Lucas F. Secco | Résumé

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Education

Ph.D. in Physics & Astronomy
University of Pennsylvania *2015–2020*

M.Sc. in Physics
University of São Paulo (Brazil) *2013–2015*

B.Sc. in Physics
Federal University Rio Grande do Sul (Brazil) *2009–2013*

Research Experience

University of Chicago
Kavli Institute of Cosmological Physics Postdoctoral Fellow *2020– present*

- Explored complex astronomical data with statistical modeling techniques such as Bayesian posterior sampling, parameter inference and estimation of statistical significance, leading to 5 impactful publications in the field of observational cosmology;
- Published a first-ever detection of non-Gaussian statistical signals with 3-point correlation functions on real data, validated them against simulations and was invited to present results at prestigious institutions worldwide;
- Mentored graduate and undergraduate students in development of astrophysical analysis tools, including Fisher-Matrix forecasting, mitigation of model biases, as well as effective project management leading to thesis completion and co-authored publications.

University of Pennsylvania
Research Assistant (Dark Energy Survey Collaboration) *2015–2020*

- Spearheaded the extraction of cosmological information from messy data sets using numerical methods such as likelihood inference and Monte Carlo sampling, compressing over 400 million data features down to 2 crucial cosmological model parameters;
- Led large (>20) and small (<5) teams of physicists, astronomers and data scientists by setting long-term research goals, short-term action items and organizing periodic meetings, coding sprints and workshops;
- Substantially contributed to software and analysis development in a supporting team member role, resulting in the co-authoring of over 30 scientific publications and being rewarded with exclusive data access rights;
- Created thousands of mock data modeled as log-normal stochastic realizations in order to quantify the cross-covariance of weak lensing observables, providing numerically stable covariance matrices for parameter inference and chi-squared optimization.

University of São Paulo (Brazil)
Research Scholar *2013–2015*

- Excelled in research on statistical methods in cosmology by modeling galaxies as biased Poisson samples of random fields in order to understand their statistical distribution in data, leading to the award of prestigious national scholarship "FAPESP".

Technical Skills

Statistics & Data Science

- Supervised & unsupervised Machine Learning, uncertainty and covariance estimation, statistical significance evaluation, model testing and parameter inference, Bayesian statistics, data engineering, analysis of simulations.

Programming

- Python, Git, LaTeX, Unix, MacOS, Microsoft Office Suite, TensorFlow, scikit-learn.

Honors & Awards

Kavli Postdoctoral Fellowship (University of Chicago) *2020-2023*
Early Career Scientist Travel Grant (Dark Energy Survey) *2017-2018*
São Paulo Research Agency (FAPESP) Scholarship *2013-2015*