

Anne Viegas Rathsam

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Address: Institute of Astronomy, Geophysics and Atmospheric Sciences, University of São Paulo, Rua do Matão, 1226, G210 – São Paulo, Brazil.

Research Interests

- (a) FGK stars: stellar parameters, chemical composition, age, mass, evolution, planets
- (b) Spectral analysis, spectral synthesis
- (c) Chemical evolution of the Milky Way, stellar clusters, chemical tagging

Education

University of São Paulo

Ph.D. in Astronomy

Thesis: Lithium in field stars and open clusters

03/2022 – Present

São Paulo, Brazil

University of São Paulo

B.Sc. in Astronomy

Dissertation: Lithium depletion in low-mass stars

03/2018 – 12/2021

São Paulo, Brazil

Publications

2 first-author and 3 co-author papers.

H-index: 3

Refereed publications:

5. Carvalho Silva, G.; Meléndez, J.; **Rathsam, A.**; Shejeelammal, J.; Martos, G. Lorenzo-Oliveira, D.; Spina, L.; Ribeiro Alves, D., 2025, ApJL, vol. 983, p. L31, [ADS link](#)
A new age–activity relation for solar analogs that accounts for metallicity
4. **Rathsam, A.**; Meléndez, J.; Karakas, A. I., 2025, A&A, vol. 693, p. A26, [ADS link](#)
Beryllium: The smoking gun of a rejuvenated star
3. Shejeelammal, J.; Meléndez, J.; **Rathsam, A.**; Martos, G., 2024, A&A, vol. 690, p. A107, [ADS link](#)
The [Y/Mg] chemical clock in the Galactic disk: The influence of metallicity and the Galactic population in the solar neighbourhood
2. **Rathsam, A.**; Meléndez, J.; Carvalho Silva, G., 2023, MNRAS, vol. 525, p. 4642, [ADS link](#)
Lithium depletion in solar analogs: age and mass effects
1. Martos, G.; Meléndez, J.; **Rathsam, A.**; Carvalho Silva, G., 2023, MNRAS, vol. 522, p. 3217, [ADS link](#)
Metallicity and age effects on lithium depletion in solar analogues

Research experience

Ph.D. researcher

03/2022 – Present

Lithium in field stars and open clusters

Advisor: Jorge Luis Meléndez Moreno, Ph.D.

Abstract: We aim to evaluate the relationship between lithium abundance and many stellar parameters in a sample of around 200 field solar analogs and 18 solar twins from old open clusters. The results will be valuable for the study of transport mechanisms in stars and models of stellar interiors.

Undergraduate research assistant

03/2021 – 12/2021

Lithium depletion in low-mass stars

Advisor: Jorge Luis Meléndez Moreno, Ph.D.

Abstract: We examined the presence of lithium in stars less massive than the Sun, evaluating the destruction of this element inside cool stars due to the deepening of the convective zone in low-mass stars.

Undergraduate research assistant

10/2019 – 11/2020

A new sample for the search of habitable planets

Advisor: Jorge Luis Meléndez Moreno, Ph.D.

Abstract: Our goal was to determine which stellar types are more suitable for studies towards detecting potentially habitable planets, considering the equipment we have available today. Based on these results, we selected stars that fit our criteria and characterized them based on their stellar parameters, adopting the spectroscopic method.

Teaching experience

Teaching assistant: AGA0100 - Introduction to Astronomy I

03/2023 – 07/2023

Teaching Improvement Program at IAG/USP

Elaboration of teaching material and offering of practical/computational activities.

Fellowships

- | | |
|---|-------------------|
| 5. FAPESP Ph.D. Research Fellow at IAG/USP – Brazil
Process no. 2023/07617-5 | 10/2023 - Present |
| 4. CAPES/PROEX Ph.D. Research Fellow at IAG/USP – Brazil
Process no. 88887.823858/2023-00 | 03/2023 – 09/2023 |
| 3. CAPES/PROEX M.Sc. Research Fellow at IAG/USP – Brazil
Process no. 88887.684392/2022-00 | 04/2022 – 02/2023 |
| 2. FAPESP Undergraduate Research Assistant Fellow at USP – Brazil
Process no. 2020/15789-2 | 03/2021 – 12/2021 |
| 1. FAPESP Undergraduate Research Assistant Fellow at USP – Brazil
Process no. 2019/19208-7 | 10/2019 – 12/2020 |

Conference presentations & posters

- | | |
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| 14. Between The Lines: a Stellar Spectroscopy Workshop, Santiago, Chile
<i>High-precision stellar chemical analysis: methods and applications</i> (flash talk & poster) | 12/2024 |
| 13. IAU Symposium 395: Stellar populations in the Milky Way and beyond, Paraty, Brazil
<i>Rejuvenated through a merger: beryllium abundance in the ancient star HD 65907</i> (poster) | 11/2024 |
| 12. XLVII Annual Meeting of the Brazilian Astronomical Society, Águas de Lindóia, Brazil
<i>Lithium depletion in solar-type stars</i> (talk) | 09/2024 |
| 11. IX IAG Science Day, São Paulo, Brazil
<i>Beryllium: the smoking gun of the rejuvenated star HD 65907</i> (flash talk) | 09/2024 |
| 10. XVII Latin American Regional IAU Meeting, Montevideo, Uruguay
<i>Lithium depletion in solar analogs: age, mass, and planet effects</i> (talk) | 11/2023 |
| 9. XLVI Annual Meeting of the Brazilian Astronomical Society, Rio de Janeiro, Brazil
<i>Lithium depletion in solar analogs: age, mass, and planet effects</i> (poster) | 10/2023 |

8. Spectral Fidelity, Florence, Italy <i>Lithium depletion in solar analogs: age, mass, and planet effects</i> (talk)	09/2023
7. exoLaTam22 (workshop) <i>Lithium depletion in solar analogs</i> (flash talk)	12/2022
6. VII IAG Science Day (virtual), Brazil <i>Lithium depletion in solar analogs</i> (flash talk)	11/2022
5. XLV Annual Meeting of the Brazilian Astronomical Society (virtual), Brazil <i>Lithium depletion in solar analogs: age and mass effects</i> (poster)	09/2022
4. 29° USP International Symposium of Undergraduate Research (virtual), Brazil <i>Lithium depletion in low-mass stars</i> (flash talk)	10/2021
3. XLIV Annual Meeting of the Brazilian Astronomical Society (virtual), Brazil <i>Lithium depletion in low-mass stars</i> (poster)	09/2021
2. 28° USP International Symposium of Undergraduate Research (virtual), Brazil <i>A new sample for the search of habitable planets</i> (flash talk)	10/2020
1. 27° USP International Symposium of Undergraduate Research, São Paulo, Brazil <i>What types of stars to study in the search of a habitable Earth?</i> (poster)	09/2019

Conference organization

2. IAU Symposium 395: Stellar populations in the Milky Way and beyond, Paraty, Brazil LOC Member	11/2024
1. Practical Precision Spectroscopy Workshop, São Paulo, Brazil LOC Member	01/2023

Granted observing time

4. MAROON-X/Gemini South PI: Rathsam, A Queue mode	11.5 hours (Band 1)
3. MAROON-X/Gemini South PI: Rathsam, A Queue mode	14.4 hours (Band 3)
2. HDS/Subaru (via Gemini exchange program) PI: Meléndez, J Remote observation	1 night
1. UVES/VLT-ESO PI: Rathsam, A Queue mode	5.2 hours

Outreach

Astronomical service for schools

04/2024 - present

Service offered by IAG/USP to schools every Tuesday and Thursday, with the goal of scientific outreach to elementary and high school students. Each service consists of the transmission of a previously recorded talk on astronomy topics followed by a live Q&A.

Complementary information

Languages

1. Portuguese: native
2. English (advanced): understands/reads/writes/speaks well. Scored 106/120 on TOEFL iBT (07/2021).

Skills

1. Programming: L^AT_EX, PYTHON (5+ years); little experience with C++, BASH and parallel programming (MPI)
2. Databases & softwares: IRAF, q², MOOG