

Massimo Guidi

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📅 Date of birth: 15/03/1994



Research appointments

- 2024-Now **Post-doc, University of Bologna**, Via Piero Gobetti, 93/2, 40129 Bologna, Host: Prof. Michele Moresco. Currently funded by the Horizon Europe conceptual study of the Wide-field Spectroscopic Telescope (WST); previously PRIN Project: *Optimizing the extraction of cosmological information from Large Scale Structure analysis in view of the next large spectroscopic surveys*
- 2023 -2024 **Post-doc, Israel Institute of Technology**, Technion city, Haifa 32000, Israel. Host: Prof. Adi Nusser

Membership

Roles in galaxy surveys

- 2020-now: **Euclid Consortium**: Associate active Member (SWG-GC and OU-PF, 3.2 FTE up to November 2025).
- 2023-2026: **Euclid Consortium**: Lead of the Key Project *Full-shape modelling of two-point and three-point correlation functions in configuration space* on the Flagship simulations (Euclid Collaboration: Guidi et al. 2026, A&A 707, A228).
- 2026-now: **Euclid Consortium**: Lead of the Key Project on the joint 2PCF+3PCF full-shape analysis of Euclid DR1.
- 2024-now: **Wide-Field Spectroscopic Telescope**: Lead of Quasar and Galaxy Clustering + IGM/Lyman α forest Work Package of the Cosmology Working Group

Affiliations

- 2024-now: **INAF** (National Institute of Astrophysics): Bologna Unit Associate.
- 2019-2023: **INFN** (National Institute of Nuclear Physics): Roma Tre Unit Associate.
- 2024-now: **CosmoVerse (COST Action CA21136)**: Associate Member

Education

- 2019, November - 2023, June **Ph.D in Physics, Roma Tre University** (*A new model for three-point statistics to probe Galaxy Clustering in the nonlinear regime*), Supervisor: Prof. Enzo Branchini. Ph.D defense: June 2023
- 2017, January - 2019, January **Master of Science Degree in Physics** (*Constraining dark energy with cosmological data*), Supervisor: Prof. Alessandro Melchiorri, "Sapienza" University. Evaluation: full marks with honours (110/110 cum laude).
- 2013, October - 2016, December **Bachelor of Science Degree in Physics** (*Non-locality and realism in quantum mechanics*), Supervisor: Prof. Eugenio Del Re, "Sapienza" University. Evaluation: full marks with honours (110/110 cum laude).

Scholarships

- 2021/2022  **Tutor at *Analisi Matematica 1* course for Physics and Mathematics**, Roma Tre University, Rome, Italy. Tutorship winner from Roma Tre University: Tutor activity at "Analisi Matematica 1", Bachelor of Science in Physics and Mathematics, first-year course
- 2018, March-July  **Tutor at *Laboratorio di Meccanica* course**, La Sapienza University, Rome, Italy Scholarship winner from La Sapienza University: Tutor activity at "Laboratorio di Meccanica", Bachelor of Science in Physics, first years course
- 2017, March-December  **Assistant at *Bruno Pontecorvo Laboratory***, La Sapienza University, Rome, Italy Scholarship winner from La Sapienza University

Grants

- 2026  Short Term Scientific Mission (STSM) grant from CosmoVerse COST Action (CA21136); mission hosted at ICCUB, Barcelona, September 2026
- 2025, July  Young Researcher and Innovator Conference Grant from CosmoVerse Action
- 2020, April  Winner of a fellowship for talented students, children or orphans of INPS employees
- 2018, April  Winner of a fellowship for talented students, children or orphans of INPS employees
- 2017, April  Winner of a fellowship for talented students, children or orphans of INPS employees

Computational Resources

- 2026, January  PI of *FCCB23* (HP10CHA8ZF): IS CRA Class-C project: 1.250.000 CPU hours and 10.000 GPU hours on CINECA Leonardo
- 2025, November  PI of *Lik3BOSS* (HP10CYL1YH): IS CRA Class-C project: 1.250.000 CPU hours and 10.000 GPU hours on CINECA Leonardo
- 2025, April  PI of *FS3PCF* (HP10Co1P7G): Iscra Class-C project: 10.000 CPU hours on CINECA Leonardo
- 2024, July  PI of *INA24C3B12*: INAF project: 125.000 CPU hours on CINECA Leonardo
-  PI of *3mulate* (HP10CKB8PA): IS CRA Class-C project: 85.000 CPU hours and 10.000 GPU hours on CINECA Leonardo

Mentoring Experience

PhD Thesis

- ongoing since Nov, 2025  Andrea Labate, Co-supervision of a PhD thesis at the University of Bologna, "*Towards a comprehensive clustering analysis: maximizing the scientific return through the combination of lower-order and higher-order correlation functions in configuration and Fourier space*".

Master Thesis

- 2026, March  Lorenzo Cavazzini, Co-supervision of a Master thesis at the University of Bologna, "*Constraining cosmology combining lower- and higher-order correlation functions from BOSS data*". Evaluation: full marks with honours.

Mentoring Experience (continued)

- 2025, October  Andrea Labate, Co-supervision of a Master thesis at the University of Bologna, "*Disentangling Massive Neutrino Cosmologies with Higher-Order Clustering Statistics*". Evaluation: full marks with honours. → PhD student at University of Bologna.
- 2024, October  Kristers Nagainis, Co-supervision of a Master thesis at the University of Bologna, "*Enabling cosmological analysis at BAO scale with a new matter anisotropic three-point correlation function emulator*". Evaluation: full marks with honours. → PhD student at University of Leiden.

Skills

- Languages  Strong reading, writing and speaking competencies in English, native Italian, and basic knowledge of Spanish
- Coding  Python, R, Mathematica, C, C++, Fortran90, Git, $\LaTeX$ (Developer for configuration space galaxy clustering analyses codes, with particular attention to parallelisation and computational cost minimisation), High Performance Computing. Maintainer for the public code MeasCorr and Mod3l
- Misc.  Academic research, teaching, training, consultation, $\LaTeX$ typesetting and publishing.

Conferences

Scientific Organizing Committee

- July 14, 2025 July 18, 2025  Optimizing the Extraction of Cosmological Information from the Latest Spectroscopic Redshift Surveys, Sexten, Italy
- February 2026 ongoing  *Cosmology Journal Club* organiser at Bologna Physics and Astronomy Department

Talks

- 2026, 2nd July  *First full-shape joint analysis of the 2PCF and 3PCF in redshift space on real data*, European Astronomical Society Annual Meeting, Lausanne, Switzerland
- 2026, 24th March  *Towards cosmological constraints from the first full-shape joint 2PCF + 3PCF analysis on real data*, Rencontres de Moriond, La Thuile, Italy
- 2026, 4th February  *Full-shape joint two-point and three-point clustering statistics in configuration space*, Euclid Galaxy Clustering Science Working Group Meeting, Lightning talk, Marseille, France
- 2025, 24th September  *Modeling higher-order peculiar velocity density correlations*, DESC workshop on cosmology with peculiar velocities, Marseille, France
- 2025, 15th June  *Cosmology from Large Scale full-shape analyses combining 2PCF and 3PCF*, Optimizing the Extraction of Cosmological Information from the Latest Spectroscopic Redshift Surveys, Sexten, Italy
- 2025, 3rd June  *Cosmology with full-shape galaxy clustering statistics beyond 2-point*, Cosmology on Safari, Hluhluwe, South Africa
- 2025, 12th March  *Cosmology with higher-order statistics with the Wide Field Spectroscopic Telescope*, WST Italian Workshop, Napoli, Italy

Conferences (continued)

- 2025, 22nd January  *Toward the first, joint full-shape 2PCF + 3PCF analysis on real data*, Euclid Galaxy Clustering Science Working Group Meeting, Garching, Germany
- 2024, 12th July  *Accelerating Likelihood Exploration to Constrain Cosmological Parameters Using 2- and 3-Point Correlation Functions Emulators*, Aurum, the "Gabriele D'Annunzio University and Icranet, Pescara, Italy
- 2024, 9th July  *Constraining Cosmological Parameters Combining 2- and 3-Point Correlation Functions: First Step Towards the Future Euclid Dataset*, Aurum, the "Gabriele D'Annunzio University and Icranet, Pescara, Italy
- 2024, 18th June  *Accelerating Maximum Likelihood Estimation to Constrain Cosmological Parameters Using 2- and 3- Point Correlation Functions*, Sapienza University, Rome, Italy
- 2024, 31st January  *A joint 2PCF + 3PCF analysis in real space in view of Euclid*, Laboratoire d'Astrophysique de Marseille, Marseille, France
- 2023, 5th June  *Modelling the large-scale structure with three-point correlation function (3PCF)*, Post-Industrial Bispectrum Meeting, University of Milan, Milan, Italy
- 2023, 21st February  *Modelling the three-point correlation function (3PCF) of the large-scale structure in the small-scale regime*, University of Milan, Milan, Italy
- 2023, 15th February  *Constraining the large-scale structure with new modelling approaches of the three-point correlation function*, Laboratoire d'Astrophysique de Marseille, Marseille, France
- 2022, 14th November  *The 2PCF + 3PCF analysis in real space*, Euclid GC Modelling Challenge Meeting, Invited talk, IFPU, Trieste, Italy
- 2022, 20th October  *Going nonlinear: modelling the real-space next-to-leading order three-point correlation function of Large Scale Structure of the universe*, European Astronomical Society Annual Meeting, Valencia, Spain
- 2022, 1st July  *Modelling the next-to-leading order 3-point correlation function*, Euclid Early Career Workshop, online
- 2021, 9th September  *Going nonlinear: toward a 1-loop model for the 3-point matter correlation function*, PRIN meeting: discovering the Dark Universe, from Darklight to Dark Matter, Barolo, Italy
- 2021, 13th July  *Modelling higher order statistics of the cosmic density field*, Astrophysics Journal Club, Sapienza University of Rome, Italy

Schools and courses

- 2024, June  *Computing and High Performance Computing in Astronomy and Astrophysics*, CNR Area Territoriale di Ricerca di Bologna, Bologna, Italy
- 2024, February  *Machine learning and Deep Learning @INAF-IASF*, Milano, Italy
- 2020, June  *Advanced Euclid School: the science of future cosmological surveys*, online

Field of interests

Area of research	Area of specialization
Higher order statistics	Cosmic Microwave Background
Galaxy/Haloes biasing	Large Scale Structure of the Universe
Non-gaussianity in cosmology	Bayesian inference in cosmology
Peculiar Velocities	Dark Energy
Cosmological Perturbation Theory	Galaxy Clustering
Numerical integration	Computational cosmology
Emulators for Galaxy Clustering	Machine Learning techniques
Massive Neutrinos	High Performance Computing

Relevant Research Publications

- 1 M. **Guidi**, M. Moresco, A. Veropalumbo, L. Cavazzini, A. Farina, and A. Labate, “First full-shape joint analysis of the two- and three-point correlation functions on real data: Λ CDM cosmological constraints from BOSS DR12,” *arXiv e-prints*, arXiv:2606.26237, arXiv:2606.26237, Jun. 2026. [DOI: 10.48550/arXiv.2606.26237](#). arXiv: 2606.26237 [astro-ph.CO].
- 2 A. Farina, **M. Guidi**, A. Veropalumbo, and C. Guida, “Denoising clustering covariance matrices with Rotational Invariant Estimators,” *arXiv e-prints*, arXiv:2604.13851, arXiv:2604.13851, Apr. 2026. [DOI: 10.48550/arXiv.2604.13851](#). arXiv: 2604.13851 [astro-ph.CO].
- 3 A. Farina, A. Veropalumbo, E. Branchini, and **M. Guidi**, “Modeling and measuring the anisotropic halo 3-point correlation function: a coordinated study,” *JCAP*, vol. 2026, no. 2, p. 028, 2026. [DOI: 10.1088/1475-7516/2026/02/028](#). arXiv: 2408.03036 [astro-ph.CO].
- 4 A. Labate, **Guidi, M.**, M. Moresco, and A. Veropalumbo, “The imprints of massive neutrinos on the 3-point correlation function of large-scale structures,” *A&A*, vol. 708, A210, 2026. [DOI: 10.1051/0004-6361/202558719](#). arXiv: 2512.16992 [astro-ph.CO].
- 5 **M. Guidi**, M. Moresco, H. K. Herrera-Alcantar, G. Aricò, S. Camera, C. Carbone, A. Cimatti, S. Contarini, P. Dayal, G. Degni, A. Farina, C. Giocoli, and [...], “Beyond Stage IV: Quasar and Galaxy Clustering and the Fundamental Physics of the 2040s (WST white paper),” *arXiv e-prints*, Dec. 2025. [DOI: 10.48550/arXiv.2512.15294](#). arXiv: 2512.15294 [astro-ph.CO].
- 6 **Guidi, M.**, A. Veropalumbo, E. Branchini, A. Eggemeier, and C. Carbone, “Modelling the next-to-leading order matter three-point correlation function using FFTLog,” *JCAP*, vol. 2023, no. 8, 066, p. 066, Aug. 2023. [DOI: 10.1088/1475-7516/2023/08/066](#). arXiv: 2212.07382 [astro-ph.CO].

Euclid Collaboration publications as lead author

- 1 Euclid Collaboration, **Guidi, M.**, A. Veropalumbo, A. Pugno, M. Moresco, E. Sefusatti, C. Porciani, E. Branchini, and [...], “Euclid preparation. Full-shape modelling of 2-point and 3-point correlation functions in real space,” *A&A*, vol. 707, A228, 2026. [DOI: 10.1051/0004-6361/202556177](#). arXiv: 2506.22257 [astro-ph.CO].

Euclid Collaboration publications as core contributor

- 1 Euclid Collaboration, B. Camacho Quevedo, [...], **M. Guidi**, and [...], “Euclid preparation. Galaxy power spectrum modelling in redshift space,” *A&A*, vol. 713, A259, 2026. [DOI: 10.1051/0004-6361/202659593](#). arXiv: 2601.20826 [astro-ph.CO].

- 2 Euclid Collaboration, M. Kärcher, [...], **M. Guidi**, and [...], “Euclid preparation. Galaxy 2-point correlation function modelling in redshift space,” *A&A*, vol. 713, A212, 2026.  DOI: 10.1051/0004-6361/202658887. arXiv: 2601.04780 [astro-ph.CO].
- 3 Euclid Collaboration, D. Linde, [...], **M. Guidi**, and [...], “Euclid preparation: Testing multi-field inflation with galaxy power spectrum and bispectrum,” *arXiv e-prints*, arXiv:2605.21436, arXiv:2605.21436, May 2026.  DOI: 10.48550/arXiv.2605.21436. arXiv: 2605.21436 [astro-ph.CO].
- 4 Euclid Collaboration, K. Pardede, [...], **M. Guidi**, and [...], “Euclid preparation. Galaxy power spectrum and bispectrum modelling,” *arXiv e-prints*, arXiv:2603.27966, arXiv:2603.27966, Mar. 2026.  DOI: 10.48550/arXiv.2603.27966. arXiv: 2603.27966 [astro-ph.CO].
- 5 Euclid Collaboration, E. Sarpa, [...], **M. Guidi**, and [...], “Euclid preparation. Baryon acoustic oscillations extraction techniques: comparison and optimisation,” *A&A (in press)*, 2026.  DOI: 10.1051/0004-6361/202660781. arXiv: 2605.03446 [astro-ph.CO].
- 6 Euclid Collaboration, A. Veropalumbo, [...], **M. Guidi**, and [...], “Euclid preparation. Three-dimensional galaxy clustering in configuration space: Three-point correlation function estimation,” *arXiv e-prints*, arXiv:2605.03012, arXiv:2605.03012, May 2026.  DOI: 10.48550/arXiv.2605.03012. arXiv: 2605.03012 [astro-ph.CO].
- 7 Euclid Collaboration, A. Pezzotta, [...], **M. Guidi**, and [...], “Euclid preparation. XLI. Galaxy power spectrum modelling in real space,” *A&A*, vol. 687, A216, A216, Jul. 2024.  DOI: 10.1051/0004-6361/202348939. arXiv: 2312.00679 [astro-ph.CO].

Author of 108 papers (4 as first author, 9 with a major contribution as second to fourth author or as Euclid Collaboration core contributor), 1 proceeding, 1 white paper; citations: 2078, h-index: 19 (source INSPIRE-HEP, 23/10/2026). A full list of the **95 large collaboration publications** up to October 2026 is available on my ORCID: 0000-0001-9408-1101

Miscellanea

Since 2026: Referee for Journal of Cosmology and Astroparticle Physics (JCAP)

References

Prof. Michele Moresco (Post-Doc supervisor): michele.moresco@unibo.it

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Dr. Alfonso Veropalumbo (PhD co-supervisor): alfonso.veropalumbo@inaf.it