Lais Borbolato

Universidade de São Paulo - Instituto de Astronomia, Geofísica e Ciências Atmosféricas (IAG)

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Education

PhD **University of São Paulo**, Ph.D. in Astronomy, Universidade de São Paulo — 2023 - 2027

- Advisor: Prof. Dr. Silvia Rossi, co-advisor: Prof. Dr. Hélio D. Perottoni
- Thesis title: *The Milky Way's disk structures as a memory of its turbulent past*

BSc **University of São Paulo**, BSc in Astronomy, Universidade de São Paulo — 2019 – 2022

- Advisor: Prof. Dr. Silvia Rossi, co-advisor: Prof. Dr. Hélio D. Perottoni
- Thesis title: *Kinematics and Detailed Chemistry for Monoceros Overdensity*.

Work experience

Ph.D. — 2024 – 2027

- Funding by São Paulo Research Foundation (FAPESP) - Total: 198,000 BRL
- Project: The Milky Way's disk structures as a memory of its turbulent past

Ph.D. — 2023 – 2024

- Funding by Brazilian Federal Agency for Support and Evaluation of Graduate Education (CAPES) - Total: 79,200 BRL
- Project: The Milky Way's disk structures as a memory of its turbulent past

Undergraduate Research — 2021 – 2022

- Funding by São Paulo Research Foundation (FAPESP) - Total: 7,200 BRL
- Project: Kinematics and Detailed Chemistry for Monoceros Overdensity

Undergraduate Research — 2020 – 2021

- Funding by Institutional Scientific Initiation Scholarship Program of the National Council for Scientific and Technological Development (PIBIC/CNPq) - Total: 4,800 BRL
- Project: Chemodynamical properties of the Monoceros Stellar Overdensity

Unified scholarship program (PUB) — 2019 – 2020

- Total: 4,800 BRL
- Customer service at the Abrahão de Moraes Observatory in Valinhos, São Paulo

Teaching and Outreach

Hands-on session: How to communicate your research. — 2025

- This course was offered at IAG/USP to undergraduate Astronomy students, with the aim of teaching them how to disseminate their scientific work.

Teaching: Preparatory classes for the Brazilian Astronomy Olympiad. — 2026

- Classes were taught at the Etapa school for high school students.

Teaching: Preparatory classes for the Brazilian Astronomy Olympiad — 2025

- Classes were taught at the Liceu Pasteur Start Anglo school for elementary and high school students, totaling 25 hours.

Hands-on session: Astronomical data visualization with Matplotlib for Brazilian students — 2025

- This course was offered at IAG/USP for undergraduate Astronomy students, aiming to help them create clearer and more visually engaging figures for their academic productions.

Teaching assistant: Astronomy for Teachers (IAG-USP) — 2024

- This advanced training course is designed to offer Brazilian high school physics teachers an introductory overview of various fields of astronomy, presented from a modern and up-to-date perspective.

Astronomical Service at IAG-USP — 2022 - 2024

- Supervisor of guided visits at IAG-USP and teaching assistant in virtual sessions with public school students.

Night with the Stars - Abrahão de Morais Observatory — 2019 - 2023

- Monitor assisting with customer service at the Abrahão de Moraes Observatory (OAM) in Valinhos, São Paulo, including assembling telescopes and leading hands-on workshops with children.

ASTROMINAS (website) — 2020 - 2021

- This project is dedicated to promoting Science and Technology among female high school students, helping to facilitate their access to university.

Cecília project (website) — 2020 - 2021

- This project is dedicated to disseminating and popularizing Earth and Universe sciences in schools.

Learning and Service

Organizer: "Astronomy at Noon" Seminar Series — 2024 - 2025

- Cycle of Seminars of the Astronomy Department of IAG/USP every Thursday at noon. It is dedicated to undergraduate students in exact sciences

Organizer: Milky Way Brazillian Group (MWBR) — 2024 - 2025

Member: Brazilian Astronomical Society (SAB) — 2019 - 2025

Students representative: Astronomy Program Coordinating Committee (IAG-USP) — 2024

Students representative: Defense of Diversity, Human Rights and Democracy Committee, CDDDHD (IAG-USP) — 2021 - 2022

Students representative: IAG-USP Council — 2020 - 2021

Organizer: Brazilian Astronomy Olympiad (OBA) — 2019 - 2020

Publications

1st Author Publications - Journal Articles

The Low-α Splash Population in the Milky Way — 2026

Borbolato, L.; Amarante, J A. S.; Perottoni, H. D.; Rossi, S.; Debattista, V. P.; Zhao-Yu, L.; Deg, N.; Khachaturyants, T.; 2026, submitted. arXiv

Early Co-formation of the Milky Way's Thin and Thick Disks at Redshift $z > 2$ — 2025

Borbolato, L.; Rossi, S.; Perottoni, H. D.; Limberg, G.; Amarante, J A. S.; Queiroz, A. B. A.; Chiappini, C.; Anders, F.; Santucci, R. M.; Barbosa, F. O.; Nogueira-Santos, J. V.; 2025, ApJ, 994, 126. DOI: 10.3847/1538-4357/ae0c96

All-sky Kinematics and Chemistry of Monoceros Stellar Overdensity 2024

Borbolato, L.; Perottoni, H. D.; Rossi, S.; Limberg, G.; Pérez-Villegas, A.; Anders, F.; Antoja, T.; Laporte, C. F. P.; Rocha-Pinto, H. J.; Santucci, R. M.; 2024, ApJ, 960, 52.

DOI: 10.3847/1538-4357/ad02fb

Co-authored Publications - Journal Articles

Characterizing the velocity anisotropy of the Milky Way's stellar halo 2026

Barbosa, F. O.; Pérez-Villegas, A.; Rossi, S.; Santucci, R. M.; Aguilar, L.; Perottoni, H. D.; Limberg, G.; **Borbolato, L.**; Nogueira-Santos, J. V. 2026, submitted. arXiv

GASTRO library II: Exploring Chemical Bimodalities in Disk Galaxies with GSE-like Mergers and Massive Star-forming Clumps 2025

Amarante, J. A. S.; Laporte, C. F. P.; Debattista, V. P.; Beraldo e Silva, L.; Limberg, G.; Perottoni, H. D.; Li, Z.; **Borbolato, L.**; Fiteni, K.; Cao, C.; Deg, N.; Khachaturyants, T.; Liao, X.; 2025, submitted. arXiv

Extending the Chemical Reach of the H3 Survey: Detailed Abundances of the Dwarf-galaxy Stellar Stream Wukong/LMS-1 2024

Limberg, G.; Ji, A. P.; Naidu, R. P.; Chiti, A.; Rossi, S.; Usman, S. A.; Ting, Y.; Zaritsky, D.; Bonaca, A.; **Borbolato, L.**; Speagle, J. S.; Chandra, V.; Conroy, C.; 2024, MNRAS, 530, 3.

10.1093/mnras/stae969

Searching for Extragalactic Exoplanetary Systems: The Curious Case of BD+20 2457 2021

Perottoni, H. D.; Amarante, J. A. S.; Limberg, G.; Rocha-Pinto, H. J.; Rossi, S.; Anders, F.; **Borbolato, L.**; 2021, ApJL, 913, L3..

10.3847/2041-8213/abfb06

Conferences, Workshops & Contributed talks

Talk XLVIII Annual Meeting of the Brazilian Astronomical Society (Caxambu, Brazil) Oct 2025
- Title: *Thin disk splash population: evidence for early chemical thin disk formation in the Milky Way*

Talk IAG Science Day (São Paulo, Brazil) Sep 2025
- Title: *The formation of the ancient Milky Way disk*

Talk Deciphering the Cosmic Code for Galaxy Formation (Puerto Varas, Chile) Dec 2024
- Title: *Deciphering the old Milky Way thin disk formation*

Poster IAU Symposium 395: Stellar populations in the Milky Way and beyond (Paraty, Brazil) Nov 2024
- Title: *The Early and Fast Settlement of Milky Way Disk*

Talk XLVII Annual Meeting of the Brazilian Astronomical Society (Águas de Lindóia, Brazil) Sep 2024
- Title: *Deciphering the earliest stages of the Milky Way disk formation*

Talk XXXII IAU General Assembly (Cape Town, South Africa) Aug 2024
- Title: *The Early and Fast Settlement of Milky Way Disk*

Talk XVII Latin American Regional IAU Meeting (Montevidéu, Uruguai) Nov 2023
- Title: *All-sky Kinematics and Chemistry of Monoceros Stellar Overdensity*

Talk XLVI Annual Meeting of the Brazilian Astronomical Society (Rio de Janeiro, Brazil) Oct 2023
- Title: *Kinematics and Detailed Chemistry for Monoceros Overdensity*

Poster 75th Annual Meeting of the Brazilian Society for the Advancement of Science (Curitiba, Brazil) — Jun 2023
- Title: *Kinematics and Detailed Chemistry for Monoceros Overdensity*

Poster 30th International Symposium on Scientific and Technological Initiation at USP (São Paulo, Brasil) — Oct 2022
- Title: *Kinematics and Detailed Chemistry for Monoceros Overdensity*

Poster XLV Annual Meeting of the Brazilian Astronomical Society (Virtual) — Sep 2022
- Title: *Kinematics and Detailed Chemistry for Monoceros Overdensity*

Poster 29th International Symposium on Scientific and Technological Initiation at USP (Virtual) — Oct 2021
- Title: *Chemodynamical properties of the Monoceros Stellar Overdensity*

Poster XLIV Annual Meeting of the Brazilian Astronomical Society (Virtual) — Sep 2021
- Title: *Chemodynamical properties of the Monoceros Stellar Overdensity*

Honors and Awards

Dr. Abrahão Aun Medal for outstanding scientific activities in the municipality of Vinhedo, SP, Brazil — 2025

Honorable Mention for PhD Research Presentation at the X IAG Science Day — 2025
- Title: The formation of the ancient Milky Way disk

Work awarded at the 75th Annual Meeting of the Brazilian Society for the Advancement of Science (SBPC) — 2023
- Title: Chemodynamical properties of the Monoceros Stellar Overdensity

Honorable mention at the 30th International Symposium on Scientific and Technological Initiation at USP (SIICUSP) — 2022
- Title: Chemodynamical properties of the Monoceros Stellar Overdensity

Gold medal at the Brazilian Astronomy and Astronautics Olympiad (OBA) — 2018

Gold medal at the Brazilian Astronomy and Astronautics Olympiad (OBA) — 2017

Honorable mention at the Brazilian Public School Mathematics Olympiad (OBMEP) — 2015

Skills

Languages: Portuguese (native), English

Programming: Python (main), R-project

Other resources: TOPCAT (large data sets), AGAMA/galpy/Gala (dynamics)