Diogo Henrique Francis de Souza

Curriculum Vitae

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Education

- **Jet Propulsion Laboratory / NASA** — California, United State
  Postdoc — *October 2024 to present*
- **Stony Brook University, Department of Physics and Astronomy** — New York, United State
  Visiting scholar — *August 2023 - January 2024*
- **São Paulo State University, Institute of Theoretical Physics & ICTP/SAIFR** — São Paulo, Brazil
  PhD Student — *August 2020 - August 2024*
  Doctorate Thesis: *Dark Energy and Neutrinos in Cosmology*
- **Federal University of Rio Grande do Sul, Department of Astronomy** — Rio Grande do Sul, Brazil
  MSc of Physics and Astrophysics — *August 2018 - August 2020*
  Master Thesis: *Formalism to determine the precision of cosmological parameters from the analysis of the angular correlation function*
- **Federal University of Minas Gerais, Institute of Exact Sciences** — Minas Gerais, Brazil
  Bachelor of Physics — *August 2012 - August 2017*
  Graduate Thesis: *Friedmann-Lemaître-Robertson-Walker cosmological model and the accelerated expansion of the Universe*

Papers

- **Can neutrino-assisted early dark energy models ameliorate the H0 tension in a natural way?**
  de Souza, Diogo H. F.; Rosenfeld, Rogerio. arXiv:2302.04644
- **Early dark energy constraints with late-time expansion marginalization**
  Rebouças, João; Gordon, Jonathan; de Souza, Diogo H. F.; Zhong, Kunhao; Miranda, Vivian; Rosenfeld, Rogerio; Eifler, Tim; Krause, Elisabeth. arXiv: 2302.07333

Papers in progress

- **Investigating Late-Time Dark Energy in light of DESI Y1 BAO**
  João Rebouças, Diogo H. F. de Souza, Kunhao Zhong, Vivian Mirandac and Rogerio Rosenfeld. arXiv: 2408.14628 - *Preparing for submission to JCAP*

Other text production

- **IAU Symposium 359 Galaxy Evolution and Feedback across Different Environments (GALFEED), International Astronomical Union Proceedings Series:**
  De Souza, D., & Santiago, B. (2020). Cosmological forecasts from photometric measurements of the angular correlation function for the Legacy Survey of Space and Time. Proceedings of the International Astronomical Union, 15(S359), 46-48. doi:10.1017/S1743921320001878
- **MSc Dissertation: Formalism for the determination of precision Formalismo para determinação da precisão de parâmetros cosmológicos a partir da análise da função de correlação angular**
  Summary: Analysis of the formalism to obtain estimates of the precision for cosmological parameters that a given future photometric survey has the potential to constrain. Key words: Angular correlation function, angular power spectra, covariance matrix, Fisher matrix, galaxy distribution function, peculiar velocity, redshift space distortion, Feldman, Kaiser & Peacock estimator. Link: https://lume.ufrgs.br/handle/10183/213428#

Membership in Professional Organizations

- Laboratório Interinstitucional de e-Astronomia (LIneA) / Interinstitutional e-Astronomy Laboratory.
- Dark Energy Survey (DES).
- Rubin Observatory Legacy Survey of Space and Time Dark, Energy Science Collaboration (LSST DESC).

Skills Summary

- **Foreign language:** English: Intermediate B2 - TOEFL iBT (May 04 2022)
- **Programming languages experience:** Fortran, Python, Mathematica, C, HTML, CSS, JavaScript, Shell Script
- **Operation System experience:** Linux (Ubuntu, Debian), Windows
- **Cosmological Codes:** CAMB, CLASS, Cobaya, CosmoSIS, CosmoPower, CoCoa

Professional Activities, Participation in Events and Complementary Training

- **Translation proofreader (2023):**
  I was one of the proofreader for the translation from English to Portuguese of a classroom resource book by Perimeter Institute. The book is called "Beyond Bohr: A Quantum Approach to the Atom". Link: https://resources.perimeterinstitute.ca/products/beyond-bohr-a-quantum-approach-to-the-atom?variant=41974659449010
- **Minicourse taught: The accelerated expansion of the universe and the cosmological parameters (2023):**
  I was the tutor of this minicourse. Minicourse address - http://outreach.ictp-saifr.org/escola-verao237/
- **Attended minicourse: Minicourse on the Entropy of Cosmological Perturbations (2022):**
  Minicourse address - https://www.ictp-saifr.org/minicourse-on-the-entropy-of-cosmological-perturbations/
- **Attended minicourse: Minicourse on Early Universe Cosmology (2022):**
  Minicourse address - http://portal.if.usp.br/pg/pt-br/noticia/minicurso-em-cosmologia
- **SAIFR/Princípia Workshop on the Nature of Dark Matter (2022):**
  Wrokshop address - https://www.ictp-saifr.org/dm2022/
- **Workshop on Classical Gravity and Applications (2022):**
  Wrokshop address - https://www.ictp-saifr.org/cga2022/
- **Congress "Paulo Leal Ferreira de Física" (2021):**
  I was one of the organizers and the responsible to managing the congress website.
- **Sdumont Supercomputer Summer School (2021):**
  Attended minicourses:
  1) Introduction to SDUMONT/SLURM enviroment and performance assessment tools BULLX-DE.
  2) Introduction to parallel E/S.
  3) Introduction to programming with OpenMP.
  4) Advanced programming with OpenMP.
  5) Code Optmization with Parallel Studio: a case study.
  6) Introduction to programming with CUDA.
  7) Introduction to parallel scientific workflows in Python/Parsl.
  8) R to HPC.
- **IV Joint ICTP-Trieste/ICTP-SAIFR School on Cosmology: Challenges for the Standard Cosmological Model (2021):**
  Focus on some recent challenges in Cosmology: the recent developments concerning tensions in the standard cosmological model, the modelling and testing of fundamental physics on nonlinear scales and the use of gravitational waves to test cosmology.
- **LSST Brazil (2021):**
  General overview and updates about the LSST to the Brazilian community.
- **School of Particles, Astroparticles, Fields and Cosmology (2020):**
  Introduction to a wide range of topics in physics to help students decide their career.
- **IAU Symposium 359 Galaxy Evolution and Feedback across Different Environments (GALFEED) (2020):**
  I did a presentation of my master project about Cosmological forecasts from photometric measurements of the angular correlation function for the Legacy Survey of Space and Time.
- **III Joint ICTP-Trieste/ICTP-SAIFR School on Observational Cosmology (2019):**
  I did a presentation of my master project about Forecast of Cosmological Parameters for LSST.
- **LIneA Bootcamp (2019):**
  I did a presentation of my master project about Forecast of cosmological parameters for LSST.
- **IFGW Winter School of Observational Cosmology (2018):**
  I attended four minicourses: 1) Large Scale Structure, 2) Dark Energy, 3) Statistical methods in cosmology, 4) Observing the universe.
- **Academic Week of Physics and Engineering Physics (2018).**
- **Symposium for Young Scientists (2018).**
- **69° Annual Meeting of SBPC (Sociedade Brasileira para o Progresso da Ciência - Brazilian Society for the Progress of Science) (2017).**
- **I National Latin American University Physics Olympiad ONUF (2017).**
- **2016 ICTP-SAIFR Competition for Young Physicists (2016).**
- **National University Physics Olympiad ONUF (2016).**
- **2015 ICTP-SAIFR Competition for Young Physicists (2015).**
- **XIV Brazilian Olympiad of Astronomy and Astronautics IOBFOG OBA (2011).**
- **XIII Brazilian Olympiad of Astronomy and Astronautics IOBFOG OBA (2010).**
- **XI Brazilian Olympiad of Astronomy and Astronautics IOBFOG OBA (2008).**
- **I Brazilian Rocket Olympiad OBA (2007).**
- **X Brazilian Olympiad of Astronomy and Astronautics IOBFOG (2007).**

Honors and Awards

- Book Access Scholarship Bernardo Álvares, Federal University of Minas Gerais (2016).
- 2nd place on Brazilian Olympiad of Astronomy and Astronautics IOBFOG - Category 3, Brazilian Astronomical Society and Brazilian Space Agency (2007).

Additional Information

- Physics teacher volunteer in 2022 for 6 month at "Psico", a college-prep school (located at University of Sao Paulo) for low income people. Website: https://sites.google.com/view/cursinhopsicousp?pli=1
- Previous experience in private physics classes.
- Git Hub: https://github.com/diogohf