

Affiliation
Instituto de Física
Teórica (IFT), CSIC

Dr. George Alestas

Physicist - Researcher 

Collaborations

Euclid
LIGO
VIRGO
LISA

Website

georgealestas.github.io

Tel & Skype

(+30) 6989964269
alestasg

E-mail

alestasg@gmail.com

Languages

Greek → Native
English → Fluent

Professional Summary

A highly motivated researcher specializing in Cosmology and Astrophysics. I am proficient in the theoretical and numerical exploration of cosmological models, including cosmological parameter inference using Bayesian analysis and machine learning techniques. I have also worked on aspects of the Hubble and S_8 tensions. Part of the Euclid, LIGO, Virgo and LISA collaborations. I have co-supervised two MSc. and two BSc. students. I would describe myself as a fast learner and an excellent collaborator.

Positions & Academic Visits

2023	Visiting Researcher Institute for Artificial Intelligence and Fundamental Interactions (IAIFI), Boston	MIT & Harvard
2023	Visiting Researcher Kobayashi-Maskawa Institute (KMI), Japan	Nagoya University
2022 - Now	Postdoctoral Studies Instituto de Física Teórica (IFT), Madrid	Universidad Autónoma de Madrid
2018 - 2022	PhD in Cosmology <i>PhD Thesis:</i> " Λ CDM and the Implications of the Hubble Tension" <i>Advisor:</i> Prof. Leandros Perivolaropoulos Grade: Summa Cum Laude	University of Ioannina

Publication Record

Seventeen papers with a total of more than 1600 citations and **h-index = 11**, including two articles published in conference proceedings and two N-author reviews. The codes developed and used in the analysis of my papers are publicly available at **GitHub**. Click [here](#) for my up-to-date InspireHEP profile.

- DESI constraints on α -attractor inflationary models**, G. Alestas, M. Caldarola, S. Kuroyanagi, S. Nesseris, Preprint: <https://arxiv.org/abs/2410.00827>
- To curve, or not to curve: Is curvature-assisted quintessence observationally viable?**, G. Alestas, M. Delgado, I. Ruiz, Y. Akrami, M. Montero, S. Nesseris, Phys.Rev.D 110 (2024) 10, 106010, DOI: 10.1103/PhysRevD.110.106010
- Enhancing Cosmological Model Selection with Interpretable Machine Learning**, I. Ocampo, G. Alestas, S. Kuroyanagi, S. Nesseris, Phys.Rev.Lett. 134 (2025) 4, 041002, DOI: 10.1103/PhysRevLett.134.041002
- Applying the Viterbi Algorithm to Planetary-Mass Black Holes Searches**, G. Alestas, G. Morras, T. Yamamoto, J. Garcia-Bellido, S. Kuroyanagi, S. Nesseris, Phys.Rev.D 109 (2024) 12, 123516, DOI: 10.1103/PhysRevD.109.123516
- Machine learning constraints on deviations from general relativity from the large scale structure of the Universe**, G. Alestas, L. Kazantzidis and S. Nesseris, Phys.Rev.D 106 (2022) 10, 10, DOI: 10.1103/PhysRevD.106.103519
- Constraining a late time transition of G_{eff} using low- z galaxy survey data**, G. Alestas, L. Perivolaropoulos and K. Tanidis, Phys.Rev.D 106 (2022) 2, 023526, DOI: 10.1103/PhysRevD.106.023526 (More than 20 citations)

7. **Late-transition vs smooth $H(z)$ deformation models for the resolution of the Hubble crisis**, G. Alestas, D. Camarena, E. Di Valentino, L. Kazantzidis, V. Marra, S. Nesseris and L. Perivolaropoulos, Phys.Rev.D 105 (2022) 6, 063538, DOI: 10.1103/PhysRevD.105.063538 (More than 60 citations)
8. **Hints for a gravitational constant transition in Tully-Fisher data**, G. Alestas, I. Antoniou and L. Perivolaropoulos, Universe 7 (2021) 366, DOI: 10.3390/universe7100366, (More than 30 citations)
9. **Late time approaches to the Hubble tension deforming $H(z)$, worsen the growth tension**, G. Alestas, L. Perivolaropoulos, Mon.Not.Roy.Astron.Soc. 504 (2021) 3, 3956-3962, DOI: 10.1093/mnras/stab1070, (More than 60 citations)
10. **A $w-M$ phantom transition at $z_t < 0.1$ as a resolution of the Hubble tension**, G. Alestas, L. Kazantzidis, L. Perivolaropoulos, Phys.Rev.D 103 (2021) 8, 083517, DOI: 10.1103/PhysRevD.103.083517, (More than 70 citations)
11. **Existence and Stability of Static Spherical Fluid Shells in a Schwarzschild-Rindler-anti-de Sitter Metric**, G. Alestas, G.V. Kraniotis, L. Perivolaropoulos, Phys.Rev.D 102 (2020) 104015, DOI: 10.1103/PhysRevD.102.104015, (More than 10 citations)
12. **H_0 tension, phantom dark energy, and cosmological parameter degeneracies**, G. Alestas, L. Kazantzidis, L. Perivolaropoulos, Phys.Rev.D 101 (2020) 12, 123516, DOI: 10.1103/PhysRevD.101.123516, (More than 140 citations)
13. **Evading Derrick's theorem in curved space: Static metastable spherical domain wall**, Alestas G., Perivolaropoulos L., Phys.Rev.D 99 (2019) no.6, 064026, DOI: 10.1103/PhysRevD.99.064026, (More than 10 citations)

Articles published in conference proceedings:

1. **Stable, Spherical and Thin Fluid Shells**, G. Alestas, G. V. Kraniotis, L. Perivolaropoulos, Published in Phys.Sci.Forum 2021, 2, 24, DOI: 10.3390/ECU2021-09332
2. **An Overview of Nonstandard Signals in Cosmological Data**, G. Alestas, G. V. Kraniotis, L. Perivolaropoulos, Published in Phys.Sci.Forum 2021, 2, 28, DOI: 10.3390/ECU2021-09333

N-author articles:

1. **Euclid. I. Overview of the Euclid mission**, Euclid Collaboration, Y. Mellier *et al.*, Preprint: <https://arxiv.org/abs/2405.13491>
2. **Cosmology Intertwined: A Review of the Particle Physics, Astrophysics, and Cosmology Associated with the Cosmological Tensions and Anomalies**, E. Di Valentino *et al.*, Contribution to: 2022 Snowmass Summer Study, Published in JHEAp 34 (2022) 49-211, DOI: 10.1016/j.jheap.2022.04.002, (More than 700 citations)

Scholarships & Grants

2022-23	Grant for IFT - Institute for Artificial Intelligence and Fundamental Interactions (IAIFI) exchange program on academic visits.
2022-23	Application of machine learning to new cosmological observations, Funding institution: Ministerio de Ciencia e Innovación, i-LINK 2021
2021-22	Fellow of the Greek State and the European Union (European Social Fund – ESF) through the Operational Programme "Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK)"
2020-21	Fellow of the Greek State and the European Union (European Social Fund – ESF) through the Operational Programme "Human Resources Development, Education and Lifelong Learning 2014-2020"
2020	European Cooperation in Science & Technology (COST) grant for a short term scientific mission (STSM) in the context of the action "CA15117 - Cosmology and Astrophysics Network for Theoretical Advances and Training Actions (CANTATA)" and the project "Search for Hints of Modified Gravity in Cosmological Data"

Conferences Attended & Talks Given

- Seminar at the Smithsonian center for astrophysics, November 2023, Harvard, **(Talk)**
- Cosmo23 - 2023 Conference in Cosmology, September 2023, Madrid, Spain, **(Co-Organizer)**
- Kickoff workshop, June 2023, Nagoya University, Japan, **(Talk)**
- i-Link workshop, June 2023, Nagoya University, Japan, **(Talk)**
- Seminar at ICF, February 2023, UNAM, Mexico, **Invited Talk**
- HEP 2020 - 38th Conference on Recent Developments in High Energy Physics and Cosmology, September 2021, Athens, Greece.
- 16th Marcel Grossmann Meeting - MG16, July 2021, Rome, Italy, **(Talk)**
- 19th online Conference in the String Phenomenology Conference Series, June 2020, Boston, United States.
- 9th Korea Institute of Advanced Study (KIAS) Workshop on Cosmology and Structure Formation webinar, November 2020, Seoul, South Korea
- Workshop on Quantum Fields and Nonlinear Phenomena, SEENET-MTP-CERN-ICTP Joint Meeting, 2020, Romania, **(Talk)**
- SEENET-MTP Balkan School on High Energy and Particle Physics: Theory and Phenomenology, 2019, Ioannina, **(Talk)**
- HEP 2019 - Recent Developments on High Energy Physics and Cosmology, 2019, Athens

Research Interests

Theoretical Cosmology, Observational Cosmology, Machine Learning, Hubble Tension, Modified Gravity, Dark Energy, Data Analysis, Gravitational waves

Programming Knowledge

- Linux, Windows
- Python, C/C++, Fortran, HTML, Tensorflow
- COSMOMC/CAMB, MontePython/Class, Mathematica, Matlab

Skills

Cosmology, Theoretical Astrophysics, Machine Learning Techniques, Computational Physics, General Relativity, Data Analysis

Teaching Experience

- | | | |
|---------|---|--|
| 2021-22 | Teaching Assistant
Classical Electrodynamics I (5th Semester Core Course – 52), my duties were:
1. The tutoring of third year students.
2. The grading of weekly assignments. | University of Ioannina |
| 2021-22 | Teaching Assistant
Gravity and General Theory of Relativity (Advanced Undergraduate Elective Course – 106), my duties were:
1. The grading of weekly assignments and reports. | University of Ioannina |
| 2020-21 | Teaching Assistant
Cosmology (Advanced Undergraduate Elective Course – 105), my duties were:
1. The grading of weekly assignments and reports. | University of Ioannina |
| 2020-21 | Teaching Assistant
Gravity and General Theory of Relativity (Advanced Undergraduate Elective Course – 106), my duties were:
1. The grading of weekly assignments and reports. | University of Ioannina |
| 2019-20 | Teaching Assistant
Classical Electrodynamics I (5th Semester Core Course – 52), my duties were:
1. The grading of weekly assignments and reports. | University of Ioannina |
| 2016-17 | Teaching Assistant
Astrophysics Laboratory (TAE450), my duties were:
1. The tutoring of third and fourth year students.
2. The grading of weekly assignments and reports. | University of Patras |

2016-17

Teaching Assistant

University of Patras

Astronomy Laboratory (TAE451), my duties were:

1. The tutoring of third and fourth year students.
2. The grading of weekly assignments and reports.
3. Demonstrating the use of Astronomical equipment.

Student Supervision

MSc. Students

Universidad Autónoma de Madrid, UAM

1. Raul Rodriguez
2. Victor de Mora

BSc. Students

University of Oviedo & Ioannina

1. Alberto Nieto
2. Raul Enrique Pariente

Societies

- Student Member of the American Physical Society (APS)
- Junior Member of the Hellenic Society on Relativity, Gravitation and Cosmology

Professional References

Prof. Leandros Perivolaropoulos - leandros@uoi.gr (PhD Advisor)

Dr. Sachiko Kuroyanagi - sachiko.kuroyanagi@csic.es

Asst. Prof. Savvas Nesseris - savvas.nesseris@csic.es

Prof. Domenico Saponi - domenico.saponi@uchile.cl

Dr. Yashar Akrami - yashar.akrami@csic.es