Carla Sofia Nunes de Carvalho, PhD, Eng CURRICULUM VITÆ

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Research Interests

Applied Mathematics, Engineering, Statistical Physics, Theoretical Physics.

Professional Experience

10/2016– : Data Scientist at Nokia Networks (Applications & Analytics), Amadora, Portugal
• Responsible for the selection and preparation of material for a data science tutorial (in Jupyter), including theory and code.
• Prepared the road map for an automated anomaly detection algorithm; proposed an estimation of the business impact of anomalies in a mobile network; prepared and characterized the data (in Python) for input in an internet–of–things application of an automated anomaly detection algorithm; formulated a model for the probability of outage based on a hierarchical failure model.
• Conceived a dynamical model for the number of transmissions in a fixed network and estimated the model parameters (in Python) to assess how the traffic is affected by technical characteristics of the connection; classified subscribers according to similarities in the traffic pattern.
• Conceived a model for the effectiveness of marketing campaigns and implemented it into a modular algorithm (in Python).
• First data scientist hired.

10/2016– : Postdoctoral collaborator at Faculty of Sciences, U. of Lisbon, Portugal
• Evaluated the expected performance of the COrE+ satellite mission proposal in regards to measurements from maps of the cosmic microwave background radiation.

10/2013–09/2016: Postdoctoral researcher, jointly at the Faculty of Sciences, U. of Lisbon, Portugal and at the Research Center for Astronomy and Applied Mathematics, Academy of Athens, Greece
• Evaluated the expected performance of the COrE+ satellite mission proposal in regards to the measurement of the peculiar velocity from maps of the cosmic microwave background radiation.
• Estimated cosmological parameters (in Python) from type Ia supernova data to constrain late–time accelerating cosmological solutions of gravity theories alternative to general relativity.
• Estimated cosmological parameters across the sky (in Python) from type Ia supernova data to measure inhomogeneities in the large–scale structure of the Universe.
• Designed and implemented an algorithm (in IDL) for the automatic generation of the sky survey for the wide field observation programme of the ESA Euclid mission.
• Developed a meta–analysis method (in R) to assess robustly the correlation between the occurrence of coronary heart disease and the presence of a potential genetic risk factor.

11/2012–04/2013: Collaborator of Rector Innovation Advisors, Athens, Greece
• Conceived an attribution model and implemented it into a modular algorithm (in R). Attribution modelling is the process of accurately valuing advertising techniques along the path that extends from the exposure to ads, to the conversion into sales.

05/2012: Collaborator of Geoanalysis S.A. Geoinformation Technologies, Athens, Greece
• Designed and wrote an algorithm (in Matlab) for automated combination of borderlines in satellite maps.

10/2010–09/2013: Postdoctoral researcher, jointly at the Faculty of Sciences, U. of Lisbon, Portugal and at the Research Center for Astronomy and Applied Mathematics, Academy of Athens, Greece

• Further developed a new estimator (in IDL) of the gravitational weak lensing signal from maps of the cosmic microwave background radiation. The lensing signal is a measure of the total mass in the Universe.
• Developed a new method (in IDL and Matlab) for a fast and robust pattern search among proteins using their molecular surfaces.
• Collaborator of the Observatory of Athens for the analysis (in Matlab) of satellite data on the geomagnetic field.

10/2008–09/2010: Postdoctoral researcher, School of Mathematics, U. of Kwazulu–Natal, South Africa
• Developed a new estimator (in IDL and Python) of the gravitational weak lensing signal from maps of the cosmic microwave background radiation.
• Developed a method (in R) to assess the correlation between the occurrence of coronary heart disease and the presence of potential risk factors using hypothesis testing.
• Contributed actively to the scientific effort in the Atacama Cosmology Telescope collaboration.

09/2007–09/2008: Postdoctoral researcher, Lab. of Theoretical Physics, U. of Paris–South, France
• Modelled spurious, non–Gaussian signals that contaminate the physical correlations from maps of the cosmic microwave background radiation (in IDL, R and Matlab).
• Contributed actively to the scientific effort in the ESA Planck space probe collaboration.

09/2005–08/2008: Postdoctoral researcher, Dept. of Physics, IST, Technical U. of Lisbon, Portugal
• Related signatures of extra spatial dimensions to violations of conservation laws in the observed Universe.
• Modelled the effect of the over–expression of an osteosarcoma gene upon the induction of cell death.

11/2004–08/2005: Postdoctoral researcher, Dept. of Fundamental Physics, U. of Barcelona, Spain
• Modelled the gravitational interaction in the presence of one extra spatial dimension.

Research Activity

• 35 publications in international refereed journals (plus 1 submitted, plus 1 to be submitted), 9 publications in conference proceedings, 6 invited reviews, 9 engineering papers, 3 white papers; h–index=12, g–index=30 (NASA/ADS Metrics);
• 46 oral presentations at international conferences/meetings and as invited speaker in universities/research centres, 8 talks for general audience.
• 46 participations in international conferences/meetings, 3 participations in radio/tv programmes, 1 participation in science pannel.
• 5 non–academic software productions.

International Collaborations

• 2014–... : Member of the CMB–X Science Working Group of the Euclid Consortium for the study of the cross–correlation of the Euclid data with CMB data.
• 2014–... : Member of the Science and Data Analysis working groups of COrE/PRISM for the reformulation of the mission proposal, the study of the polarisation of the CMB radiation due to weak gravitational lensing and the study of the boost effect in the CMB due to the peculiar velocity.
• 2013–... : Member of the Theory Science Working Group of the Euclid Consortium for the validation of cosmological models with the Euclid data.
• 2011–... : Member of the Weak Lensing Science Working Group of the Euclid Consortium for the study of the gravitational weak lensing from galaxy maps measured by the ESA Euclid space probe.
• 2011–... : Member of the Sky Survey Working Group of the Euclid Consortium for the design of the sky survey of the ESA Euclid space probe.
• 2008–2010: Member of the Atacama Cosmology Telescope collaboration for the study of the gravitational weak lensing from maps of the cosmic microwave background radiation.
• 2007–2008: Associate researcher of the ESA Planck space probe collaboration for the study of non-Gaussianity in maps of the cosmic microwave background radiation.

Student Mentoring

• 07/2016–08/2016: I. Góralczyk, Summer internship, FCUL.
• 06/2016–07/2016: K. Prabhu, Summer internship, FCUL.
• 2015–... : Mentor in the Odysseus II programme for Lisbon, Portugal (http://www.odysseus-contest.eu/resources/network-of-mentors/). This programme aims to inspire young people throughout Europe to engage in space exploration through a series of educational activities.
• 2014–2015: K. Marques, BSc project, FCUL, marked 19 out of 20. Subject: Estimation of cosmological parameters across the sky from type Ia supernova data.
• 2013–2014: R. Tonet, BSc project, FCUL, marked 19 out of 20. Subject: Measurement of the lensing potential map from CMB full–sky temperature maps.
• 2013–2014: A. Azinheira, BSc project, FCUL, marked 17 out of 20. Subject: Estimator of the lensing potential map from the CMB lensed polarisation power spectrum.
• 27/07/2013–05/08/2013: Leader of the Portuguese team at the 7th International Olympiad on Astronomy and Astrophysics, Volos.
• 2009–2010: J. Ridl, MSc, University of Kwazulu–Natal, Durban. Subject: Estimator of the lensing potential power spectrum from the CMB lensed temperature power spectrum.
• 2006–2007: J.N. Laia, MSc, IST, Technical University of Lisbon. Subject: (4+1)–dimensional braneworld model for the induction of a (3+1)–dimensional cosmological constant.

Teaching

• 12/04/2011: Lesson (for the purpose of evaluation of the didactic competences) on "Motion in non–inertial reference frames" (in Greek), Aristoteleion University of Thessaloniki.
• 2002–2003: Example classes of the General Relativity course, Part IIB (third year of the Cambridge degree in Mathematics), DAMTP, University of Cambridge.
• 2001–2004: Example classes of the General Relativity course, Part III, DAMTP, University of Cambridge, by invitation of the lecturer.

Refereeing

• 2013–... : Member of the Editorial Board for the *Journal of Molecular Biochemistry.*
• 2013: Guest Editor for a Special Issue on Emerging Pharmacological Targets and Drug Discovery of the journal *Computational and Mathematical Methods in Medicine.*
• Referee for: *Central European Journal of Physics, Classical and Quantum Gravity, IEEE Journal of Biomedical and Health Information, Journal of Mathematical Physics, Journal of the Renin-Angiotensin-Aldosterone System, Mathematical Biosciences, Physical Review D* and *Reports on Progress in Physics.*

Management

• 2015–2016 : Member of the LOC of the 2016 Euclid Consortium Meeting, Lisbon.
• Twice member of MSc Degree Committees, twice member of BSc Project Evaluation Committees.
• Twice co–organizer of Euclid Sky Survey Team Meetings, FCUL, Lisbon.
• 2013–2015: Organizer of the weekly journal club, CAAUL–IA, Lisbon.
• 2008–2009: Organizer of the weekly journal club, School of Mathematics, Durban.

Funding

Projects

• 2017: Co–PI (leader of the Portuguese pole) of the H2020–COMPET–2017 proposal to support the work on the data calibration for the Euclid weak lensing analysis.
• 2016–2020: Participant in the COST project "CANTATA".
• 2016–2017: Participant in the FCT–DAAD–2015 project "The nature of the dark side of the Universe".
• 2012–2014: Participant in the CERN/FP/123618/2011 from FCT.
• 2012–2013: Participant in the Research Funding Program "Thales" from the European Social Fund.
• 2007–2008: Participant in the Projet Blanc VIMS–PLANCK from Agence Nationale de la Recherche.

Scholarships
• 10/2010–09/2016: Postdoctoral research scholarship from FCT, Portugal.
• 07/2007–08/2007: Scholarship from the Ministry of Culture of Greece.
• 06/2006–07/2006: Scholarship from the National and Kapodistrian U. of Athens, Greece.
• 09/2005–08/2008: Postdoctoral research scholarship from FCT, Portugal.
• 01/2004–10/2004: Doctoral scholarship from the Calouste Gulbenkian Foundation, Portugal.
• 10/1999–09/2003: Doctoral scholarship from FCT, Portugal.

Education

10/2000–10/2004: PhD, Dept. of Applied Mathematics and Theoretical Physics, U. of Cambridge, UK
• PhD in modelling the universe in the presence of extra spatial dimensions.
• Thesis: **Cosmology of Braneworld Universes.**
• Awarded in Jan 2005.
• Recognized by ΔΟΑΤΑΠ as equal to a corresponding AEI degree in 2009. Registered in Portugal in 2012.

10/1999–06/2000: Certificate of Advanced Study in Mathematics (Part III), Dept. of Applied Mathematics and Theoretical Physics, U. of Cambridge, UK
• MSc–equivalent of the Cambridge degree in Mathematics.
• Graduated with Merit.

09/1994–08/1999: Eng. in Technological Physics, IST, Technical U. of Lisbon, Portugal
• Engineering degree with a broad spectrum of Physics and high level of Mathematics.
• Thesis: **Proposed Astrophysical Test of Lorentz Invariance.**
• Graduated with mark 18 out of 20.
• Recognized by the ΔΟΑΤΑΠ as equal to a corresponding AEI degree.

Other Skills & Training

Computer Skills
• Proficient in programming languages: IDL, Python, R, Reduce.
• Proficient in numerical and visualization packages: Maple, Mathematica, Matlab.
• Knowledgeable about Mac OS/Unix Administration, MS Office.

Language Skills
• Fluent in Greek: Certificate of Greek Proficiency (May 2010).
• Fluent in English: Certificate of Advanced English (Dec 1994).
• Natively fluent in Portuguese.

Awards
• Cambridge University Titles of Excellence in Sport Honour (Karate):
2003/2004: **Full Blue**;
2000/2001, 2001/2002 and 2002/2003: **Half Blue**.
• 1993, 1994: Winner at the **Youth Journalism Contest,** Portugal.

Coursera Courses
• 08/2017: "Machine learning"
• 10/2016: "Financial Markets"
• 09/2016: "Regression models" (not graded)
• 08/2016: "Statistical inference" (not graded)
• 02/2016: "Reproducible research"
• 12/2015: "Exploratory data analysis"
• 11/2015: "Getting and cleaning data"
• 09/2015: "R programming"
• 09/2015: "Data scientist toolbox"

• 06/2015: "Cluster analysis in data mining"
• 04/2015: "Pattern discovery in data mining"
• 01/2015: "Bioinformatics: Introduction and Methods"

Board of European Students of Technology (BEST) Courses
• 03/08–14/08/1999: "Hunting the Eclipse", Cluj-Napoca, Romania.
• 01/09–12/09/1997: "Applied Optics", Stockholm, Sweden.

Volunteering
• 2004–2005: Secretary of the Darwin College Terpsichore Greek Dance Society.
• 2002–2004: Instructor of the Karate Union of Great Britain.
• 2001–2003: Treasurer of the Darwin College Women's Basketball Club.

Personal Information

Birth: 1976, Coimbra, Portugal | **Nationality:** Portuguese | **Marital Status:** Single

Appendix: Research Activity

Publications in Refereed Journals
[37] R. Scaramella et al., **The Euclid Reference Survey: Status at the Preliminary Design Review,** to be submitted (2017).
[36] C. Inserra et al., **Superluminous Supernovae in Euclid,** submitted to A&A (2017).
[35] P. Natoli et al., **Exploring Cosmic Origins with CORE: Mitigation of Systematic Effects,** accepted for publication in JCAP (arXiv:1707.04224 [astro-ph.CO]).
[34] A. Challinor et al., **Exploring Cosmic Origins with CORE: Gravitational Lensing of the CMB,** (arXiv:1707.02259 [astro-ph.CO]).
[33] J. Delabrouille et al., **Exploring Cosmic Origins with CORE: Survey Requirements and Mission Design,** (arXiv:1706.04516 [astro-ph.IM]).
[32] P. de Bernardis et al., **Exploring Cosmic Origins with CORE: The Instrument,** accepted for publication in JCAP (arXiv:1705.02170 [astro-ph.IM]).
[31] C. Burigana, C.S. Carvalho et al., **Exploring Cosmic Origins with CORE: Effects of Observer Peculiar Motion,** (arXiv:1704.05764 [astro-ph.CO]).
[30] M. Remazeilles et al., **Exploring Cosmic Origins with CORE: B-mode Component Separation,** accepted for publication in JCAP (arXiv:1704.04501 [astro-ph.CO]).
[29] J.-B. Melin et al., **Exploring Cosmic Origins with CORE: Cluster Science,** accepted for publication in JCAP (arXiv:1703.10456 [astro-ph.CO]).
[28] F. Finelli et al., **Exploring Cosmic Origins with CORE: Inflation,** (arXiv:1612.08270 [astro-ph.CO]).
[27] E. Di Valentino et al., **Exploring Cosmic Origins with CORE: Cosmological Parameters,** accepted for publication in JCAP (arXiv:1612.00021 [astro-ph.CO]).
[26] G. De Zotti et al., **Exploring Cosmic Origins with CORE: Extragalactic Sources in Cosmic Microwave Background maps,** (arXiv:1609.07263 [astro-ph.GA]).
[25] I. Heywood et al., **A deep/wide 1–2 GHz snapshot survey of SDSS Stripe 82 using the Karl G. Jansky Very Large Array in a compact hybrid configuration,** Month.Not.Roy.Ast.Soc. 460, 4433 (2016) (arXiv:1605.09079 [astro-ph.IM]).
[24] D. Sáez-Gómez, C.S. Carvalho, F.S.N. Lobo and I. Tereno, **Constraining $f(T, \mathcal{T})$ gravity models using type Ia supernovae,** Phys.Rev.D 94, 024034 (2016) (arXiv:1603.09670 [gr-qc]).
[23] C.S. Carvalho and S. Basilakos, **Angular distribution of cosmological parameters as a probe of inhomogeneities: a kinematic parametrization,** A&A 592, A152 (2016) (arXiv:1603.07519 [astro-ph.CO]).
[22] C.S. Carvalho and K. Marques, **Angular distribution of cosmological parameters as a probe of space–time inhomogeneities,** A&A 592, A102 (2016) (arXiv: 1512.07869 [astro-ph/CO]).
[21] C.S. Carvalho, **Integrated probability of coronary heart disease subject to the –308 tumor necrosis factor–α SNP: a Bayesian meta–analysis,** PeerJ (2015), https://peerj.com/articles/1236/ (arXiv:1509.03693 [q-bio.QM]).
[20] C.S. Carvalho et al., **Protein signatures using electrostatic molecular surfaces in harmonic space,** PeerJ

(2013), https://peerj.com/articles/185/ (arXiv:1310.6980 [q-bio.QM]).
[19] C.S. Carvalho, I. Tereno and S. Basilakos, **CMB Lensing Reconstruction from the WMAP 7–year data,** Phys.Rev.D 88, 062002 (2013) (arXiv:1212.6658 [astro-ph.CO]).
[18] D. Vlachakis et al., **Speeding up the drug dicovery process: Structural similarity searches using molecular surfaces,** EMBnet.J. 18,1 (2012), http://journal.embnet.org/index.php/embnetjournal /article/view/501.
[17] R. Hlozek et al., **The Atacama Cosmology Telescope: a measurement of the primordial power spectrum,** Astrophys.J. 749, 90 (2012) (arXiv:1105.4887 [astro-ph]).
[16] B.S. Sherwin et al., **The Atacama Cosmology Telescope: Evidence for Dark Energy from the CMB Alone,** Phy.Rev.Lett. 107, 021302 (2011) (arXiv:1105.0419 [astro-ph]).
[15] C.S. Carvalho and I. Tereno, **CMB Lensing Reconstruction with Point Source Masks,** Phys.Rev.D 84, 063001 (2011) (arXiv:1103.2305 [astro-ph]).
[14] S. Das et al., **The Atacama Cosmology Telescope: Detection of the Power Spectrum of Gravitational Lensing,** Phy.Rev.Lett. 107, 021301 (2011) (arXiv: 1103.2124 [astro-ph]).
[13] C.S. Carvalho and K. Moodley, **Real Space Estimator for the Weak Lensing Convergence from the CMB,** Phys.Rev.D 81, 123010 (2010) (arXiv:1005.4288 [astro-ph]).
[12] M. Bucher, C.S. Carvalho, K. Moodley and M. Remazeilles, **CMB Lensing Reconstruction in Real Space,** Phys.Rev.D 85, 043016 (2012) (arXiv:1004.3285 [astro-ph]).
[11] M. Bucher, B. van Tent and C.S. Carvalho, **Detecting Bispectral Acoustic Oscillations from Inflation Using a New Flexible Estimator,** Month.Not.Roy.Ast.Soc. 407, 2193 (2010) (arXiv:0911.1642 [astro-ph]).
[10] E. Vourvouhaki and C.S. Carvalho, **A Bayesian approach to the probability of coronary heart disease subject to the –308 tumor necrosis factor–α SNP,** BioSystems 105, 181 (2011) (arXiv:0907.2043 [q-bio]).
[9] C.S. Carvalho and L. Perivolaropoulos, **Kink–Antikink Formation from an Oscillation Mode by Sudden Distortion of the Evolution Potential,** Phys.Rev.D 79, 065032 (2009) (arXiv:0901.4109 [hep-ph]).
[8] O. Bertolami, C. Carvalho and J. Laia, **A New Source for a Brane Cosmological Term from a Modified Gravity Model in the Bulk,** Nuc.Phys.B 807, 56 (2009) (arXiv:0805.1546 [hep-th]).
[7] O. Bertolami and C. Carvalho, **Spontaneous Symmetry Breaking in the Bulk and the Localization Mechanism of Fields on the Brane,** Phys.Rev.D 76, 104048 (2007) (arXiv:0705.1923 [hep-th]).
[6] E. Vourvouhaki, C. Carvalho and P. Aguiar, **Model for Osteosarcoma–9 as a Potent Factor in Cell Survival and Resistance to Apoptosis,** Phys.Rev.E 76, 011926 (2007) (q-bio.SC/0608030).
[5] O. Bertolami and C. Carvalho, **Lorentz Symmetry Derived from Lorentz Violation in the Bulk,** Phys.Rev.D 74, 083020 (2006) (gr-qc/0607043).
[4] M. Bucher and C. Carvalho, **Linearized Israel Matching Conditions for Cosmological Perturbations in a Moving Brane Background,** Phys.Rev.D 71, 083511 (2005) (hep-th/0412064).
[3] P. Binétruy, M. Bucher and C. Carvalho, **Models for the Brane–Bulk Interaction: Toward Understanding Braneworld Cosmological Perturbations,** Phys.Rev.D 70, 043509 (2004) (hep-th/0403154).
[2] C. Carvalho and M. Bucher, **Separation Distribution of Vacuum Bubbles in de Sitter Space,** Phys.Lett.B 546, 8 (2002) (hep-ph/0207275).
[1] O. Bertolami and C.S. Carvalho, **Proposed Astrophysical Test of Lorentz Invariance,** Phys.Rev.D 61, 103002 (2000) (gr-qc/9912117).

Publications in Conference Proceedings
[9] I. Tereno et al., **Euclid Space Mission: Building the Sky Survey,** Statistical Challenges in 21st century Cosmology, IAU Symposium No. 306 (2014) (arXiv:1502.00903 [astro-ph.IM]).
[8] R. Scaramella et al., **Euclid Space Mission: A Cosmological Challenge for the Next 15 Years,** Statistical Challenges in 21st century Cosmology, IAU Symposium No. 306 (2014) (arXiv:1501.04908 [astro-ph.CO]).
[7] C.S. Carvalho, **Unlensing the CMB in Real Space: A New Approach to Extract the Weak Lensing Convergence,** J. Phys. Conf. Ser. 283, 012008 (2011).
[6] C.S. Carvalho, **Modelling non–Gaussianity from Foreground Contaminants,** J. Phys. Conf. Ser. 189, 012006 (2009) (arXiv:0901.3613 [astro-ph.CO]).
[5] O. Bertolami and C. Carvalho, **Non–minimal Coupling as a Mechanism for Spontaneous Symmetry Breaking in the Brane,** Proceedings of the Conference "From Quantum to Emergent Gravity: Theory and Phenomenology" (arXiv:0710.2743 [hep-th]).
[4] O. Bertolami and C. Carvalho, **Lorentz Symmetry and the Brane,** Proceedings of the XI Marcel Gross-

mann Meeting on General Relativity (astro-ph/0701191).
[3] O. Bertolami and C. Carvalho, **Brane Lorentz Symmetry from Lorentz Breaking in the Bulk,** Proceedings of the Third International Workshop DICE2006 (gr-qc/0612129).
[2] C. Carvalho, **Signatures of Extra Dimensions,** Proceedings of the Rencontres de Moriond 2006.
[1] C. Carvalho, **The Value of Ω_0 in a Colliding Bubble Universe,** Proceedings of the JENAM 2002.

Invited Reviews
[6] C.S. Carvalho, **Patterns in Proteins,** invited contribution to Visão Junior (2016).
[5] C.S. Carvalho, **Light and Gravitation,** invited contribution to Visão Junior (2016).
[4] P. Avelino et al., **Unveiling the Dynamics of the Universe,** Symmetry 8, 70 (2016) (arXiv:1607.02979 [astro-ph.CO])
[3] C.S. Carvalho, **The Cosmic Light,** Commemoration of the International Year of Light, FCUL, Gabinete de Comunicação, Imagem e Cultura, http://www.fc.ul.pt/noticia/17-08-2015/luz-cósmica-primordial-e-perene (2015).
[2] D. Vlachakis, G. Tsiliki, C.S. Carvalho and S. Kossida, **Gordian Knot: Using 2D Molecular Surfaces to Perform 3D Structural Similarity Searches,** J.Mol.Biochem. 2, 80 (2013).
[1] C.S. Carvalho, **The Cosmic Microwave Background Radiation: The Memories of the Universe Revealed,** Journal of the Hellenic Astronomical Society "Hipparchos" (2011).

Engineering Papers
[9] C.S. Carvalho, **Prediction of Outage from PULSAR Anomaly Detection: Theoretical Model,** Jul 2017.
[8] Nokia Networks, **Analytics Engine: A Big Data Analytics Framework for Communication Service Providers,** Jun 2017.
[7] C.S. Carvalho, **Data Preparation for PULSAR Input: Methods and Results,** May 2017.
[6] C.S. Carvalho, **Analysis of CEM4Fixed Data: Methods and Preliminary Results,** May 2017.
[5] C.S. Carvalho and P. Dias, **Analytics Data Store: A Data Science Application in Telco Analytics,** Jan 2017.
[4] R. Scaramella et al., **Euclid Mission Operation Concept Document,** Nov 2015.
[3] R. Scaramella et al., **Euclid Mission Operation Concept Document,** Nov 2013.
[2] Rector, **Velti Advanced MIR Analytics Project: Method and Results,** Apr 2013.
[1] Rector, **Velti Advanced MIR Analytics Project: Literature Review,** Dec 2012.

White Papers
[3] K. Abazajian et al., **Neutrino Physics from the Cosmic Microwave Background and Large Scale Structure,** arXiv:1309.5383 [astro-ph.CO].
[2] K. Abazajian et al., **Inflation Physics from the Cosmic Microwave Background an Large Scale Structure,** arXiv: 1309.5381 [astro-ph.CO].
[1] A. Cooray et al., **The Herschel–SPIRE Legacy Survey (HSLS): The Scientific goals of a shallow and wide submillimeter imaging survey with SPIRE,** arXiv:1007.3519 [astro-ph.CO].

Software productions
[5] 2017: **Nokia Networks:** Fixed–network transmission model.
[4] 2016: **Nokia Networks:** Marketing efficiency model.
[3] 2013–2015: **Euclid Consortium:** Automatic generation of the sky survey for the wide field observation programme of the ESA Euclid mission.
[2] 2012–2013: **Rector Innovation Advisors:** Attribution model.
[1] 2012: **Geoanalysis S.A. Geoinformation Technologies:** Automated combination of borderlines in satellite maps.

Work Presentations
• 13/11/2015: **Angular Distribution of Cosmological Parameters as a Measurement of Spacetime Inhomogeneities,** IA ON2 Meeting, Lisbon.
• 12/02/2015: **Automated Generation of Tessellation–Based Wide Surveys,** Euclid Sky Survey Working Group Meeting, ESRIN, Frascati.

• 02/04/2014: **Automated Tessellation–Based Survey (2),** Euclid Sky Survey Working Group Meeting (Teleconf.)
• 31/01/2014: **Automated Tessellation–Based Survey (1),** Euclid Sky Survey Working Group Meeting (Teleconf.)
• 04/09/2013: **Tools for a Survey from Scratch (2),** Euclid Sky Survey Team Meeting, IAP, Paris.
• 07/03/2013: **Tools for a Survey from Scratch (1),** Euclid Sky Survey Team Meeting, INAF–OAR, Monteporzio.
• 17/04/2010: **Unlensing the CMB: A Real–Space Approach,** ACT General Meeting, Princeton University.
• 23/03/2010: **Unlensing the CMB: A Real–Space Approach,** Astronomy, Cosmology and HPC Workshop, Cape Town.
• 17/11/2009: **Extraction of the Lensing Potential from the CMB,** ACT General Meeting, Princeton University.

Invited Talks/Seminars
• 26/01/2016: **Angular distribution of cosmological parameters as a measurement of spacetime inhomogeneities,** IA Seminar, Faculty of Sciences, University of Lisbon.
• 05/06/2014: **CMB Polarisation Measurements and Implications for Inflation,** CFTC, University of Lisbon.
• 18/12/2013: **Physics of the CMB Weak Gravitational Lensing,** Colloquium at the Faculty of Sciences, University of Lisbon.
• 11/06/2013: **The Euclid Space Mission** (in Greek), KEAEM, Academy of Athens.
• 17/07/2012: **CMB Lensing: Research and Results** (in Greek), KEAEM, Academy of Athens.
• 06/12/2011: **Measuring the Gravitational Lensing in the Cosmic Microwave Background,** CENTRA, IST, Lisbon.
• 27/07/2011: **Measuring the Gravitational Lensing in the Cosmic Microwave Background,** CAUP, University of Porto.
• 30/03/2011: **Measuring the Gravitational Lensing in the Cosmic Microwave Background,** IAA, National Observatory of Athens.
• 14/12/2010: **Gravitational Lensing of the Cosmic Microwave Background** (in Greek), KEAEM, Academy of Athens.
• 11/11/2010: **Gravitational Lensing of the Cosmic Microwave Background,** Centre for Astronomy and Astrophysics, University of Lisbon.
• 19/08/2010: **Gravitational Lensing of the Cosmic Microwave Background,** ACRU and NiTHEP seminar, University of Kwazulu–Natal.
• 09/12/2009: **How to Extract the Lensing Potential from the CMB,** Mini–workshop on CMB related research, IUCAA, Pune.
• 26/11/2009: **Extraction of the Lensing Potential from the CMB** (in Greek), Dept. Astrophysics, Astronomy and Mechanics, University of Athens.
• 30/04/2008: **How to Fake Non–Primordial Non-Gaussianity in the CMB,** NCSR Dimokritos, Athens.
• 28/04/2008: **How to Fake $f_{NL} \neq 0$: A General Class of Models for Characterizing the Non–Gaussian CMB Foreground Contaminants,** KEAEM, Academy of Athens.
• 23/10/2007: **Non–minimal Coupling as a Mechanism for Spontaneous Symmetry Breaking on the Brane,** LPT, University Paris-South XI, Orsay.
• 27/07/2007: **Spontaneous Symmetry Breaking in the Bulk as a Mechanism for Localization on the Brane,** National Technical University of Athens.
• 21/03/2007: **Spontaneous Symmetry Breaking in Braneworlds,** CFTC, University of Lisbon.
• 16/01/2007: **Lorentz Symmetry from Lorentz Violation in the Bulk,** LPT, Université Paris–Sud, Orsay.
• 21/11/2006: **Lorentz Symmetry from Lorentz Violation in the Bulk,** IST, Lisbon.
• 14/05/2004: **Models for the Brane–Bulk Interaction,** DAMTP, University of Cambridge.
• 07/06/2002: **Separation Distribution of Vacuum Bubbles in de Sitter Space,** DAMTP, University of Cambridge.
• 17/05/2002: **Separation Distribution of Vacuum Bubbles in de Sitter Space,** DAMTP, University of Cambridge.

Other Talks/Seminars

• 11/09/2013: **The Euclid Space Mission,** 11th Meeting of the Hellenic Astronomical Society, Athens.
• 05/09/2011: **Weak Gravitational Lensing as a Tool for Cosmology,** 10th Meeting of the Hellenic Astronomical Society, Ioannina.
• 22/07/2010: **Real–Space Estimator for the CMB Weak Lensing Convergence,** DUEL International Conference, Edinburgh.
• 10/06/2010: **Unlensing the CMB: A Real–Space Approach to Extract the Weak Lensing Potential,** NEB 14, Ioannina.
• 06/06/2008: **How to Fake $f_{NL} \neq 0$: A General Class of Models for Characterizing the Non–Gaussian CMB Foreground Contaminants,** NEB XIII, Thessaloniki.
• 17/09/2007: **Spontaneous Symmetry Breaking in the Bulk as a Mechanism for Localization on the Brane,** Fourth Aegean Summer School, Mytilini.
• 14/04/2007: **Spontaneous Symmetry Breaking in Braneworlds,** Iberian Cosmology Meeting, Bilbao.
• 02/12/2006: **Lorentz Symmetry from Lorentz Violation in the Bulk,** Iberian Cosmology Meeting, Porto.
• 21/03/2006: **Signatures of Extra Dimensions,** Rencontres de Moriond, La Thuile.
• 26/09/2005: **Cosmological Perturbations from the Brane–Bulk Interaction,** Third Aegean Summer School, Chios.
• 27/04/2005: **Boundary Conditions for Linear Cosmological Perturbations in a Moving Brane Background,** String Cosmology Workshop, Uppsala.
• 09/06/2004: **Models for the Brane–Bulk Interaction,** Workshop on String and Brane Cosmology, Paris.
• 03/03/2004: **Models for the Brane–Bulk Interaction,** UK Cosmology Meeting, Imperial College, London.
• 03/09/2002: **The Value of Ω_0 in a Colliding Bubble Universe,** JENAM 2002, Porto.

Outreach Talks

• 21/07/2017: Invited speaker in the **"Ignite"** public talk, ENAA 2017, FCUL.
• 01/04/2017: Speaker in the **"IAstro Junior"** (www.iastro.pt/iastrojunior), Calouste Gulbenkian Planetarium, Lisbon.
• 17/09/2016: Invited speaker in the science pannel on the **"Constelations"** play, Teatro Aberto, Lisbon.
• 2016: Speaker (three times) in the **"Ignite Astro Tour"** (http://www.iastro.pt/press/igniteastro116).
• 03/05/2014: **New Observations and Challenges for Cosmology,** invited talk for a general audience at the Núcleo Interactivo de Astronomia, Lisbon.
• 06/07/2011: **The Path of a Researcher,** invited talk for students at the Secondary School of Sé, Guarda.
• 26/02/2004: **What If Gravity Lived in Five Dimensions? Some Cosmological Implications,** invited talk for a general audience at Darwin College, Cambridge.

Visits

• 23/06–06/07/2010: Institute of Cosmology and Gravitation, University of Portsmouth.
• 16–30/04/2010: Dept. Astrophysical Sciences, University of Princeton.
• 05–31/07/2009: Dept. Astrophysical Sciences, University of Princeton.
• 01–12/12/2008: Dept. Physics, University of Ioannina.

Conferences/Meetings

• 14/09/2017: *Euclid Sky Survey Working Group Meeting,* FCUL, Lisbon, Portugal.
• 30/05–03/06/2016: *Euclid Consortium Conference,* Lisbon, Portugal.
• 17–20/05/2016: *COrE+ Workshop,* CERN, Geneva, Switzerland.
• 28–29/09/2015: *COrE+ Workshop,* Paris Diderot University, France.
• 08–12/06/2015: *Euclid Consortium Conference,* Lausanne, Switzerland.
• 27–29/05/2015: *Euclid Sky Survey Team Meeting,* CAAUL, Lisbon, Portugal.
• 12–13/02/2015: *Euclid Sky Survey Working Group Meeting,* ESRIN, Frascati, Italy.
• 09–11/02/2015: *Euclid Sky Survey Team Meeting,* INAF–OAR, Monteporzio, Italy.
• 23–26/06/2014: *Euclid Sky Survey Team Meeting,* CAAUL, Lisbon, Portugal.
• 25–29/05/2014: *Statistical Challenges in 21st century Cosmology, IAU Symposium No.306,* Lisbon, Portugal.
• 05–09/05/2014: *Euclid Consortium Conference,* Marseille, France.

• 26–28/02/2014: *Euclid Sky Survey Team Meeting,* INAF–IASF, Bologna, Italy
• 10–11/02/2014: *COrE/PRISM workshop*, Paris Diderot University, France.
• 22–25/10/2013: *Euclid Weak Lensing SWG and Shear OHU Meeting,* INAF–OAR, Monteporzio, Italy.
• 08–12/09/2013: *11th Meeting of the Hellenic Astronomical Society,* Athens, Greece.
• 03–06/09/2013: *Euclid Sky Survey Team Meeting,* IAP, Paris.
• 13–15/05/2013: *Euclid Consortium Conference,* Leiden, Netherlands.
• 07/03/2013: *Euclid Sky Survey Team Meeting,* INAF–OAR, Monteporzio, Italy.
• 14–18/05/2012: *Euclid Consortium Conference,* Copenhagen, Denmark.
• 08–09/10/2011: *New Imaging Technologies in Health and Disease,* Biomedical Research Foundation of the Academy of Athens, Greece.
• 05–08/09/2011: *10th Meeting of the Hellenic Astronomical Society,* Ioannina, Greece.
• 18–22/07/2010: *DUEL International Conference: ten years of cosmic shear,* Edinburgh, UK.
• 08–11/06/2010: *NEB 14: "Recent Developments in Gravity",* Ioannina, Greece.
• 23/03/2010: *Astronomy, Cosmology and HPC Workshop,* CHPC, Cape Town, South Africa.
• 08–10/12/2009: *Mini–workshop on CMB related research,* IUCAA, Pune, India.
• 27–30/07/2009: *PIRE Grant Physics Summer Conference: Weak Lensing,* Philadelphia, USA.
• 09–11/07/2008: *The Physics of Cosmological Recombination,* Garching, Germany.
• 04–06/06/2008: *NEB XIII: "Recent Developments in Gravity",* Thessaloniki, Greece.
• 28–30/11/2007: *Integrative Post–Genomic: A Multidisciplinary Approach to Living Systems,* Lyon, France.
• 24–27/09/2007: *First Annual School of the EU Network "UniverseNet": The Origin of the Universe,* Lesvos, Greece.
• 17–22/09/2007: *Fourth Aegean Summer School: Back Holes,* Lesvos, Greece.
• 09–13/07/2007: *Cosmology & Strings, A Workshop on Cosmology as a Testing Ground for String Theory,* Abdus Salam ICTP, Trieste, Italy.
• 18–25/03/2006: *Rencontres de Moriond: Contents and Structures of the Universe,* La Thuile, Italy.
• 26/09–12/10/2005: *Third Aegean Summer School: The Invisible Universe, Dark Matter and Dark Energy,* Chios, Greece.
• 25–28/04/2005: *String Cosmology Workshop,* Uppsala, Sweden.
• 07–11/06/2004: *Workshop on String and Brane Cosmology,* Paris, France.
• 18–20/12/2003: *Annual Theory Meeting,* Grey College, Durham, UK.
• 21/07–01/08/2003: *Workshop on Cosmological Perturbations on the Brane,* University of Cambridge, UK.
• 31/12/2002–09/01/2003: *The 20th Jerusalem Winter School in Theoretical Physics on String Theory: from Confinement to Cosmology,* Institute for Advanced Studies, Hebrew University of Jerusalem, Israel.
• 16–18/12/2002: *Annual Theory Meeting,* University College, Durham, UK.
• 02–07/09/2002: *JENAM 2002–The Unsolved Universe: Challenges for the Future,* Porto, Portugal.
• 17–19/12/2001: *Annual Theory Meeting,* University College, Durham, UK.
• 30/08–4/09/2001: *COSMO–01 International Workshop on Particle Physics and the Early Universe,* Rovaniemi, Finland.
• 21–25/08/2001: *M Theory Cosmology Conference,* University of Cambridge, UK.
• 16–18/12/1998: *The 1st Lisbon School on Superstrings,* IST, Lisbon, Portugal.