Miguel A. Sabogal García

Curriculum Vitæ

Mail: msabogal@est.uniatlantico.edu.co **Web page:** msabogal.github.io **Telephone:** + 57 3017958948

Over the last 3 years I actively participated in many physics research that resulted in international scientific publications. These experiences allowed me to acquire strengths in leadership, creativity, and perseverance while building skills in a wide range of programming languages, developing specialized software, and performing data management.

Research Experience, Publications, and Projects

Peer-Reviewed Publications

- Cardona, W., & **Sabogal, M. A.** Holographic energy density, dark energy sound speed, and tensions in cosmological parameters: H0 and S8. Journal of Cosmology and Astroparticle Physics, 2023(02), 045. DOI 10.1088/1475-7516/2023/02/045 arXiv:2210.13335.

- Oliveros, A., **Sabogal, M.A.,** & Acero, M.A. Barrow holographic dark energy with Granda–Oliveros cutoff. Eur. Phys. J. Plus 137, 783 (2022). DOI: 10.1140/epjp/s13360-022-02994-z**.**

- **Sabogal, M. A.** , Parra, I. C. , Bandera, M. , Gallardo, J. , & Mejía-Cortés, C. (2020, May). Mobility of localized beams in non-homogeneous photonic lattices. In Journal of Physics: Conference Series (Vol. 1547, No. 1, p. 012023). IOP Publishing. DOI: 10.1088/1742-6596/1547/1/012023.

In Preparation

- **Sabogal, M.A.**, & Gonzalez, J.(2022). Hubble constant estimation from BAO signals with LSST-simulated data. Draft: zenodo.7131390.

Professional experience

02/2023 - Current ***High school teacher****, Fundación Educativa Instituto Experimental del Atlántico "José Celestino Mutis".*
Tasks performed:
- *Teaching Physics and programming courses*
- *Preparation of syllabus and pedagogical materials*
- *Examination preparation and student grading*

05/2022 - 08/2022 **Research intern***, RECA Internship program 2022, Red de Estudiantes de Astronomía de Colombia.*
Tasks performed:
- *Design and development of specialized software in Python and Writing of scientific articles*
- *Statistical analysis using Markov chain Monte Carlo (MCMC)*
- *Non-parametric reconstruction using Gaussian Processes (Machine Learning)*
- *Develop the end-to-end project plans with the execution team*

06/2020 - 12/2022 **Junior Software Developer***, Instituto Colombiano de Neurociencias Aplicadas SAS.*
Tasks performed:
- *Assisting Senior Developer with the development, and maintenance of all menu maintenance portal code using Python*
- *Developing automation scripts in Python for data management*
- *Keeping the project manager informed of the overall status of the solution*
- *Be part of technical discussions and solution*

Volunteer experience

08/2019 - 06/2022 ***Supportive Mentor****, Physics Program, Universidad del Atlántico*

Tasks performed:
- *In-person and virtual classes of Physics and Mathematics*
- *Academic support to students in their first semesters and mid-career.*
- *Mentoring colleagues providing advice and guidance on best practice and development techniques*

Education

- 2015 – 2022 **Physicist,** Bachelor's degree/ *Universidad del Atlántico.*

Computational skills

Specialized software ***Cosmic Linear Anisotropy Solving System (CLASS)*** and ***Gaussian processes (GaPP)*****:** *Advanced*

Python: Advanced, **C/C++:** Intermediate, **Fortran 90:** Intermediate, **MATLAB/Mathematica/Excel**: Advanced, **HTML:** Basic

Techniques: Process Automation, Machine Learning, Statistical analysis using MCMC, Web scraping, Object-oriented programming.

Tools: Selenium, Beautifulsoup, Scrapy, NumPy, SciPy, Pandas.

Honors and Awards

- *Funding award **"Enabling Science Program 2021 Award - 51"**, granted by the Legacy Survey of Space and Time (**LSST**) observatory.*
- ***Undergraduate Honors Theses***, Universidad del Atlántico.

Additional languages

English (TOEFL**)** Read: **C1** Speak: **B2** Write: **B2** Listen: **C1** **Test date:** Nov 2022

Presentations and Events

Event: *XIV Latin American Symposium on High Energy Physics*

Type of event: *International Congress*

Type of participation: *Speaker*

Conference title: *Decoding Holographic Dark Energy in the structure formation*.

Place: *QUITO, ECUADOR - Universidad San Francisco de Quito, 14/11/2022 – 18/11/2022.*

Event: *CoCo 2021: Cosmology in Colombia*

Type of event: *National Congress*

Type of participation: *Speaker*

Conference title: *Cosmological analysis of Barrow holographic dark energy model considering the Granda-Oliveros infrared cutoff.*

Place: *Online, 08/09/2021 – 11/09/2021.*

Event: *RECA Internships 2022 Symposium*

Type of event: *National Symposium*

Type of participation: *Speaker and Intern*

Conference title: *Hubble constant estimation from BAO signals with LSST-simulated data*

Place: *Online - Universidad de Antioquia, 29/08/2022 – 30/08/2022.*

Courses and certifications

PYTHON IN ASTRONOMY Astropy Course(2022)

Work references

Mario A. Acero Ortega, Ph.D. in Physics **ORCID.**
Associate Professor, Physics Program, Faculty of Basic Sciences, Universidad del Atlántico.
Regular Member and Co-Founder of Colombian Network on High Energy Physics
Distinction from Neutrino Physics Center, Fermilab: Batavia, Illinois, US
Contact info: marioacero@mail.uniatlantico.edu.co or (+57) 313 497-3415