

MICHELE MANCARELLA — Curriculum Vitae

✉ mancarella@cpt.univ-mrs.fr ◇ www.cpt.univ-mrs.fr/~mancarella

Cosmologist with background in theory, statistical analysis, machine learning. Experience in the private sector in the field of artificial intelligence and data science. Research interests include: gravitational waves, cosmology, multimessenger astrophysics, statistical methods, machine learning, modified gravity, dark energy.

CONTACT AND PERSONAL INFORMATION

- **Email:** mancarella@cpt.univ-mrs.fr
- **Address:** Centre de Physique Théorique, Campus de Luminy, Case 907 163 Avenue de Luminy, 13288 Marseille Cedex 9, France
- **Born:** October 16th, 1989, Italy
- **Citizenship:** Italian

RESEARCH AND PROFESSIONAL POSITIONS

Chaire d'Excellence (tenure-track professorship) <i>Centre de Physique Théorique (CPT), Aix-Marseille Université</i>	From April 2024 <i>Marseille, France</i>
--	---

- Responsibilities: group leader of project "COSMOAGG" with research grant from A*Midex foundation - Initiative of excellence; undergraduate, Master, Ph.D. -level teaching; Ph.D. and postdoc advisor and supervisor of masters internships.

Postdoctoral Researcher <i>Astrophysics unit, Department of Physics, University of Milan-Bicocca</i>	Oct 2022 - March 2024 <i>Milano, Italy</i>
--	---

- ERC-funded position (PI D. Gerosa). Responsibilities: teaching (Ph.D. level), supervision of master theses.

Postdoctoral Researcher <i>Department of Theoretical Physics, University of Geneva</i>	Oct 2019 - Sep 2022 <i>Genève, Switzerland</i>
--	---

- Research-oriented position. Responsibilities: teaching (undergraduate level), supervision of master theses, organization of seminars, journal clubs, machine learning meetings.

Data Science Fellow and freelance collaborator <i>Data ScienTest (startup)</i>	Mar-Jun 2018, Jan-Jun 2019 <i>Paris, France</i>
--	--

- Intensive program in Data Science; open-sourced machine learning tool for hate speech detection (🔗).
- Redaction of the english version of an introductory course in Data Science.

Artificial Intelligence Fellow <i>Pi School (startup)</i>	October-December 2018 <i>Roma, Italy</i>
---	---

- Development of deep learning tools with state-of-the-art Natural Language Processing models (🔗).

EDUCATION

Ph.D. in Cosmology <i>Institut de Physique Théorique, CEA-Saclay and University Paris-Saclay</i>	2014-2017 <i>Saclay, France</i>
--	------------------------------------

- Ph.D. Advisor: Filippo Vernizzi. Thesis title: "Consistency tests of the universe and cosmic relics"
- Support by the excellence program "Thèses Phares" by the French Commissariat à l'Énergie Atomique (CEA)

- Long-term visit at CERN (Switzerland), 8 months (2015-16)

Laurea Magistrale (Master's Degree) in Theoretical Physics

2011-2014

University of Pisa

Pisa, Italy

- Grade: 110/110 cum Laude (with distinction).
- Thesis advisor: Michele Maggiore. Thesis title: "Non-local gravity and dark energy". Thesis lead to 1 publication and 1 conference proceeding.
- Mobility: Erasmus Placement at Université de Genève, Switzerland (2013); Summer Undergraduate Research Experience (SURE), University of Leicester, UK (2012); Gravitational-Wave Astronomy Summer School, University of Texas at Brownsville, TX, USA (2012)

Laurea Triennale (Bachelor's Degree) in Physics

2008-2011

University of Pisa

Pisa, Italy

- Grade: 110 /110 cum Laude (with distinction).
- Mobility: INFN-LIGO Summer Exchange Programme, University of Mississippi, Oxford MS, USA (2010)

Maturità classica (High School Diploma in Classical Studies)

2003-2008

Liceo Classico "Giovanni Pascoli"

Gallarate, Italy

- Humanities-oriented high school. Final grade: 100/100.

INTERNATIONAL AND NATIONAL COLLABORATIONS

- **Einstein Telescope** collaboration. **Coordinator** of Division 9 (*Detector configurations and common tools*) of the Observational Science Board.
- **Virgo** collaboration. **Coordinator** of the *Cosmological pipeline development subgroup* within the CBC Cosmology group.
- **LISA** collaboration (full member)
- **EUCLID consortium** . **Deputy lead** of the Gravitational-Wave Science Working Group and **coordinator** of the *Dark Sirens* work package.
- **Groupement de Recherche Ondes Gravitationnelles**. **Coordinator** of the *cosmology* division.

METRICS

Scope	Papers	Preprints	Citations	h-index
All	84 (INSPIRE)	24 (INSPIRE)	7,301 (INSPIRE)	38 (INSPIRE)
Non-collaboration	37 (INSPIRE)	1 (INSPIRE)	2,026 (INSPIRE)	23 (INSPIRE)
Collaboration	47 (INSPIRE)	23 (INSPIRE)	5,275 (INSPIRE)	25 (INSPIRE)

Preprints are included in the paper totals.

Collaboration breakdown: 47 papers – LVK 40; ET 4; LISA 2; other 1.

Talks: 45 total; 23 invited.

Link to publication list	INSPIRE , NASA/ADS
ORCID ID	0000-0002-0675-508X
Scopus author ID	56272747400
Web of Science author ID	AAY-3766-2021
Software	pymcpop-gw  : high-dimensional GW population inference with HMC EF-TIGRE  : EFT of Interacting DE with Gravitational Redshift CHIMERA  : cosmology with BBH population models and galaxy catalogs GWFAST  : Fisher-matrix forecasts for gravitational-wave detectors MGCosmoPop  : cosmology with black holes population models DarkSirensStat  : cosmology with gravitational-wave/galaxy correlation BaCoN  : a bayesian neural network for dark matter power spectra
Link to software	Personal GitHub, CosmoStatGW repository

FUNDING AND SCHOLARSHIPS

Research grants

- **A*Midex foundation - Initiative of excellence grant**, PI, 600k EUR, N. AMX-22-CEI-02 COS-MOAGG "*Cosmology and Astrophysics with Gravitational Waves and Galaxy Catalogs*" 2024-2027

Computing

- **Centre de Calcul Intensif d'Aix-Marseille allocation**, PI, 2500000 CPU Hours "*GW-CROSS - Cross correlating gravitational-wave and galaxy surveys*" 2025-2026

Other funding

- Postdoc funding by ERC Starting Grant No. 945155-GWmining. PI Davide Gerosa 2022-2025
- Postdoc funding by Fond National Suisse, grant 200020_191957. PI Michele Maggiore 2021-2022
- Postdoc funding by the SwissMap National Center for Competence in Research, "FT Felder G" Grant N. S19320. PI Michele Maggiore 2019-2020
- Artificial Intelligence fellowship, Pi School, Rome, Italy. 2018
- Ph.D. scholarship "Consistency tests of the Universe and cosmic relics" by the excellence program "Thésés Phares" of the French Commissariat à l'Energie Atomique (CEA). Advisor and Principal Investigator: Filippo Vernizzi. 2014-2017

Scholarships

- Data Science scholarship "Aide Individuel à la formation" , City of Paris, France. 2018
- Erasmus Placement scholarship (from University of Pisa to University of Geneva). 2013/14
- Summer Undergraduate Research Experience (SURE) scholarship, University of Leicester, UK 2012
- Gravitational-Wave Astronomy travel grant, University of Texas at Brownsville, TX, USA 2012
- University of Pisa outreach fellowship, Pisa, Italy 2011/12
- INFN-LIGO Summer Exchange program grant, from INFN Pisa to University of Mississippi, Oxford MS, USA. 2010

SERVICE

Positions

- Permanent position as a high school teacher in Physics, Italian Ministry of Education. On leave for research from Sep. 2022

Qualifications

- Italian qualification for the role of assistant professor, Sec. 02/A2 (Theoretical Physics of Fundamental Interactions) from 2023
- French "Qualification aux fonctions de maître de conférences", Sec. 29 (Constituants élémentaires), N. 23229345855 from 01/02/2023
- French "Qualification aux fonctions de maître de conférences", Sec. 34 (Astronomie, astrophysique), N. 23234345855 from 02/02/2023

Professional activities

- Machine Learning Meetings organizer, University of Geneva 2019/20, 2020/21
- Journal Club organizer, University of Geneva 2019/20, 2020/21
- Cosmology and Particle Physics Seminars organizer, University of Geneva 2019/20
- Undergraduate students' representative, Physics department council, University of Pisa 2012-2014

Referee

- Journals: Physical Review Letters, Physical Review D, Journal for Cosmology and Astroparticle Physics, The Astrophysical Journal
- Grants: ERC, Swiss National Foundation

Organisation of conferences and schools

- 5th MaNiTou Summer School on Gravitational Waves (Marseille, France), member of Organising Committee 2025
- 8th general meeting of the French Gravitational-Wave Research Network (GdR) (Marseille, France), member of Organising Committee 2024
- Conference "Gravitational-wave populations: what's next?" (Milan, Italy), member of Local Organising Committee 2023

TEACHING, MENTORING, OUTREACH

Hired postdocs

- Viola De Renzi (Aix-Marseille Univ.) 2024-2027
- Sayantani Bera (Aix-Marseille Univ.) 2024-2027

Ph.D. student supervision

- Alessandro Agapito (Aix-Marseille Univ.), 100% 2024-2027
- Alessandro Pedrotti (Aix-Marseille Univ.), co-supervision 2024-2027

Incoming visitors

- Andrea Begnoni (Univ. of Padova), visiting PhD 2025
- Felipe Barbosa (Universidade Federal do Espírito Santo), visiting PhD 2025
- P. Zeduri (Univ. of Milan-Bicocca), Erasmus Placement 2025

Ph.D courses

- "Multi-messenger cosmology" (co-teaching, 3 hrs/yr taught), Aix-Marseille Université 2025, 2026
- "Current and future challenges in gravitational-wave astronomy" (co-teaching, 15 hrs total, 5 hrs taught), Univ. Milan-Bicocca 2023

Master courses

- "The Relativistic Universe" - module on Gravitational Waves, Aix-Marseille Univ., 8 hrs/yr 2024, 2025

Undergraduate courses

- Special and General Relativity (Relativité restreinte et générale, Systèmes du monde - L3), 15 hrs/yr
2024/25, 2025/26
- Electrodynamics II (teaching assistant), Univ. de Genève, 2019/20, 2020/21, 2021/22
- Mathematical Methods for Physicists I (teaching assistant) Univ. de Genève, 2021/22

Undergraduate students' mentoring

- P. Zeduri, Università Milano Bicocca / Aix-Marseille Université, Master's thesis 2025-26
- M. Santoni, Aix-Marseille Université, Master's thesis 2025
- A. Pedrotti, Università Milano Bicocca, Master's thesis 2023-24
- S. Sferlazzo, Università Milano Bicocca, Bachelor's thesis 2023
- L. Carbone, Università Milano Bicocca, Bachelor's thesis "*Assessing the measurability of black-hole spin parameters with next-generation gravitational-wave observatories*" 2023
- M. Schulz, Università di Bologna, Master thesis "*Dark Sirens as Cosmological Probes*" 2022
- B. Hertzsch, ETH Zurich, Summer project "*Autoencoding Star Formation from Cosmological Parameters*" 2021
- E. Genoud-Prachex, University of Geneva, Master thesis "*Constraining modified gravitational wave propagation with the black hole mass gap*" 2020/21
- F. Iacovelli, University of Rome La Sapienza, Master thesis "*Cosmology with gravitational waves: coalescing binaries without electromagnetic counterpart*" (Co-supervision) 2019/20

Outreach

- Mentor of high school students within the *Athéna* program at the University of Geneva 2021
- Seminar for general public and researchers in social sciences: "*A critical perspective on algorithms between data science and social sciences*", Maison des Sciences Economiques, Paris, France. 2018
- Guide for the permanent exposition on Physics and History of Science of the University of Pisa 2011/12
- Seminars for high school students within the "Science Week" of the city of Gallarate, Italy: introduction to General Relativity and Gravitational Waves 2010, 2016

SKILLS AND LANGUAGES

Computing	Python (> 1000 lines), Mathematica (> 500 lines), R, C, Matlab (> 100 lines), Bash, Git, slurm
Libraries	scikit-learn, NumPy, SciPy, Matplotlib, pandas, keras, tensorflow, PySpark, pytorch, caret, ggplot, dplyr, pymc, numpyro, jax
Languages	Italian (Mother Tongue), English (fluent), French (Fluent)