

Brief Curriculum Vitae of Dr. Spyros Basilakos

(Director of Research)

1. Personal data:

Born in Athens 6/10/1972 (spoken languages: Greek, English and basic Spanish)
Member of the Hellenic Astronomical Soc. and the Greek association of Relativity and Cosmology.

Married to Nasia Darra and father of two children.

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2. Higher Education:

- Mathematics degree, University of Thessaloniki Greece (1991-1995)
- M.Sc. in Astronomy, University of Athens (1995-1997)
- Ph.D. in Physical Cosmology, University of Athens (1997-2000) [supervisor Prof. M. Plionis]. For the duration of my entire Ph.D. studies, the State Fellowship Institution has awarded me a fellowship after a national competition. I was awarded, by the Hellenic Astronomical Society, the best PhD thesis of the year 2000.

3. Academic Appointments:

14/11/1999 – 16/10/2001: Research associate: Imperial College, London [head of the department at that time Prof. Rowan-Robinson].

02/12/2002 – 31/08/2005: Research associate: National Observatory of Athens. Working on Theoretical Astrophysics and Cosmology in the framework of the project 'X-ray Astrophysics with ESA's mission XMM'.

01/10/2005 – 28/09/2006: Research associate: Kapteyn Institute of Astronomy (Groningen, The Netherlands). Working on (a) large-scale structure of DM halos using GADGET simulations, (b) the nature of dark energy and (c) Physical Cosmology. This project funded by the Dutch State (NOVA fellowship).

28/09/2006 – 06/05/2010: Researcher (faculty) at the Academy of Athens (Centre of Astronomy & Applied Mathematics). Working on Theoretical Physics, Physical Cosmology and Dark Energy.

06/05/2010 – 10/10/2014: Senior Researcher (faculty) at the Academy of Athens (Centre of Astronomy & Applied Mathematics). Working on Theoretical Physics, Physical Cosmology, Gravity and Dark Energy.

03/06/2011 – 31/12/2011: Visiting Professor (sabbatical) at the University of Barcelona department of Physics. Working on nature of dark energy and alternative theories of gravity.

10/10/2014 – Present: Director of Research at the Academy of Athens (Centre of Astronomy and Applied Mathematics). Working on Theoretical Physics, Physical Cosmology, Gravity and dark energy.

I have served as a vice President of the association of researchers at the Academy of Athens (2011-2014).

Councillor of the Governing Board of the Hellenic Society for Relativity, Gravity and Cosmology HSRGC (2016-2018).

Member of the committee that proposed to the Greek Ministry of Education the National council for Research and Technology for the period (2017-2021).

Compulsory Military service in the Greek Army (26/11/2001-26/11/2002) as a Military Police Officer (rank: sergeant major).

3. Fields of interest:

My main interests concentrate on the Nature of Dark Energy, unification between Dark Matter & Dark Energy, Evolution of Perturbations and Structure Formation in different Cosmological models, Early Universe (including inflation), quantification of the Large-Scale Structure of the Universe using numerical simulations and observational data, quantification of the Hubble expansion using different high- z Tracers.

In particular:

- (a) Cosmological and statistical tests of General Relativity. Classical and quantum Cosmology of scalar fields.
- (b) Nature of dark energy [$\Lambda(t)$, scalar-vector fields, modified gravity etc] and the accelerating Universe.
- (c) Constraints on the cosmological parameters using observational data.
- (d) The physics of inflation and the evolution of matter perturbations.
- (e) Statistical and geometrical measures for quantifying large-scale structure (galaxies, X-ray sources and clusters of galaxies).
- (f) Use of numerical cosmological simulations for testing, describing and comparing scenarios of structure formation utilizing the Press-Schechter formalism.
- (g) Use of alternative high- z tracers (HII-galaxies and X-ray selected AGN) to estimate the Dark Energy equation of State.
- (h) Models of the large-scale bias between mass-tracers and the underlying matter distribution.

4. Publications:

In the ~16 years of my academic career, my research work has led to ~120 publications in refereed journals (MNRAS, Phys. Rev. D., ApJ, A&A, JCAP, GRG, IJMPD, Astro-particle Physics). I have also 45 articles in conference proceedings. Out of the 120 refereed publications, I am the first author in ~60% of these, while I am a single author in 10 publications. Finally, my h-factor is 32 according to NASA's ADS database (http://adsabs.harvard.edu/abstract_service.html). My publications list can be found in (<http://astro.academyofathens.gr/people/sbasil/>).

5. Conference participation, organization & seminars:

I have given oral contributions in many international (37) and Hellenic (9) conferences and I was an invited speaker in some of these. I have participated in the LOC of 11 scientific international conferences. I have also been invited to present seminars in various departments and institutes (cf. Durham Univ., Cambridge Univ., Imperial College, Sussex Univ., Nottingham Univ., Universidad Autonoma de Madrid - Spain, Universidad de Barcelona - Spain, University of Leiden - The Netherlands and INAOE in Mexico).

6. International Awards:

The following two scientific articles: "From inflation to dark energy through a dynamical Λ : an attempt at alleviating fundamental cosmic puzzles" and "A viable Starobinsky-like inflationary scenario in the light of Planck and BICEP2 results" by Basilakos, Lima & Sola, have received honorable mentions in the 2013 and 2014 competition by the Gravity Research Foundation (USA). Both articles have been published by the Int. J. of Mod. Phys. D. (Special Issue).

7. Referee - Review Editor:

For the years 2007-2008 I have been an official referee of the European Science Foundation (ESF) in the field of "Dark Energy". For the years 2009-2010 I have been an official referee of the French National Research Agency (ANR) in the field of Cosmology. I am a regular referee of journals MNRAS, JCAP, ApJ, PRD, Astronomy & Astrophysics, IJMPD.

I was an editor (in collaboration with Prof. Manolis Plionis) of the Special Issue of IJMPD (published in 2015) on the topic "Testing Inflationary scenarios with the Planck and BICEP2 data". Also, I was invited to serve the Review Editorial Board of High-Energy and Astroparticle Physics journal.

8. Student supervision & Teaching:

Member of the supervising committee of 5 **PhD** theses: Andronikos Paliathanasis (Un. of Athens 2014), Constantinos-Parouris Orthodoxos (Un. of Pelloponese 2014), currently supervising theses of Athina Pouri (Un. of Athens), Alexandros Papageorgiou (Un. of Thessaloniki) and I. Papagianopoulos (Un. of Athens). Member of the supervising committee of 3 **MSc** theses and 4 **BSc** theses.

I taught (tutorials) at the Imperial College for two academic years (1999-2001) the undergraduate first year course in Mathematics/Astrophysics. Since the year of 2013, I'm teaching the course of Cosmology at the University of Athens (Dep. of

Mathematics and Physics).

9. Post-doc supervision:

I have supervised (in collaboration with Dr. I. Tereno) the post-doctoral fellowship of Dr. C. S. Carvalho in the field of Cosmology and dark energy (location Research Centre for Astronomy Academy of Athens, duration: 2010-2014).

10. Recent collaborations:

(a) "*Alternative high-z tracers of the dark energy equation of state*": In this project we propose to use HII-like galaxies to measure the dark energy equation of state. This collaboration includes the following researchers: M. Plionis (NOA Greece), R. Terlevich (Cambridge UK/INAOE Mexico), E. Terlevich (INAOE), F. Bressolin (IfA Hawaii USA) and J. Melnick (ESO Chile).

(b) "*The Physics of Dark Energy*": I am collaborating with Prof. M. Plionis, Prof. J. Sola and his team (Un. of Barcelona), Prof. S. Capozziello (Un. of Naples), Prof. N. Mavromatos (Kings College), Prof. J. Barrow (Cambridge UK) and Prof. J. A. S. Lima and his team (Un. of Sao Paulo Brasil) to study the dynamical properties of the FLRW flat cosmological models in which the vacuum energy density evolves with time $\Lambda(t)$.

(c) "*XMM/LSS collaboration*": I am participating in the analysis of XMM/LSS new survey (M. Pierre, 11 sq. deg) in collaboration with several the Universities and Institutes. One of the aims of this program (in which I have the responsibility) is to study the clustering/biasing properties of the X-ray sources detected in the XMM/LSS survey. Note, that the extension of the original XMM/LSS survey is currently being realized.

11. Referees:

My curriculum vitae is supported by the following referees: a) **Prof. N. Mavromatos**, Kings College London (nikolaos.mavromatos@kcl.ac.uk), b) **Prof. S. Capozziello**, University of Naples (capozzie@na.infn.it), c) **Prof. J. Sola**, University of Barcelona (sola@ecm.ub.edu), d) **Prof. A. Lima**, University of Sao Paulo (limajas@astro.iag.usp.br) and e) **Prof. J. Barrow**, University of Cambridge UK (jdb34@hermes.cam.ac.uk).