

## Contact

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<https://www.researchgate.net/profile/Alanny-Melo> (ResearchGate)

<https://scholar.google.com/citations?user=XSbRVtUAAAAJ&hl=pt-BR> (Google Scholar)

<http://lattes.cnpq.br/6542699550245691> (Lattes)

## Softwares

Petrel

SiroSOM

OpendTect

Oasis Montaj

Trace

ER Mapper

ArGis

QGis

Corel Draw

## Languages

Portuguese (Native)

English (Fluent)

Spanish (Intermediate)

# Alanny Christiny Costa Melo

PhD in Geodynamics and Geophysics

Natal, Rio Grande do Norte, Brazil

## Summary

I have a Bachelor's degree in Geology (2014), an M.Sc. (2016) and a Ph.D. in Geodynamics and Geophysics (2021) from the Federal University of Rio Grande do Norte (UFRN). During my doctoral studies I spent a split period at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of Queensland (UQ). I also hold a specialization in Environmental Management with an emphasis on Water Resources from the Federal Institute of Education, Science and Technology of Rio Grande do Norte (IFRN), where I later taught technical-education courses in geosciences.

My research focuses on applied geophysics for regional mapping, sedimentary-basin analysis using seismic and potential-field methods, self-organizing maps (SOM), geomorphology, geoprocessing, remote sensing, GIS, hydrogeology and broader environmental studies. My most recent project involved the seismostratigraphic and structural interpretation of the Pará–Maranhão and Barreirinhas basins in the central sector of Brazil's Equatorial Margin (MECO), along with a backstripping analysis of both onshore and offshore wells in the Barreirinhas Basin.

## Experience

### Universidade Federal do Rio Grande do Norte (UFRN)

Natal, Rio Grande do Norte, Brazil

#### Postdoctoral Researcher

December 2023 – current

Develop research on seismostratigraphic and structural interpretation in Pará-Maranhão and Barreirinhas based in seismic and well data, in the central sector of the Equatorial Margin of Brazil (MECO). Additionally, conduct a backstripping study in wells in both onshore and offshore Barreirinhas basin.

November 2022 – October 2023

Fellow of the Training Program in Geosciences and Informatics Applied to the Oil and Natural Gas Sector (PRH-42) of the ANP. Used potential methods (magnetic and gravimetric), seismic and exploratory well data, in addition to applying advanced anomaly enhancement techniques, semi-automatic detection of sources and seismic attributes in an integrated way to investigate the deep structuring of the Barreirinhas basin, in Brazilian Equatorial Margin.

### Aarhus University (AU)

Aarhus, Denmark

#### Visiting Postdoctoral Researcher

April 2025 – current

Investigate the structural reconstruction of the basins of the Western Equatorial Margin of Brazil through the integration of seismic and well data.

## Main publications

MACÊDO FILHO, A.A.; OLIVEIRA, A.L.; MANSUR, E. O T.; JANASI, V.A.; **MELO, A. C.C.**; LIMA, F.G.F.; ÁVILA, C.F.; TAVAZZANI, L.; DANTAS, A.R. Geochemistry, geochronology, and tectonic aspects of the Angicos plutonism: Insights into equigranular high-K calc-alkaline magmatism in the northern Borborema Province. *LITHOS*, v. 502-503, p. 108007, 2025.

PEREIRA, A.K. BARBALHO ; **MELO, A.C. C.** The importance of Environmental Education in the teaching-learning process: promoting ecological awareness. *Revista Brasileira de Educação Ambiental (Online)*, v. 19, p. 83-94, 2024.

MACÊDO FILHO, A.A.; HOLLANDA, M.H.B.M.; FRASER, S.; OLIVEIRA, A. L.; **MELO, A.C.C.**; DANTAS, A.R. Correlations among large igneous provinces related to the West Gondwana breakup: A geochemical database reappraisal of Early Cretaceous plumbing systems. *Geoscience Frontiers*, v.14, p.101479, 2023.

**MELO, A.C.C.**; de CASTRO, D. L.; OLIVEIRA, D.C.; HOLLANDA, M.H.B.M. Mesozoic dike swarms in Borborema Province (NE Brazil): A structural analysis based on airborne geophysical data and field work. *Journal of South American Earth Sciences*, v.113, p.103650, 2022.

## Instituto Nacional de Pesquisas Espaciais (INPE)

Natal, Rio Grande do Norte, Brazil

Research Geologist

September 2022 - October 2022

Worked at department of Geosciences applied to Geoprocessing and Environmental Assessment. Promoting the mapping of water bodies and the analysis and monitoring of the cliffs on the southeastern coast of Rio Grande do Norte.

## Instituto de Gestão das Águas do Estado do Rio Grande do Norte (IGARN)

Natal, Rio Grande do Norte, Brazil

Research Geologist

December 2021 - August 2022

Developed activities in the Water Resources Granting and Hydraulic Works Licensing sector, I carried out research related to the use of groundwater and aquifer monitoring, in addition to technical analysis and issuance of hydrogeological availability opinion and database curation. Also participated in several public events, providing courses, guidance and educational environmental lectures.

## The University of Queensland (UQ)

Brisbane, Queensland, Australia

Visiting Research PhD student

february 2019 - august 2019

Visiting researcher at WH Bryan Mining Geology Research Centre (BRC) at the Sustainable Minerals Institute (SMI) at UQ, using self-organizing maps in geological-geophysical interpretation and correlation for mapping mafic dikes in the Borborema Province.

## Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Brisbane, Austrália

*Visiting Research PhD Student*

august 2018 - january 2019

Visiting researcher at the Queensland Center for Advanced Technology at CSIRO where developed research with the application of machine learning, of the Self-organizing maps (SOM) type, on airborne data (magnetic and gamma-spectrometric).

## Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte (IFRN)

Parelhas, Rio Grande do Norte, Brazil

Substitute Professor

november 2017 – april 2018

Professor of the Technical Course in Mining in the concurrent and subsequent modalities. I taught the disciplines of Mineral Deposits, Introduction to Mineral Research, Mineralogy, in addition to short courses at the IFRN Museum of Ores. Also supervised students in mentoring, research and extension projects.

**MELO, A.C.C.;** DE CASTRO, D. L.; FRASER, S.J.; MACÊDO FILHO, A.A. Using self-organizing maps in airborne geophysical data for mapping mafic dyke swarms in NE Brazil. **Journal of Applied Geophysics**, v.192, p.104377, 2021.

HOLLANDA, M.H.B.M.; ARCHANJO, C.J.; MACEDO FILHO, A.A.; FOSSEN, H.; ERNST, R.E.; DE CASTRO, D.L.; **MELO, A.C.;** OLIVEIRA, A.L. The Mesozoic Equatorial Atlantic Magmatic Province (EQUAMP). Springer Geology. 1ed.: Springer Singapore, 2019, v.U, p. 87-110.

ARAUJO, R.E.B.; BEZERRA, F.H.R.; NOGUEIRA, F.C.C.; BALSAMO, F.; CARVALHO, B.R.B.M.; SOUZA, J.A.B.; SANGIARD, J.C.D.; DE CASTRO, D.L.; **MELO, A.C.C.** Basement control on fault formation and deformation band damage zone evolution in the Rio do Peixe Basin, Brazil. **Tectonophysics**, v.745, p.117 - 131, 2018.

**MELO, A.C.C.;** de CASTRO, D. L.; BEZERRA, F.H.R.; BERTOTTI, G. Rift fault geometry and evolution in the Cretaceous Potiguar Basin (NE Brazil) based on fault growth models. **Journal of South American Earth Sciences**, v.71, p.96 - 107, 2016.

## Academic education

### Universidade Federal do Rio Grande do Norte (UFRN)

#### PhD in Geodynamics and Geophysics (2016 - 2021)

Used aerogeophysical data (magnetic and gamma-spectrometric), field data, magnetic susceptibility, satellite images and the technique of Self-Organizing Maps (SOM) to map and analyze the mafic dikes that became part of the Equatorial Atlantic Magmatic Province (EQUAMP) together with the sills of the Parnaíba Basin. A structural analysis was carried out integrating magnetic patterns, field data to describe the detailed distribution of dike swarms.

#### Master in Geodynamics and Geophysics (2014-2016)

I performed the processing and interpretation of gravimetric data to promote a 3D gravimetric modeling of the Potiguar rift, used seismic and well data interpretation. The 3D gravimetric modeling was parameterized with well data and seismic interpretations to determine the maximum displacement and length of the main rift border fault, understand the geometry of rift border faults and their influence on crustal heterogeneity and the pre-existing structural fabric in the evolution of the basin architecture.

#### Bachelor of Geology (2008-2013)

Integrated project as a monitor, extension projects and scientific initiation in which worked with coastal and urban geomorphology using satellite data, bathymetry, sedimentology and field data. Also, used ER Mapper, ArGis, QGis and Google Earth software to promote geological mapping.

### Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte (IFRN)

#### Lato sensu Specialization in Environmental Management (2021-2022)

I conduct studies on the use and potential of groundwater in the city of Baraúna/RN. Analyzed data from wells that are regularized. Observed that the greatest consumption of groundwater occurs in rural areas, caused by irrigation and that the aquifer is being affected both quantitatively and qualitatively. High light that the lack of Groundwater management in the area reflects the overexploitation of the aquifer, which could, in a short period, cause a collapse in supply of water, causing a water scarcity.