Jhon Yana Galarza

Personal Information

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Current Position

June 2021-2022	CNPq Postdoctoral Fellowship, Universidade Presbiteriana Mackenzie, Brazil Project: *Searching starspots with TESS: Investigating the connection between chromospheric activity, spot coverage fraction and ages*

Formal Education/Degree

June 2021	Doctor in Astrophysics, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, São Paulo, Brazil Thesis: *The Inti survey for new solar twins and magnetic activity effects, supernova and planet engulfment* Supervisor: Prof. Dr. Jorge Meléndez
April 2016	Master in Astrophysics, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, São Paulo, Brazil Thesis: *Analysis of the chemical composition of the solar twins HIP 100963, HD 45184 and the discovery of the solar twin Inti 1* Supervisor: Prof. Dr. Jorge Meléndez
May 2013	Licentiate in Physics, Facultad de Ciencias Físicas, Universidad Nacional Mayor de San Marcos, Lima, Perú Undergraduate thesis: *Number Counts and Non-Gaussianity* Supervisors: Dr. Sarah Shandera and Dr. Teófilo Vargas
December 2012	Bachelor in Physics, Facultad de Ciencias Físicas, Universidad Nacional Mayor de San Marcos, Lima, Perú Supervisor: Dr. Teófilo Vargas

Languages

English (fluent), Portuguese (fluent) and Spanish (Native language)

Computer skills

Programming languages:	python, IRAF, RStudio, fortran
Operating systems:	Linux, Windows
Codes:	*terra*, a python code for determining planet engulfment, *TS23*, a python code for reducing echelle TS23 spectra, Automatic Equivalent widths measurements, Spectra normalization techniques

Research Experience

- Wide binaries for chemical tagging, planet engulfment, magnetic activity and girochronology.
- Galactic Archaeology through FGK stars and solar twins.
- Connection between the architecture of planetary systems and the stellar chemical composition.
- Exoplanet hunting using radial velocity and transit methods.
- Asteroseismology using Kepler/TESS light curves.

List of publications

First author: 6, from which 1 is submitted to APJ. *Second author:* 12, from which 3 are in preparation. *Number of citations as first author:* 52. ORCID: https://orcid.org/0000-0001-9261-8366

First author

1. *Evidence of rocky planet engulfment in the wide binary system HIP 71726/HIP 71737*
Yana Galarza J., López-Valdivia R., Meléndez J., Lorenzo-Oliveira D. 2021c. Submitted to ApJ
2. *Searching for new solar twins: The Inti survey for the Northern Sky.*
Yana Galarza J., López-Valdivia R., Lorenzo-Oliveira D., et al. 2021b. MNRAS, 504, 1873–1887
3. *Explosive nucleosynthesis of a metal-deficient star as the source of a distinct odd-even effect in the solar twin HIP 11915.*
Yana Galarza J., Meléndez J., Karakas A. I., Asplund M., and Lorenzo-Oliveira D. 2021a, MNRAS, 502, L104–L109. Citations: 3
4. *The effect of stellar activity on the spectroscopic stellar parameters of the young solar twin HIP 36515.*
Yana Galarza J., Meléndez J., et al. 2019, MNRAS, 490, L86–L90. Citations: 18
5. *High-precision analysis of the solar twin HIP 100963.*
Yana Galarza J., Meléndez J., Ramírez I., et al. 2016, A&A, 589, A17. Citations: 18
6. *Serendipitous discovery of the faint solar twin Inti 1.*
Yana Galarza J., Meléndez J., and Cohen J. C. 2016, A&A, 589, A65. Citations: 13

Contributing author

7. *Past and Future of the Magnetic Sun: No Dynamo Disruption after solar Age*
Lorenzo-Oliveira D., **Yana Galarza J.**, et al. 2021. to be submitted $<$ 1 month.
8. *Radial velocity precision of ESPRESSO through the analysis of the solar twin HIP 11915*
Yuri Netto., et al. (including **Yana Galarza J.**) 2021. to be submitted $<$ 1 month.
9. *TESS lightcurves as an age indicator through solar twins.*
Ponte G., et al. (including **Yana Galarza J.**) 2021, to be submitted $<$ 1 month.
10. *Binary systems as Maunder Minimum states detectors: The first observational candidate ζ^2 Ret.*
Flores M., et al. (including **Yana Galarza J.**) 2021, A&A, 645, L6
11. *Rotation of Solar Analogs Crossmatching Kepler and Gaia DR2.*
do Nascimento J. D. J, et al. (including **Yana Galarza J.**) 2020, ApJ, 898, 173
12. *How Magnetic Activity Alters What We Learn from Stellar Spectra.*
Spina L., et al. (including **Yana Galarza J.**) 2020, ApJ, 895, 52

13. *The ancient main-sequence solar proxy HIP 102152 unveils the activity and rotational fate of our Sun.*
Lorenzo-Oliveira D., et al. (including **Yana Galarza J.**) 2020, MNRAS, 495, L61–L65

14. *Constraining the evolution of stellar rotation using solar twins.*
Lorenzo-Oliveira D., et al. (including **Yana Galarza J.**) 2019, MNRAS, 485, L68–L72

15. *The Li–age correlation: the Sun is unusually Li deficient for its age.*
Carlos M., et al. (including **Yana Galarza J.**) 2019, MNRAS, 485, 4052–4059

16. *Thorium in solar twins: implications for habitability in rocky planets.*
Botelho R., et al. (including **Yana Galarza J.**) 2019, MNRAS, 482, 1690–1700

17. *The Solar Twin Planet Search. V. Close-in, low-mass planet candidates and evidence of planet accretion in the solar twin HIP 68468.*
Meléndez J., et al. (including **Yana Galarza J.**) 2017, A&A, 597, A34

18. *Number counts and non-Gaussianity.*
Shandera S., et al. (including **Yana Galarza J.**) 2013, PHYSICAL REVIEW, D88, 103506

Scientific Talks

I have delivered more than 10 scientific talks at conferences, workshops and seminars. I was invited to give 4 talks on spectroscopy of high resolution.

- Precision Spectroscopy: From Galaxy Evolution to Exoplanets. *A solar twin with a distinct odd-even effect*. 2021, São Paulo, Brazil. **Oral presentation.**
- La Silla Observing Summer School: *Characterising Nearby Galaxies with Optical Imaging*. 2020, Santiago, Chile. **Oral presentation.**
- Pulsations Along Stellar Evolution: *Asteroseismology of the binary system 16 Cyg*. 2019, La Plata, Argentina. **Oral Presentation.**
- Workshop de espectroscopia de alta resolução: *Searching for new solar twins: The Inti survey for the Northern Sky*. 2019, Campos do Jordão, SP. **Oral Presentation.**
- Precision Spectroscopy: Rotation, Magnetic Activity and Lithium. *The effect of stellar activity on the stellar parameters of the young solar twin HIP 36515*. 2019, São Paulo, Brazil. **Oral presentation.**
- Rynberg Conference on Star-Planet connection: *The effect of stellar activity on the stellar parameters of the young solar twin HIP 36515*. 2019, Tegernsee, Munich, Germany. **Poster presentation.**
- Precision Spectroscopy: From the First stars to exoplanets. *The effect of stellar activity on the stellar parameters of a young solar twin*. 2018, São Paulo, Brazil. **Oral presentation.**
- Seminario de la Universidad Diego Portales: *The effect of stellar activity on the stellar parameters of the young solar twin*. 2018, Santiago, Chile. **Oral presentation.**
- Extremely Precise Radial Velocities III: *A new sample for hunting planets around solar twins*. 2017, State College, PA, USA. **Poster presentation.**
- Seminario de Ciencias del Instituto Peruano de Geofísica: *Serendipitous discovery of the faint solar twin Inti 1*. 2016, Lima, Perú. **Invited to give a talk.**
- First Peruvian Space Week 2016: **The search for new solar twins, planets and the study of star-planet connection**. 2016, Lima Perú. **Invited to give a talk.**
- First Peruvian School of Astronomy: *Serendipitous discovery of the faint solar twin Inti 1*. 2016, Lima, Perú. **Invited to give a talk.**
- XXXIX Reunião Anual da SAB: *O descobrimento da gêmea solar Inti 1*. 2015, Ouro Preto, MG, Brazil. **Poster presentation.**

- XXXVIII Reunião Anual da SAB: *Spectral Classification of Stars and the Temperature Scale of B-A-F-G-K Stars*. 2014, Búzios, RJ, Brazil. **Poster presentation.**

Honours and awarded Grants

- **CNPq** Postdoctoral Fellowship. From 300 applicants, my project was picked in eighth place.
- **European Southern Observatory travel grant**. Equiv $1k for attending La Silla Observing Summer School. 2020, Santiago, Chile.
- **Universidad de la Plata**. Equiv $1k for attending the Pulsations Along Stellar Evolution. 2019, La Plata, Argentina.
- **Universidad Pontificia Católica del Perú**. Equiv $1.5k for attending the First Peruvian Space Week 2016. Lima, Perú.
- **Reserva técnica CNPq**. Equiv $4k for attending workshops, seminars and visiting observatories.
- **CNPq** Fellowship for PhD Studies, Universidade de São Paulo, Brazil.
- **CAPES** Fellowship for Master Studies, Universidade de São Paulo, Brazil.
- **Undergraduate Theoretical Physics Summer Program** at Perimeter Institute, Ontario, Canada (Equiv $8k).

Scientific Leadership and Teaching Activities

- **Supervision of Bachelor Student - Daniel Gamarra**. I created, planned and supervised the project *Searching for new solar twins using public spectroscopic surveys*. Project will be disseminated as a publication. Universidad Nacional Mayor de San Marcos. 2020-2021.
- **Supervision of Bachelor Student - Aldair Portal**. I created, planned and supervised the project *Quilla: a tool for a fast spectroscopic stellar parameter determinations*. Project will be disseminated as a publication. Universidad Nacional Mayor de San Marcos. 2020-2021.
- **Supervision of Bachelor Student - Guilherme de Oliveira**. I helped installing the programs and taught how to estimate spectroscopic stellar parameters. *Project Solar Twins Blue stragglers*. Universidade de São Paulo. 2017.
- **Organizer of the Precision Spectroscopy workshops 2015, 2016, 2017, 2018, 2019, and 2021**. I helped organizing the scientific program and was in charge of the logistics.
- **Teaching Assistant: Introdução à astronomia.** Undergraduate course. Prof. Dra. Vera Jatenco. Universidade de São Paulo. 2019-I and 2020-I
- **Teaching Assistant: Atmosferas estelares.** Undergraduate online course. Prof. Teófilo Vargas. Universidad Nacional Mayor de San Marcos. 2019-II.
- **Teaching Assistant: Fundamentos da astronomia.** Undergraduate course. Prof. Dr. Augusto Damineli. Universidade de São Paulo. 2018-II.
- **Teaching Assistant: Transporte de Energia em Astrofísica.** Undergraduate course. Prof. Dr. Marcos Peres Diaz. Universidade de São Paulo. 2017-II.

Telescope Experience

Approved Proposals:
I created, wrote and planned all the proposals listed bellow. As Brazil is not member of some of the observatories listed bellow, the proposals were submitted thanks to our collaborators.

- **TESS Space Telescope**, USA (Guest Investigator program):

I *Asteroseismology of solar twins with TESS: The Sun as a star.* Program ID: G022106. Sectors: 14-26. **PI: J. Yana Galarza**, 2019.

II *Asteroseismology of solar twins with TESS: The Sun as a star.* Program ID: G011208. Sectors: 1-13. **PI: J. Yana Galarza**, 2018.

- **Subaru Observatory, Mauna Kea**, USA (exchange with Gemini):
  I 8-m Subaru + HDS spectrograph, *Solving the Sun midlife crisis: stellar evolution with NASA/TESS and Subaru/HDS.* PI: Jorge Meléndez. **Co-PI: J. Yana Galarza**, 2020-II (total: 10 h).
- **Gemini Observatory**, Mauna Kea, USA:
  I 8-m Gemini N. + GRACES spectrograph, *solar twins in the Kepler field.* **PI: J. Yana Galarza**, 2020-I (total: 12 h).
  II 8-m Gemini N. + GRACES spectrograph, *solar twins in the Kepler field.* **PI: J. Yana Galarza**, 2018-II (total: 4 h).
  III 8-m Gemini N. + GRACES spectrograph, *faint solar twins.* **PI: J. Yana Galarza**, 2018-I (total: 4.9 h).
- **SOAR Observatory**, Cerro Pachon, Chile:
  I 4-m + Goodman spectrograph, *solar twin search.* **PI: J. Yana Galarza**, From 2017-I to 2019-II (total: 96 h).
- **Magellan telescopes**, Las Campanas, Chile:
  I 6.5-m + MIKE spectrograph, *Chemical abundance of solar twins.* PI: Marcelo Tucci Maia. **Co-PI: J. Yana Galarza**, 2019-II (total: 16 h).
  II 6.5-m + MIKE spectrograph, *Chemical abundance of solar twins.* PI: Marcelo Tucci Maia. **Co-PI: J. Yana Galarza**, 2018-II (total: 16 h).
- **McDonald Observatory**, Texas, USA:
  I 2.7-m + 2dcoudé, *Chemical abundance of solar twins.* PI: Ricardo López Valdivia. **Co-PI: J. Yana Galarza**, From 2018-I to 2021-II (total: 216 h).
- **Laboratorio Nacional de Astrofísica**, Minas Gerais, Brazil:
  I 1.6-m telescope + Cassegrain, *Solar twin binaries.* **PI: J. Yana Galarza**, 2019-I, 2020-I (total: 128 h).

Observing experience:

- **Subaru Observatory, Mauna Kea**, USA:
  I 8-m Subaru + HD, high-resolution spectroscopy, 2020-II.
- **European Southern Observatory**, La Silla, Chile:
  I 3.6 m telescope + HARPS, high-resolution spectroscopy, 2019-I.
  II Danish 1.54-metre telescope + DFOSC, photometry of galaxies, 2020-I.
- **Magellan telescopes**, Las Campanas, Chile:
  I 6.5-m + MIKE, high-resolution spectroscopy, 2018-II.
- **SOAR Observatory**, Cerro Pachon, Chile:
  I 4-m + Goodman spectrograph, moderate-resolution spectroscopy, from 2017-I to 2019-II.
- **Laboratorio Nacional de Astrofísica**, Minas Gerais, Brazil:

I 1.6-m telescope + MUSICOS, moderate-resolution spectroscopy. 2016-II, 2017-I, 2019-II.

II 1.6-m telescope + Cassegrain, moderate-resolution spectroscopy, 2015-I.

References

- **Prof. Dr. Jorge Meléndez**
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- **Prof. Dr. Ivan Ramírez**
  Tacoma Community College, USA
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