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Summary

Publications: **9** papers published in major peer–reviewed journals, **2** papers in submission stage, **2** public codes, **5** proceedings.

Total number of citations: 225 [iNSPIRE] – 219 [NASA/ADS]

h-index: 6

Links to publication list: iNSPIRE, NASA/ADS, Scholar

Publications

Alphabetical order is the standard publication policy in Theoretical Cosmology, regardless of the actual contribution of the authors, and the group where I am working during my Ph.D. usually adopts such practice. I will therefore add a brief summary of my contribution to each paper I am not the first author of.

Papers in major peer-reviewed journals

[9] G. Franciolini, **F. Iacovelli**, M. Mancarella, M. Maggiore, P. Pani and A. Riotto. "Searching for Primordial Black Holes with the Einstein Telescope: impact of design and systematics". In *Phys. Rev. D* . 108, 043506 (2023). DOI: 10.1103/PhysRevD.108.043506. arXiv: 2304.03160 [gr-qc].
My contribution can be considered as first author. I had a major role in the theoretical development and writing of the paper, and I also produced many of the reported results.

[8] M. Branchesi, M. Maggiore, et al. (incl. **F. Iacovelli**). "Science with the Einstein Telescope: a comparison of different designs". In *JCAP* 07 (2023) 068. DOI: 10.1088/1475-7516/2023/07/068. arXiv: 2303.15923 [gr-qc].
I took part in the development of various sections of the work, producing in particular most of the results in the "Coalescence of compact binaries" section, and participating in the "Nuclear physics", "Population studies" and "Cosmology" sections.

[7] M. Mancarella, **F. Iacovelli**, D. Gerosa. "Inferring, not just detecting: metrics for high-redshift sources observed with third-generation gravitational-wave detectors". In *Phys. Rev. D* . 107, L101302 (2023). DOI: 10.1103/PhysRevD.107.L101302. arXiv: 2303.16323 [gr-qc].
I participated in the theoretical development and writing of the paper, also producing part of the reported results (in particular the 'inference horizon').

[6] M. Kole, **F. Iacovelli**, M. Mancarella, N. Produit. "Adding Gamma-ray Polarimetry to the Multi-Messenger Era". In *Astron. Astrophys.* 669 (2023) A77. DOI: 10.1051/0004-6361/202245205. arXiv: 2211.12403 [astro-ph.HE].
I produced the results and plots of the gravitational wave part, also participating in the theoretical development of the paper.

[5] **F. Iacovelli**, M. Mancarella, S. Foffa, M. Maggiore. "Forecasting the detection capabilities of third-generation gravitational-wave detectors using GWFAST". In *Astrophys. J.* 941 (2022) 2, 208. DOI: 10.3847/1538-4357/ac9cd4. arXiv: 2207.02771 [gr-qc].

[4] **F. Iacovelli**, M. Mancarella, S. Foffa, M. Maggiore. "GWFAST: A Fisher Information Matrix Python Code for Third-generation Gravitational-wave Detectors". In *Astrophys. J. Supp.* 263 (2022) 1, 2. DOI: 10.3847/1538-4365/ac9129. arXiv: 2207.06910 [astro-ph.IM].

[3] A. Finke, S. Foffa, **F. Iacovelli**, M. Maggiore, and M. Mancarella. "Modified gravitational wave propagation and the binary neutron star mass function". In: *Phys. Dark Univ.* 36 (2022) 100994. DOI: 10.1016/j.dark.2022.100994. arXiv: 2108.04065 [gr-qc].
I produced most of the results results, figures, and code, developing also a useful data visualization technique.

[2] A. Finke, S. Foffa, **F. Iacovelli**, M. Maggiore, and M. Mancarella. "Probing modified gravitational wave propagation with strongly lensed coalescing binaries". In: *Phys. Rev. D* 104.8 (2021), p.

084057. DOI: 10.1103/PhysRevD.104.084057. arXiv: 2107.05046 [gr-qc].
I produced most of the results results and figures within this paper, wrote the necessary code, and also contributed to the development of the theoretical framework.

[1] A. Finke, S. Foffa, **F. Iacovelli**, M. Maggiore, and M. Mancarella. "Cosmology with LIGO/Virgo dark sirens: Hubble parameter and modified gravitational wave propagation". In: *JCAP* 08 (2021), p. 026. DOI: 10.1088/1475-7516/2021/08/026. arXiv: 2101.12660 [astro-ph.CO].
This work is part of my Master's thesis, and I contributed writing parts of the accompanying code, studying in depth and handling the problem of the completeness of galaxy catalogs, as well as producing most of the figures and results.

Papers under review

[2] A. Colombo, R. Duqué, et al. (incl. **F. Iacovelli**). "Multi-messenger prospects for black hole – neutron star mergers in the O4 and O5 runs". 2023. arXiv: 2310.16894 [astro-ph.HE].
I took care of the gravitational wave modelling aspects of the paper, writing the relative part and producing the results of the gravitational wave observational prospects.

[1] **F. Iacovelli**, M. Mancarella, et al. "Nuclear physics constraints from binary neutron star mergers in the Einstein Telescope era". 2023. arXiv: 2308.12378 [gr-qc].

Public software

[2] **F. Iacovelli**, M. Mancarella. GWFAST: a Fisher information matrix Python package for GW detector networks. ascl: 2212.001. Git: https://github.com/CosmoStatGW/gwfast.

[1] **F. Iacovelli**. WF4Py: Gravitational waves waveform models in pure Python language. ascl: 2301.003 Git: https://github.com/CosmoStatGW/WF4Py.

Proceedings

[5] * **F. Iacovelli**, M. Mancarella., S. Foffa, M. Maggiore. "GWFAST: A tool to explore the capabilities of Third-generation Gravitational-wave Interferometers". In *Proceedings, PUMA22*. 2022. *Genova University Press* "Probing the Universe with Multimessenger Astronomy" p.68. e-ISBN: 978-88-3618-218-3.

[4] * M. Mancarella, N. Borghi, S. Foffa, E. Genoud-Prachex, **F. Iacovelli**, M. Maggiore, M. Moresco, M. Schulz. "Gravitational-wave cosmology with dark sirens: state of the art and perspectives for 3G detectors". In *PoS ICHEP2022 127*. 2022. arXiv: arXiv:2211.15512 [gr-qc].

[3] * **F. Iacovelli**, A. Finke, S. Foffa, M. Maggiore, M. Mancarella. "Modified gravitational wave propagation: information from strongly lensed binaries and the BNS mass function". In *Proceedings, 56th Rencontres de Moriond on Gravitation*. 2022. arXiv: arXiv:2203.09237 [gr-qc].

[2] * M. Mancarella, A. Finke, S. Foffa, E. Genoud-Prachex, **F. Iacovelli**, M. Maggiore. "Cosmology and modified gravity with dark sirens from GWTC-3". In *Proceedings, 56th Rencontres de Moriond on Gravitation*. 2022. arXiv: arXiv:2203.09238 [gr-qc].

[1] * A. Finke, S. Foffa, **F. Iacovelli**, M. Maggiore, and M. Mancarella. "Constraining the Hubble constant and modified GW propagation with LIGO/Virgo dark sirens". In: *Proceedings, 55th Rencontres de Moriond on Cosmology*. 2021.