

# Valerio MARRA – Curriculum Vitae

June 26, 2022

Cosmo-ufes & Physics Department,  
Federal University of Espírito Santo (UFES)

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Astronomical Observatory of Trieste,  
National Institute for Astrophysics (INAF)

Publons: [publons.com/researcher/1329944/valerio-marra](https://publons.com/researcher/1329944/valerio-marra)

ORCID: [0000-0002-7773-1579](https://orcid.org/0000-0002-7773-1579)

Citizenship: Italian

Languages: Italian (native), English (fluent), Portuguese (fluent)

## Main Areas of Research

Theoretical Cosmology – Dark Energy and Dark Matter – Gravitational Lensing – Large Scale Structure – Inhomogeneous Cosmological Models – Numerical simulations – Data Analysis – Astrophysics of Galaxies

## Education

Department of Physics, University of Padova, Italy.

Ph.D. in Physics, January 2005 – December 2007; graduation: March 14, 2008.

Thesis: *A Back-Reaction Approach to Dark Energy* (128 pages), [arXiv:0803.3152](https://arxiv.org/abs/0803.3152).

Advisors: Prof. Sabino Matarrese, Prof. Antonio Masiero.

Department of Physics, University of Padova, Italy.

Master's degree (Laurea V.O.) in Physics, October 1999 – October 2004; graduation: October 12, 2004.

Thesis: *Fundamental constants and their variation induced by a cosmological scalar* (115 pages, in Italian).

Advisors: Prof. Antonio Masiero, Dr. Francesca Rosati. Final grade: 110/110 magna cum laude.

## Present Position

Physics Department, Federal University of Espírito Santo, Brazil.

Assistant Professor (Professor Adjunto), November 10, 2014 – present day.

Astronomical Observatory of Trieste, National Institute for Astrophysics, Italy.

Associated Researcher, September 1, 2020 – present day.

## Previous Positions

Astronomical Observatory of Trieste, National Institute for Astrophysics, Italy.

Marie Skłodowska-Curie Fellow, September 1, 2020 – February 28, 2022.

Host: Stefano Borgani.

Physics Institute, Federal University of Rio de Janeiro, Brazil.

“Science without Borders” Fellow, April 1, 2014 – October 31, 2014.

Group leader: Prof. Ioav Waga.

Institute for Theoretical Physics, Heidelberg University, Germany.

Postdoctoral Fellow, October 1, 2011 – March 31, 2014.

Group leader: Prof. Luca Amendola.

Department of Physics, University of Jyväskylä, Finland and

Helsinki Institute of Physics, University of Helsinki, Finland.

Postdoctoral Fellow, October 1, 2008 – September 30, 2011.

Group leader: Prof. Kimmo Kainulainen.

## Visiting Positions

Kavli Institute for Cosmological Physics (KICP), The University of Chicago, USA.

Visiting Postdoctoral Fellow, May-September 2008.

Collaboration with Prof. Edward W. Kolb.

Department of Astronomy and Astrophysics, The University of Chicago, USA.

Visiting Ph.D. Student, January-December 2007.

Collaboration with Prof. Edward W. Kolb.

## International Collaborations

- PI of the [LSST Brazilian Participation Group](#) and member of [LSST Dark Energy Science Collaboration](#), 2019 – present day.
- Full member of the [J-PLUS](#) collaboration, 2019 – present day.
- Full member of the [J-PAS](#) collaboration, 2014 – present day. Coordinator of the “Large Scale Structure” Science Working Group, 2018 – present day.
- Full member of the [Euclid Consortium](#), 2013 – 2014. External collaborator, 2014 – present day (change due to the present non-European affiliation). Coordinator of the Work Package 5 “Deviations from Homogeneity and Isotropy” of the Theory Science Working Group between 2013 – 2017.

## Professional Service

- Head of the [UFES undergraduate distance-learning course in Physics](#), March 2018 – August 2020.
- Member of the PhD program [PPGCosmo](#).
- Member of the Master and PhD program [PPGFis](#).
- [INAF](#) (National Institute for Astrophysics) associate, Trieste division, 2020 – present day.
- [INFN](#) (National Institute of Nuclear Physics) associate, Padova division, 2005 — 2008.

## Italian National Scientific Qualification

- Competition sector 02/A2 (theoretical physics of fundamental interactions), fascia I (full professor). Valid from September 4, 2019 to September 4, 2028.
- Competition sector 02/A2 (theoretical physics of fundamental interactions), fascia II (associate professor). Valid from September 4, 2019 to September 4, 2028.
- Competition sector 02/C1 (astronomy, astrophysics, Earth and planetary physics), fascia II (associate professor). Valid from September 2, 2019 to September 2, 2028.

## Grants and Awards (last 5 years, won as proponent)

- 2020 – present day, over 2.5 million CPU hours at the Italian and Brazilian Tier-0 supercomputers.
- 2020 – 2022, Marie Skłodowska-Curie fellowship of the call H2020-MSCA-IF-2019 (€137.605).
- 2016 – present day, [FAPES](#): “Apoio à organização de eventos” (R\$13,000), “Apoio à participação em eventos” (R\$7,544), “Apoio à organização de eventos” (R\$11,500), Universal (R\$14,580).
- 2016 – present day, [CNPq](#): “Produtividade em Pesquisa” fellowship (R\$79,200), APV (R\$5,000), Universal (R\$21,000), “Auxílio à Promoção de Eventos Científicos” (R\$16,000).

**Reviewer for the funding agencies:**

- *Agencia Nacional de Investigación y Desarrollo*, Chile. 2021 – ongoing.
- *Narodowe Centrum Nauki*, Poland. 2019 – ongoing.
- *Marsden Fund*, New Zealand. 2019 – ongoing.
- *Conselho Nacional de Desenvolvimento Científico e Tecnológico*, Brazil. 2018 – ongoing.
- *Fundação de Amparo à Pesquisa e Inovação do Espírito Santo*, Brazil. 2018 – ongoing.

# Teaching

## **Teacher, Federal University of Espírito Santo, Brazil**

Graduate courses in Physics (60 hours, 4h per week, 1 semester, equivalent to approximately 8 CFU):

- Bayesian Inference (2016-1, 2017-2, 2019-1)
- General Relativity (2016-2)

Undergraduate courses in Physics (60 hours, 4h per week, 1 semester, equivalent to approximately 8 CFU):

- Electromagnetism (2015-1, 2017-1)
- Astrophysics (2019-2)
- Modern Physics I (2015-2, 2018-2, 2022-1)
- Modern Physics II (2022-1)
- Special Relativity (2015-2)
- General Relativity (2016-1, 2016-2, 2020-1)
- Statistical Physics (2017-1)
- Condensed Matter (2015-1)

Undergraduate distance-learning courses in Physics (15 weeks, 2h sync. + 2h async. per week, 1 semester):

- Mechanics (2017-1)
- Statistics (2018-1)
- Calculus I (2017-2)
- Calculus II (2017-2)
- Electromagnetism (2018-1, 2019-1, 2020-1)

## **Teaching Assistant, Heidelberg University, Germany**

Undergraduate courses in Physics (2h per week, 1 semester):

- General Relativity (2012-1)
- Computational Statistics (2013-1)
- Cosmology (2013-2)

## **Teaching Assistant, University of Jyväskylä, Finland**

Undergraduate courses in Physics (2h per week, 1 semester):

- Cosmology (2010-1)

# Advising

## PhD students (supervisor):

- Ranier Menote (ongoing – PPGCosmo/UFES, Brazil)
- David Francisco Camarena Torres (ongoing – PPGCosmo/UFES, Brazil)
- Rodrigo Duarte Silva (ongoing – PPGFis/UFES, Brazil)
- Tássia Andrade Ferreira (2021 – PPGCosmo/UFES, Brazil)
- Pedro Otávio Souza Baqui (2020 – PPGFis/UFES, Brazil)
- Eddy Giusepe Chirinos Isidro (2019 – PPGFis/UFES, Brazil)

## PhD students (co-supervisor):

- Mikko Pääkkönen (2014 – University of Jyväskylä, Finland – supervisor: Kimmo Kainulainen)

## Master students (supervisor):

- Laura de Carvalho (ongoing – PPGFis/UFES, Brazil)
- Ranier Menote (2021 – PPGFis/UFES, Brazil)
- David Camarena Torres (2018 – PPGFis/UFES, Brazil)
- Rodrigo Duarte Silva (2018 – PPGFis/UFES, Brazil)
- Ingrid Ferreira da Costa (2018 – PPGFis/UFES, Brazil)

## Master students (co-supervisor):

- Alexandre Posada (2013 – Heidelberg University, Germany – supervisor: Luca Amendola)
- Caroline Heneka (2013 – Heidelberg University, Germany – supervisor: Luca Amendola)
- Mikko Pääkkönen (2010 – University of Jyväskylä, Finland – supervisor: Kimmo Kainulainen)

## Undergraduate students (supervisor):

- Guilherme Fracalossi (ongoing – DFIS/UFES, Brazil)
- Ana Paula Jeakel (2019 – DFIS/UFES, Brazil)
- Elisa Dardengo Mendes Glória (2019 – DFIS/UFES, Brazil)
- Maikon Barbosa de Araujo (2017 – DFIS/UFES, Brazil)
- Vitor Leandro Pinto (2016 – DFIS/UFES, Brazil)

# Scientific Meetings

## Organization of scientific events

1. *Cosmo22*, Rio de Janeiro, RJ, Brazil. September 5-9, 2022.
2. *V José Plínio Baptista School of Cosmology*, Pedra Azul, ES, Brazil. October, 2021.
3. *PPGCosmo workshop*, Vitória, ES, Brazil. March 5-6, 2020.
4. *Gravitational Wave Challenges And Cosmology*, Natal, RN, Brazil. June 3-14, 2019.
5. *Verão Quântico 2019*, Ubu, Anchieta, ES, Brazil. February 17-22, 2019.
6. *IV José Plínio Baptista School of Cosmology*, Pedra Azul, ES, Brazil. October 15-19, 2018.
7. *XXXIX National Meeting on Particles and Fields* of the Brazilian Physical Society, Campos do Jordão, SP, Brazil. September 24-28, 2018.
8. *Inverno Astrofísico 2018*, Castelo, ES, Brazil. July 22-29, 2018.
9. *Interactions in the dark sector of the universe*, Santa Teresa, ES, Brazil. June 3-6, 2018.
10. *XXXVIII National Meeting on Particles and Fields* of the Brazilian Physical Society, Passa Quatro, MG, Brazil. September 18-22, 2017.
11. *III José Plínio Baptista School of Cosmology*, Pedra Azul, ES, Brazil. September 25-30, 2016.
12. *Black Holes and their Analogues*, Ubu-Anchieta, ES, Brazil. April 13-17, 2015.
13. *Seventh TRR33 Winter School*, Passo del Tonale, Italy, December 1-6, 2013.
14. *Sixth TRR33 Winter School*, Passo del Tonale, Italy, December 9-14, 2012.
15. *Fifth TRR33 Winter School*, Passo del Tonale, Italy, December 4-9, 2011.
16. *Workshop: Inhomogeneous Cosmologies*, Jyväskylä, Finland, August 15-19, 2011.

## Speaker at scientific events

1. *Reuven Opher Workshop on Challenges of New Physics in Space*, Brazil, December 13, 2021.  
Invited talk: “The Copernican principle in light of the latest cosmological data”.
2. *LSST Brazil 2021*, Brazil, December 8, 2021.  
Invited talk: “Cosmology with LSST Type Ia Supernovae”.
3. *CosmoBR*, Guarapari (ES), Brazil, December 8, 2021.  
Invited talk: “Tensões no modelo padrão da cosmologia”.
4. *UK-Brazil Frontiers of Science 2020*, Itatiba (SP), Brazil, March 10-13, 2020. Invited talk: “Star-Galaxy classification using machine learning in miniJPAS”.
5. *PPGCosmo workshop*, Vitória (ES), Brazil, March 5-6, 2020. Invited talk: “The Hubble-constant crisis”.
6. *XL Encontro Nacional de Física de Partículas e Campos*, Campos do Jordão (SP), Brazil, September 1-5, 2019. Invited talk: “Model independent analyses in cosmology”.
7. *II South American Dark Matter Workshop*, São Paulo (SP), Brazil, November 21-23, 2018.  
Conference talk: “No fundamental acceleration scale in disk galaxies”.

8. *The Dark Energy Revolution in Cosmology*, Rio de Janeiro (RJ), Brazil, September 28, 2018.  
Invited talk: “No fundamental acceleration scale in disk galaxies”.
9. *IV CosmoSul*, ICTP-SAIFR, São Paulo (SP), Brazil, July 31 – August 2, 2017.  
Invited talk: “Clustering dark energy and halo abundances”.
10. *12th J-PAS Meeting*, CBPF, Rio de Janeiro (RJ), Brazil, April 11, 2016.  
Invited talk: “Testing homogeneity and isotropy with J-PAS”.
11. *Vith workshop challenges of new physics in space*, Campos do Jordão, SP, Brazil. May 24-29, 2015.  
Invited talk: “Lensing of point sources”.
12. *Verão Quântico*, João Pessoa, PB, Brazil. February 23-27, 2015.  
Invited talk: “Constraining perturbations with lensing of supernovae”.
13. *1º Workshop de Física Teórica do IFES*, IFES-Cariacica, Cariacica (ES), Brazil, December 19, 2014.  
Invited opening talk: “Observational Cosmology and the Euclid Mission”.
14. *2a Reunião Carioca de Cosmologia e Gravitação*, Rio de Janeiro State University (UERJ), Brazil, April 3-4, 2014. Invited talk: “Cosmology with SNe: signals and biases”.
15. *The Quest for Dark Energy*, Ringberg Castle, Germany, June 24-29, 2012.  
Invited talk: “Systematic search for systematic bias in SN Ia data”.
16. *Workshop: Inhomogeneous Cosmologies*, Jyväskylä, Finland, August 15-19, 2011.  
Invited talk: “Gravitational lensing with the sGL method”.
17. *Finnish Cosmophysics Meeting*, Tampere, Finland, April 20-21, 2011.  
Invited talk: “Gravitational lensing with the sGL method”.
18. *45th Rencontres de Moriond, Cosmology Session*, La Thuile, Italy, March 13-20, 2010.  
Conference talk: “Gravitational lensing and parameter extraction from SNe catalogues”.
19.  *$\Lambda$ -LTB Cosmology*, KEK, Tsukuba, Japan, October 20-23, 2009.  
Invited talk: “Toy models for the inhomogeneous universe”.
20. *Invisible Universe International Conference*, Palais de l’UNESCO, Paris, France, June 29-July 3, 2009. Conference talk: “Impact of cosmic inhomogeneities on observations”.
21. *SIGRAV School in Cosmology*, GGI, Firenze, Italy, January 26-29, 2009.  
Conference talk: “Cosmological background solutions and cosmological backreactions”.
22. *43rd Rencontres de Moriond, Cosmology Session*, La Thuile, Italy, March 15-22, 2008.  
Conference talk: “On cosmological observables in a swiss-cheese universe”.
23. Les Houches Summer School (Session LXXXIV) on *Particle Physics Beyond The Standard Model*, Les Houches, France, August 1-26, 2005.  
Title of the talk: “Cosmological evolution of alpha driven by a general coupling with quintessence”.

#### Invited institute seminars

1. Università degli Studi dell’Insubria, Como, Italy, March 29, 2022.  
Seminar: “ALTB N-body simulations cosmology beyond homogeneity and isotropy”.
2. Instituto Nacional de Pesquisas Espaciais, São José dos Campos (SP), Brazil, August 24, 2021.  
Seminar: “A possible solution to the Hubble-constant crisis”.
3. SNOWMASS, August 24, 2021. Seminar: “The  $M_B$  tension”.
4. International Institute of Physics, Natal (RN), Brazil, June 23, 2021.  
Seminar: “A possible solution to the H0 crisis”.

5. Sharif University of Technology, Tehran, Iran, March 2, 2021.  
Seminar: “The Hubble-constant crisis”.
6. Institute for Theoretical Physics, Heidelberg, Germany, December 1, 2020.  
Seminar: “The Hubble-constant crisis”.
7. Institute for Fundamental Physics of the Universe, Trieste, Italy, October 2, 2020.  
Seminar: “The Hubble-constant crisis”.
8. Donostia International Physics Center, Spain, February 17, 2020.  
Seminar: “A fundamental test for MOND”.
9. IF-UFRJ, Brazil, October 10, 2019. Colloquium: “The Hubble-constant crisis”.
10. Padova University, Padova, Italy, February 21, 2019.  
Theory seminar: “Absence of a fundamental acceleration scale in galaxies”.
11. Universidad de Chile, Santiago, Chile, November 17, 2017.  
Theory seminar: “Clustering dark energy and halo abundances”.
12. ICTP-SAIFR, São Paulo (SP), Brazil, July 6, 2016.  
Theory seminar: “Constraining the halo mass function with observations”.
13. National Observatory, Rio de Janeiro (RJ), Brazil, February 24, 2016.  
Theory seminar: “Testing homogeneity and isotropy with J-PAS”.
14. UFES, Vitória (ES), Brazil, June 26, 2015.  
Theory seminar: “Coupling dark energy to dark matter inhomogeneities”.
15. National Observatory, Rio de Janeiro (RJ), Brazil, August 20, 2014.  
Theory seminar: “Signal and noise from lensing of point sources”.
16. Astronomy Unit, Queen Mary University of London, England, July 7, 2014.  
Theory seminar: “Lensing of point sources, inhomogeneous cosmology and robustness”.
17. Physics Institute, São Paulo University, Brazil, May 19, 2014.  
Theory seminar: “Cosmological information and bias from lensing of point sources”.
18. Institute for Theoretical Physics, Heidelberg University, Germany, March 12, 2014.  
Theory seminar: “so long, and thanks for all the Physik”.
19. Physics Institute, University of Bonn, Germany, February 11, 2014.  
Theory seminar: “Supernova cosmology: signals and biases”.
20. LUTH, Observatoire de Paris, France, June 5, 2013.  
Theory seminar: “Cosmological information from lensing of standard candles”.
21. Department of Physics, University of Jyväskylä, Finland, March 5, 2010.  
Theory seminar: “Modeling inhomogeneities in the universe”.
22. Institute for Theoretical Physics, Heidelberg University, Germany, October 7, 2009.  
Theory seminar: “Toy models for the inhomogeneous universe”.
23. Department of Physics, University of Jyväskylä, Finland, November 13, 2008.  
Theory seminar: “Cosmological background solutions and cosmological backreactions”.



# Outreach

## Organization

1. *Universo no Parque*, Vitória, ES, Brazil. 2017 – ongoing. General-audience seminars in the parks of Vitória, with topics ranging from astronomy to physics.
2. *Universo no Escola*, Vitória, ES, Brazil. 2017 – ongoing. General-audience seminars in the public high schools of Vitória, with topics ranging from astronomy to physics.
3. *NEXT*, Trieste, Italy, September 25-26, 2021. VR Headset simulations.

## Seminars

1. Seminar on cosmology at the elementary school “Elio de Morpurgo”, Trieste, Italy, October 21, 2021.  
Seminar: “La Cosmologia Moderna.”
2. *NEXT*, Trieste, Italy, September 25-26, 2021.  
Seminar: “A caccia di galassie per capire l’energia oscura”
3. *Pint of Science*, Trieste, Italy, September 14, 2021.  
Title: “Osservando milioni di galassie per capire la natura dell’energia oscura.”
4. 100 Anos do Eclipse de Sobral, UFES, Vitória (ES), Brazil, May 29-30, 2019.  
Title: “Cosmologia Moderna e Futura”.
5. Parque Botânico Vale, Vitória, ES, Brazil, May 13, 2018.  
Title: “O Brasil verá quase toda as galáxias observáveis!”.
6. Escola Duarte Rabelo, Vitória, ES, Brazil, June 22, 2018.  
Title: “O Brasil verá quase toda as galáxias observáveis!”.
7. Parque da Pedra da Cebola, Vitória, ES, Brazil, October 1, 2017.  
Title: “O Brasil verá quase toda as galáxias observáveis!”.
8. Seminari dell’Accademia della Marca Trevigiana, Roncade, TV, Italy, December 23, 2016.  
Title: “Le galassie dell’universo osservabile”.

## Publications

I have published in the journal *Philosophy and Cosmology* the following short story:

### [Understanding Our Only Universe](#)

Abstract: *In an imaginary dialogue between a professor and a layman about the future of cosmology, the said professor relates the paradoxical story of scientist Zee Prime, a bold thinker of a future civilization, stuck in a lonely galaxy, forever unaware of the larger universe. Zee Prime comes to acknowledge his position and shows how important it is to question standard models and status quo, as only the most imaginative ideas give us the chance to understand what he calls “our only universe” – the special place and time in which we live.*

# Valerio Marra

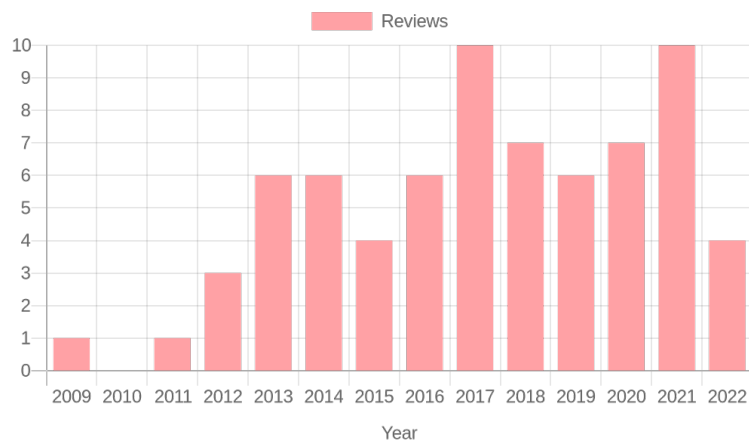
<https://publons.com/researcher/H-3974-2012/>

Web of Science ResearcherID: [H-3974-2012](#)

ORCID: 0000-0002-7773-1579

## Verified reviews

### REVIEW SUMMARY



### REVIEWER SUMMARY

(32) Physical Review D	WOS	(7) Physics of the Dark Universe	WOS
(7) Journal of Cosmology and Astroparticl...	WOS	(5) Monthly Notices of the Royal Astronom...	WOS
(3) Classical and Quantum Gravity	WOS	(2) General Relativity and Gravitation	WOS
(2) Physical Review Letters	WOS	(2) Physics Letters B	WOS
(2) The European Physical Journal C	WOS	(1) International Journal of Modern Physic...	WOS
(1) Universe	WOS	(1) Advances in High Energy Physics	WOS
(1) Aeronautics and Aerospace Open Access Jour...		(1) Palgrave Communications	WOS
(1) The Astrophysical Journal	WOS	(1) Modern Physics Letters A	WOS
(1) EPL (Europhysics Letters)	WOS	(1) Proceedings of the Royal Society A: Ma...	WOS

# Valerio MARRA – Publications

June 26, 2022

I am author of 70 Refereed Publications in the fields of cosmology and astrophysics, of which 56 with less than 8 authors. My citation summary is the following.

	< 8 authors				all		
	papers	100+ papers	h-index	citations	papers	h-index	citations
Web of Science	–	–	–	–	70	24	2100+
NASA ADS	56	3	26	1800+	70	30	2800+

I published 1 paper in *Nature Astronomy* [24], 2 papers in *Physical Review Letters* [48, 39], 1 paper in *Physical Review D Letters* [10] and 1 paper in *Monthly Notices of the Royal Astronomical Society Letters* [41].

Regarding my 14 collaboration papers:

- I contributed to Sections IV and VII of the Snowmass 2021 review [58], as stated at the beginning of those Sections.
- I contributed to the overall development of the Euclid paper [60] and, in particular, to the part on the ALTB model.
- I signed the four Letters of Interest [63, 64, 65, 66] because I was invited to participate in Snowmass 2021 thanks to my works on the Hubble-constant tension.
- I signed [59, 62, 61, 68, 69] because I was awarded the J-PAS “PathFinder Infrastructure Team” award.
- I share first authorship of the J-PAS paper [70], as stated in the paper.
- I contributed substantially to Section 4.2 “Value-added catalogues” and Section 6.3 “Large scale structure” of the presentation paper of the miniJPAS survey [67].
- I contributed to Section IV.3 “Beyond homogeneity and isotropy” of the Euclid review paper [71].

I am also author of 5 Refereed Publications in other fields [72, 73, 74, 75, 76], mostly on data analysis. In particular, I authored a paper on the COVID pandemic which was published in *The Lancet Global Health* [74] and has 400+ citations.

## Publications under Review

- [1] D. Camarena, V. Marra, Z. Sakr, and C. Clarkson, *A void in the Hubble tension? The end of the line for the Hubble bubble*, [arXiv:2205.05422](https://arxiv.org/abs/2205.05422) [astro-ph.CO].

## Refereed Publications

- [2] V. Marra, T. Castro, D. Camarena, S. Borgani, and A. Ragagnin, *The BEHOMO project:  $\Lambda$ LTB  $N$ -body simulations*, *A&A in press* (2022) , [arXiv:2203.04009](#) [[astro-ph.CO](#)].
- [3] T. Ferreira and V. Marra, *A fast and reliable method for the comparison of covariance matrices*, *Mon. Not. Roy. Astron. Soc.* **513** (2022) 5438–5445, [arXiv:2107.04211](#) [[astro-ph.CO](#)].
- [4] R. Menote and V. Marra, *Baryon acoustic oscillations in thin redshift shells from BOSS DR12 and eBOSS DR16 galaxies*, *Mon. Not. Roy. Astron. Soc.* **513** (2022) no. 2, 1600–1608, [arXiv:2112.10000](#) [[astro-ph.CO](#)].
- [5] H. Steigerwald, V. Marra, and S. Profumo, *Revisiting constraints on asymmetric dark matter from collapse in white dwarf stars*, *Phys.Rev.* **D105** (2022) 083507, [arXiv:2203.09054](#) [[astro-ph.CO](#)].
- [6] G. Alestas, D. Camarena, E. Di Valentino, L. Kazantzidis, V. Marra, S. Nesseris, and L. Perivolaropoulos, *Late-transition versus smooth  $H(z)$ -deformation models for the resolution of the Hubble crisis*, *Phys.Rev.* **D105** (2022) 063538, [arXiv:2110.04336](#) [[astro-ph.CO](#)].
- [7] H. Leandro, V. Marra, and R. Sturani, *Measuring the Hubble constant with black sirens*, *Phys.Rev.* **D105** (2022) 023523, [arXiv:2109.07537](#) [[gr-qc](#)].
- [8] H. Steigerwald, D. Rodrigues, S. Profumo, and V. Marra, *Type Ia Supernova Magnitude Step from the local Dark Matter Environment*, *Mon. Not. Roy. Astron. Soc.* **510** (2022) 4779–4795, [arXiv:2112.09739](#) [[astro-ph.CO](#)].
- [9] D. Camarena, V. Marra, Z. Sakr, and C. Clarkson, *The Copernican principle in light of the latest cosmological data*, *Mon. Not. Roy. Astron. Soc.* **509** (2022) 1291–1302, [arXiv:2107.02296](#) [[astro-ph.CO](#)].
- [10] V. Marra and L. Perivolaropoulos, *A rapid transition of  $G_{\text{eff}}$  at  $z_t \simeq 0.01$  as a solution of the Hubble and growth tensions*, *Phys.Rev.* **D104** (2021) L021303, [arXiv:2102.06012](#) [[astro-ph.CO](#)].
- [11] R. von Marttens, J. E. Gonzalez, J. Alcaniz, V. Marra, and L. Casarini, *Model-independent reconstruction of dark sector interactions*, *Phys.Rev.* **D104** (2021) 043515, [arXiv:2011.10846](#) [[astro-ph.CO](#)].
- [12] D. Camarena and V. Marra, *On the use of the local prior on the absolute magnitude of Type Ia supernovae in cosmological inference*, *Mon. Not. Roy. Astron. Soc.* **504** (2021) 5164–5171, [arXiv:2101.08641](#) [[astro-ph.CO](#)].
- [13] T. Castro, S. Borgani, K. Dolag, V. Marra, M. Quartin, A. Saro, and E. Sefusatti, *On the impact of baryons on the halo mass function, bias, and cluster cosmology*, *Mon. Not. Roy. Astron. Soc.* **500** (2021) 2316–2335, [arXiv:2009.01775](#) [[astro-ph.CO](#)].
- [14] V. Marra, D. C. Rodrigues, and A. O. de Almeida, *A fundamental test for MOND*, *Mon. Not. Roy. Astron. Soc.* **494** (2020) 2875–2885, [arXiv:2002.03946](#) [[astro-ph.GA](#)].
- [15] D. Camarena and V. Marra, *A new method to build the (inverse) distance ladder*, *Mon. Not. Roy. Astron. Soc.* **495** (2020) 2630–2644, [arXiv:1910.14125](#) [[astro-ph.CO](#)].
- [16] D. C. Rodrigues, V. Marra, A. Del Popolo, and Z. Davari, *Reply to: Overconfidence in Bayesian analyses of galaxy rotation curves*, *Nat. Astron.* **4** (2020) no. 2, 134–135, [arXiv:2002.01970](#) [[astro-ph.GA](#)].
- [17] R. von Marttens, L. Lombriser, M. Kunz, V. Marra, L. Casarini, and J. Alcaniz, *Dark degeneracy I: Dynamical or interacting dark energy?*, *Phys. Dark Univ.* **28**,100490 (2020) , [arXiv:1911.02618](#) [[astro-ph.CO](#)].
- [18] D. Camarena and V. Marra, *Local determination of the Hubble constant and the deceleration parameter*, *Phys.Rev.Res.* **2** (2020) no. 1, 013028, [arXiv:1906.11814](#) [[astro-ph.CO](#)].

- [19] Z. Davari, V. Marra, and M. Malekjani, *Cosmological constraints on minimally and non-minimally coupled scalar field models*, *Mon. Not. Roy. Astron. Soc.* **491** (2020) 1920–1933, [arXiv:1911.00209 \[gr-qc\]](#).
- [20] V. Marra and E. G. C. Isidro, *A first model-independent radial BAO constraint from the final BOSS sample*, *Mon. Not. Roy. Astron. Soc.* **487** (2019) 3419–3426, [arXiv:1808.10695 \[astro-ph.CO\]](#).
- [21] R. von Marttens, V. Marra, L. Casarini, J. E. Gonzalez, and J. Alcaniz, *Null test for interactions in the dark sector*, *Phys.Rev.* **D99** (2019) no. 4, 043521, [arXiv:1812.02333 \[astro-ph.CO\]](#).
- [22] D. C. Rodrigues, V. Marra, A. Del Popolo, and Z. Davari, *Reply to “Presence of a fundamental acceleration scale in galaxies” and “A common Milgromian acceleration scale in nature”*, *Nat. Astron.* **2** (2018) no. 12, 927–929, [arXiv:1811.05882 \[astro-ph.GA\]](#).
- [23] D. Camarena and V. Marra, *The impact of the cosmic variance on  $H_0$  on cosmological analyses*, *Phys.Rev.* **D98** (2018) 023537, [arXiv:1805.09900 \[astro-ph.CO\]](#).
- [24] D. C. Rodrigues, V. Marra, A. del Popolo, and Z. Davari, *Absence of a fundamental acceleration scale in galaxies*, *Nat. Astron.* **2** (2018) 668–672, [arXiv:1806.06803 \[astro-ph.GA\]](#).
- [25] V. Marra and D. Sapone, *Null tests of the standard model using the linear model formalism*, *Phys.Rev.* **D97** (2018) no. 8, 083510, [arXiv:1712.09676 \[astro-ph.CO\]](#).
- [26] R. C. Batista and V. Marra, *Clustering dark energy and halo abundances*, *JCAP* **11** (2017) 048, [arXiv:1709.03420 \[astro-ph.CO\]](#).
- [27] D. C. Rodrigues, A. del Popolo, V. Marra, and P. L. C. de Oliveira, *Evidence against cuspy dark matter haloes in large galaxies*, *Mon. Not. Roy. Astron. Soc.* **470** (2017) no. 2, 2410–2426, [arXiv:1701.02698 \[astro-ph.GA\]](#).
- [28] D. Camarena and V. Marra, *Cosmological constraints on the radiation released during structure formation*, *Eur.Phys.J.C* **76** (2016) 644, [arXiv:1608.08824 \[astro-ph.CO\]](#).
- [29] T. Castro, V. Marra, and M. Quartin, *Constraining the halo mass function with observations*, *Mon.Not.Roy.Astron.Soc.* **463** (2016) 1666–1677, [arXiv:1605.07548 \[astro-ph.CO\]](#).
- [30] K. Yamamoto, V. Marra, V. Mukhanov, and M. Sasaki, *Perturbed Newtonian description of the Lemaître model with non-negligible pressure*, *JCAP* **03** (2016) 030, [arXiv:1512.04240 \[gr-qc\]](#).
- [31] V. Marra, *Coupling dark energy to dark matter inhomogeneities*, *Phys.Dark Univ.* **13** (2016) 25–29, [arXiv:1506.05523 \[astro-ph.CO\]](#).
- [32] L. Amendola, T. Castro, V. Marra, and M. Quartin, *Constraining the growth of perturbations with lensing of supernovae*, *Mon.Not.Roy.Astron.Soc.* **449** (2015) 2845–2852, [arXiv:1412.3703 \[astro-ph.CO\]](#).
- [33] A. Piloyan, V. Marra, M. Baldi, and L. Amendola, *Linear Perturbation constraints on Multi-coupled Dark Energy*, *JCAP* **02** (2014) 045, [arXiv:1401.2656 \[astro-ph.CO\]](#).
- [34] C. Heneka, V. Marra, and L. Amendola, *Extensive search for systematic bias in SN Ia data*, *Mon.Not.Roy.Astron.Soc.* **439** (2014) 1855–1864, [arXiv:1310.8435 \[astro-ph.CO\]](#).
- [35] M. Quartin, V. Marra, and L. Amendola, *Accurate weak lensing of standard candles. II. Measuring  $\sigma_8$  with Supernovae*, *Phys.Rev.* **D89** (2014) 023009, [arXiv:1307.1155 \[astro-ph.CO\]](#).
- [36] I. Sawicki, V. Marra, and W. Valkenburg, *Seeding supermassive black holes with a nonvortical dark-matter subcomponent*, *Phys.Rev.* **D88** (2013) 083520, [arXiv:1307.6150 \[astro-ph.CO\]](#).
- [37] A. Piloyan, V. Marra, M. Baldi, and L. Amendola, *Supernova constraints on multi-coupled dark energy*, *JCAP* **07** (2013) 042, [arXiv:1305.3106 \[astro-ph.CO\]](#).
- [38] V. Marra, M. Quartin, and L. Amendola, *Accurate weak lensing of standard candles. I. Flexible cosmological fits*, *Phys.Rev.* **D88** (2013) 063004, [arXiv:1304.7689 \[astro-ph.CO\]](#).

- [39] V. Marra, L. Amendola, I. Sawicki, and W. Valkenburg, *Cosmic Variance and the Measurement of the Local Hubble Parameter*, *Phys.Rev.Lett.* **110** (2013) 241305, [arXiv:1303.3121 \[astro-ph.CO\]](#).
- [40] W. Valkenburg, M. Kunz, and V. Marra, *Intrinsic uncertainty on the nature of dark energy*, *Phys.Dark Univ.* **2** (2013) 219–223, [arXiv:1302.6588 \[astro-ph.CO\]](#).
- [41] W. Valkenburg, V. Marra, and C. Clarkson, *Testing the Copernican principle by constraining spatial homogeneity*, *Mon.Not.Roy.Astron.Soc.* **438** (2013) L6–L10, [arXiv:1209.4078 \[astro-ph.CO\]](#).
- [42] L. Amendola, V. Marra, and M. Quartin, *Internal Robustness: systematic search for systematic bias in SN Ia data*, *Mon.Not.Roy.Astron.Soc.* **430** (2013) 1867–1879, [arXiv:1209.1897 \[astro-ph.CO\]](#).
- [43] V. Marra, M. Paakkonen, and W. Valkenburg, *Uncertainty on  $w$  from large-scale structure*, *Mon.Not.Roy.Astron.Soc.* **431** (2013) 1891–1902, [arXiv:1203.2180 \[astro-ph.CO\]](#).
- [44] V. Marra and M. Paakkonen, *Exact spherically symmetric inhomogeneous model with  $n$  perfect fluids*, *JCAP* **01** (2012) 025, [arXiv:1105.6099 \[gr-qc\]](#).
- [45] K. Kainulainen and V. Marra, *Weak lensing observables in the halo model*, *Phys.Rev.* **D84** (2011) 063004, [arXiv:1101.4143 \[astro-ph.CO\]](#).
- [46] K. Kainulainen and V. Marra, *Accurate modeling of weak lensing with the stochastic gravitational lensing method*, *Phys.Rev.* **D83** (2011) 023009, [arXiv:1011.0732 \[astro-ph.CO\]](#).
- [47] V. Marra and M. Paakkonen, *Observational constraints on the ALTB model*, *JCAP* **12** (2010) 021, [arXiv:1009.4193 \[astro-ph.CO\]](#).
- [48] L. Amendola, K. Kainulainen, V. Marra, and M. Quartin, *Large-Scale Inhomogeneities May Improve the Cosmic Concordance of Supernovae*, *Phys.Rev.Lett.* **105** (2010) 121302, [arXiv:1002.1232 \[astro-ph.CO\]](#).
- [49] E. W. Kolb, V. Marra, and S. Matarrese, *Cosmological background solutions and cosmological backreactions*, *Gen.Rel.Grav.* **42** (2010) 1399–1412, [arXiv:0901.4566 \[astro-ph.CO\]](#).
- [50] K. Kainulainen and V. Marra, *New stochastic approach to cumulative weak lensing*, *Phys.Rev.* **D80** (2009) 123020, [arXiv:0909.0822 \[astro-ph.CO\]](#).
- [51] K. Kainulainen and V. Marra, *Supernovae observations in a “meatball” universe with a local void*, *Phys.Rev.* **D80** (2009) 127301, [arXiv:0906.3871 \[astro-ph.CO\]](#).
- [52] E. W. Kolb, V. Marra, and S. Matarrese, *Description of our cosmological spacetime as a perturbed conformal Newtonian metric and implications for the backreaction proposal for the accelerating universe*, *Phys.Rev.* **D78** (2008) 103002, [arXiv:0807.0401 \[astro-ph\]](#).
- [53] V. Marra, E. W. Kolb, and S. Matarrese, *Light-cone averages in a Swiss-cheese universe*, *Phys.Rev.* **D77** (2008) 023003, [arXiv:0710.5505 \[astro-ph\]](#).
- [54] V. Marra, E. W. Kolb, S. Matarrese, and A. Riotto, *Cosmological observables in a Swiss-cheese universe*, *Phys.Rev.* **D76** (2007) 123004, [arXiv:0708.3622 \[astro-ph\]](#).
- [55] V. Marra and F. Rosati, *Cosmological evolution of  $\alpha$  driven by a general coupling with quintessence*, *JCAP* **05** (2005) 011, [arXiv:astro-ph/0501515 \[astro-ph\]](#).

### Refereed Review Papers

- [56] V. Marra, R. Rosenfeld, and R. Sturani, *Observing the dark sector*, *Universe* **5** (2019) no. 6, 137, [arXiv:1904.00774 \[astro-ph.CO\]](#).
- [57] V. Marra and A. Notari, *Observational constraints on inhomogeneous cosmological models without dark energy*, *Class.Quant.Grav.* **28** (2011) 164004, [arXiv:1102.1015 \[astro-ph.CO\]](#).

## Refereed Collaboration Papers

- [58] E. Abdalla *et al.*, *Cosmology Intertwined: A Review of the Particle Physics, Astrophysics, and Cosmology Associated with the Cosmological Tensions and Anomalies*, *Journal of High Energy Astrophysics* **34** (2022) 49–211, [arXiv:2203.06142 \[astro-ph.CO\]](#).
- [59] G. Martínez-Solaèche *et al.*, *The miniJPAS survey: Identification and characterization of the emission line galaxies down to  $z < 0.35$  in the AEGIS field*, *A&A* **661** (2022) A99, [arXiv:2204.01698 \[astro-ph.GA\]](#).
- [60] S. Nesseris, D. Sapone, M. Martinelli, D. Camarena, V. Marra, *et al.*, *Euclid: Forecast constraints on consistency tests of the  $\Lambda$ CDM model*, *A&A* **660** (2022) A67, [arXiv:2110.11421 \[astro-ph.CO\]](#).
- [61] V. Salzano *et al.*, *J-PAS: forecasts on interacting vacuum energy models*, *JCAP* **09** (2021) 033, [arXiv:2102.06417 \[astro-ph.CO\]](#).
- [62] D. Figueruelo *et al.*, *J-PAS: Forecasts for dark matter - dark energy elastic couplings*, *JCAP* **07** (2021) 022, [arXiv:2103.01571 \[astro-ph.CO\]](#).
- [63] E. Di Valentino *et al.*, *Snowmass 2021 Letter of interest - Cosmology Intertwined I: Perspectives for the next decade*, *Astroparticle Physics* **131** (2021) 102606, [arXiv:2008.11283 \[astro-ph.CO\]](#).
- [64] E. Di Valentino *et al.*, *Snowmass 2021 Letter of interest - Cosmology Intertwined II: The Hubble constant tension*, *Astroparticle Physics* **131** (2021) 102605, [arXiv:2008.11284 \[astro-ph.CO\]](#).
- [65] E. Di Valentino *et al.*, *Snowmass 2021 Letter of interest - Cosmology intertwined III:  $f\sigma_8$  and  $S_8$* , *Astroparticle Physics* **131** (2021) 102604, [arXiv:2008.11285 \[astro-ph.CO\]](#).
- [66] E. Di Valentino *et al.*, *Snowmass 2021 Letter of interest - Cosmology Intertwined IV: The age of the universe and its curvature*, *Astroparticle Physics* **131** (2021) 102607, [arXiv:2008.11286 \[astro-ph.CO\]](#).
- [67] S. Bonoli *et al.*, *The miniJPAS survey: a preview of the Universe in 56 colours*, *A&A* **653** (2021) A31, [arXiv:2007.01910 \[astro-ph.CO\]](#). <https://doi.org/10.1051/0004-6361/202038841>.
- [68] R. M. González Delgado *et al.*, *The miniJPAS survey: identification and characterization of galaxy populations with the J-PAS photometric system*, *A&A* **649** (2021) A79, [arXiv:2102.13121 \[astro-ph.GA\]](#).
- [69] G. Martínez-Solaèche *et al.*, *J-PAS: Measuring emission lines with artificial neural networks*, *A&A* **647** (2021) A158, [arXiv:2008.04287 \[astro-ph.GA\]](#).
- [70] P. Baqui, V. Marra, *et al.*, *The miniJPAS survey: star-galaxy classification using machine learning*, *A&A* **645** (2021) A87, [arXiv:2007.07622 \[astro-ph.IM\]](#).
- [71] L. Amendola *et al.*, *Cosmology and fundamental physics with the Euclid satellite*, *Living Rev. Rel.* **21** (2018) no. 1, 2, [arXiv:1606.00180 \[astro-ph.CO\]](#).

## Refereed Publications – Data analysis applied to other fields

- [72] V. Marra and M. Quartin, *A Bayesian estimate of the early COVID-19 infection fatality ratio in Brazil based on a random seroprevalence survey*, *International Journal of Infectious Diseases* **111** (2021) 190–195.
- [73] Baqui, Pedro and Marra, Valerio and Alaa, Ahmed M. and Bica, Ioana and Ercole, Ari and van der Schaar, Mihaela, *Comparing COVID-19 risk factors in Brazil using machine learning: the importance of socioeconomic, demographic and structural factors*, *Scientific Reports* **11** (2021) 15591.
- [74] Baqui, Pedro and Bica, Ioana and Marra, Valerio and Ercole, Ari and van der Schaar, Mihaela, *Ethnic and regional variations in hospital mortality from COVID-19 in Brazil: a cross-sectional observational study*, *The Lancet Global Health* **8** (2020) 1018–26.
- [75] L. Amendola, V. Marra, and M. Quartin, *The evolving perception of controversial movies*, *Palgrave Communications* **1** (2015) 15038, [arXiv:1512.07893 \[physics.soc-ph\]](#).

## Refereed Publications in Other Fields

- [76] V. Marra, *Understanding Our Only Universe*, Philosophy and Cosmology **19** (2017) 50–54.  
[http://ispcjournal.org/journals/2017-19/Marra\\_19.pdf](http://ispcjournal.org/journals/2017-19/Marra_19.pdf).

## Publications in Conference Proceedings

- [77] D. C. Rodrigues and V. Marra, *The radial acceleration relation and its emergent nature*, in *IAU Symposium 359: Galaxy Evolution and Feedback Across Different Environments*, vol. 15, pp. 457–459. Cambridge University Press, 2021. [arXiv:2005.12384](https://arxiv.org/abs/2005.12384) [gr-qc].
- [78] D. C. Rodrigues, V. Marra, A. del Popolo, and Z. Davari, *Investigating the absence of fundamental acceleration scale in galaxies*, in *Conference on Gravitation and Cosmology in 1397*, IPM Proceedings, pp. 43–46. 2019.
- [79] C. Heneka, A. Posada, V. Marra, and L. Amendola, *Searching for bias and correlations in a Bayesian way - Example: SN Ia data*, in *IAU Symposium 306: Statistical Challenges in 21st Century Cosmology*, vol. 10, pp. 19–21. Cambridge University Press, 2014. [arXiv:1407.2531](https://arxiv.org/abs/1407.2531) [astro-ph.CO].
- [80] V. Marra, *Gravitational lensing and parameter extraction from SNe catalogues*, in *45th Rencontres de Moriond, Cosmology Session*, J. D. Etienne Augé and J. T. T. Vâ, eds. Thê Giói Publisher, 2010.
- [81] K. Kainulainen and V. Marra, *Impact of cosmic inhomogeneities on SNe observations*, in *Invisible Universe International Conference*, J.-M. Alimi and A. Fuözfa, eds., vol. 1241, pp. 1043–1050. 2010. [arXiv:0911.5584](https://arxiv.org/abs/0911.5584) [astro-ph.CO].
- [82] V. Marra, *On cosmological observables in a swiss-cheese universe*, in *43rd Rencontres de Moriond, Cosmology Session*, Y. G.-H. Jacques Dumarchez and J. T. T. Vãn, eds. Thê Giói Publisher, 2008. [arXiv:0805.4233](https://arxiv.org/abs/0805.4233) [astro-ph].

## Dissertations

- [83] V. Marra, *A back-reaction approach to dark energy*. Ph.d. thesis, Department of Physics, University of Padua, March, 2008. [arXiv:0803.3152](https://arxiv.org/abs/0803.3152) [astro-ph].  
<http://paduaresearch.cab.unipd.it/588>. Advisors: Prof. Sabino Matarrese, Prof. Antonio Masiero.
- [84] V. Marra, *The fundamental constants and their variation induced by a cosmological scalar*, master thesis, Department of Physics, University of Padua, October, 2004.  
<http://www.turbogl.org/stuff/MThesis.pdf>. Advisors: Prof. Antonio Masiero, Dr. Francesca Rosati.



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