAGES

- German: Native Speaker
- English: Fluent
- French: Advanced
- Italian: Advanced