

Riccardo Buscicchio | Curriculum Vitæ

riccardo.buscicchio@unimib.it • www.riccardobuscicchio.com • December 13, 2025

Relativistic astrophysicist, advanced data analysis and statistical frameworks for Bayesian and frequentist inference. Space-mission modelling, signal detection and parameter estimation in gravitational-wave astronomy. Gravitational-wave lensing. Population inference, stochastic background searches. Milky Way morphology, supernovae precursors, supermassive black holes accretion model inference.

Contacts

Email: riccardo.buscicchio@unimib.it

Address: Università degli Studi di Milano-Bicocca, Piazza della Scienza 3, 20126 Milano, Italy.

Nationality: Italy

Website & publications record: www.riccardobuscicchio.com – [arXiv](#) – [ORCID](#)

Academic positions

Università degli Studi di Milano-Bicocca	Milan, Italy
Postdoc (Assegnista di ricerca), Department of Physics “G.Occhialini”	2021 - 2024
◦ Main activity: development of LISA data analysis ground-segment for the Italian Space Agency (Phase A).	
Università degli Studi di Milano-Bicocca	Milan, Italy
Postdoc (Assegnista di ricerca), Department of Physics “G.Occhialini”	2024 - current
◦ Main activity: development of LISA data analysis ground-segment for the Italian Space Agency (Phase B).	

Education

University of Birmingham	Birmingham, UK
Ph.D., School of Physics & Astronomy	2017-13/07/2022
◦ Supervisor: A. Vecchio. Thesis resulted in 6 short-author publications.	
◦ Thesis Title: Topics in Bayesian population inference for Gravitational Wave Astronomy	

This thesis explores a number of topics related to Bayesian inference in gravitational-wave astronomy. From hierarchical inference on population of stellar mass binary black hole mergers, to the development of an end-to-end parameter estimation routine for space-based interferometers. Other topics are investigated: population of binary white dwarfs in satellite galaxies of the Milky Way; constraints from stochastic background on lensing of gravitational waves from binary neutron star and binary black hole mergers; statistical techniques for simultaneous inference on multiple undistinguishable sources.

Università degli Studi di Pisa	Pisa, Italy
Master's degree in Theoretical physics	2013-2016
◦ Final degree grade: 110/110	
◦ Supervisor: G. Cella. Thesis resulted in one short-author publications.	
◦ Thesis title: An improved detector for non-gaussian stochastic background of gravitational waves.	

This thesis explored the idea of using functional formalism from stochastic processes and classical field theory to develop a new detection algorithm, with improved performance, for non-gaussian stochastic backgrounds of gravitational waves.

Columbia University	New York NY, USA
INFN-NSF Summer Internship	Jun-Sept 2013
◦ Supervisor: S. Marka, I. Bartos.	

We estimated the contribution to noise level in second and third generation ground-based detectors due to primary and secondary cosmic ray showers impinging on the interferometer mirrors.

Università degli Studi di Pisa	Pisa, Italy
Bachelor's degree in Physics	2008-2012

- *Final degree grade*: 109/110.
- *Thesis title*: Template banks for gravitational wave detection: an application of Information Geometry.

This thesis explored the idea of using differential geometry formalism (as defined in the context of Information theory) to develop a template placing algorithm over source parameter space with non-trivial manifold structure.

Metrics

Publications:

- 32** short-author papers published in major peer-reviewed journals
(out of which **8** first-authored papers and **8** lead by supervised student).
- 13** collaboration papers with substantial contribution, published in major peer-reviewed journals
- 60** collaboration papers in total, published in major peer-reviewed journals
- 8** papers in submission stage,
- 2** other publications (thesis, white papers, reviews)

Total number of citations: >17000. **h-index**: 25 (from ADS and iNSPIRE record).

Web links to list services: [ADS](#); [iNSPIRE](#); [arXiv](#); [orcid](#).

Full list of publications available below and at www.riccardobuscicchio.com/publications.

Full list of presentations available below and at www.riccardobuscicchio.com/talks.

Codes & Datasets

Title	Code	Dataset	Zenodo DOI	Public
◦ Bahamas Galactic Foreground	✓	✓	10.5281/zenodo.17527235	✓
◦ Bahamas	✓		10.5281/zenodo.16087705	✓
◦ Hypertriangulation Map	✓		10.5281/zenodo.13897708	✓
◦ Bayesian PowerLaw Sensitivity	✓	✓	10.5281/zenodo.14384633	✓
◦ Milky Way Satellites		✓	10.5281/zenodo.3668904	✓
◦ LISA stellar BBH catalogues and samples	✓	✓	10.5281/zenodo.14426778	✓
◦ LISA MBHB catalogues and samples		✓	10.5281/zenodo.13787674	✓
◦ Chirp Gravitational Wave Alerts	✓		10.5281/zenodo.3525063	✓

Grants, Prizes, & Awards

Career prizes:

- Braccini PhD Thesis Prize, Gravitational Wave International Committee honorable mention. 2021
- Michael Penston PhD Thesis Prize, Royal Astronomical Society runner-up prize. 2021

Grants:

- Royal Society of Edinburgh “Gravity under the lens” (col, PI Dr. Berry, Univ. of Glasgow, UK) 2025-2027
- EuroHPC PRACE “LABELFIT” proposal, 224k CPUh on Leonardo DCGP 2025
- EuroHPC PRACE “LISA-FIT” proposal, 100k CPUh on Leonardo BOOSTER 2023
- Google Cloud for Researchers, 4kEUR Google Cloud Research Credits 2023
- CINECA ISCRA Type-C project “LISA-MW” proposal, 10k CPUh at the Italian National HPC center. 2022
- Travel Grant, Horizon 2020 AHEAD 2020 (High Energy Astrophysics) 2021
- Travel Grant, American Physical Society, DGRAV Student Travel Grant 2020
- Travel Grant, Institute of Physics Student Travel fund 2019
- Travel Grant, Royal Astronomical Society, UK. 2018

Invited research visits:

- Kavli visitor program research visit — DAMTP Univ. Cambridge, Cambridge, UK 07/10/2024-18/10/2024
- Research visit — Max Planck Institute for Astrophysics, Garching, DE 23/11/2023-30/11/2023
- Research visit — Albert Einstein Institute, Potsdam, DE 16/04/2023-23/04/2023
- Research visit — Univ. of Stavanger, Stavanger, NO 08/02/2023-29/03/2023
- AHEAD 2020 program research visit — APC, Univ. Paris Diderot, Paris, FR 01/12/2023-07/01/2023
- Research visit — APC, Univ. Paris Diderot, Paris, FR 26/10/2022-30/11/2022
- Research visit — Univ. of Stavanger, Stavanger, NO 26/09/2022-19/10/2022

- Research visit — Univ. of Birmingham, Birmingham, UK
- Research visit — Columbia University, New York, US

05/07/2022-10/07/2022

06/04/2022-13/04/2022

Student supervision

According to current national regulations, as a research fellow I cannot be officially appointed as supervisor of students at any level. However, upon agreement with the relevant permanent staff, I have supervised the work of students in the percentages shown below.

Ph.D. student co-supervisor:

- B. Saiguhan, University of Milano-Bicocca, PhD, 100% 2025-2028
- L. Viganò, University of Milano-Bicocca, PhD, 80% 2025-2028
- F. Nobili, University of Insubria, PhD, 100% 2024-2027
- A. Spadaro, University of Milano-Bicocca, PhD, 100% 2022-2025
- F. Pozzoli, University of Insubria, PhD, 100% 2022-2025

MSc student co-supervision:

- R. Bosoni De Martini, University of Milano-Bicocca, Master's thesis, 100% 2025-2026
- L. Viganò, University of Milano-Bicocca, Master's thesis, 100% 2024-2025
(now PhD student at Univ. of Milano-Bicocca)
- M. Bellotti, University of Milano-Bicocca, Master's thesis, 100% 2024-2025
(now PhD student at Observatoire Cote d'Azur)
- D. Chirico, University of Milano-Bicocca, Master's thesis, 100% 2023-2024
- S. Corbo, Politecnico di Milano, Master's thesis, 100% 2023-2024
- R. Rosso, University of Pisa, Master's thesis, 80% 2023-2024
(now PhD student at Univ. of Pisa)
- G. Astorino, University of Pisa, Master's thesis, 80% 2023-2024
(now PhD student at Univ. of Pisa)
- M. Piarulli, University of Milano-Bicocca, Master's thesis, 100% 2022-2023
(now PhD student at Univ. of Toulouse)
- A. Spadaro, University of Milano-Bicocca, Master's thesis, 100% 2021-2022
(now PhD student at Univ. of Milano-Bicocca)
- A. Carzaniga, University of Milano-Bicocca, Master's thesis, 100% 2021-2022
- A. Geminardi, University of Milano-Bicocca, Master's thesis, 100% 2021-2022
(now PhD student at Univ. of Pavia)
- E. Finch, University of Birmingham, Year 4 project, 50% 2018
- V. Spasova, University of Birmingham, Year 4 project, 50% 2018

BSc student supervision:

- H. P. G. Carabajo, University of Milano-Bicocca, Bachelor's thesis, 100% 2023-2024

Taught classes

Acad.Year

- **Inference models in LISA**, PhD course, Univ. of Trento (Italy). 2026
- **Current and future challenges in GW astronomy**, PhD course, Milano-Bicocca (Italy). 2023
Content: Introduction to gravitational-wave data analysis.
Space-based and ground-based interferometers.
Source populations: compact object binaries, stochastic backgrounds.
- **Mathematical physics and gravity** (MAF900), PhD course, Univ. of Stavanger (Norway). 2023
Content: Introduction to gravitational-wave data analysis. Space-based interferometers.
Source populations: compact object binaries, stochastic backgrounds.
Signal modeling: galactic and extragalactic compact object binaries
astrophysical and cosmological stochastic backgrounds.
Signal detection and parameter estimation: frequentist and Bayesian approaches.
Advanced stochastic sampling techniques.
- **Lecture in Astrostatistics** (F5802Q014/20), Astrophysics MSc, Univ. of Milano-Bicocca (Italy) 2022
Content: Source populations: compact object binaries, stochastic backgrounds.

Introduction to gravitational-wave data analysis. Space-based interferometers.
Signal detection and parameter estimation: frequentist and Bayesian approaches.

Tutoring	Acad.Year
<ul style="list-style-type: none"> ○ Python Computing Lab, Bachelor's degree in Physics, Univ. of Birmingham, UK Content: Python programming, simulation of physical systems in celestial and classical mechanics, thermodynamics, electromagnetism. Data analysis. 	2017-2021
<ul style="list-style-type: none"> ○ Maths for physicists, Bachelor's degree in Physics, Univ. of Birmingham, UK Content: Linear algebra, differential and integral calculus, differential equations Groups and representations theory 	2017-2019
<ul style="list-style-type: none"> ○ Physics and communication skills, Master's degree in Physics, Univ. of Birmingham, UK. Content: \LaTeX basics. Drafting of lab reports, publications, seminars 	2019

Academic service, editorial and research responsibilities

International collaboration responsibilities

○ LISA Consortium AstroWG coordinator, project "Updatable predictions for stBBH in LISA"	2025-2026
○ PAQA co-chair of the Coordination Unit L2D (Global Fit, ESA LISA Project Office)	2024-2026
○ DDPC-Italy Lead of the LISA DDPC national coordination initiative	2024-2026

Journal referee

○ Physical Review Letters	○ Physical Review D
○ The Astrophysical Journal Letters	○ The Open Journal of Astrophysics
○ Journal of Cosmology and Astroparticle Physics	○ NASA Technology Transfer Program
○ Monthly Notices of the Royal Astronomical Society	○ IoP Classical and Quantum Gravity
○ Institute of Physics Machine Learning: Science and Technology	○ Institute of Physics Trusted Reviewer Excellence program

Editorial responsibilities

○ Editorial board Lensing working group in the LIGO, Virgo, KAGRA collaboration	2023
○ Co-editor of a Living Review in relativity issue on "LISA data analysis"	2022-2023

Conference organizer

○ <i>LISA Without Frontiers</i> Workshop Sprint Session Coach, Sexten, IT.	2026
○ <i>LISA Distributed Data Processing Center June Workshop</i> , Milan, IT.	2025
○ IFPU focus week on " <i>Emerging methods in GW population inference</i> ", Trieste, Italy.	2024
○ <i>LISA Astrophysics Working Group Conference</i> , Birmingham, UK.	2022
○ <i>Gravitational-wave populations: what's next?</i> , Milan, Italy.	2023
○ <i>Gravitational-wave Excellence Alliance Training (GrEAT) PhD school</i> , Birmingham, UK.	2019
○ <i>Gravitational-wave Open Science Center First Open Data Workshop</i> , (online)	2019

Outreach & public engagement

○ Orientation activities for high-school students as part of the <i>PNRR Orientation</i> project, Milan, Italy.	2024-2025
○ Development of illustrations and animations for LISA Consortium	2023
○ Development of illustrations and graphic content for LIGO Magazine	2022-2023
○ Development of visualisation interface and skymaps content for GW alerts web and smartphone app. https://chirp.sr.bham.ac.uk	2022-2023
○ Organization of biweekly public engagement events " <i>Astronomy in the city</i> ", Birmingham, UK	2017-2021
○ Organizer of the "PhD meet and greet" event series, University of Birmingham	2021
○ Lectures to high-school students, Italy	since 2021

Professional recognition and service

○ National Scientific Habilitation (ASN) as associated professor. in Astrophysics, Cosmology and Space Science (GSD 02/PHYS-05 - PHYS-05/A)	2023
○ French Qualification for teaching in Higher Education in Astrophysics (Sec.34), French Ministry of higher education and research (qualification no.23234388826).	2023
○ LSC Academic Advisory Committee.	2019-2021
○ Secretary for the Research Fellows Council, University of Milano-Bicocca	2024-2025

- Research Fellow Representative, Department of Physics, University of Milano-Bicocca 2023-2025

Memberships

- LISA Distributed Data Processing Center, full member. since 2024
- LISA Consortium, core member. since 2018
- Italian Center for Supercomputing (ICSC). since 2021
- TEONGRAV National Initiative (Gravity Theory) since 2021
Italian National Institute for Nuclear Physics (INFN).
- LIGO, Virgo, Kagra Collaboration, full member. since 2017
- Italian Society of General Relativity and Gravitational Physics (SIGRAV) since 2021
- Istituto Nazionale di Astrofisica (INAF) since 2021
- American Physical Society (APS), member.
- Italian Physical Society (SIF), member 2021
- Royal Astronomical Society (RAS), fellow. 2018-2021

Skills

Programming languages: Python (advanced), Bash (advanced), Julia (advanced), R (advanced), Mathematica, Go, Stan, C, Qt5.

Other scientific tools: PyTorch, TensorFlow, LIGO lalsuite, \LaTeX , git, HPC tools, containerization, continuous integration, cloud computing, web development.

Languages: English (fluent), Italian (native), French (basic)

Hobbies

Swimming, running, rock climbing, photography. Sci-fi books, electronic music.

Publications

Submitted short-author and collaboration papers which I have substantially contributed to:

Supervised students publications marked with *.

- 8.* *samsara: A Continuous-Time Markov Chain Monte Carlo Sampler for Trans-Dimensional Bayesian Analysis.*
G. Astorino, L. Valbusa Dall'Armi, **R. Buscicchio**, J. Pomper, A. Ricciardone, W. Del Pozzo.
[arXiv:2511.07385 \[stat.CO\]](#).
7. *The first year of LISA Galactic foreground.*
R. Buscicchio, F. Pozzoli, D. Chirico, A. Sesana.
[arXiv:2511.03604 \[astro-ph.IM\]](#).
6. *Functional inference on deviations from General Relativity.*
C. Pacilio, **R. Buscicchio**.
[arXiv:2507.13454 \[gr-qc\]](#).
5. *GWTC-4.0: Updating the Gravitational-Wave Transient Catalog with Observations from the First Part of the Fourth LIGO-Virgo-KAGRA Observing Run.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
[arXiv:2508.18082 \[gr-qc\]](#).
4. *Comparing astrophysical models to gravitational-wave data in the observable space.*
A. Toubiana, D. Gerosa, M. Mould, S. Rinaldi, M. Arca Sedda, T. Bruel, **R. Buscicchio**, J. Gair, L. Paiella, F. Santoliquido, R. Tenorio, C. Ugolini.
[arXiv:2507.13249 \[gr-qc\]](#).
- 3.* *Bahamas: BAYesian inference with HAMILtonian Montecarlo for Astrophysical Stochastic background.*
F. Pozzoli, **R. Buscicchio**, A. Klein, D. Chirico.
[arXiv:2506.22542 \[astro-ph.IM\]](#).
2. *LISA Definition Study Report.*
M. Colpi, K. Danzmann, M. Hewitson, K. Holley-Bockelmann, et al. (incl. **R. Buscicchio**).
[arXiv:2402.07571 \[astro-ph.CO\]](#).
1. *The last three years: multiband gravitational-wave observations of stellar-mass binary black holes.*
A. Klein, G. Pratten, **R. Buscicchio**, P. Schmidt, C. J. Moore, E. Finch, A. Bonino, L. M. Thomas, N. Williams, D. Gerosa, S. McGee, M. Nicholl, A. Vecchio.
[arXiv:2204.03423 \[astro-ph.HE\]](#).

Short-author papers published in major peer-reviewed journals:

Supervised students publications marked with *.

- 32.* *Environmental effects in the LISA stochastic signal from stellar-mass black hole binaries.*
R. Chen, R. S. Chandramouli, F. Pozzoli, **R. Buscicchio**, E. Barausse.
Physical Review D 112, (2025) 084053. [arXiv:2507.00694 \[gr-qc\]](#).
31. *Variability in the massive black hole binary candidate SDSS J2320+0024: no evidence for periodic modulation.*
F. Rigamonti, L. Bertassi, **R. Buscicchio**, F. Cocchiararo, S. Covino, M. Dotti, A. Sesana, P. Severgnini.
Astronomy & Astrophysics 702 (2025) A242. [arXiv:2505.22706 \[astro-ph.GA\]](#).
- 30.* *Is the stochastic signal really detectable?.*
F. Pozzoli, J. Gair, **R. Buscicchio**, L. Speri.
Physical Review D 112, (2025) 064035. [arXiv:2412.10468 \[astro-ph.IM\]](#).
29. *A test for LISA foreground Gaussianity and stationarity. I. Galactic white-dwarf binaries.*
R. Buscicchio, A. Klein, V. Korol, F. Di Renzo, C.J. Moore, D. Gerosa, A. Carzaniga.
European Physical Journal C 85, (2025) 887. [arXiv:2410.08263 \[astro-ph.HE\]](#).
- 28.* *Accelerating LISA inference with Gaussian processes.*
J. El Gammal, **R. Buscicchio**, G. Nardini, J. Torrado.
Physical Review D 112, (2025) 063010. [arXiv:2503.21871 \[astro-ph.HE\]](#).
- 27.* *Test for LISA foreground Gaussianity and stationarity: extreme mass-ratio inspirals.*
M. Pirulli, **R. Buscicchio**, F. Pozzoli, O. Burke, M. Bonetti, A. Sesana.
Physical Review D 111, (2025) 103047. [arXiv:2410.08862 \[astro-ph.HE\]](#).
- 26.* *Cyclostationary signals in LISA: a practical application to Milky Way satellites.*
F. Pozzoli, **R. Buscicchio**, A. Klein, V. Korol, A. Sesana, F. Haardt.
Physical Review D 111, (2025) 063005. [arXiv:2410.08274 \[astro-ph.GA\]](#).

25. *Characterization of non-Gaussian stochastic signals with heavier-tailed likelihoods.*
N. Karnesis, A. Sasli, **R. Buscicchio**, N. Stergioulas.
[Physical Review D 111, \(2025\) 022005. arXiv:2410.14354 \[gr-qc\].](#)
24. *Stellar-mass black-hole binaries in LISA: characteristics and complementarity with current-generation interferometers.*
R. Buscicchio, J. Torrado, C. Caprini, G. Nardini, M. Pieroni, N. Karnesis, A. Sesana.
[Journal of Cosmology and Astroparticle Physics 01 \(2025\) 084. arXiv:2410.18171 \[astro-ph.HE\].](#)
- 23.* *Stars or gas? Constraining the hardening processes of massive black-hole binaries with LISA.*
A. Spadaro, **R. Buscicchio**, D. Izquierdo-Villalba, D. Gerosa, A. Klein, G. Pratten.
[Physical Review D 111, \(2025\) 023004. arXiv:2409.13011 \[astro-ph.HE\].](#)
22. *Partial alignment between jets and megamasers: coherent or selective accretion?.*
M. Dotti, **R. Buscicchio**, F. Bollati, R. Decarli, W. Del Pozzo, A. Franchini.
[Astronomy & Astrophysics 692 \(2024\) A233. arXiv:2403.18002 \[astro-ph.GA\].](#)
21. *Expected insights on type Ia supernovae from LISA's gravitational wave observations.*
V. Korol, **R. Buscicchio**, Ruediger Pakmor, Javier Morán-Fraile, Christopher J. Moore, Selma E. de Mink.
[Astronomy & Astrophysics 691 \(2024\) A44. arXiv:2407.03935 \[astro-ph.HE\].](#)
- 20.* *A weakly-parametric approach to stochastic background inference in LISA.*
F. Pozzoli, **R. Buscicchio**, C. J. Moore, A. Sesana, F. Haardt, A. Sesana.
[Physical Review D 109, \(2024\) 083029. arXiv:2311.12111 \[astro-ph.CO\].](#)
19. *A fast test for the identification and confirmation of massive black hole binary.*
M. Dotti, F. Rigamonti, S. Rinaldi, W. Del Pozzo, R. Decarli, **R. Buscicchio**.
[Astronomy & Astrophysics 680 \(2023\) A69. arXiv:2310.06896 \[astro-ph.HE\].](#)
- 18.* *Glitch systematics on the observation of massive black-hole binaries with LISA.*
A. Spadaro, **R. Buscicchio**, D. Vetrugno, A. Klein, D. Gerosa, S. Vitale, R. Dolesi, W. J. Weber, M. Colpi.
[Physical Review D 108 \(2023\) 123029. arXiv:2306.03923 \[gr-qc\].](#)
17. *Implications of pulsar timing array observations for LISA detections of massive black hole binaries.*
N. Steinle, H. Middleton, C. J. Moore, S. Chen, A. Klein, G. Pratten, **R. Buscicchio**, E. Finch, A. Vecchio.
[Monthly Notices of the Royal Astronomical Society 525 2 \(2023\). arXiv:2305.05955 \[astro-ph.HE\].](#)
16. *Parameter estimation of binary black holes in the endpoint of the up-down instability.*
V. De Renzi, D. Gerosa, M. Mould, **R. Buscicchio**, L. Zanga.
[Physical Review D 108 \(2023\) 024024. arXiv:2304.13063 \[gr-qc\].](#)
15. *Improved detection statistics for non Gaussian gravitational wave stochastic backgrounds.*
M. Ballelli, **R. Buscicchio**, B. Patricelli, A. Ain, G. Cella.
[Physical Review D 107 \(2023\) 124044. arXiv:2212.10038 \[gr-qc\].](#)
14. *Detecting non-Gaussian gravitational wave backgrounds: a unified framework.*
R. Buscicchio, A. Ain, M. Ballelli, G. Cella, B. Patricelli.
[Physical Review D 107 \(2023\) 063027. arXiv:2209.01400 \[gr-qc\].](#)
13. *Detectability of a spatial correlation between stellar-mass black hole mergers and Active Galactic Nuclei in the Local Universe.*
N. Veronesi, E.M. Rossi, S. van Velzen, **R. Buscicchio**.
[Monthly Notices of the Royal Astronomical Society 514 2 \(2023\). arXiv:2203.05907 \[astro-ph.HE\].](#)
12. *Bayesian parameter estimation of stellar-mass black-hole binaries with LISA.*
R. Buscicchio, A. Klein, E. Roebber, C. J. Moore, D. Gerosa, E. Finch, A. Vecchio.
[Physical Review D 104 \(2021\) 044065. arXiv:2106.05259 \[astro-ph.HE\].](#)
11. *An Interactive Gravitational-Wave Detector Model for Museums and Fairs.*
S. J. Cooper, A. C. Green, H. R. Middleton, C. P. L. Berry, **R. Buscicchio**, E. Butler, C. J. Collins, C. Gettings, D. Hoyland, A. W. Jones, J. H. Lindon, I. Romero-Shaw, S. P. Stevenson, E. P. Takeva, S. Vinciguerra, A. Vecchio, C. M. Mow-Lowry, A. Freise.
[American Journal of Physics 89 \(2021\) 702–712. arXiv:2004.03052 \[physics.ed-ph\].](#)
10. *Evidence for hierarchical black hole mergers in the second LIGO–Virgo gravitational-wave catalog.*
C. Kimball, C. Talbot, C.P.L. Berry, M. Zevin, E. Thrane, V. Kalogera, **R. Buscicchio**, M. Carney, T. Dent, H. Middleton, E. Payne, J. Veitch, D. Williams .
[Astrophysical Journal Letters 915 \(2021\) L35. arXiv:2011.05332 \[astro-ph.HE\].](#)
9. *Testing general relativity with gravitational-wave catalogs: the insidious nature of waveform systematics.*
C. J. Moore, E. Finch, **R. Buscicchio**, D. Gerosa.
[iScience 24 \(2021\) 102577. arXiv:2103.16486 \[gr-qc\].](#)

8. *LoCuSS: The splashback radius of massive galaxy clusters and its dependence on cluster merger history.*
M. Bianconi, **R. Buscicchio**, G. P. Smith, S. L. McGee, C.P. Haines, A. Finoguenov, A. Babul.
Astrophysical Journal 911 (2021) 136. [arXiv:2010.05920 \[astro-ph.GA\]](#).
7. *Search for Black Hole Merger Families.*
D. Veske, A. G. Sullivan, Z. Marka, I. Bartos, K. R. Corley, J. Samsing, **R. Buscicchio**, S. Marka.
Astrophysical Journal Letters 907 (2021) L48. [arXiv:2011.06591 \[astro-ph.HE\]](#).
6. *Constraining the lensing of binary black holes from their stochastic background.*
R. Buscicchio, C. J. Moore, G. Pratten, P. Schmidt, M. Bianconi, A. Vecchio.
Physical Review Letters 125 (2020) 141102. [arXiv:2006.04516 \[astro-ph.CO\]](#).
5. *Constraining the lensing of binary neutron stars from their stochastic background.*
R. Buscicchio, C. J. Moore, G. Pratten, P. Schmidt, A. Vecchio.
Physical Review D 102 (2020) 081501. [arXiv:2008.12621 \[astro-ph.HE\]](#).
4. *Measuring precession in asymmetric compact binaries.*
G. Pratten, P. Schmidt, **R. Buscicchio**, L. M. Thomas.
Physical Review Research 2 (2020) 043096. [arXiv:2006.16153 \[gr-qc\]](#).
3. *Populations of double white dwarfs in Milky Way satellites and their detectability with LISA.*
V. Korol, S. Toonen, A. Klein, V. Belokurov, F. Vincenzo, **R. Buscicchio**, D. Gerosa, C. J. Moore, E. Roebber, E. M. Rossi, A. Vecchio.
Astronomy & Astrophysics 638 (2020) A153. [arXiv:2002.10462 \[astro-ph.GA\]](#).
2. *Milky Way satellites shining bright in gravitational waves.*
E. Roebber, **R. Buscicchio**, A. Vecchio, C. J. Moore, A. Klein, V. Korol, S. Toonen, D. Gerosa, J. Goldstein, S. M. Gaebel, T. E. Woods.
Astrophysical Journal Letters 894 (2020) L15. [arXiv:2002.10465 \[astro-ph.GA\]](#).
1. *Label Switching Problem in Bayesian Analysis for Gravitational Wave Astronomy.*
R. Buscicchio, E. Roebber, J. M. Goldstein, C. J. Moore.
Physical Review D 100 (2019) 084041. [arXiv:1907.11631 \[astro-ph.IM\]](#).

Collaboration papers, with substantial contribution, published in major peer-reviewed journals:

13. *Search for gravitational-lensing signatures in the full third observing run of the LIGO-Virgo network.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
Astrophysical Journal 970 (2021) 191. [arXiv:2304.08393 \[gr-qc\]](#).
12. *GWTC-2.1: Deep Extended Catalog of Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
Physical Review D 109 (2024) 022001. [arXiv:2108.01045 \[gr-qc\]](#).
11. *The population of merging compact binaries inferred using gravitational waves through GWTC-3.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
Physical Review X 13 (2021) 011048. [arXiv:2111.03634 \[astro-ph.HE\]](#).
10. *Tests of General Relativity with GWTC-3.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
Physical Review D (in press). [arXiv:2112.06861 \[gr-qc\]](#).
9. *Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
Astrophysical Journal Letters (2021) 923. [arXiv:2105.06384 \[gr-qc\]](#).
8. *GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
Physical Review X 13 (2023) 041039. [arXiv:2111.03606 \[gr-qc\]](#).
7. *Observation of gravitational waves from two neutron star-black hole coalescences.*
LIGO Scientific Collaboration, Virgo Collaboration.
Astrophysical Journal Letters, 915, L5 (2021). [arXiv:2106.15163 \[astro-ph.HE\]](#).
6. *GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run.*
LIGO Scientific Collaboration, Virgo Collaboration.
Physical Review X 11 (2021) 021053. [arXiv:2010.14527 \[gr-qc\]](#).

5. *Population Properties of Compact Objects from the Second LIGO-Virgo Gravitational-Wave Transient Catalog.*
LIGO Scientific Collaboration, Virgo Collaboration.
[Astrophysical Journal Letters 913 \(2021\) L7](#). [arXiv:2010.14533 \[astro-ph.HE\]](#).
4. *Upper Limits on the Isotropic Gravitational-Wave Background from Advanced LIGO's and Advanced Virgo's Third Observing Run.*
LIGO Scientific Collaboration, Virgo Collaboration, KAGRA collaboration.
[Physical Review D 104 \(2021\) 022004](#). [arXiv:2101.12130 \[gr-qc\]](#).
3. *Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo .*
LIGO Scientific Collaboration, Virgo Collaboration.
[Astrophysical Journal 882 \(2019\) L24](#). [arXiv:1811.12940 \[astro-ph.HE\]](#).
2. *Properties and astrophysical implications of the 150 Msun binary black hole merger GW190521.*
LIGO Scientific Collaboration, Virgo Collaboration.
[Astrophysical Journal Letters 900 \(2020\) L13](#). [arXiv:2009.01190 \[astro-ph.HE\]](#).
1. *GW190521: A Binary Black Hole Merger with a Total Mass of 150 M_{\odot} .*
LIGO Scientific Collaboration, Virgo Collaboration.
[Physical Review Letters 125 \(2020\) 101102](#). [arXiv:2009.01075 \[gr-qc\]](#).

Other publications:

2. *LISA - Laser Interferometer Space Antenna - Definition Study Report.*
The European Space Agency.
[ESA-SCI-DIR-RP-002](#).
1. *Topics in Bayesian population inference for gravitational wave astronomy.*
R. Buscicchio.
[PhD thesis](#).

Seminar & Talks

Invited talks marked with *.

Conferences and workshops:

30. *Is your stochastic signal really detectable?*.
XXVI SIGRAV conference on general relativity and gravitation, Univ. of Milano-Bicocca, Milan, Italy, 2025/09/09.
- 29.* *Emergence of Milky Way structure in the first year of LISA data.*
CERN UniGe Gravitational Wave meeting, Geneva, Switzerland, 2025/05/23.
28. *LISA stellar-mass black holes informed by the GWTC-3 population: event rates and parameters reconstruction.*
LISA Astrophysics Working Group Meeting 2024, Garching, Germany, 2024/11/05.
- 27.* *Astrophysics panel session.*
GRASP: Gravity Shape Pisa 2024, Pisa, Italy, 2024/10/24.
- 26.* *Beyond Gauss? A more accurate model for LISA astrophysical noise sources.*
Kavli Institute for Cosmology Seminars, Cambridge, United Kingdom, 2024/10/14.
- 25.* *Beyond Gauss? A more accurate model for LISA astrophysical noise sources.*
Heterogeneous Data and Large Representation Models in Science, Toulouse, France, 2024/10/01.
24. *LISA stellar-mass black holes informed by the GWTC-3 population: event rates and parameters reconstruction.*
15th International LISA Symposium, Dublin, Ireland, 2024/07/08.
- 23.* *LISA data analysis: from the stochastic background to the Milky Way.*
11th LISA Cosmology Working Group Workshop, Porto, Portugal, 2024/06/19.
- 22.* *An introduction to Bayesian Inference.*
International Pulsar Timing Array Student Week, Milan, Italy, 2024/06/17.
- 21.* *Statistical challenges in LISA data analysis.*
LAUTARO joint meeting, GSSI-University of Milano-Bicocca, Milano, Italy, 2024/04/17.
20. *From mHz to kHz: stochastic background implications on astrophysical sources and population reconstruction.*
LISA Astrophysics working group workshop, University of Milano-Bicocca, Milano, Italy, 2023/09/13.
19. *Non-gaussian gravitational wave backgrounds across the GW spectrum.*
XXV Sigrav conference on general relativity and gravitation, SISSA, Trieste, Italy, 2023/09/04.
- 18.* *LISA SGWB data analysis (session chair).*
Data Analysis Challenges for SGWB Workshop, CERN, Geneva, Switzerland, 2023/07/19.
- 17.* *Global Fit and foregrounds.*
LISA SGWB detection brainstorming, Univ. of Geneva, Geneva, Switzerland, 2023/07/17.
- 16.* *Beyond functional forms: non-parametric methods. (panelist talk).*
Gravitational-wave populations: What's next?, University of Milano-Bicocca, Milan, Italy, 2023/07/01.
15. *The last three years : multiband gravitational-wave observations of stellar-mass binary black holes.*
LISA Astrophysics working group workshop, University of Birmingham, Birmingham, UK, 2022/06/23.
14. *The last three years : multiband gravitational-wave observations of stellar-mass binary black holes.*
American Physical Society (APS) April meeting, New York (NY), USA, 2022/04/12.
13. *Bayesian parameter estimation of stellar-mass black-hole binaries with LISA.*
XXIV Sigrav conference on general relativity and gravitation, Urbino, Italy, 2021/09/08.
12. *Chirp: a web and smartphone application for visualization of gravitational-wave alerts.*
14th Amaldi Conference on Gravitational Waves, (online), 2021/07/21.
- 11.* *Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run.*
2nd EPS conference on gravitation, (online, on behalf of LVK), 2021/05/27.
- 10.* *Bayesian parameter estimation of stellar-mass black-hole binaries with LISA.*
LISA Data Challenge meeting, (online), 2021/06/17.
- 9.* *Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run.*
Webinar on behalf of the LVK collaboration, (online), 2021/05/27.
8. *Milky Way Satellites Shining Bright in Gravitational Waves.*
13th LISA Symposium, (online), 2020/09/13.
7. *Constraining the Lensing of Binary Black Holes from Their Stochastic Background.*
LISA Sprint workshop, CCA, Flatiron Institute, New York (NY), USA, 2020/03/04.
6. *Multiple source detection in GW astronomy: the label switching problem.*
30th Texas Symposium, University of Portsmouth, Portsmouth, UK, 2019/12/12.
5. *Non-gaussian Stochastic background search with importance sampling.*
LIGO, Virgo, KAGRA September meeting, Warsaw, Poland, 2019/09/01.

4. *An improved detector for non-Gaussian stochastic background.*
Stochastic Background Data Analysis for LISA meeting, Instituto de Fisica Teorica, Madrid, Spain, 2019/06/01.
3. *Hierarchical nonparametric density estimation for population inference.*
LIGO, Virgo, KAGRA March meeting, Winsconsin, USA, 2019/03/18.
2. *Fast Evaluation of Campbell processes N-point correlation functions.*
Astro Hack Week: Data Science for Next-Generation Astronomy, Lorentz Center, Leiden, The Netherlands, 2018/08/01.
1. *Stochastic Gravitational Wave Background Data Analysis for Radler.*
5th LISA Cosmology Working Group workshop, Physicum, University of Helsinki, Helsinki, Finland, 2018/06/01.

Seminars:

- 10.* *Fast LISA inference using Gaussian processes.*
University of Geneva, Geneva, Switzerland, 2025/05/21.
- 9.* *Emergence of Milky Way structure in the first year of LISA data.*
Department of Physics, University of Pisa, Pisa, Italy, 2025/05/16.
- 8.* *Statistical challenges in GW inference: an application of field theory to direct population reconstruction in LISA.*
APP seminar, SISSA, Trieste, Italy, 2024/05/06.
- 7.* *GRAF: Gravitational waves data and global fit.*
Department of Physics, University of Milano-Bicocca, Milan, Italy, 2023/12/14.
- 6.* *LISA global inference: statistical and modelling challenges for the Milky Way.*
Max Planck Institute for Astrophysics, Garching, Germany, 2023/11/29.
- 5.* *LISA Global inference: modelling, statistical, and computational challenges.*
Department of Physics, University of Pisa, Pisa, Italy, 2023/10/04.
- 4.* *Gravitational waves in the many sources, many detectors era.*
Institute for Mathematics and Physics, University of Stavanger, Stavanger, Norway, 2022/09/29.
- 3.* *Stellar mass binary black holes : what, when, and where.*
Astroparticule et cosmologie, Université Paris Cité, Paris, France, 2022/06/12, (online).
- 2.* *The last three years: multiband gravitational-wave observations of stellar-mass binary black holes.*
Physics Department, Columbia University, New York (NY), USA, 2022/04/07.
- 1.* *Set the alarm : Bayesian parameter estimation of stellar-mass black-hole binaries with LISA.*
Sun Yat-sen University, Zhuhai, China, 2021/07/30, (online).

Outreach:

5. *Onde gravitazionali: ascoltare l'Universo anzich'e solo guardarlo.*
University of Milano-Bicocca, Milan, Italy, 2024.
4. *An orchestra of lasers and gravitational waves.*
Pint of Science 2024, Milan, Italy, 2024.
3. *Gravitational-waves in space and on Earth.*
Manchester Museum of Science and Industry, Manchester, UK, 2018.
2. *An orchestra of lasers and gravitational waves.*
Manchester Museum of Science and Industry, Manchester, UK, 2018.
1. *A Universe of waves.*
Science Caf'e, Italy, 2018.

Date: December 13, 2025