João A. S. Amarante
Curriculum Vitae

Professional Address

Department of Astronomy
School of Physics and Astronomy
Shanghai Jiao Tong University,
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Education

PhD Astrophysics, Shanghai Astronomical Observatory, University of Chinese Academy of Sciences, Sept. 2016 - Nov. 2020

PhD Thesis: The interface of the thick disc and stellar halo as seen by *Gaia*, LAMOST and hydrodynamical simulations
Supervisor: Martin C. Smith
CAS-TWAS Fellowship

B.Sc. Electrical Engineering, Universidade Federal do Rio de Janeiro, 2013-2014

Interrupted

M.Sc. Astrophysics, Universidade Federal do Rio de Janeiro, 2010-2012

Master Thesis: Statistical Proprieties of Planetary Systems
Supervisor: Helio J. Rocha Pinto
CNPq scholarship (08/2010 - 08/2012)

B.Sc. Astronomy, Universidade Federal do Rio de Janeiro, 2006-2010

Senior Thesis: A Statistical Study of Planeatry Systems
Advisor: Helio J. Rocha Pinto
CNPq scholarship (06/2007 - 06/2010)

Appointments

Postdoc Researcher at DOA-SJTU, Shanghai, China. 2024-present

Postdoc Researcher at ICC-UB, Barcelona, Spain. 2022-2024

Visiting Fellow at UCLAN, Preston, UK. 2021-2024

Publications

ADS Link

Refereed Publications

- **Amarante, J. A. S.**, Koposov, S., L., Laporte, C. Mapping the anisotropic Galactic stellar halo with blue horizontal branch stars, *Astronomy & Astrophysics*, Volume 690, id.A166, 2024.
- **Amarante, J. A. S.**, Debattista, V., Beraldo e Silva, L., Laporte, C., Deg, N. GASTRO Library. I. The Simulated Chemodynamical Properties of Several Gaia-Sausage-Enceladus-like Stellar Halos, *The Astrophysical Journal*, Volume 937, Issue 1, id.12, 18 pp, 2022.

- **Amarante, J. A. S.**, Beraldo e Silva, L., Debattista, V., Smith, M., The Splash without a merger, *The Astrophysical Journal Letters*, Volume 891, Issue 2, id.L30, 7 pp, 2020.
- **Amarante, J. A. S.**, Smith, M., Boeche, C., The tale of the tail - disentangling the high transverse velocity stars in Gaia DR2, *Monthly Notices of the Royal Astronomical Society*, Volume 492, Issue 3, p.3816-3828, 2020.
- Bernet, Marcel, and 11 more, including **Amarante, J. A. S.**, Dark Matter spiral arms in Milky Way-like halos, *Astronomy & Astrophycs*, Volume 697, id.A214, 2025
- Debattista, V., Khachaturyants, T., **Amarante, J. A. S.**, and 3 more. Azimuthal metallicity variations, spiral structure, and the failure of radial actions based on assuming axisymmetry, *Monthly Notices of the Royal Astronomical Society*, Volume 537, Issue 2, pp.1620-1645.
- Rix, H-W, and 17 more, including **Amarante, J. A. S.**, The Extremely Metal-rich Knot of Stars at the Heart of the Galaxy, *The Astrophysical Journal*, Volume 975, Issue 2, id.293, 9 pp, 2024.
- Perottoni, and 17 more, including **Amarante, J. A. S.**, The S-PLUS Ultra-Short Survey: First data release. *The Astrophysical Journal*, Volume 691, id.A138, 12 pp, 2024.
- Li, Zhuohan, Zhao Gang, Zhang, Ruizhi, Xue, Xiang-Xiang, Chen, Yuqin, **Amarante, J. A. S.**. Exploring the ex-situ components within *Gaia* DR3, *Monthly Notices of the Royal Astronomical Society*, Volume 527, Issue 4, pp.9767-9781, 2024.
- Ji, Alexander P., +SDSS-V collaboration, **Amarante, J. A. S.**. Spectacular nucleosynthesis from early massive stars, *The Astrophysical Journal Letters*, Volume 961, Issue 2, id.L41, 25 pp, 2024.
- Anders, F., Gispert. P., Ratcliffe, B., Chiappini, C., Minchev, I., Nepal, S., Queiroz, A. B. A., **Amarante, J. A. S.**, and 7 more. Spectroscopic age estimates for APOGEE red-giant stars: Precise spatial and kinematic trends with age in the Galactic disc. *Astronomy & Astrophysics*, Volume 678, id.A158, 2023.
- Almeida-Fernandes, F., Placco, V. M., Rocha-Pinto, H. J., Fernandes, M. B., Limberg, G., Beraldo e Silva, L. , **Amarante, J. A. S.**, and 6 more. Chemodynamical properties and ages of metal-poor stars in S-PLUS , *Monthly Notices of the Royal Astronomical Society*, Volume 523, Issue 2, pp.2934-2951, 2023.
- Debattista, V., Liddicott, D., Gonzalez, O., Beraldo e Silva, L., **Amarante, J. A. S.**, and 9 more. The imprint of clump formation at high redshift. II. The chemistry of the bulge, *The Astrophysical Journal*, Volume 946, Issue 2, id.118, 17 pp, 2023.
- Limberg, G., Queiroz, A. B., Perottoni, H., Rossi, S., **Amarante, J. A. S.**, and 4 more, Phase-space Properties and Chemistry of the Sagittarius Stellar Stream Down to the Extremely Metal-poor ([Fe/H]<-3) Regime. *The Astrophysical Journal*, Volume 946, Issue 2, id.66, 15 pp, 2023.
- Perottoni, H., Limberg, G., **Amarante, J. A. S.**, and 5 more, The Unmixed Debris of Gaia-Sausage/Enceladus in the Form of a Pair of Halo Stellar Overdensities . *The Astrophysical Journal Letters*, Volume 936, Issue 1, id.L2, 7 pp, 2022.
- Perottoni, H., **Amarante, J. A. S.**, Limberg, G., and 4 more, Searching for Extragalactic Exoplanetary Systems: The Curious Case of BD+20 2457. *The Astrophysical Journal Letters*, Volume 913, Issue 1, id.L3, 10 pp, 2021.
- Fiteni, K., Caruana, J., **Amarante, J. A. S.**, Debattista, V., Beraldo e Silva, L., The relative efficiencies of bars and clumps in driving disc stars to retrograde motion. *Monthly Notices of the Royal Astronomical Society*, Volume 503, Issue 1, p.1418-1430, 2021.
- Beraldo e Silva, L., Debattista, V., Nidever, D., **Amarante, J. A. S.**, Garver, B., Co-formation of the thin and thick discs revealed by APOGEE-DR16 and Gaia-DR2. *Monthly Notices of the Royal Astronomical Society*, Volume 502, Issue 1, pp.260-272, 2021.

Popular Scientific Publications & Media

AAS Journal Author Series - chat about my publication on single merger models, Youtube link

Amarante, J. A. S. & Perottoni, H., Segredos da Via Láctea, *Revista Brasileira de Astronomia*, Brazil, 2022

Amarante, J. A. S., Notícias de outros mundos, *Ciência Hoje das Crianças*, Brazil, 2008

Proceedings

Amarante, J.A.S., Smith, M., Boeche, C., The high transverse velocity stars in *Gaia*-LAMOST, *Proceedings of the International Astronomical Union*, IAU Symposium, Volume 353, 2020, pp. 59-60

Amarante, J. A. S., Rocha-Pinto, Helio, J., Planetary populations according to the orbital angular momentum. *Proceeding of the International Astronomical Union*, IAU Symposium, Volume 265, 2009, v.265 p.420-421

Observational & Computational Experience

HPC Proposal: Marenostrum HPC at Red Española de Supercomputación - 1720 CPU Kh - Project title: *Exploring the impact of the Sagittarius galaxy on the chemodynamical evolution of the Milky Way* - PI: **João A. S. Amarante**, Co-PI: Chervin Laporte, Victor P. Debattista, Teresa Antoja - July 2023

Telescope Proposal: Graces - Gemini Observatory (14.4 hours) - Unravelling the accreted origin of a stellar overdensity - PI Hélio Pertonni, Co-PI: **João A. S. Amarante**, Guilherme Limberg, Silvia Rossi, Helio J. Rocha-Pinto, 2022.

Observational experience: Palomar Observatory – USA, 2018 (3 nights) – 5.1m telescope: Double Spectrograph (DBSP)

Last 5 years Conferences, Workshops & Contributed talks

The Milky Way assembly tale, Bologna, Italy, May, 2024

Talk: Studying the stellar disc and halo of the Milky Way with the GASTRO Simulations and Blue Horizontal Branch Stars

Revealed by *Gaia*: the central halo of the Milky Way Cambridge, UK, September 2023

Talk: GASTRO library: interpreting substructures of the Milky Way stellar halo with SPH + N-body single merger models

The Milky Way Revealed by *Gaia* Barcelona, September 2023

Talk: GASTRO library: studying substructures of the Milky Way stellar halo with SPH + N-body single merger models

Talk: The mass-loss history of the Sagittarius dwarf galaxy (on behalf of Chervin Laporte)

Seminar at National Astronomical Observatories of China, Beijing, July 2023

Talk: Studying the Milky Way evolution with N-body + SPH models

Seminar at Tsinghua University, Beijing, July 2023

Talk: GASTRO library: studying substructures of the Milky Way stellar halo with SPH + N-body single merger models

Colloquium at Shanghai Astronomical Observatory, Shanghai, June 2023

Talk: Studying the Milky Way evolution with N-body + SPH models

Unsolved Problems in Astrophysics and Cosmology 2022 Jerusalem, December 2022

Invited talk (on behalf of Prof. Chervin Laporte): Mantras and Challenges in Galactic Archaeology

SDSS-V Science Festival 2022, Toronto, Canada, November 2022

IfA, University of Edinburgh, lunch talk, Edinburgh, UK, October 2022

Talk: GASTRO library: studying substructures of the Milky Way stellar halo with SPH + N-body single merger models

Brazilian Astronomical Society Annual Meeting (RASAB) 2022, online, September 2022

Talk: GASTRO library: studying substructures of the Milky Way stellar halo with SPH + N-body single merger models

PNCG "Galaxies" 2022, Strasbourg, France, June 2022

Talk: GASTRO library: studying substructures of the Milky Way stellar halo with SPH + N-body single merger models

Institute of Space Sciences & Astronomy seminar, University of Malta, Malta, April 2022

Talk: Studying the Milky Way evolution with N-body + SPH models

ICCUB seminar, Barcelona, Spain, March 2022

Talk: Studying the Milky Way evolution with SPH + N-body models

Brazilian Astronomical Society Annual Meeting (RASAB) 2021, online, September 2021

Talk: The effects of clumps and mergers in disc galaxies: implications to the Milky Way

The N-Body Shop Conference, online Conference, January 2021

Talk: The effects of clumps and mergers in disc galaxies: Implications to the Milky Way

Galaxy Coffee - informal seminar of the Galaxies & Cosmology department - MPIA, Heidelberg, Germany, September, 2020

Talk (online): The effects of clumps and mergers in disc galaxies: Implications to the Milky Way

Summer/Winter Schools

Summer School on Galactic Dynamics 2019, Shanghai, China, 2019

Heildelberg Summer School 2018: Gaia Data & Science, Heildeberg, Germany, 2018

XVI Special Courses of the Observatório Nacional, Rio de Janeiro/Brazil, 2011

Second Iberoamerican School of Astrobiology, Montevideo/Uruguay, 2009

Poster: Angular Momentum Distribution on Extrasolar Planetary Systems

W.E. Heraeus Physics School on The Early Phase of Planet Formation, Bad Honnef/Germany, 2008

Poster: Angular Momentum Distribution on Extrasolar Planetary Systems

Honors and Awards

Full PhD scholarship - Chinese Academy of Science and The World Academy of Science (CAS-TWAS) scholarship

Best Undergraduate Project in Astronomy, 2010, Universidade Federal do Rio de Janeiro

Best Undergraduate Project in Astronomy, 2008, Universidade Federal do Rio de Janeiro

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Peer reviews

The Astronomical Journal (AJ), Publications of the Astronomical Society of Australia (PASA), Astronomy & Astrophysics (A&A), The Astrophysical Journal (ApJ), Monthly Notices of the Royal Astronomical Society (MNRAS)

Addition Research Experience

Science visit: Royal Observatory Edinburgh, Edinburgh, United Kingdom, 17/10/2022 – 30/10/2022. I was hosted by Dr. Sergey E. Koposov. During the visit, we worked on an ongoing project to probe the Milky Way stellar halo with DECaLS observational data.

Science Visit: Jeremiah Horrocks Institute, University of Central Lancashire, United Kingdom, 09/2019 – 03/2020. The scope of the visit was to join Professor Victor P. Debattista's group on a project comparing their suite of state-of-art chemo-dynamical simulations of the Milky Way to data from *Gaia* satellite. The visit resulted in a published paper and continued scientific collaboration in future projects.

Science Visit: Royal Observatory Edinburgh, Edinburgh, United Kingdom, 03/03/2020 – 05/03/2020. I was hosted by Dr. Jorge Penarrubia. During the visit, I showed my work during the institute's Wednesday "Theory Lunch"and had science conversations with Dr. Penarrubia and colleagues.

Science Visit: California Institute of Technology, California, USA, 24/09/2018 – 27/09/2018. I was hosted by Professor Evan Kirby. During the visit, I joined Professor Kirby's group meeting and discussed my current work at his group meeting.

Science Visit: Oxford University, Oxford, United Kingdom, 09/04/2018 – 12/04/2018. I was hosted by Dr. Ralph Schoenrich. During the visit, Dr. Schoenrich and I had fruitful discussions about my work and he gave important advice to improve the quality of my analysis which was part of the paper Amarante et al., MNRAS, 2020, 492, 3816

Teaching Experience

Undergraduate project - Student: Mónica Arroyo Aregenté, Universitat de Barcelona, Title: Remnants of a dwarf galaxy merger in an idealized Galaxy simulation. 2023.

Tutoring - Undergraduate Physics for Engineering students and basic Math and Physics for Primary and High School students, 2011-2016

Work Experience

Artificial Intelligence Laboratory, 2013-2014.

Study of Simultaneous Localization and Mapping problem

CNP-q Fellowship

Interinstitutional Laboratory of e-Astronomy, 2011.

Worked to Sloan Digital Sky Survey III / Braziliam Participation Group

Organization of Events

Shanghai, China, 2018

Shanghai Hack-a-thon: three-day event to build up collaborations and hands on activities on Gaia data analysis

The life and times of the Milky Way - the symbiosis between Gaia and ground based spectroscopic surveys. Member of the Local Organising Committee.

Observatório do Valongo, Universidade Federal do Rio de Janeiro, 2011

Folhetim Astronômico: Biweekly seminars to discuss graduate students projects

Membership in Scientific Societies and Groups

Co-founder and member of the *Milky Way BR Group*

Member of Sociedade Astronômica Brasileira (Brazilian Astronomical Society)

Other Considerations

Computer skills

Operational System: Linux

Simulation codes: `GASOLINE, CHANGA, AREPO`

Languages: Python (AGAMA, PYNBODY, EMCEE, GALPY), LaTeX

Languages

Native: Portuguese

Advanced: English

Intermediate: Spanish