JULIA MARCOLAN

Julia Marcolan Teixeira (J. Marcolan)

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Languages: Portuguese (native), English (fluent)

ABOUT ME

As a PhD student in Computational Physics at IFSC, I have the privilege of being supervised by Prof. Dr. Alberto Tannús, with co-supervision from Prof. Dr. Francisco Guilhien. My research focuses on Magnetic Resonance Imaging (MRI), specifically exploring ultra-short relaxation times for seed evaluation. Beyond my commitment to academic research, I have a strong passion for science and technology outreach. My focus is on promoting the inclusion of women in STEM fields through projects and initiatives aimed at increasing female representation and engagement in these important and dynamic fields

REASEARCH INTERESTS

- Magnetic Resonance Imaging for ultra-short relaxation times
- Time Domain Nuclear Magnetic Resonance (TD-NMR)
- Low-field spectroscopy
- Sequence simulation and development
- NMR instrumentation
- Gender in science

EDUCATION

PhD in Computation Physics
Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.
2023 - present

Master's degree in Computation Physics
Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.
2021 - 2023

Bachelor's degree in Computation Physics
Instituto de Ciências Exatas, Universidade Federal Fluminense, Volta Redonda - RJ, Brazil.
2014 - 2019

PROGRAMMING & SKILLS

- Git, Github.
- Python.
- Fortran 95.
- C, C++.
- JavaScript (Cypress)
- End-to-end Tests
- API Tests

REASEARCH EXPERIENCE

Ultra-Short relaxation time Magnetic Resonance Imaging applied in seed evaluation.

2023 - present

Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.

OBJECTIVES: My research project aims to investigate the application of MRI and image segmentation techniques to evaluate mechanical injuries and damage inflicted on seeds by insects during field or storage conditions. To achieve this goal, I am implementing ultra-short relaxation time image sequences on the Digital Magnetic Resonance Spectrometer (DMRS) developed by CIERMag.

Strategies for obtaining the J spectrum at low field

2023 - present

Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.

OBJECTIVES: I'm working on a research project that aims to explore different strategies for obtaining the J coupling spectrum at low field (around 0.5T). This collaboration involves Prof. Dr. Itamar Ronen from the University of Sussex, Brighton, and the Sussex Medical School in Brighton, UK.

Digital Magnetic Resonance Spectrometer (DMRS) from CIERMag: Calibration and Relaxometry Measurements Methodology

2021 - 2023

Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.

OBJECTIVES: The objective of this research was to develop NMR methods for the Digital Magnetic Resonance Spectrometer (DMRS), an alternative solution developed by CIERMag in response to the limitations of commercial equipment. These methods encompass software designs containing pulse sequences, validation scripts, and data processing, facilitating a broad spectrum of NMR applications.

Construction of a low-resolution Fourier spectrometer using a Michelson interferometer.

2014 - 2019

Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.

OBJECTIVES: The aim of this research project was to construct a Michelson interferometer using recycled materials. My specific contribution as an intern researcher was in the instrumentation aspect, where I developed the control prototype using Arduino.

LEADERSHIP EXPERIENCES

Supervision, co-supervision

- **Maria Vitoria Lima da Silva, graduate student (co-supervision)**   2024 - present

   Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.

   Project: Implementation of Magnetic Resonance Relaxometry Methods in the Digital Magnetic Resonance Spectrometer (DMRS) for simultaneous T1 and T2 determination.

- **Caio Cesar Fernandes, graduate student (co-supervision)**   2024 - present

   Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.

   Project: Implementation of the Inverse Laplace Transform as a tool for the Digital Magnetic Resonance Spectrometer (DMRS).

Organizations

- **Financial Coordinator of the Integrated Physics Week at the São Carlos Institute of Physics (SIFSC).**

   Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil.   2023 - 2024

PRESENTATIONS
Invited talks

- **The Influence of Women in Computational Physics and Science and Technology.** 2023
  XXI Semana Acadêmica da Física
  Universidade Estadual do Norte Fluminense Darcy Ribeiro, Campos - RJ, Brazil.

- **Computational physics and magnetic resonance, what is it?** 2022
  Angelim Institute Talent Laboratory Project
  Centro de Divulgação Científica e Cultural (CDCC), São Carlos - SP, Brazil.

- **Enhancing Science Outreach: Exploring Diverse Promotion Strategies** 2022
  Inaugural Lecture of the Graduate Program at the Federal Institute of Rio de Janeiro.
  Federal Institute of Rio de Janeiro, Volta Redonda - RJ, Brazil.

Poster and attendances

- 13° Semana Integrada do Instituto de Física de São Carlos, São Carlos - SP, Brazil - 2023.
- XVII Jornada Brasileira de Ressonância Magnética, Fortaleza - CE, Brazil - 2022.
- 12° Semana Integrada do Instituto de Física de São Carlos, São Carlos - SP, Brazil - 2022.
- Spinus 2022, Saint-Petersburg State University, Saint-Petersburg, Rússia - 2022.
- 22nd International Magnetic Measurement Workshop (IMMW22), Brazilian Center for Research in Energy and Materials (CNPEM), Campinas - SP, Brazil - 2022.
- 2° Encontro da Pós- Graduação da Universidade de São Paulo, Universidade de São Paulo, São Paulo - SP, Brazil - 2022.
- 11° Semana Integrada do Instituto de Física de São Carlos, São Carlos - SP, Brazil - 2021.
- Physics Mini-Colloquia, Universidade Federal Fluminense, Volta Redonda - RJ, Brazil, 2017.

TEACHING EXPERIENCE

- Physics and Mathematics Teacher (High School Level) at the Master Class for Entrance Exams, Volta Redonda - RJ, Brazil. 2019-2020.
- Math Circle Teacher at the Math Circle, São Paulo - SP, 2022-2023.
- Hands-On: How to Use the DMRS, Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos - SP, Brazil, 2024

AWARDS, SCHOLARSHIPS AND GRANTS

- Multidisciplinary Olympiad for Public Schools in Barra Mansa, Barra Mansa City Hall, 2007.
- Full Scholarship for High School Studies at Verbo Divino School, Barra Mansa - RJ, 2009 - 2011.
- CNPq Scholarship for the Master's Program, 2021 - 2022.
- Best Poster at the NMR Users Meeting 2022, Magnetic Resonance in Chemistry, 2022.
- CAPES Scholarship for the Doctoral Program, 2023 - Present.
- Honorable Mention - Yvonne Primerano Mascarenhas Academic Excellence Award (PhD category), 2023.

SERVICE & OTHERS

- Evaluator for the Scientific Initiation category at the 13th Integrated Week of the Institute of Physics, São Carlos - SP, Brazil - 2023.
- Evaluator for the Scientific Outreach category at the 12th Integrated Week of the Institute of Physics, São Carlos - SP, Brazil - 2023.
- Volunteer at the Mulheres CAASO Feminist Collective, Universidade de São Paulo, São Carlos (2021 - present).
- Collaborator at "Minas do IFSC," a group aiming to promote gender diversity at the Institute of Physics of São Carlos (2021 - present).
- Judge at the Brazilian Young Scientists Fair, 2020.
- Volunteer at the Medusas Feminist Collective, Federal Fluminense University (2014 - 2017).
- Organization of the First Lecture Series on Women - Medusas Collective UFF Volta Redonda, 2016.

SCIENTIFIC OUTREACH

- Co-host of the podcast "Which Julia Said That?" about academic experience (2021 - present).
- Screenwriter and content assistant for the "A Matemaníaca" channel (2022 - present).

PUBLICATIONS

- **TEIXEIRA, Julia Marcolan**. Digital magnetic resonance spectrometer (DMRS) from CIERMag: calibration and relaxometry measurements methodology. 2023. Dissertação (Mestrado em Física Computacional) - Instituto de Física de São Carlos, Universidade de São Paulo, São Carlos, 2023. doi:10.11606/D.76.2023.tde-14022023-115956. Acesso em: 2024-04-15.
- **MARCOLAN, J**. Mulheres em ciência e tecnologia: as origens históricas da inversão de gênero (Women in Science and Technology: The Historical Origins of Gender Reversal). Revista Blogs Unicamp, 05 dez. 2023.
- AURELIANO, T. ; Márcio Luiz de Castro ; Aline Ghilardi ; Thaís Lôbo ; BRUSATTE, S. ; FULFARO, M. ; PADILHA, P. ; FREITAS, L. M. ; YABU, F. ; **MARCOLAN, J** ; AUGUSTA, B. . Introdução. In: Tito Aureliano; Márcio Luiz de Castro; Aline Ghilardi,;Thaís Lôbo. (Org.). DINO HAZARD: Comics. 1ed.: , 2021, v. 1, p. 1-.
- SOUZA, ANDERSON ; MASSAFFERRI, ANDRÉ ; NETO, AROLDO ; PEREYRA, EVA ; SOUSA, FREDERICO ; ALVES, GILVAN ; OLIVEIRA, GUILHERME ; **MARCOLAN, JULIA** ; SARDELICH, PEDRO ; CUNHA, VITOR ; LIMA, WELLISSON ; BERNARDES, WILLIANE . Medidas de Fluxo, Velocidade e Vida-média de múons no Rio de Janeiro. NOTAS TÉCNICAS DO CBPF, v. 8, p. 25-33, 2018.