

Marco Raveri

OCTOBER 29, 2018

CONTACT
INFORMATION

437 William Eckhardt Research Center
Kavli Institute for Cosmological Physics
The University of Chicago
5640 South Ellis Avenue
Chicago, IL 60637

E-mail: mraveri@uchicago.edu
Web page: marcoraveri.com

CURRENT POSITION

University of Chicago, KICP, Chicago, Illinois
Postdoctoral researcher

Sept 2016 - Present

RESEARCH
INTERESTS

Dark Energy and Gravity phenomenology. Statistical and computational methods for cosmology. Observational cosmology and forecasting. Cosmological signatures of Dark Matter and neutrinos.

EDUCATION

Ph.D. in Astrophysics, June 2016

SISSA/ISAS International School for Advanced Studies
Dissertation Topic: The Threefold Way to Cosmological Tests of Gravity
Advisors: Carlo Baccigalupi (SISSA), Alessandra Silvestri (Instituut-Lorentz)

Master in High Performance Computing, Dec 2016

SISSA/ISAS International School for Advanced Studies and
ICTP - Abdus Salam International Centre for Theoretical Physics
Dissertation Topic: Computational Challenges in Cosmological Tests of Gravity
Advisors: Luca Heltai (SISSA), Alessandra Silvestri (Instituut-Lorentz)

Master Degree in Physics, July 2012

University of Padua
Dissertation Topic: General Relativistic Effects in Cosmological Large Scale Structure Formation
Advisors: Sabino Matarrese, Nicola Bartolo (UNIPD)

Bachelor Degree in Physics, July 2009

University of Padua
Dissertation Topic: Dynamical Models for Dark Energy
Advisor: Sabino Matarrese (UNIPD)

PROFESSIONAL
ACTIVITIES

- Member of the **EUCLID** collaboration, **2015-present**
- Member of the **CMB-S4** collaboration, **2016-present**
- Member of the **Dark Energy Survey** (DES) collaboration, **2018-present**
- Member of the **Dark Energy Science Collaboration** (DESC), **2018-present**
- Member of the KICP Friday seminar series committee **2018**
- Member of the Italian Physical Society (SIF), Italian National Institute for Nuclear Physics (INFN), Italian National Institute for Astrophysics (INAF), **2012-2016**
- Referee for Physical Review Letters, Physical Review D, Journal of Cosmology and Astroparticle Physics (JCAP), Physics of the Dark Universe, The Astrophysical Journal

OPEN-SOURCE
CODES

EFTCAMB/EFTCosmoMC, principal developer (eftcamb.org)
CosmicFish, principal developer (cosmicfish.github.io)

OUTREACH AND
SERVICE

- Adler Planetarium Astronomy Conversations **Fall 2018 - present**
- Lifelong Learning Senior Citizen Public Lecture **Fall 2016 - present**

TECHNICAL SKILLS • Computer languages: Fortran, C/C++, Python, scripting languages
• Scientific software: CAMB, CosmoMC, CLASS, Mathematica

ACADEMIC
REFERENCES

Wayne Hu, Horace B. Horton Professor, Department of Astronomy and Astrophysics, KICP, Enrico Fermi Institute, University of Chicago, 5640 South Ellis Avenue, Chicago, IL 60637 (USA).
e-mail: whu@background.uchicago.edu, Office: 439, Phone: +1 773 702 0160,
Homepage: <http://background.uchicago.edu/~whu/>.

Carlo Baccigalupi, Full Professor, Astrophysics Sector, SISSA/ISAS International School for Advanced Studies, Via Bonomea 265, 34136, Trieste (Italy).
e-mail: bacci@sissa.it, Office: 506, Phone: +39 040 3787 475,
Homepage: <https://sites.google.com/view/carlobaccigalupi>.

Alessandra Silvestri, Associate Professor, Instituut Lorentz for Theoretical Physics, Leiden University, Niels Bohrweg 2, Leiden, NL-2333 CA, (Netherlands).
e-mail: silvestri@lorentz.leidenuniv.nl, Office: 270, Phone: +31 71 527 5540,
Homepage: <http://wwhome.lorentz.leidenuniv.nl/~silvestri/>.

Sabino Matarrese, Full Professor, Dept. of Physics and Astronomy, The University of Padua, Via Marzolo 8, 35131, Padova (Italy).
e-mail: sabino.matarrese@unipd.it, Phone: +39 049 8277 120.

Levon Pogosian, Professor, Dept. of Physics Simon Fraser University, 8888 University Drive, Burnaby, BC, V5A 1S6 (Canada).
e-mail: levon@sfu.ca, Phone: +1 (778) 782 7598,
Homepage: <http://www.sfu.ca/~levon>

Licia Verde, ICREA Professor, Institute of Cosmological Sciences (ICC) UB-IEEC, Marti i Franques 1, 08028, Barcelona (Spain).
e-mail: liciaverde@icc.ub.edu,
Homepage: <http://icc.ub.edu/~liciaverde/HomePage.html>

Luca Heltai, Associate Professor, Mathematics Sector, SISSA/ISAS International School for Advanced Studies, Via Bonomea 265, 34136, Trieste (Italy).
e-mail: luca.heltai@sissa.it, Phone: +39 040 3787 449,
Homepage: <http://people.sissa.it/~heltai/>.

PUBLICATIONS

28 papers, 18 published, 5 submitted, 500+ citations of published papers, excluding experimental collaboration papers, according to Inspire.

Submitted papers

(* alphabetical order of all or part of the authors indicates equal contribution)

23. DES collaboration,
“Dark Energy Survey Year 1 Results: Constraints on Extended Cosmological Models from Galaxy Clustering and Weak Lensing”,
arXiv:1810.02499 [astro-ph.CO], submitted to Phys. Rev. D (2018).
22. * Meng-Xiang Lin, **Marco Raveri**, Wayne Hu,
“Phenomenology of Modified Gravity at Recombination”,
arXiv:1810.02333 [astro-ph.CO], submitted to Phys. Rev. D (2018).

21. * Giampaolo Benevento, **Marco Raveri**, Andrei Lazanu, Nicola Bartolo, Michele Liguori, Philippe Brax, Patrick Valageas,
“K-mouflage Imprints on Cosmological Observables and Data Constraints”,
arXiv:1809.09958 [astro-ph.CO], submitted to JCAP (2018).
20. * Juan Espejo, Simone Peirone, **Marco Raveri**, Kazuya Koyama, Levon Pogosian, Alessandra Silvestri,
“Phenomenology of Large Scale Structure in scalar-tensor theories: joint prior covariance of w_{DE} , Σ and μ in Horndeski”,
arXiv:1809.01121 [astro-ph.CO], submitted to Phys. Rev. D (2018).
19. **Marco Raveri**, Wayne Hu,
“Concordance and Discordance in Cosmology”,
arXiv:1806.04649 [astro-ph.CO], submitted to Phys. Rev. D (2018).

Refereed papers

(* alphabetical order of all or part of the authors indicates equal contribution)

18. Simone Peirone, Kazuya Koyama, Levon Pogosian, **Marco Raveri**, Alessandra Silvestri,
“Large-scale structure phenomenology of viable Horndeski theories”,
Phys. Rev. D **97**, no. 4, 043519 (2018) arXiv:1712.00444 [astro-ph.CO].
17. * Andrew J. Long, **Marco Raveri**, Wayne Hu, Scott Dodelson,
“Neutrino Mass Priors for Cosmology from Random Matrices”,
Phys. Rev. D **97**, no. 4, 043510 (2018) arXiv:1711.08434 [astro-ph.CO].
16. Simone Peirone, Noemi Frusciante, Bin Hu, **Marco Raveri**, Alessandra Silvestri,
“Do current cosmological observations rule out all Covariant Galileons?”,
Phys. Rev. D **97**, no. 6, 063518 (2018) arXiv:1711.04760 [astro-ph.CO].
15. Emilio Bellini, *et al.*,
“Comparison of Einstein-Boltzmann solvers for testing general relativity”,
Phys. Rev. D **97**, no. 2, 023520 (2018) arXiv:1709.09135 [astro-ph.CO].
14. **Marco Raveri**, Wayne Hu, Timothy Hoffman, Lian-Tao Wang,
“Partially Acoustic Dark Matter Cosmology and Cosmological Constraints”,
Phys. Rev. D **96**, no. 10, 103501 (2017) arXiv:1709.04877 [astro-ph.CO].
13. **Marco Raveri**, Philip Bull, Alessandra Silvestri, Levon Pogosian,
“Priors on the effective Dark Energy equation of state in scalar-tensor theories”,
Phys. Rev. D **96**, no. 8, 083509 (2017) arXiv:1703.05297 [astro-ph.CO].
12. Simone Peirone, Matteo Martinelli, **Marco Raveri**, Alessandra Silvestri,
“Impact of theoretical priors in cosmological analyses: the case of single field quintessence”,
Phys. Rev. D **96**, no. 6, 063524 (2017) arXiv:1702.06526 [astro-ph.CO].
11. Gong-Bo Zhao, **Marco Raveri**, *et al.*,
“Dynamical dark energy in light of the latest observations”,
Nature Astronomy **1**, no. 9, 627 (2017) arXiv:1701.08165 [astro-ph.CO].
10. * Simone Peirone, **Marco Raveri**, Matteo Viel, Stefano Borgani, Stefano Ansoldi,
“Constraining $f(R)$ Gravity with Planck Sunyaev-Zel’dovich Clusters”,
Phys. Rev. D **95**, no. 2, 023521 (2017) arXiv:1607.07863 [astro-ph.CO].
9. * Bin Hu, **Marco Raveri**, Matteo Rizzato, Alessandra Silvestri,
“Testing Hu-Sawicki $f(R)$ gravity with the effective field theory approach”,
Mon. Not. Roy. Astron. Soc. **459**, no. 4, 3880 (2016) arXiv:1601.07536 [astro-ph.CO].
8. **Marco Raveri**,
“Are cosmological data sets consistent with each other within the Λ cold dark matter model?”,
Phys. Rev. D **93**, no. 4, 043522 (2016) arXiv:1510.00688 [astro-ph.CO].

7. * Noemi Frusciante, **Marco Raveri**, Daniele Vernieri, Bin Hu, Alessandra Silvestri, “*Hořava Gravity in the Effective Field Theory formalism: From cosmology to observational constraints*”, Phys. Dark Univ. **13**, 7 (2016) arXiv:1508.01787 [astro-ph.CO].
6. * Bin Hu, **Marco Raveri**, “*Can modified gravity models reconcile the tension between the CMB anisotropy and lensing maps in Planck-like observations?*”, Phys. Rev. D **91**, number 12, pages 123515 to 123515-7 (2015) arXiv:1502.06599 [astro-ph.CO].
5. * Bin Hu, **Marco Raveri**, Alessandra Silvestri, Noemi Frusciante, “*Exploring massive neutrinos in dark cosmologies with EFTCAMB/EFTCosmoMC*”, Phys. Rev. D **91**, no. 6, 063524 (2015) arXiv:1410.5807 [astro-ph.CO].
4. **Marco Raveri**, Carlo Baccigalupi, Alessandra Silvestri, Shuang-Yong Zhou, “*Measuring the speed of cosmological gravitational waves*”, Phys. Rev. D **91**, no. 6, 061501 (2015) arXiv:1405.7974 [astro-ph.CO].
3. **Marco Raveri**, Bin Hu, Noemi Frusciante, Alessandra Silvestri, “*Effective Field Theory of Cosmic Acceleration: constraining dark energy with CMB data*”, Phys. Rev. D **90**, no. 4, 043513 (2014) arXiv:1405.1022 [astro-ph.CO].
2. Bin Hu, **Marco Raveri**, Noemi Frusciante, Alessandra Silvestri, “*Effective Field Theory of Cosmic Acceleration: an implementation in CAMB*”, Phys. Rev. D **89**, no. 10, 103530 (2014) arXiv:1312.5742 [astro-ph.CO].
1. * Noemi Frusciante, **Marco Raveri**, Alessandra Silvestri, “*Effective Field Theory of Dark Energy: a Dynamical Analysis*”, JCAP, Volume 1402, Issue 02, pages 026, (2014) arXiv:1310.6026 [astro-ph.CO].

Other contributions

5. CMB-S4 Collaboration, “*CMB-S4 Science Book, First Edition*”, arXiv:1610.02743 [astro-ph.CO], (2016).
4. **Marco Raveri**, Matteo Martinelli, Gong-Bo Zhao and Yuting Wang, “*CosmicFish Validation Notes V1.0*”, arXiv:1607.01005 [astro-ph.CO], (2016).
3. **Marco Raveri**, Matteo Martinelli, Gong-Bo Zhao and Yuting Wang, “*Information Gain in Cosmology: From the Discovery of Expansion to Future Surveys*”, arXiv:1606.06273 [astro-ph.CO], (2016).
2. **Marco Raveri**, Matteo Martinelli, Gong-Bo Zhao and Yuting Wang, “*CosmicFish Implementation Notes V1.0*”, arXiv:1606.06268 [astro-ph.CO], (2016).
1. Bin Hu, **Marco Raveri**, Noemi Frusciante, Alessandra Silvestri, “*EFTCAMB/EFTCosmoMC: Numerical Notes v3.0*”, arXiv:1405.3590 [astro-ph.IM], (2014-2017).

- TALK AND SEMINARS
25. Seminar at Princeton University and Institute for Advanced Study, Princeton (New Jersey) “*Concordance Cosmology and beyond*”, Nov 15;
 24. Seminar at the University of Pennsylvania, Philadelphia (Pennsylvania) “*Concordance Cosmology and beyond*”, Nov 15;
 23. Seminar at the Institute for Nuclear and Particle Astrophysics (INPA), Berkeley (California) “*Concordance Cosmology and beyond*”, Nov 15;

22. Seminar at the University of Illinois Urbana-Champaign, (Illinois)
“Concordance Cosmology and beyond”, Oct 18;
21. The Future of H0: Crisis or Concordance workshop, Chicago, (Illinois)
“Concordance and Discordance In Cosmology”, Oct 18;
20. Seminar at SISSA, Trieste, (Italy)
“Concordance Cosmology and beyond”, Sept 18;
19. CASTLE workshop, Tagliolo, (Italy)
“Concordance and Discordance In Cosmology”, Sept 18;
18. Seminar at the University of Padova, Padova, (Italy)
“Concordance Cosmology and beyond”, Sept 18;
17. Joint SPT-DES Analysis workshop, Chicago, (Illinois)
“Testing the Concordance of Cosmological Observations”, Jun 18;
16. Venice Cosmology Workshop, Venice, (Italy)
“Is Cosmology over?”, Jun 18;
15. KICP Postdoc Symposium, Chicago, (Illinois)
“The Effective Field Theory approach to gravitation on cosmological scales”, Oct 16;
14. Plenary Talk, CMB-S4 collaboration meeting, Chicago, (Illinois)
“CMB-S4, Dark Energy and Gravity”, Sept 16;
13. Theoretical Cosmology in the Era of Large Surveys, Galileo Galilei Institute workshop, Florence, (Italy),
“Efficient exploration of Modified Gravity models in the era of Large Surveys”,
“Testing the Concordance of Cosmological Observations”, Apr 16;
12. Seminar at the Max-Planck-Institut für Astrophysik (MPA), Garching, (Germany),
“The Threefold Way to Cosmological Tests of Gravity”, Jan 16;
11. Seminar at the Instituut-Lorentz for theoretical physics, Leiden (Netherlands),
“The EFTCAMB Einstein-Boltzmann solver”, Nov 15;
10. Seminar at the Institute for Theoretical Physics at the University of Heidelberg, Heidelberg (Germany)
“The Effective Field Theory approach to gravitation on cosmological scales”, Nov 15;
9. Seminar at the Institute for Nuclear and Particle Astrophysics (INPA), Berkeley (California)
“The Effective Field Theory approach to gravitation on cosmological scales”, Oct 15;
8. Seminar at the Stanford Institute for Theoretical Physics (SITP), Stanford (California)
“The Effective Field Theory approach to gravitation on cosmological scales”, Oct 15;
7. Seminar at the Institute for Strings, Cosmology and Astroparticle Physics (ISCAP), New York (New York)
“The Effective Field Theory approach to gravitation on cosmological scales”, Oct 15;
6. Seminar at the University of Pennsylvania, Philadelphia (Pennsylvania)
“The Effective Field Theory approach to gravitation on cosmological scales”, Oct 15;
5. COSMO-15, Warsaw (Poland),
 contributed talk: *“The Effective Field Theory approach to modified gravity phenomenology”*,
 Sept 15;
4. Euclid Consortium meeting, Lausanne (Switzerland),
 contributed talk: *“Computation of CMB-LSS cross correlation spectra in EFT Cosmologies”*,
 June 15;
3. Seminars at NAOC: National Astronomical Observatories, Chinese Academy of Sciences, Beijing (China),
“The Effective Field Theory Approach to Dark Energy Phenomenology”,
“Measuring the speed of cosmological gravitational waves”, May 15;

2. Invited lecturer to Virtual Institute of Astroparticle Physics,
“Measuring the speed of cosmological gravitational waves”, June 14;
1. Seminar at the Instituut-Lorentz for theoretical physics, Leiden (Netherlands),
“Measuring the speed of cosmological gravitational waves”, June 14.