Titouan Muzellec

Nationality: French   **Date of birth:** 10/11/1995   **Phone number:** (+33) 689075365

Email address: titouan.muzellec@gmail.com   **Email address:** titouan.muzellec@unina.it

Skype: titouan.muzellec

Home: 3 impasse du coteau, 35400 Saint-Malo (France)

WORK EXPERIENCE

Postdoctoral researcher
RISSC Lab, Università Degli Studi Di Napoli Frederico II, Dipartimento di Fisica "Ettore Pancini" [17/05/2024 – Current]

City: Naples | **Country:** Italy

PhD in Seismology - XXXVI Cycle - PhD program Structural Engineering, Geotechnics, and Seismic Risk
RISSC Lab, Università Degli Studi Di Napoli Frederico II, Dipartimento di Fisica "Ettore Pancini" [01/11/2020 – 16/05/2024]

City: Naples | **Country:** Italy

PhD project in seismology, supervised by Prof. Aldo Zollo and Dr. Grazia De Landro, focused on the spatial and temporal variations of the medium properties and the fluid influence through the application to the 2014 Northern Nagano (Japan) earthquake sequence. In this thesis work, we developed an earthquake location strategy based on the picking refinement using waveforms similarity, the three-dimensional velocity model estimated by multi-scale travel-time tomography, and the double difference location procedure to characterize the complexity of the fault structure and the rupture process. The high precision earthquake location provides the opportunities to rethink the geometrical complexity of the fault system and the related medium properties variations estimated by coda wave interferometry on S-wave coda and ambient noise cross-correlation functions.

Geophysicist
RISSC Lab, Università Degli Studi Di Napoli Frederico II, Dipartimento di Fisica "Ettore Pancini" [01/02/2020 – 31/10/2020]

City: Naples | **Country:** Italy

Research project focused on a dataset of small earthquakes in the region of Nagano (Japan). I use the Coda wave interferometry (CWI) to detect the velocity variation related to fluid migration in the structure. By using CWI, I compare the coda wave of some earthquakes which occurred in the same cluster and I get the velocity variations during the time interval of these events.

Internship
ISTerre Chambéry, Savoie Mont Blanc University [01/2019 – 07/2019]

City: Le Bourget-du-Lac | **Country:** France

Analysis and location of mechanical disturbances in the structure of Kilauea volcano during the major eruption of 2018. Study supervised by Philippe Lesage and Corentin Caudron, ISTerre Chambéry, Savoie Mont Blanc University, Campus Scientifique, 73376 Le Bourget-du-Lac, France.

Internship
ISTerre Chambéry, Savoie Mont Blanc University [05/2018 – 06/2018]

City: Le Bourget-du-Lac | **Country:** France

Study of drumbeats of the Turrialba volcano (Costa Rica) supervised by Philippe Lesage, ISTerre Chambéry, Savoie Mont Blanc University, Campus Scientifique, 73376 Le Bourget-du-Lac, France.

Internship
Earthquake research Institute [05/2017 – 08/2017]

City: Tokyo | **Country:** Japan

Study of volcanic earthquakes in Kirishima prefecture on Kyushu Island (Japan) supervised by Minoru Takeo, Earthquake Research Institute, University of Tokyo, Building 2, Yayoi Campus, 〒1130032 Tokyo, 文京区Yayoi, 1−1−1, Japan.

Internship
OSUR, Rennes 1 University [05/2016 – 06/2016]

City: Rennes | **Country:** France

Study of magnetic anomalies in the region of Ouarsenis (Algerian Atlas) supervised by Tahar Aïfa, Earth Sicences UMR6118, Rennes 1 University, Campus de Beaulieu, 35042 Rennes Cedex, France.

EDUCATION AND TRAINING

PhD in seismology - PhD program Structural Engineering, Geotechnics, and Seismic Risk - XXXVI Cycle
University of Naples Federico II [01/11/2020 – 31/01/2023]

City: Naples | **Country:** Italy | **Field(s) of study:** Seismology | **Thesis:** 4D medium properties variations and fluid influence: application to the 2014 Northern Nagano (Japan) earthquake sequence. Supervised by Prof. Aldo Zollo and Dr. Grazia De Landro.

Master's degree in Earth Sciences, Environment, specialize in Geophysics
Grenoble Alpes University [09/2017 – 06/2019]

City: Grenoble | **Country:** France | **Field(s) of study:** Geophysics - Seismology | **Thesis:** Analysis and location of mechanical disturbances in the structure of Kilauea volacano during the major eruption of 2018. Supervised by Prof. Philippe Lesage and Prof. Corentin Caudron.

Bachelor's degree in Earth Sciences
Rennes 1 University [09/2013 – 06/2016]

City: Rennes | **Country:** France

TEACHING

Courses supervised as teacher assistant during the PhD

• Digitial signal processing and analysis : Course sessions 2020-2021 and 2021-2022 for master students (10h) Introduction to MATLAB programming and application exercises focus on several field of signal processing : Properties of the time series, Convolution, Correlation, Interpolation, Discretization, Fourier transform, Smoothing, and Filtering.

• Earthquake Seismology : Course sessions 2021-2022 and 2022-2023 for master students (10h) Introduction to Seismic Analysis code (SAC) and application exercises focus on several field of seismology : Phase picking, Magnitude estimation, Location, Focal mechanism, and Point source approximation / Extended source.

LANGUAGE SKILLS

Mother tongue(s): French

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Linux (Terminal Commands, Bash/Shell) / Programming (MATLAB, Python, Fortran) / ArcGIS, QGIS, Python, Generic Mapping Tools (GMT) / Seismic Analysis Code / FPFIT / HYPO71, NonLinLoc, NonLinLoc-SSST, HypoDD

OTHER SKILLS

Digital skills in seismology

- MSNoise (The standard MSNoise workflow is designed to go from seismic data archives to dv/v curves. The monitoring is achieved by computing the cross-correlation of continuous seismic records for each pair of a network and by studying the changes in the cross-correlation function relative to a reference. Follow the link : http://www.msnoise.org/)

- TOMOTV (Linearized tomographic inversion code to estimated three-dimensional velocity models at different scales by inverting arrival times. Latorre, D., Virieux, J., Monfret, T., Monteiller, V., Vanorio, T., Got, J. L., & Lyon-Caen, H. (2004). A new seismic tomography of Aigion area (Gulf of Corinth, Greece) from the 1991 data set. *Geophysical Journal International*, 159(3), 1013-1031.)

PUBLICATIONS

Camanni, G., De Landro, G., Mazzoli, S., Michele, M., Muzellec, T., Schaff, D. P., ... & Zollo, A. (2024). Remobilization of Inverted Normal Faults Drives Active Extension in the Axial Zone of the Southern Apennines Mountain Belt (Italy). Journal of the Geological Society. (Accepted for publication). (Rank A)

Scotto di Uccio, F., Lomax, A., Natale, J., Muzellec, T., Festa, G., Nazeri, S., ... & Zollo, A. (2024). Delineation and fine-scale structure of fault zones activated during the 2014–2024 unrest at the Campi Flegrei caldera (Southern Italy) from high-precision earthquake locations. Geophysical Research Letters, 51(12), e2023GL107680. (Rank A)

Adinolfi, G. M., De Landro, G., Picozzi, M., Carotenuto, F., Caruso, A., Nazeri, S., Colombelli, S., Tarantino, S., Muzellec, T., Emolo, A., Zollo, A., Orefice, A., Ulivieri, B., Calcagni, D., & Piantanida, M. (2023). Comprehensive study of micro-seismicity by using an automatic monitoring platform. Frontiers in Earth Science, 11, 1073684. (Rank A)

Muzellec, T., Lesage, P., Caudron, C., & Got, J. L. (2023). Migration of Mechanical Perturbations Estimated by Seismic Coda Wave Interferometry During the 2018 Pre-Eruptive Period at Kīlauea Volcano, Hawaii. Journal of Geophysical Research: Solid Earth, 128(8), e2022JB026224. (Rank A)

CONFERENCES AND SEMINARS

[22/01/2024 – 25/01/2024] Online Poster presentation
American Geophysical Union (AGU) 2023
Poster presentation: Muzellec, T., Provenzano, G., Brossier, R., Métivier, L., De Landro, G., & Zollo, A. Full Waveform Inversion on the Complex 3D Multi-segmented Rupture Zone of the 2014 M w 6.2 Northern Nagano Earthquake Sequence. *AGU23*.

[11/07/2023 – 20/07/2023] Berlin, Germany
General Assembly of the International Union of Geodesy and Geophysics (IUGG) - 28th Edition 2023
Oral presentation: The complex 3D multi-segmented rupture of the 2014 Mw 6.2 Northern Nagano Earthquake revealed by high-precision aftershock locations.

[19/09/2021 – 24/09/2021] Virtual Edition
General Assembly of the European Seismologival Commission (ESC) - 37th Edition 2021
Poster presentation: Refinement of automatic arrival-time measurements based on cross-correlation and Hierarchical clustering.

[22/05/2022 – 28/05/2022] Vienna, Austria
European Geosciences Union (EGU) 2022
Oral presentation: Muzellec, T., De Landro, G., Zollo, A., & Russo, G. (2022, May). Insight on the 2014 MJMA 6.7, northern Nagano earthquake sequence evolution in space and time through high resolved earthquake locations. In EGU General Assembly Conference Abstracts (pp. EGU22-10541).

RECOMMENDATIONS

Name: **Aldo Zollo**
Email: aldo.zollo@unina.it

Name: **Grazia De Landro**
Email: grazia.delandro@unina.it

Name: **Corentin Caudron**
Email: corentin.caudron@ulb.be

Name: **Philippe Lesage**
Email: lesage@univ-smb.fr