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Observatório Nacional (ON)
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RJ - Brazil

Brief Description

Graduated in Physics (2012) at Universidade do Estado do Rio de Janeiro (UERJ), with a Master's (2016) and PhD (2020) degree in Geophysics at Observatório Nacional (ON). Currently, I am a Researcher in the Coordenação de Geofísica (COGEO) at Observatório Nacional (ON/MCTI) and an Adjunct Professor in the Departamento de Geologia Aplicada at the Faculdade de Geologia (DGAP/FGEL) of the Universidade do Estado do Rio de Janeiro (UERJ). I am also coordinate the Laboratório de Geofísica Exploratória (LAGEX-FGEL) at the same university. The main areas of my interest are Applied Geophysics and Solid Earth Geophysics, with an emphasis on developing methodologies for modelling and inverting geophysical data, particularly magnetic and gravimetric data. Additionally, I have also experience in using scanning magnetic microscopy for the characterization of magnetic materials and rock samples, focusing on developing new technologies in Paleomagnetism and Rock Magnetism. In recent years, I am interested in the development and application of advanced computational methods in Geophysics and Theoretical Geophysics.

Education

2016 - 2020	PhD in Geophysics , Observatório Nacional (ON), Brazil
2014 - 2016	MSc in Geophysics , Observatório Nacional (ON), Brazil
2007 - 2012	BSc in Physics , Universidade do Estado do Rio de Janeiro (UERJ), Brazil

Work

2025 - on	Researcher , Observatório Nacional (ON), Brazil
2021 - on	Adjunct Professor , Universidade do Estado do Rio de Janeiro (UERJ), Brazil
2020 - 2021	Postdoctoral Researcher , Observatório Nacional (ON), Brazil
2013 - 2014	Technician , Universidade Estadual do Norte Fluminense (UENF), Brazil

Awards and Scholarships

2020 - 2021	Postdoctoral Fellowship Centro Nacional de Desenvolvimento Científico e Tecnológico (CNPq) Observatório Nacional (ON), Brazil
2016 - 2020	PhD Scholarship Centro Nacional de Desenvolvimento Científico e Tecnológico (CNPq) Observatório Nacional (ON), Brazil
2014 - 2016	MSc Scholarship Centro Nacional de Desenvolvimento Científico e Tecnológico (CNPq) Observatório Nacional (ON), Brazil
2007 - 2009	Scientific Initiation Scholarship Centro Nacional de Desenvolvimento Científico e Tecnológico (CNPq) Centro Brasileiro de Pesquisas Físicas (CBPF), Brazil

Educational Resources

2021 - on	Geofísica I , GitHub: andrelreis/geofisica1
2021 - on	Geofísica II , GitHub: andrelreis/geofisica2
2023 - on	Introdução ao Processamento Sísmico , GitHub: andrelreis/processamento-sismico
2021 - on	Inversão de Dados Geofísicos , GitHub: andrelreis/introducao-inversao
2021 - 2021	Métodos Potenciais , GitHub: andrelreis/metodos-potenciais

Projects and Grants

2024	Métodos computacionalmente eficientes para a descrição magnética de amostras de rocha em escala micrométrica Fundação de Amparo à Pesquisa do Rio de Janeiro (FAPERJ)
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Conference Participations

2019	Equivalent layer technique for estimating magnetization direction SEG Annual Meeting, San Antonio, TX - USA
2017	SED for optimal acquisition design and sensor-to-sample distance applied to scanning magnetic microscopy Bi-annual meeting of the Latinmag, Querétaro - México
2016	Impact of the sensor area, acquisition design and position noise on the estimation of the magnetization distribution within a rectangular rock sample AGU Fall Meeting, San Francisco, CA - USA

Presentations

2023	Teoria do Potencial Aplicada: uma contribuição para a descrição de rochas ígneas em bacias sedimentares X SAGEO-UERJ, <i>Invited Speaker</i> , DOI: 10.6084/m9.figshare.24156039.v1
2020	Inversão de dados magnéticos para estimar as três componentes do campo Jornada PCI-ON, <i>Invited Speaker</i> , DOI: 10.6084/m9.figshare.13256657.v1
2019	Equivalent layer technique for estimating magnetization direction SEG Annual Meeting, <i>Oral presentation</i> , DOI: 10.6084/m9.figshare.9899321.v1
2017	SED for optimal acquisition design and sensor-to-sample distance applied to Scanning Magnetic Microscopy Bi-annual Meeting of the Latinmag, <i>Oral presentation</i> , DOI: 10.6084/m9.figshare.9899282.v1
2016	Impact of the sensor area, acquisition design and position noise on the estimation of the magnetization distribution within a rectangular rock sample AGU Fall Meeting, <i>Poster presentation</i> , DOI: 10.6084/m9.figshare.9899213.v1

- 2023 **Computational aspects of the equivalent-layer technique: review**
Oliveira Jr, VC; Takahashi, D; **Reis, ALA**; Barbosa, VCF
Frontiers in Earth Sciences, DOI: [10.3389/feart.2023.1253148](https://doi.org/10.3389/feart.2023.1253148)
- 2023 **Construction of a Hall effect scanning magnetic microscope using permanent magnets for characterization of rock samples**
Araujo, JFDF; **Reis, ALA**; Yokoyama, E; Medina, CD; Osorio, FG; Luz-Lima, C; De Falco, A; Lima, CDA; Silva, JFC; Sinimbu, LIM; Gutierrez, FV; Pottker, WE; La Porta, FA; Mendoza, LAF; Tahir; Del Rosso, T; Bruno, AC
Journal of Magnetism and Magnetic Materials, DOI: [10.1016/j.jmmm.2022.170304](https://doi.org/10.1016/j.jmmm.2022.170304)
- 2022 **Spinel nanoparticles characterization by inverting scanning magnetic microscope maps**
Loreto, JM; **Reis, ALA**; Loreto, RP; Labre, C; Chaves, JF; Lima, CDA; Bruno, AC; Luz-Lima, C; Merino, ILC; Saitovitch-Baggio, E; Solorzano, G; Araujo, JFDF
Ceramics International, DOI: [10.1016/j.ceramint.2022.04.149](https://doi.org/10.1016/j.ceramint.2022.04.149)
- 2021 **Detecting surface-breaking flaws with a Hall effect gradiometric sensor**
Junior, EBM; Osorio, FG; Gutierrez, FV; Del Rosso, T; Tahir; Mendoza, LAF; Luz-Lima, C; Yokoyama, E; **Reis, ALA**; Perez, G; Loreto, JM; Bruno, AC; Araujo, JFDF
Measurement, DOI: [10.1016/j.measurement.2020.108808](https://doi.org/10.1016/j.measurement.2020.108808)
- 2020 **Generalized positivity constraint on magnetic equivalent layers**
Reis, ALA; Oliveira Jr, VC; Barbosa, VCF
Geophysics, DOI: [10.1190/GEO2019-0706.1](https://doi.org/10.1190/GEO2019-0706.1)
- 2019 **Characterizing Complex Mineral Structures in Thin Sections of Geological Samples with a Scanning Hall Effect Microscope**
Araujo, JFDF; **Reis, ALA**; Oliveira Jr, VC; Santo, AF; Luz-Lima, C; Yokoyama, E; Mendoza, LAF; Pereira, JMB; Bruno, AC
Sensors, DOI: [10.3390/s19071636](https://doi.org/10.3390/s19071636)
- 2019 **Scanning Magnetic Microscope Using a Gradiometric Configuration for Characterization of Rock Samples**
Araujo, JFDF; **Reis, ALA**; Correa, AAP; Yokoyama, E; Oliveira Jr, VC; Mendoza, LAF; Pacheco, MAC; Luz-Lima, C; Santo, AF; Osorio, FG; Brito, GE; Araujo, WWR; Tahir; Bruno, AC; Del Rosso, T
Materials, DOI: [10.3390/ma12244154](https://doi.org/10.3390/ma12244154)
- 2016 **Estimating the magnetization distribution within rectangular rock samples**
Reis, ALA; Oliveira Jr, VC; Yokoyama, E; Bruno, AC; Pereira, JMB
Geochemistry, Geophysics, Geosystems, DOI: [10.1002/2016GC006329](https://doi.org/10.1002/2016GC006329)

Defense Committee Participations

2025	Jennifer Ribeiro Silvério da Conceição PhD qualifying Observatório Nacional (ON)
2024	Lanna Isabely Moraes Sinimbu PhD qualifying Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio)
2024	Gelson Ferreira de Souza Junior PhD qualifying Universidade de São Paulo
2023	Lanna Isabely Moraes Sinimbu MSc defense Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio)
2023	Victor Lebre Fiaux Rodrigues MSc defense Universidade do Estado do Rio de Janeiro (UERJ)
2023	Leonardo Campos João MSc defense Universidade do Estado do Rio de Janeiro (UERJ)
2023	Renato Mota Xavier de Meneses PhD defense Universidade Federal Fluminense (UFF)
2023	Victor Lebre Fiaux Rodrigues MSc qualifying Universidade do Estado do Rio de Janeiro (UERJ)
2022	Rômulo Rodrigues de Oliveira MSc defense Universidade Federal Fluminense (UFF)
2022	Guilherme Zequini Gomes MSc defense Universidade do Estado do Rio de Janeiro (UERJ)
2021	Bruno Lima de Freitas Undergraduate thesis defense Universidade Federal Fluminense (UFF)
2020	Allan Soares Ramalho Undergraduate thesis defense Universidade Federal Fluminense (UFF)
2020	Shayane Paes Gonzalez PhD qualifying Universidade Federal Fluminense (UFF)

Technical Skills

Programming	Python, FORTRAN
Markup	Markdown, LaTeX
Graphics	InkScape, GIMP

Languages

Portuguese	Native
English	Advanced
Italian	Begginer
Spanish	Begginer