Riccardo **Buscicchio** | Curriculum Vitæ

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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

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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 **7** first-authored papers and **8** lead by supervised student).
13 collaboration papers with substantial contribution, published in major peer-reviewed journals
47 collaboration papers in total, published in major peer-reviewed journals
5 papers in submission stage,
2 other publications (thesis, white papers, reviews)

Total number of citations: >15900. **h-index**: 24 (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	✓		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*

Other funding:

- 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*

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 authorization by the relevant permanent staff, I have supervised the work of students in the percentages shown below.

Ph.D. student co-supervisor:

- F. Nobili, University of Insubria, 100% *2024-2027*
- A. Spadaro, University of Milano-Bicocca, 100% *2022-2025*

- F. Pozzoli, University of Insubria, 100% *2022-2025*

MSc student co-supervision:

- L. Viganò, University of Milano-Bicocca, Master's thesis, 100% *2024-2025*
- M. Bellotti, University of Milano-Bicocca, Master's thesis, 100% *2024-2025*
- 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*
- G. Astorino, University of Pisa, Master's thesis, 80%. *2023-2024*
- 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***

- **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***

- **Python Computing Lab**, Bachelor's degree in Physics, Univ. of Birmingham, UK *2017-2021*
  Content: Python programming, simulation of physical systems in celestial
  and classical mechanics, thermodynamics, electromagnetism. Data analysis.
- **Maths for physicists**, Bachelor's degree in Physics, Univ. of Birmingham, UK *2017-2019*
  Content: Linear algebra, differential and integral calculus, differenzial equations
  Groups and representations theory
- **Physics and communication skills**, Master's degree in Physics, Univ. of Birmingham, UK. *2019*
  Content: LaTeX basics. Drafting of lab reports, publications, seminars

Academic service, editorial and research responsibilities

International collaboration responsibilities

Co-chair of the Coordination Unit L2D (Global Fit, ESA LISA Project Office) *2024-2025*

Journal referee

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

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

- *LISA Distributed Data Processing Center June Workshop*, Milan, IT. *2025*
- IFPU focus week on "*Emerging methods in GW population inference*", Trieste, Italy. *2024*
- *LISA Astrophysics Working Group Conference*, Birmingham, UK. *2022*
- *Gravitational-wave populations: what's next?*, Milan, Italy. *2023*
- *Gravitational-wave Excellence Alliance Training (GrEAT) PhD school*, Birmingham, UK. *2019*
- *Gravitational-wave Open Science Center First Open Data Workshop*, (online) *2019*

Outreach & public engagement

- Orientation activities for high-school students as part of the *PNRR Orientation* 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 *"Astronomy in the city"*, 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. *2023*
  in Astrophysics, Cosmology and Space Science (GSD 02/PHYS-05 - PHYS-05/A)
- French Qualification for teaching in Higher Education in Astrophysics (Sec.34), *2023*
  French Ministry of higher education and research (qualification no.23234388826).
- LSC Academic Advisory Committee. *2019-2021*
- Secretary for the Council of Research Fellows, 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), Mathematica, Go, R (advanced), Stan, C, Qt5.

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

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

Hobbies

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

Publication list

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

5. *Functional inference on deviations from General Relativity.*
C. Pacilio, **R. Buscicchio**.
arXiv:2507.13454[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 in major peer-reviewed journals:

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), (in press). 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 (2025), (in press). arXiv:2505.22706[astro-ph.GA].
30. *Is your 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. Piarulli, **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 Renzis, 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 in major peer-reviewed journals, which I have substantially contributed to.:

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].

PhD thesis, technical reports.:

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.

Full presentation list

Invited talks marked with *.

Talks at conferences:

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.

Talks at department 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, Universitè Paris Citè, 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 & public engagement talks:

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: October 1, 2025