

Julia M. T. Roquette

Ph.D in Physics · Astrophysicist · DataScientist

QUNIVERSITY OF GENEVA, SWITZERLAND

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Languages_

Portuguese Mother Tongue

English

Comprehends

Reads

Writes

Speaks

French

Comprehends

Speaks

Writes

Computer Skills_

Operating Systems:

Programming Language

Python

Under the Python umbrella:

Object oriented programming, Numpy, Astropy, Scipy, Pandas, Matlplotlib, Seaborn, Scikit-learn

Software for Data Analysis:

TOPCAT

Excel

Origin Lab

Photometry:

AstrOmatic

Document Compilation:

LaTeX

MS Word

Other:

Jupyter

JavaScript

Shell Scripting

GIMP

HTMI

Current position _____

Dec 2021 - Present Maître Assistant (senior postdoc)

as part of the EU H2020/SPACE project

NEMESIS

University of Geneva

SWITZERLAND

Previous professional experience ____

Jun 2018 - Dec 2021 Research Fellow

University of Exeter

as part of the ERC project AWESoMeStars

UNITED KINGDOM

Nov 2017 - May 2018 Substitute Lecturer*

Universidade Federal de Sergipe (UFS)

BRAZIL

*Note on Research Career Break: I was employed under a full-time teaching contract with no prescribed time for research. I had a research career break between May 2017 and May 2018.

Education _

Mar 2013 - Apr 2017 PhD in Physics

Universidade Federal de Minas Gerais (UFMG)

Advisor: Dr. Sílvia H. P Alencar

BRAZIL

Title: Variability and Rotation of Young Low Mass Stars: The Case of Cygnus OB2 Association

Apr 2015 - Mar 2016 Visiting PhD student

Institut de Planetologie et d'Astrophysique de

Grenoble (IPAG) FRANCE

Aug 2011 - Feb 2013 Master's in Physics

Advisor: Dr. Jerome Bouvier

Universidade Federal de Minas Gerais (UFMG)

Advisor: Dr. Luiz P R Vaz

BRAZIL

Title: "Levantamento Fotométrico nas Bandas J, H e K de Estrelas Variáveis na Região Central de Cygnus OB2" (JHK Survey of Photometric Variability in the center of Cygnus OB2)

Mar 2007 - Jul 2011 Bachelor's in Physics

Universidade Federal de Minas Gerais (UFMG)

Physics Department

BRAZIL

Undergraduate research experience _____

May 2008 - Jul 2011 Scientific Initiation intern at the Laboratory of Astrophysics

Project Title: "Photometric Variability of Young Stars" - Supervisor: Dr. Luiz P R Vaz

UFMG, BRAZIL

Aug 2007 - Apr 2008 Scientific Initiation intern at the Laboratory of Semiconductors

Project Title: "Study of Photoluminescence and Electroluminescence of Conjugate

Polymers" - Supervisor: Dr. Luiz A Cury

UFMG, BRAZIL

Scientific programs approved as Principal Investigator.

Telescope: ESO VIRCAM/VISTA A CENSUS OF ROTATION AND VARIABILITY IN THE CARINA NEBULA COMPLEX

Code: 109.2303.001 observing time: 24.97h

Telescope: ESO VIRCAM/VISTA A CENSUS OF ROTATION AND VARIABILITY IN THE CARINA NEBULA COMPLEX

Code: 105.20LT observing time: 24.52h - lost to the COVID-19 Pandemic

Telescope: CFHT/WIRCAM

TESTING ENVIRONMENTAL EFFECTS DURING EARLY ROTATIONAL EVOLUTION OF LOW MASS STARS: EVALUATION OF THE

ROTATIONAL SCENARIO IN THE OB ASSOCIATION CYGOB2

observing time: 9.96h - observed in 2017 Code: 17AF17

Activities for the scientific community _

CONFERENCE ORGANISATION:

Currently organising the Special Session 13 ("Angular momentum evolution of star-disk systems") For the EAS **Annual Meeting 2023**

will take place on Krakow 11 July 2023

INSTITUTIONAL RESPONSIBILITIES:

Sep 2022 - now Organiser of the Stellar Group Weekly Seminars

University of Geneva (Switzerland)

Aug 2012 - Jul 2014 Student representative at the Physics Department Graduate Commission

Physics Department - UFMG (Brazil)

May 2010 - Apr 2011 Vice President of the Physics Students Association (Diretório Acadêmico da Física)

Exact Sciences Institute (ICEx) - UFMG (Brazil)

MEMBERSHIP IN SCIENTIFIC SOCIETIES:

March 2022 - now Swiss Society for Astrophysics & Astronomy (SSAA)

Member

March 2022 - now European Astronomical Society (EAS)

Member

Oct 2012 - now Brazillian Society of Astronomy

Associate Member

PEER-REVIEWER:

2021 Scientific reviewer for the MNRAS

Refereed 2 papers

PARTICIPATION IN VIVAS AND JURY

23rd June 2022 Panel of Examiners of the MSc Thesis" A study of young stellar objects with Gaia" by Nicholas Storm

University of Geneva, Switzerland

Panel of Examiners of the BSc thesis "Quantidades cinemáticas e dinâmicas cósmmicas via dados de H(z)" 21th Feb 2018 ("Kinematic Cosmic quantities via H(z) data") by Dinorah Barbosa da Fonseca

At the Federal University of Sergipe, Brazil

Panel of Examiners of the BSc thesis "Teste cosmológico com a idade de Galáxias velhas" ("Cosmologic tests 21th Feb 2018 using old galaxies ages")

At the Federal University of Sergipe, Brazil

ACTIVITIES CONTRIBUTING TO DIVERSITY AND INCLUSION

Apr 2016 - Apr 2017 Board Member of the PRISMA - LGBTQ ICEx

University Student Collective for LGBTQ Rights at Exact Sciences Institute - UFMG (Brazil)

Outreach_

"Por que alguns astrofísicos estão interessados em entender como as estrelas giram?" ("Why are astrophysicists interested in 28/04/2018 understanding how the stars rotate?")

Gave a talk to the general public during an outreach event of SEASE Astronomia in Aracaju, Brazil

18-19/07/2022: Monitor at the 3D Cinema sessions carried out during the "Portes ouvertes de l'Observatoire"

Open door at the Observatory - celebration of 250 years anniversary of the Geneva Observatory, Switzerland.

Grants & Fellowships

MERAC funding and travel awards

2022

Granted by the MERAC Foundation through the Swiss Society for Astrophysics and Astronomy

€5,940

Project Title: An observational search for environmental feedback on rotation in the Carina Nebulae Complex - Duration: 2 year

CNPq Sandwich Scholarship for one year as visiting PhD Student Abroad (CNPq/SWD)

2015

Granted by the Brazilian National Council for Scientific and Technological Development

€20.000

Project Title: Cygnus OB2 Association: Study about Low Mass Star Rotation - Duration: 1 year

PhD Scholarship (CNPq/GD) for a 4 years PhD at the Physics Department of the UFMG

2013

Granted by the Brazilian National Council for Scientific and Technological Development

Title of the project: Title: Variability and Rotation of Young Low Mass Stars: The Case of Cygnus OB2 Association

*I had the 2nd best grade in the Physics Exams for the selection of PhD Students

R\$125, 512

Master Scholarship (CNPq/GM) for a 2 years MSc at the Physics Department of the UFMG

2011

Granted by the Brazilian National Council for Scientific and Technological Development

R\$28,800

Title of the project: Title: JHK Survey of Photometric Variability in Cygnus OB2

*I had the 1st best grade in the Physics Exams for the selection of Master Students

3 Scientific Initiation Scholarships (3 years: 1 FAPEMIG/PROBIC and 2 CNPq/PIBIC))

2008, 2009, 2010

Granted by the Foundation for Research Support of the State of Minas Gerais (1 year and by the Brazilian National Council for Scientific and

Technological Development (2 years)

total: *R*\$14, 400

Project Title: "Photometric Variability of Stars in Cygnus OB2"

Funds for 12h/week undergraduate research at the Laboratory of Astrophysics of UFMG.

Scientific Initiation Scholarship (10month, CNPq/PIBIC)

2007

Granted by the Brazilian National Council for Scientific and Technological Development

R\$3, 240

Project Title: "Study of Photoluminescence and Electroluminescence of Conjugate Polymers"

Funds for 12h/week undergraduate research at the Laboratory of Semiconductors of UFMG

Conferences and Schools attended ___

CONTRIBUTED TALKS

The Spin Evolution of Stars Born in Clusters

8th July 2022 Cool Stars 21, Toulouse, France, plenary talk

The Orion Star-Formation Complex as a training set for Machine Learning Techiniques

29th June 2022 EAS meeting, Valencia, Spain, Section SS20 Big data in Star and Planet Formation

The Spin Evolution of Stars in Clusters

17th Sep 2021 XLIV Annual Meeting of the Brazilian Society of Astronomy - (online conference)

Exploring the consequences of external photoevaporation of circumstellar disks on the rotational evolution of low mass stars

2nd Mar 2021 Cool Stars 20.5 - virtually anywhere (online conference)

Does the environment matter? Investigating the spin rates of low mass stars in the young Cygnus OB2 associations

24th Sep 2019 Thinkshop 16 - The rotation periods of cool stars: Measurements, uses, connections and prospects - - Potsdam, Germany

Near-infrared variability and rotation of young low-mass stars in Cygnus OB2: a tale on the environmental influence on the early stellar evolution?

31st Jan 2018 Star Formation and Young Stars in Cygnus, Keele University, UK,

Near-Infrared Variability of Disk-bearing Stars in Cygnus OB2

24th Aug 2016 Star Formation 2016, Early-career session, Exeter, UK

POSTER PRESENTATIONS

The Orion Star-Formation Complex as a training set for Machine Learning Techiniques

8th July 2022

Cool Stars 21, Toulouse, France,

Exploring the role of the environment on the rotational history of low mass stars

18-21 Oct 2021

Star Formation: From clouds to discs - A Tribute to the Career of Lee Hartmann - online participation

The rotation of low mass stars at 30 Myr in the cluster NGC 3766

30 Jun - 6 Jul 2019

IAU Symposium 354: Solar and Stellar Magnetic Fields: Origins and Manifestations - Copiapo, Chile

Does environment matter? The rotational scenario of low mass stars in the young Cygnus OB2 association

7-18 June 2021 ESCAPE Summer School on Data Science for Astronomy, Astroparticle and Particle Physics

04-08 Sep 2017

XLI Annual Meeting of Brazilian Society of Astronomy, São Paulo, Brazil, Stars and Solar Physics Session.

8+ poster presentations: at the "400 Years of Stellar Rotation" and the XIV Latin American Regional IAU Meeting in 2013. At the XXXVIII, XVII and XXXV Annual Meeting of Brazilian Society of Astronomy in 2014, 2012, and 2010. At the XVIII and XIX Week of Scientific Initiation of UFMG in 2009 and 2010

SCHOOLS

11-15 July 2022 Summer School for Astrostatistics in Crete

Crete, Greece

13-17 June 2022 Astrophysics Multipurpose Software Environment (AMUSE) Summer School

Geneva, Switzerland

6-11 Oct. 2019 School of Astrostatistics 2019: Variability and Time Series Analysis

Online

11-16 Oct. 2015 School of Astrostatistics 2015: Clustering and Classification

Autrans, France Les Houches, France

1+ previous schools: XXI Winter School on Physics (Physics Department of UFMG - Belo Horizonte, Brazil, 12-16 Jul 2010)

Teaching and Supervision _

SUPERVISION OF JUNIOR RESEARCHERS

Astrophysics Lab II project "Mapping the photometric variability of young stellar objects with public surveys"

Sep – Dec 2022

Mentored 1 MSc student in the development of a research project

University of Geneva,

Switzerland

Switzerland

4-month project

Astrophysics Lab II project "The age dispersion of young clusters as an uncertainty in spin evolution models"

Feb – May 2022

Mentored 1 MSc student in the development of a research project

University of Geneva,

4-month project

Bachelor's Project: "Mapping the interstellar extinction in young clusters"

Oct-Nov 2020

Mentored 4 undergraduate students in the development of a research project

University of Exeter, UK

3-month project

Summer Project: "Investigating the Effect of Massive Stars in the Rotational Scenario of Pre-Main-Sequence Clusters"

Jun-Sep 2020

 $Mentored\,1\,summer\,student\,in\,the\,development\,of\,a\,research\,project$

University of Exeter, UK

3-month project

Summer Project: "Recovering Praesepe's Spin Distribution at Birth"

Jun-Sep 2020

Co-supervised 1 summer student in the development of a research project

University of Exeter, UK

3-month

Master Project: "Mining stellar spin rates:Do field stars rotate differently in different parts of the the Galaxy?"

Dec 2018 - May 2020

Mentored 3 Master's students in the development of a research project

University of Exeter, UK

18-month

TEACHING

Telescope demonstrator (night time)

Oct 2019 -

University of Exeter, UK

Feb 2020

Supervised students during night-time observations at the Physics Department's 14-inch telescope as part of the development of the astrophysics experiments of Practical Physics II

(English)

Duties:

- Every observing night, I initiated the telescope and obtained flat and bias images
- Guided the students in the operation of the telescope and production of observational logs

"Python for Dummies" workshop

19th Apr 2018

Institut de Planetologie etd'Astrophysique de Grenoble, France

(English)

Gave an introductory workshop on Python (2h) for researchers and PhD students with previous experience in programming in other languages

Full-time Lecturer in Physics and Astrophysics

Nov 2017 -

Physics Department of the Federal University of Sergipe, Brazil

May 2018

I taught the three following undergraduate modules:

(Portuguese)

Astrobiology (60h): Modern topics in the field of Astrobiology

Laboratory of Astronomy and Astrophysics (60h): Computational tools for the analysis of astronomical data. Python, Astropy, Virtual Observatory tools, TOP-

Laboratory of Physics I (2x30h) Practical Physics Lab with experiments on the subjects of fundamental mechanics and thermodynamics

My responsibilities included preparing and delivering lectures, tutoring students, preparing, applying and marking exams and homework. For the practical modules, I was both the lecturer and the demonstrator. Line managers: Prof. Dr. Sergio Scarano (scaranojr@ufs.br) and Prof. Ana Maia (afmaia@ufs.br)

Part-time Lecturer in Physics

Mar-Apr 2013

As part of the "Mandatory Teaching Training program" for PhD students at ICEx-UFMG, Brazil

Aug-Sep 2013

Taught the module Fundamentals of Solid and Fluid Mechanics (2×15h)

(Portuguese)

Duties: Preparing and delivering lectures. Tutoring students. Preparing, applying and marking exams and homework. Mentor: Prof. Dr. Ariete Righi (righi@fisica.ufmg.br)

Demonstrator and Tutor in Physics

Sep 2013 -

of the Licentiate in Chemistry and Biology Programs of the EaD-UFMG (UFMG e-learning), Brazil

Sep 2014

As part of the Universidade Aberta do Brasil (Brazilian Open University)

(Portuguese)

Role 1: online tutor in the modules of Fundamentals of Mechanics, Fundamentals of Thermodynamics, Fundamentals of Electromagnetism and Fundamentals of Modern Physics. Duties: tutoring students online in solving physics problems, marked exams and homework.

Role 2: Demonstrator in the experimental physics lab. Duties: Travelled to remote areas of the estate of Minas Gerais (in Brazil) to deliver (in-person) demonstration of physics labs. Also applied and marked lab homework and exams.- Line manager: Prof. Dr Wagner Conradi

OTHER TEACHING-RELATED ACTIVITY - LEARNING MATERIALS

"XXCygni Experiment" Cookbooks of multi-epoch photometry with Python

2019-2021

At the University of Exeter, I lead the transition of the astronomy experiments in the discipline Practical Physics II from IRAF to Python

University of Exeter, UK

Along with Prof. Sean Matt, we used my Python solution to the experiments to write up Jupyter-Notebooks and Cookbooks provided as learning material for the discipline Practical Physics II.

List of Publications _

PEER REVIEWED PUBLICATIONS

First Author

Roquette, J. and Matt, S. P. and Winter, A. J. and Amard, L. and Stasevic, S. The influence of the environment on the spin evolution of low-mass stars - I.

2021 External photoevaporation of circumstellar discs. MNRAS, 508(3):3710-3729, dec 2021 - link: https://doi.org/10.1093/mnras/stab2772

My contribution: I developed all the steps in this research presented, including the codes published with the paper. I also wrote most of the manuscript.

Roquette, J. and Alencar, S. H. P. and Bouvier, J. and Guarcello, M. G. and Reipurth, B. Near-infrared time-series photometry in the field of Cygnus OB2 association. II. Mapping the variability of candidate members. A&A, 640:A128, aug 2020 - link:

https://www.aanda.org/articles/aa/pdf/2020/08/aa36984-19.pdf

My contribution: This study was a follow up on my PhD research developed during my first year as a postdoc. I developed all the steps in the research presented and fully wrote the manuscript.

Roquette, J. and Bouvier, J. and Moraux, E. and Bouy, H. and Irwin, J. and Aigrain, S, and Lachaume, R. "The rotation of low mass stars at 30 Myr in the cluster NGC 3766". IAU Symposium, 354:200–203, jan 2020 - link: https://doi.org/10.1017/S1743921319009797

My contribution: My co-authors observed the NGC3766 cluster as part of the Monitor Project. My collaborators did the observations, photometry extraction, calibration and light-curve production. My contribution to the project was leading the data analysis and interpretation, including cluster membership, stellar parameter determination and time-series analysis. Partial results were presented by myself at the IAU 354 conference in 2019, along with this proceeding.

Roquette, J. and Bouvier, J. and Alencar, S. H. P. and Vaz, L. P. R. and Guarcello, M. G. Near-infrared time-series photometry in the field of Cygnus OB2 association. I. Rotational scenario for candidate members. A&A, 603:A106, jul 2017 - link:

https://www.aanda.org/articles/aa/pdf/2017/07/aa30337-16.pdf

My contribution: This study was developed as part of my PhD research. I developed myself all the steps in the research presented and fully wrote the manuscript.

Major contribution

2020

2017

See, Victor and Roquette, Julia and Amard, Louis and Matt, Sean P. Photometric Variability as a Proxy for Magnetic Activity and Its Dependence on Metallicity. ApJ, 912(2):127, may 2021 - link: https://iopscience.iop.org/article/10.3847/1538-4357/abed47

My contribution: I compiled and processed the sample used in the paper and wrote Section 2 in the manuscript. I also contributed to the analysis of the rotational period recovery rates presented in Section 4.

Amard, L. and Roquette, J. and Matt, S. P. Evidence for metallicity-dependent spin evolution in the Kepler field. MNRAS, 499(3):3481–3493, oct 2020 - link: https://doi.org/10.1093/mnras/staa3038

My contribution: I did the whole data compilation and processing, statistical analysis and all the plots in the paper. I fully developed and wrote Section 2 and 3 in the manuscript, that collect, process and analyse the observational dataset.

Moderate contribution

Sousa, A. P. and Bouvier, J. and Alencar, S. H. P. and Donati, J. -F. and Alecian, E. and Roquette, J. and Perraut, K. and Dougados, C. and Carmona, A. and Covino, S. and Fugazza, D. and Molinari, E. and Moutou, C. and Santerne, A. and Grankin, K. and Artigau, É. and Delfosse, X. and Hebrard, G. and SPIRou Consortium. Star-disk interaction in the T Tauri star V2129 Ophiuchi: An evolving accretion-ejection structure. A&A, 649:A68, may 2021 - link:https://doi.org/10.1051/0004-6361/202140346

My contribution: I contributed to this paper with Section "3 - Infrared Photometry", for which I performed data reduction, photometric extraction, light-curve production and time-series analysis that was used to confirm the rotation period of the target star, infrared-fluxes were also used to calibrate some of the spectra used in the paper.

Minor contribution

Angeloni, R. and Contreras Ramos, R. and Catelan, M. and Dékány, I. and Gran, F. and Alonso-García, J. and Hempel, M. and Navarrete, C. and Andrews, H. and Aparicio, A. and Beamín, J. C. and Berger, C. and Borissova, J. and Contreras Peña, C. and Cunial, A. and de Grijs, R. and Espinoza, N. and Eyheramendy, S. and Ferreira Lopes, C. E. and Fiaschi, M. and Hajdu, G. and Han, J. and Hełminiak, K. G. and Hempel, A. and Hidsalgo, S. L. and Ita, Y. and Jeon, Y.-B. and Jordán, A. and Kwon, J. and Lee, J. T. and Martín, E. L. and Masetti, N. and Matsunaga, N. and Milone, A. P. and Minniti, D. and Morelli, L. and Murgas, F. and Nagayama, T. and Navarro, C. and Ochner, P. and Pérez, P. and Pichara, K. and Rojas-Arriagada, A. and Roquette, J. and Saito, R. K. and Siviero, A. and Sohn, J. and Sung, H.-I. and Tamura, M. and Tata, R. and Tomasella, L. and Townsend, B. and Whitelock, P. The VVV Templates Project Towards an automated classification of VVV light-curves. I. Building a database of stellar variability in the near-infrared. A&A, 567:A100, jul 2014 - link: https://www.aanda.org/articles/aa/pdf/2014/07/aa23904-14.pdf

My contribution: I provided the collaboration a set of well characterised near-infrared light-curves for young stellar objects, used as training-set in their machine-learning algorithm.

THESIS AND DISSERTATIONS

Variability and Rotation of Young Low Mass Stars: The case of the Cygnus OB2 Association (in English)

Julia Maria Torres Roquette

 $\textbf{link:} \ \texttt{http://lilith.fisica.ufmg.br/posgrad/Teses_Doutorado/decada2010/julia-roquette/JuliaRoquette-tese.pdf}$

Levantamento Fotométrico nas Bandas J, H e K de Estrelas Variáveis na Região Central de Cygnus OB2 (in Portuguese)

Julia Maria Torres Roquette

 $\textbf{link:} \ \texttt{http://lilith.fisica.ufmg.br/posgrad/Dissertacoes_Mestrado/decada2010/julia-roquette/JuliaMTRoquette-diss.}$

pdf

COOKBOOKS AND LEARNING MATERIAL

PHY_2026 Photometry Cookbook 1: Image Calibration, PHY_2026 Photometry Cookbook 2: Alignment & Coordinates and PHY_2026 Photometry Cookbook 3: Photometry - Authors: Sean Matt, Julia Roquette, Tom Wilson - Learning material provided by the University of Exeter as part of the module PHY2026 (Practical Physics II) - XXCygni Experiment

link: https://drive.google.com/file/d/1f__K02IkCBjHXpLov3ZLWk_furZZYkbw/view?usp=sharing

link: https://drive.google.com/file/d/1f__KO2IkCBjHXpLov3ZLWk_furZZYkbw/view?usp=sharing

link: https://drive.google.com/file/d/1f__KO2IkCBjHXpLov3ZLWk_furZZYkbw/view?usp=sharing

Interests Outside Academia _

ॐ cycling (bike-touring), ♣Bike-mechanics and wheel building, Cheesemaking, Climbing, ♣ Puzzles of Art, ✔ Sci-Fi, 🗐 Literature, Comic Books, Cinema, Hiking, 🛍 Traveling, Computers, T-shirt Design

Bike Mechanic Volunteer at the Ride On Cycling for All,

June 2020 -December 2021

Every Saturday from 10am to 5pm I was a Bike Mechanics Volunteer at the Ride On (https://www.rideoncycling.org/), a charity in Exeter that has the goal of helping more and more people to get into cycling.

Exeter, UK

- During 1.5 yrs of volunteering, I helped the charity to service and refurbish more than 50 donated bikes that were put back in circulation.
- I was one of the creators and organisers of the Wom+n's Workshop, in which once a week, I taught basic bike-mechanics skills to other women and members of the LGBTQ+ community.
- In December 2021 I gave an interview to a local magazine called Exeter Living about my role at Ride On and the Wom+n's Workshop (The interview can be read on this link: https://issuu.com/mediaclash/docs/el291_final/34).

Bike Mechanic at the Péclôt 13

May 2022 - now

part-time (every other Saturday) - There, I work with bike repair and refurbishing

Geneva, Switzerland