Affiliation
Instituto de Fisica Teorica (IFT), CSIC

Collaborations
Euclid
LIGO
VIRGO
LISA

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Languages
Greek → Native
English → Fluent

Dr. GeorgeAlestas

Physicist - Researcher

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 various well-known MCMC software and gravitational wave data analysis. I have worked on modified gravity models and several aspects of the Hubble and S_8 tensions. Part of the Euclid, LIGO, Virgo and LISA collaborations. I would describe myself as a fast learner and an excellent collaborator.

Education & Academic Visits

2023 **Short Academic Visit** — MIT & Harvard
Institute for Artificial Intelligence and Fundamental Interactions (IAIFI), Boston

2023 **Short Academic Visit** — Nagoya University
Nagoya University, Japan

2022 - Now **Postdoctoral Studies** — Universidad Autónoma de Madrid
Instituto de Fisica Teorica (IFT), Madrid

2018 - 2022 **PhD in Cosmology** — University of Ioannina
PhD Thesis: "ΛCDM and the Implications of the Hubble Tension"
Advisor: Prof. Leandros Perivolaropoulos
Grade: Summa Cum Laude

Publication Record

Ten papers (highlighted most important) with a total of more than 900 citations and **h-index = 9**, two articles published in conference proceedings and one N-author review. The codes used in the analysis of all the papers are publicly available at **GitHub**. Click **here** for my up to date InspireHEP profile.

1. **Applying the Viterbi Algorithm to Planetary-Mass Black Holes Searches**, G. Alestas, G. Morras, T. Yamamoto, J. Garcia-Bellido, S. Kuroyanagi, S. Nesseris, Preprint: https://arxiv.org/abs/2401.02314
2. **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
3. **Constraining a late time transition of $G_{\rm eff}$ 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)
4. **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 50 citations)
5. **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)

6. **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 50 citations)

7. **A w–M phantom transition at zt<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 60 citations)

8. **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)

9. **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 120 citations)

10. **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. **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 500 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, Hubble Tension, Modified Gravity, Dark Energy, Data Analysis, Gravitational waves, Soliton Physics

Programming Knowledge

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

Skills

Cosmology, Theoretical Astrophysics, Computational Physics, General Relativity, Data Analysis

Teaching Experience

2021-22 **Teaching Assistant** University of Ioannina
Classical Electrodynamics I (5th Semester Core Course – 52), my duties were:
1. The tutoring of third year students.
2. The grading of weekly assignments.

2021-22 **Teaching Assistant** University of Ioannina
Gravity and General Theory of Relativity (Advanced Undergraduate Elective Course – 106), my duties were:
1. The grading of weekly assignments and reports.

2020-21 **Teaching Assistant** University of Ioannina
Cosmology (Advanced Undergraduate Elective Course – 105), my duties were:
1. The grading of weekly assignments and reports.

2020-21 **Teaching Assistant** University of Ioannina
Gravity and General Theory of Relativity (Advanced Undergraduate Elective Course – 106), my duties were:
1. The grading of weekly assignments and reports.

2019-20 **Teaching Assistant** University of Ioannina
Classical Electrodynamics I (5th Semester Core Course – 52), my duties were:
1. The grading of weekly assignments and reports.

2016-17 **Teaching Assistant** University of Patras
Astrophysics Laboratory (TAE450), my duties were:
1. The tutoring of third and fourth year students.
2. The grading of weekly assignments and reports.

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.

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**
Dr. Yashar Akrami - **yashar.akrami@csic.es**
Dr. Eleonora Di Valentino - **E.Divalentino@shef.ac.uk**
Asst. Prof. Panagiota E. Christopoulou - **pechris@physics.upatras.gr**