

# Luis Angel Gutiérrez Soto

CURRICULUM VITAE

## PERSONAL INFORMATION

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<i>Nationality</i>	Colombian
<i>Phone</i>	(+54) 9 2216818395
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## EDUCATION

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**PhD in Astronomy** 2015-2019

*Observatório do Valongo, Universidade Federal do Rio de Janeiro (UFRJ),  
Rio de Janeiro, Brazil*

Advisors: Denise Rocha Gonçalves and Stavros Akras

**Master in science (Astrophysics)** 2012-2015

*Centro de Radioastronomía y Astrofísica (CRYA), Universidad Nacional  
autónoma de México (UNAM), Morelia, Michoacán, México*

Advisor: William John Henney

**Bachelor of Education in Mathematics and Physics** 2005-2010

*Universidad Popular del Cesar (UPC), Valledupar, Cesar, Colombia*

Advisor: Elio Fabio Mejía Henao

## ADDITIONAL EDUCATION

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**Third Winter School of the Valongo Observatory**

**Short-term course**

2017

*Observatório do Valongo, UFRJ, Rio de Janeiro, Brazil*

**XX Special Courses Cycle of the National Observatory**

**Short-term course**

2015

*Observatório Nacional, Rio de Janeiro, Brazil*

**Superior Normalist with Emphasis**

**in Spanish Language**

2003-2004

*Escuela Normal Superior María Inmaculada, Manaure, Cesar, Colombia*

## LANGUAGES

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- Spanish (Native)
- English (Fluent)
- Portuguese (Fluent)

## ACADEMIC AND PROFESSIONAL PROFILE

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**Postdoctoral Researcher** 2022-Present  
*Instituto de Astrofísica de La Plata,*  
*CONICET – UNLP, La Plata, Argentina*  
Supervisor: Favio R. Faifer  
Co-supervisor: Claudia Lucia Mendes de Oliveira

**Postdoctoral Researcher** 2020-2022  
*Instituto de Astronomia, Geofísica e Ciências Atmosféricas (IAG),*  
*Universidade de São Paulo, Brazil*  
Supervisor: Claudia Lucia Mendes de Oliveira

## TEACHING

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**Assistant Professor** 2016  
*Stellar Evolution, University level,*  
*Observatório do Valongo, UFRJ, Rio de Janeiro, Brazil*

**Assistant Professor** 2016  
*Extragalactic Astronomy, University level,*  
*Observatório do Valongo, UFRJ, Rio de Janeiro, Brazil*

**Mathematics and Physics Teacher** 2010  
*Centro de Enseñanza Media “Santa Teresita”, High School,*  
*Valledupar, Cesar, Colombia*

**Mathematics and Physics Teacher** 2009  
*Institución Educativa Manuel Germán Cuello, High School,*  
*Valledupar, Cesar, Colombia. Pedagogical and Educational*  
*Practices of the Bachelor’s Degree in Mathematics and Physics*

## OBSERVATIONAL EXPERIENCE

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**PI** 2022  
*SOAR Telescope*  
Spectroscopic confirmation of planetary nebula candidates in VPHAS+ (DR3) and ALLWISE, impacting Galaxy’s PNe statistics

**Telescope Operator** 2020-2024  
*T80-Sur Telescope, Southern Photometric Local Universe Survey (S-PLUS)*  
Responsibilities included telescope operation, data acquisition, and instrument maintenance

## MENTORSHIP AND SUPERVISION

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**Scientific Initiation** 2020-2024  
*Giovanna Liberato César*

The identification and optical follow-up spectroscopy of PN and SySt candidates in photometric surveys.

Observatório do Valongo, Universidade Federal do Rio de Janeiro.  
Role: Co-supervisor

## **PARTICIPATION IN UNDERGRADUATE THESIS COMMITTEES**

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On February 27, 2024, I participated as a member of the evaluation committee for the final project titled “Photometric Selection and Spectroscopic Confirmation of Planetary Nebulae and Symbiotic Stars in the Galactic Plane”, presented by Giovanna Liberato Cézar

## **REVIEWER FOR INTERNATIONAL JOURNAL**

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**International Journal of Electrical and Computer Engineering (IJECE).**  
*Served as a peer reviewer for submitted manuscripts*

## **RESEARCH VISITS**

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Observatório do Valongo, Universidade Federal do Rio de Janeiro (UFRJ). <i>Rio de Janeiro, Brazil</i> Host: Denise Rocha Gonçalves and Marco Grossi	2024
Center for the Study of the Physics of the Cosmos of Aragón (CEFCA). <i>Teruel, Spain</i> Host: Carlos López Sanjuan	2018

## **AWARDS AND TITLES**

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<b>Young Researcher and Innovator</b> <b>“Virginia Gutiérrez de Pineda”</b> <i>Colciencias, Colombia</i>	2010
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## **SKILLS**

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- **Programming:** PYTHON, FORTRAN
- **Software:** TOPCAT, ALADIN, CLOUDY, L<sup>A</sup>T<sub>E</sub>X
- **Data Query:** Astronomical Data Query Language (ADQL)
- **Machine Learning:** Applied to astronomy and astrophysical simulations
- **Linux:** Development and maintenance of data analysis servers, task automation, system monitoring
- **Shell Scripting:** Automation of tasks
- **Astronomy:** Telescope operation, data processing, astronomical instrumentation
- **Experience:** Operated T80-Sul telescope for Southern Photometric Local Universe Survey (S-PLUS) project

## REFEREED ARTICLES

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1. *The Fourth S-PLUS Data Release: 12-filter photometry covering 3000 square degrees in the Southern Hemisphere*  
F. R. Herpich, F. Almeida-Fernandes, G.B Oliveira Schwarz, ... **L. A. Gutiérrez-Soto** et al., 2024, A&A, submitted.
2. *The S-PLUS Fornax Project (S+FP): A first 12-band glimpse of the Fornax galaxy cluster*  
A. V. Smith Castelli, A. Cortesi, R. F. Haack, A. R. Lopes, J. Thainá-Batista, ... **L. A. Gutiérrez Soto** et al., 2024, MNRAS.
3. *Unveiling compact planetary nebulae: Broad-band survey analysis and LAMOST confirmation*  
**L. A. Gutiérrez-Soto**, M. Belén Mari, W. A. Weidmann, F. R. Faifer, 2024, NewA, 109, 102207.
4. *Euclid preparation. XXVII. A UV-NIR spectral atlas of compact planetary nebulae for wavelength calibration.*  
Euclid Collaboration: K. Paterson, M. Schirmer, Y. Copin, J. -C. Cuillandre, W. Gillard, **L. A. Gutiérrez Soto** et al., 2023, A&A, 674, A172.
5. *Spectroscopic analysis tool for intEgraL fieLd unIt daTacubEs (SATELLITE): case studies of NGC 7009 and NGC 6778 with MUSE.*  
S. Akas, H. Monteiro, J. R. Walsh, J. García-Rojas, I. Aleman, ... **L. A. Gutiérrez-Soto** et al., 2022, MNRAS, 512, 2202.
6. *Data Release 2 of S-PLUS: accurate template-fitting based photometry covering 1000 square degrees in 12 optical filters.*  
F. Almeida-Fernandes, L. Sampedro, F. R. Herpich, A. Molino, C. E. Barbosa, ... **L. A. Gutiérrez-Soto** et al., 2022, MNRAS, 511, 4590.
7. *Catalogue of the central stars of planetary nebulae. Expanded edition.*  
W. A. Weidmann, M. B. Mari, E. O. Schmidt, G. Gaspar, M. M. Miller Bertolami, G. A. Oio, **L. A. Gutiérrez-Soto**, M. G. Volpe, R. Gamén, and D. Mast, 2020, A&A, 640, A10.
8. *J-PLUS: Tools to identify compact planetary nebulae in the Javalambre and southern photometric local universe surveys.*  
**L. A. Gutiérrez-Soto**, D. R. Gonçalves, S. Akas, A. Cortesi, C. López-Sanjuan, M. A. Guerrero et al., 2020, A&A, 633, A123.
9. *The Southern Photometric Local Universe Survey (S-PLUS): improved SEDs, morphologies, and redshifts with 12 optical filters.*  
C. Mendes de Oliveira, T. Ribeiro, W. Schoenell, A. Kanaan, R. A. Overzier, ... **L. A. Gutiérrez-Soto**, et al., 2019, MNRAS, 489, 241.
10. *J-PLUS: The Javalambre Photometric Local Universe Survey.*  
A. J. Cenarro, M. Moles, D. Cristóbal-Hornillos, A. Marín-Franch, A. Ederoclite, ... **L. A. Gutiérrez-Soto** et al., 2019, A&A, 622, A176.

## NON-PEER-REVIEWED ARTICLES

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1. *Bow shocks, bow waves, and dust waves. IV. Shell shape statistics.*  
W. J. Henney, J. A. Tarango-Yong, **L. A. Gutiérrez-Soto**, S. J. Arthur, 2019, arXiv, arXiv:1907.00122.

These articles are preprints or manuscripts available on arXiv and have not yet undergone peer review.

## **PUBLISHED WORKS IN CONFERENCE PROCEEDINGS**

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1. *Photometric candidate selection and spectroscopic confirmation of new PNe and SySts in the Galactic plane*,  
Giovanna Liberato, Denise R Gonçalves, **L. A. Gutiérrez-Soto**, S. Akas, 2023, *Boletim da Sociedade Astronômica Brasileira*. Vol. 34, pp. 100-103.
2. *Exploring the population of H $\alpha$  emitters in the Southern Photometric Local Universe Survey (S-PLUS)*.  
**L. A. Gutiérrez-Soto**, R. Lopes de Oliveira, S. Akas, et al., 2023, BAAA, 64, 187.
3. *Identification of interacting galaxies in the S-PLUS database*.  
G. B Oliveira Schwarz, N. M. Cardoso, A. Cortesi, A. V. Smith Castelli, G. Lucatelli, ... **L. A. Gutiérrez-Soto** et al., 2022, BAAA, Buenos Aires. *Boletín de la Asociación Argentina de Astronomía*, Vol. 63, pp. 259-261.
4. *Identifying Galactic halo PN candidates in the imaging surveys: J-PLUS/S-PLUS and J-PAS*.  
**L. Gutiérrez-Soto**, D. R. Gonçalves, S. Akas, A. Cortesi, A. Ederoclite, et al., Latin American Regional IAU Meeting (LARIM) Cartagena 2016, 2017, Cartagena de Indias, Colombia. *Rev. Mex. Astron. Astrofís. (Serie de Conferencias)*, Vol. 49, pp. 162-162.

## **TALKS AND POSTERS AT SCIENTIFIC MEETINGS**

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1. *S-PLUS: An atlas of integrated H $\alpha$  fluxes for planetary nebulae in the Magellanic Clouds*.  
**L. A. Gutiérrez-Soto**, A. R. Lopes, A. V. Smith Castelli, F. R. Faifer & R. Haack. San Juan, Argentina, 2023. Conference. La 65<sup>o</sup> Reunión Anual de la Asociación Argentina de Astronomía. **Poster Presenter**.
2. *An Integrated H $\alpha$  Flux Atlas of Planetary Nebulae in the Magellanic Clouds: Combining S-PLUS Photometry and Spectroscopic Analysis*.  
**L. A. Gutiérrez-Soto**, A. R. Lopes, A. V. Smith Castelli & F. R. Faifer. Montevideo, Uruguay, 2023. Conference. XVII Latin American Regional IAU Meeting. **Speaker**.
3. *S-PLUS: An atlas of integrated H $\alpha$  fluxes for planetary nebulae in the Magellanic Clouds*.  
**L. A. Gutiérrez-Soto**, A. R. Lopes, A. V. Smith Castelli & F. R. Faifer. La Serena, Chile. 2023, Conference. Galaxy Groups and Clusters III: Laboratories to study Galaxy Evolution (GGCIII). **Poster Presenter**.
4. *An atlas of integrated H $\alpha$  fluxes for planetary nebulae in the Magellanic Clouds*.  
**L. A. Gutiérrez-Soto**, A. R. Lopes, A. V. Smith Castelli & F. R. Faifer. Córdoba, Argentina, 2023, Conference. XII Friends of Friends Meeting. **Poster Presenter**.
5. *Exploring the population of H $\alpha$  emitters in the Southern Photometric Local Universe Survey (S-PLUS)*.

- L. A. Gutiérrez-Soto**, R. Lopes de Oliveira, S. Akas, et al., 2022, Conference. 64° Reunión Anual de la Asociación Argentina de Astronomía. **Speaker**.
6. *Revealing the population of compact emission line sources in the Southern Photometric Local Universe Survey (S-PLUS)*.  
**L. A. Gutiérrez-Soto** & S-PLUS Collaboration. 17th S-PLUS Collaboration Meeting, 2022, Rio de Janeiro, Brazil. **Speaker**.
  7. *H $\alpha$  emitters from the Southern Photometric Local Universe Survey (S-PLUS)*.  
**L. A. Gutiérrez-Soto**, R. Lopes de Oliveira, S. Akas, D. R. Gonçalves, C. Mendes de Oliveira & S-PLUS Collaboration. 16th S-PLUS Collaboration Meeting, 2021, São Paulo, Brazil. **Poster Presenter**.
  8. *Planetary nebulae in S-PLUS*.  
**L. A. Gutiérrez-Soto**, D. R. Gonçalves, S. Akas & S-PLUS Collaboration. 15th S-PLUS Collaboration Meeting, 2021, São Paulo, Brazil. **Speaker**.
  9. *Planetary nebulae in S-PLUS*.  
**L. A. Gutiérrez-Soto**, D. R. Gonçalves, S. Akas & S-PLUS Collaboration. 14th S-PLUS Collaboration Meeting, 2020, São Paulo, Brazil. **Speaker**.
  10. *Tools to identify planetary nebulae and symbiotic stars*.  
**L. A. Gutiérrez-Soto**, Denise R. Gonçalves, Stavros Akas and the J-PLUS & S-PLUS collaborations. 10th S-PLUS Meeting. 2019, São Paulo, Brazil. **Speaker**.
  11. *Photometric tools to select planetary nebulae and symbiotic stars in J-PLUS and S-PLUS surveys*.  
**L. A. Gutiérrez-Soto**, Denise R. Gonçalves, Stavros Akas and J-PLUS & S-PLUS collaborations. II Workshop: chemical abundances in gaseous nebulae. 2019, São José dos Campos, São Paulo, Brazil. **Poster Presenter**.
  12. *Detecting Galactic halo planetary nebulae and symbiotic stars in multi-band photometric surveys*.  
**L. A. Gutiérrez-Soto**, D. R. Gonçalves & S. Akas. XXXth General Assembly of the International Astronomical Union (IAU). Division G: Stars and Stellar Physics, 2018, Vienna, Austria. **Speaker**.
  13. *Galactic halo planetary nebulae and symbiotic stars in multi-band photometric surveys*.  
**L. A. Gutiérrez-Soto**, D. R. Gonçalves S. Akas. Workshop "Science with SOAR and Gemini telescopes: preparing for the GMT". 2018, São José dos Campos, São Paulo, Brazil. **Speaker**.
  14. *S-PLUS, J-PLUS and J-PAS in the search for planetary nebulae*.  
**L. A. Gutiérrez-Soto**, D. R. Gonçalves, S. Akas, A. Cortesi, S. Daflon, et al. XLI Reunião Anual da Sociedade Astronômica Brasileira 2017, 2018, São Paulo, Brazil. Boletim da Sociedade Astronômica Brasileira, 30, no. 1, 158-159. **Poster Presenter**.
  15. *Identifying Galactic halo PN candidates in the imaging surveys: J-PLUS/S-PLUS and J-PAS*.  
**L. Gutiérrez-Soto**, D. R. Gonçalves, S. Akas, A. Cortesi, A. Ederoclite, et al., Latin American Regional IAU Meeting (LARIM) Cartagena 2016, Cartagena de Indias, Colombia. *Rev. Mex. Astron. Astrofís. (Serie de Conferencias)*. **Poster Presenter**.

16. *A catalog of stationary bow shocks in the Orion Nebula.*  
**L. A. Gutiérrez-Soto**, W. J. Henney, J. A. Tarango-Yong, OSSF14: The Olympian Symposium on Star Formation, 2014, Paralia Katerini, Greece. **Poster Presenter.**

## **PARTICIPATION IN OTHER EVENTS**

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1. 3rd J-PLUS Virtual Meeting. 2020, Teruel, España.
2. 12th J-PAS Collaboration Meeting. 2016, Río de Janeiro, Brasil.
3. Frontiers in Contemporary Astrophysics. 2013, Morelia, México.
4. Noveno encuentro colombiano de matemática educativa. 2008, Valledupar, Colombia.

## **FINANCIAL SUBSIDIES**

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**Consejo Nacional de Investigaciones Científicas  
y Técnicas, CONICET.** 2022  
*Postdoctoral Fellowship*

**Fundação de Amparo à Pesquisa do Estado  
de São Paulo, FAPESP.** 2020  
*Postdoctoral Fellowship*

**Coordenação de Aperfeiçoamento de Pessoal  
de Nível Superior, CAPES.** 2015  
*Doctoral Studies Fellowship*

**Dirección General de Asuntos del Personal  
Académico, DGAPA.** 2013  
*Master's Studies Fellowship*

**Departamento Administrativo de Ciencia,  
Tecnología e Innovación, COLCIENCIAS.** 2010  
*Research Stay Fellowship*