Davide Gerosa | Curriculum Vitae

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Relativistic astrophysicist and gravitational-wave astronomer, studying the impact of Einstein's general relativity on the astrophysical world. Research interests include astrophysical inference with gravitational-wave sources, black-hole binary spin dynamics, black-hole recoils, accretion disks and tests of general relativity.

Personal information

Present position: NASA Einstein Fellow.
California Institute of Technology, TAPIR MC 350-17,
1200 E California Blvd, Pasadena, CA 91125, USA.

Citizenship: Italy, EU.

Personal webpage: `www.tapir.caltech.edu/~dgerosa`

Research experience

California Institute of Technology **Pasadena CA, USA**
NASA Einstein Fellow *2016-now*

- *Support*: Einstein postdoctoral prize fellowship. Part of the NASA prize fellowship program, Einstein Fellowships are prestigious awards in theoretical astrophysics consisting of personal research grant at selected US institution. See `cxc.cfa.harvard.edu/fellows`.

University of Cambridge **Cambridge, UK**
Ph.D. candidate, Department of Applied Mathematics and Theoretical Physics *2013-2016*

- *Support*: Isaac Newton Studentship; STFC Ph.D. Studentship. The Isaac Newton Studentship is the only astronomy-specific Ph.D. scholarship of the University of Cambridge.
- *Supervisor*: Ulrich Sperhake.
- *Thesis*: Source modelling at the dawn of gravitational-wave astronomy. Resulted in 14 publications.

Extended research visits:

- Institut Astrophysique de Paris. Paris, France. *Jul 2015*
- University of Mississippi, Oxford MS, USA. *Aug-Dec 2012*
- Caltech, Pasadena CA, USA. LIGO Summer Undergraduate Research Fellow (SURF). *Jun-Aug 2012*

Education

Università degli Studi di Milano **Milan, Italy**
Master's degree in Astrophysics *2010-2013*

- *Final degree grade*: 110/110 with distinction ("cum laude").
- *Average class grade*: 30/30 with 7/12 distinctions ("cum laude"). Top 1% of my class.
- *Thesis advisors*: Giuseppe Lodato, Emanuele Berti. Thesis resulted in 2 publications.

Università degli Studi di Milano **Milan, Italy**
Bachelor's degree in Physics *2007-2010*

- *Final degree grade*: 110/110 with distinction ("cum laude").
- *Average class grade*: 29.84/30 with 18/26 distinctions ("cum laude"). Top 1% of my class.

Liceo Scientifico Statale Paolo Frisi **Monza MB, Italy**
Scientific High School degree *2002-2007*

- *Final grade*: 100/100.

Grants, scholarships and awards

Einstein Postdoctoral Prize Fellowship, NASA. *2016-now*

Giulio Rampa Ph.D Thesis Prize, Italian Society for General Relativity and Gravitation. *2018*

Stefano Braccini Ph.D Thesis Prize, Gravitational Wave International Committee. *2017*

Isaac Newton Ph.D. Studentship, DAMTP & IoA, University of Cambridge. *2013-2016*

STFC Ph.D. Studentship, UK Science & Technology Facilities Council. *2013-2016*

Royal Astronomical Society Travel Grant, Royal Astronomical Society. *2016*

Rouse Ball Studentship in Mathematics, Trinity College, University of Cambridge. *2015*

Smith-Rayleigh-Knight Essay Prize, Faculty of Mathematics, University of Cambridge. *2015*

LIGO Summer Undergraduate Research Fellowship, California Institute of Technology. *2012*

Undergraduate Studentship, Physics Department, University of Milan. *2007-2008*

Publications

Counts: **27** papers published in major peer-reviewed journals, **5** papers in submission stage, **4** other papers published in conference proceedings, software journals, etc, (out of which **18** first-authored papers and **3** papers covered by press releases).

Total number of citations: >1000 (using ADS and InSpire).

h-index: 16

Web links to list services: ADS; INSPIRE; ARXIV.

Full list of publications available below and at `www.tapir.caltech.edu/~dgerosa/pub`.

Presentations

Counts: **29** talks at conferences, **25** talks at department seminars, **7** posters at conferences, (out of which **38** invited presentations).

Full list of presentations available below and at `www.tapir.caltech.edu/~dgerosa/talks`.

Teaching and Mentoring

Ph.D. student projects:

- R. Tso, Caltech. *2017-2018*

Undergraduate student mentoring:

- J. Vosmera, University of Cambridge. Summer project. *2015*
- B. Veronesi, University of Milan. Bachelor's thesis. *2015*
- R. Barbieri, University of Cambridge (visiting from University of Pavia). Summer project. *2016*
- K. Chamberlain, Caltech (visiting from Montana State University). Summer project. *2017*
- R. Barbieri, Caltech (visiting from University of Pavia). Master's thesis. *2018*
- L. Reali, University of Milan. Bachelor's thesis. *2018*
- A. Lima, Caltech (visiting from Bowdoin College). Summer project. *2018*

Teaching assistant:

- University of Cambridge, Part III General Relativity (master class). *2015-2016*
- University of Cambridge, Part II General Relativity (3rd-year undergraduate class). *2014-2016*

Outreach and Service

Referee

- Physical Review Letters
- Physical Review D
- Science Advances
- The Astrophysical Journal
- Monthly Notices of the Royal Astronomical Society
- General Relativity and Gravitation
- Europhysics Letters
- European Physical Journal Plus

Grant proposal reviewer and panelist

- NASA Astrophysics Theory Program (ATP), USA;
- NASA Graduate Fellowship Program (NESSF), USA;
- STFC DiRAC HPC allocation proposals; UK.

Organized conferences

- *Numerical Relativity beyond General Relativity*, Benasque Science Center, Spain. *2018*
- *APS Pacific Coast Gravity Meeting*, Caltech. *2018*
- *The disc migration issue: from planets to black holes*, University of Cambridge. *2017*
- *Einstein's Legacy: Celebrating 100 yrs of General Relativity*, Queen Mary University of London. *2015*

Outreach activities

- TV Interview on gravitational waves and black-hole kicks aired on Cambridge TV. *2016*
  (see *cambridge-tv.co.uk/davide-gerosa-black-holes*).
- Actively involved in the Cambridge Science Festival, faculty of Mathematics. *2015*
- Research coverage by the Caltech outreach journal: CURJ, Vol.15 No.1 (2014). *2014*
- Scientific journalist for the Italian on-line newspaper *ilsussidiario.net*. *since 2013*
- Astronomy and relativity lectures to high-school students. *since 2011*

Professional recognition

- Italian Habilitation to Associate Professorship in Theoretical Physics *2018-2024*
  (Abilitazione Scientifica Nazionale, Settore 02/A2).

Academic Service

- Seminar organizer, TAPIR seminar series, Caltech. *2018-now*
- Observer member, management committee of European COST Action grant "GWverse". *2017-now*
- PhD representative, Gravitational Physics committee of the UK Institute of Physics. *2014-2016*
- Undergraduate student representative, Science Faculty Council, University of Milan. *2008-2012*

Code and data sharing

- *Developer* of open-source Python module PRECESSION, `github.com/dgerosa/precession`.
  Toolbox to study the post-Newtonian dynamics of spinning black-hole binaries; used in 20+ papers.
- *Open source project*: FILLTEX, automatic LaTex bibliography, `github.com/dgerosa/filltex`.
- *Research outputs*: public catalog of numerical-relativity waveform in scalar-tensor theory of gravity; black-hole binary evolution YouTube channel, open source software SURRKICK, GWDET, SPOPS.

Memberships

- LISA Consortium (associate member)
- American Physical Society (member)
- GWIC 3G Science case subcommittee
- Royal Astronomical Society (member)

Skills

Programming languages: Python (advanced), Bash, Mathematica, C, Fortran.

Other scientific tools: LIGO lalsuite, LaTex, GIT, SVN, Gnuplot, SuperMongo. Supercomputer jobs.

Languages: English (fluent), Italian (native).

Hobbies

Alpinism, rock climbing, skiing. Climbed to the top of Monte Rosa, 2nd highest mountain in the Alps.

Avid soccer player (and FC Inter fan). Jogging, tennis and squash player.

Rock music, great fan of Bruce Springsteen.

Full publication list

Submitted papers:

5. *The binary black hole explorer: on-the-fly visualizations of precessing binary black holes.*
V. Varma, L. C. Stein, **D. Gerosa**.
arXiv:1811.06552 [astro-ph.HE].

4. *Wide precession: binary black-hole spins repeatedly oscillating from full alignment to full anti-alignment.*
D. Gerosa, Alicia Lima, Emanuele Berti, Ulrich Sperhake, Michael Kesden, Richard O'Shaughnessy.
arXiv:1811.05979 [gr-qc].

3. *Optimizing LIGO with LISA forewarnings to improve black-hole spectroscopy.*
R. Tso, **D. Gerosa**, Y. Chen.
arXiv:1807.00075 [gr-qc].

2. *Black holes, gravitational waves and fundamental physics: a roadmap.*
L. Barack, et al. (199 authors incl. **D. Gerosa**).
arXiv:1806.05195 [gr-qc].

1. *The origin of low spin black holes in LIGO/Virgo mergers.*
K. Belczynski, J. Klencki, G. Meynet, C. L. Fryer, D. A. Brown, M. Chruslinska, W. Gladysz, R. O'Shaughnessy, T. Bulik, E. Berti, D. E. Holz, **D. Gerosa**, M. Giersz, S. Ekstrom, C. Georgy, A. Askar, J.-P. Lasota.
arXiv:1706.07053 [astro-ph.HE].

Papers in major peer-reviewed journals:

27. *Frequency-domain waveform approximants capturing Doppler shifts.*
K. Chamberlain, C. J. Moore, **D. Gerosa**, N. Yunes.
Physical Review D, in press. arXiv:1809.04799 [gr-qc].

26. *High-accuracy mass, spin, and recoil predictions of generic black-hole merger remnants.*
V. Varma, **D. Gerosa**, F. Hébert, L. C. Stein, H. Zhang.
Physical Review Letters, in press. arXiv:1809.091259 [gr-qc].

25. *Spin orientations of merging black holes formed from the evolution of stellar binaries.*
D. Gerosa, E. Berti, R. O'Shaughnessy, K. Belczynski, M. Kesden, D. Wysocki, W. Gladysz.
Physical Review D 98 (2018) 084036. arXiv:1808.02491 [astro-ph.HE].

24. *Mining gravitational-wave catalogs to understand binary stellar evolution: a new hierarchical bayesian framework.*
S. R. Taylor, **D. Gerosa**.
Physical Review D 98 (2018) 083017. arXiv:1806.08365 [astro-ph.HE].

23. *Gravitational-wave astrophysics with effective-spin measurements: asymmetries and selection biases.*
K. K. Y. Ng, S. Vitale, A. Zimmerman, K. Chatziioannou, **D. Gerosa**, C.-J. Haster.
Physical Review D 98 (2018) 083007. arXiv:1805.03046 [gr-qc].

22. *Black-hole kicks from numerical-relativity surrogate models.*
D. Gerosa, F. Hébert, L. C. Stein
Physical Review D 97 (2018) 104049. arXiv:1802.04276 [gr-qc].
- Open source code.

21. *Explaining LIGO's observations via isolated binary evolution with natal kicks.*
D. Wysocki, **D. Gerosa**, R. O'Shaughnessy, K. Belczynski, W. Gladysz, E. Berti, M. Kesden, D. Holz
Physical Review D 97 (2018) 043014. arXiv:1709.01943 [astro-ph.HE]

20. *Impact of Bayesian priors on the characterization of binary black hole coalescences.*
S. Vitale, **D. Gerosa**, C.-J. Haster, K. Chatziioannou, A. Zimmerman.
Physical Review Letters 119 (2017) 251103. arXiv:1707.04637 [gr-qc].

19. *Long-lived inverse chirp signals from core collapse in massive scalar-tensor gravity.*
U. Sperhake, C. J. Moore, R. Rosca, M. Agathos, **D. Gerosa**, C. D. Ott.
Physical Review Letters 119 (2017) 201103. arXiv:1708.03651 [gr-qc].

18. *Nutational resonances, transitional precession, and precession-averaged evolution in binary black-hole systems.*
X. Zhao, M. Kesden, **D. Gerosa**.
Physical Review D 96 (2017) 024007. arXiv:1705.02369 [gr-qc].

17. *Inferences about supernova physics from gravitational-wave measurements: GW151226 spin misalignment as an indicator of strong black-hole natal kicks.*
R. O'Shaughnessy, **D. Gerosa**, D. Wysocki.
Physical Review Letters 119 (2017) 011101. arXiv:1704.03879 [gr-qc].
• APS Editor's choice (physics.aps.org). Covered by press release.

16. *Are merging black holes born from stellar collapse or previous mergers?*
D. Gerosa, E. Berti.
Physical Review D 95 (2017) 124046. arXiv:1703.06223 [gr-qc].
• PRD Editors' Suggestion.

15. *On the equal-mass limit of precessing black-hole binaries.*
D. Gerosa, U. Sperhake, J. Vošmera.
Classical and Quantum Gravity 34 (2017) 6, 064004. arXiv:1612.05263 [gr-qc].

14. *Black-hole kicks as new gravitational-wave observables.*
D. Gerosa, C. Moore.
Physical Review Letters 117 (2016) 011101. arXiv:1606.04226 [gr-qc].
• PRL Editors' Suggestion. Covered by press release.

13. *PRECESSION: Dynamics of spinning black-hole binaries with python.*
D. Gerosa, M. Kesden.
Physical Review D 93 (2016) 124066. arXiv:1605.01067 [astro-ph.HE].
• Open source code.

12. *Numerical simulations of stellar collapse in scalar-tensor theories of gravity.*
D. Gerosa, U. Sperhake, C. D. Ott.
Classical and Quantum Gravity 33 (2016) 13, 135002. arXiv:1602.06952 [gr-qc].

11. *Distinguishing black-hole spin-orbit resonances by their gravitational wave signatures. II: Full parameter estimation.*
D. Trifirò, R. O'Shaughnessy, **D. Gerosa**, E. Berti, M. Kesden, T. Littenberg, U. Sperhake.
Physical Review D 93 (2016) 044071. arXiv:1507.05587 [gr-qc].

10. *Testing general relativity with present and future astrophysical observations.*
E. Berti, et al. (53 authors incl. **D. Gerosa**).
Classical and Quantum Gravity 32 (2015) 24, 243001. arXiv:1501.07274 [gr-qc]. Topical Review.

9. *Precessional instability in binary black holes with aligned spins.*
D. Gerosa, M. Kesden, R. O'Shaughnessy, A. Klein, E. Berti, U. Sperhake, D. Trifirò.
Physical Review Letters 115 (2015) 141102. arXiv:1506.09116 [gr-qc].
• PRL Editors' Suggestion.

8. *Tensor-multi-scalar theories: relativistic stars and 3+1 decomposition.*
M. Horbatsch, H. O. Silva, **D. Gerosa**, P. Pani, E. Berti, L. Gualtieri, U. Sperhake.
Classical and Quantum Gravity 32 (2015) 20, 204001. arXiv:1505.07462 [gr-qc].
• IoP Editor's choice (CQG+, IOPselect).

7. *Multi-timescale analysis of phase transitions in precessing black-hole binaries.*
D. Gerosa, M. Kesden, U. Sperhake, E. Berti, R. O'Shaughnessy.
Physical Review D 92 (2015) 064016. arXiv:1506.03492 [gr-qc].

6. *Spin alignment and differential accretion in merging black hole binaries.*
D. Gerosa, B. Veronesi, G. Lodato, G. Rosotti.
Monthly Notices of the Royal Astronomical Society 451 (2015) 3941-3954. arXiv:1503.06807 [astro-ph.GA].

5. *Effective potentials and morphological transitions for binary black-hole spin precession.*
M. Kesden, **D. Gerosa**, R. O'Shaughnessy, E. Berti, U. Sperhake.
Physical Review Letters 114 (2015) 081103. arXiv:1411.0674 [gr-qc].
• Covered by press release.

4. *Missing black holes in brightest cluster galaxies as evidence for the occurrence of superkicks in nature.*
D. Gerosa, A. Sesana.
Monthly Notices of the Royal Astronomical Society 446 (2015) 38-55. arXiv:1405.2072 [astro-ph.GA].

3. *Distinguishing black-hole spin-orbit resonances by their gravitational-wave signatures.*
D. Gerosa, R. O'Shaughnessy, M. Kesden, E. Berti, U. Sperhake.
Physical Review D 89 (2014) 124025. arXiv:1403.7147 [gr-qc].

2. *Resonant-plane locking and spin alignment in stellar-mass black-hole binaries: a diagnostic of compact-binary formation.*
D. Gerosa, M. Kesden, E. Berti, R. O'Shaughnessy, U. Sperhake.
Physical Review D 87 (2013) 10, 104028. arXiv:1302.4442 [gr-qc].

1. *Black hole mergers: do gas discs lead to spin alignment?*
G. Lodato, **D. Gerosa**.
Monthly Notices of the Royal Astronomical Society Letters 429 (2013) L30-L34. arXiv:1211.0284 [astro-ph.CO].

Conference proceedings, software papers, etc.:

4. *Reanalysis of LIGO black-hole coalescences with alternative prior assumptions.*
D. Gerosa, S. Vitale, C.-J. Haster, K. Chatziioannou, A. Zimmerman.
Proc. of the International Astronomical Union, IAU Symposium 338, in press. arXiv:1712.06635 [astro-ph.HE].

3. *Surprises from the spins: astrophysics and relativity with detections of spinning black-hole mergers.*
D. Gerosa
Journal of Physics: Conference Series 957 (2018) 1, 012014. arXiv:1711.10038 [astro-ph.HE].

2. *filltex: Automatic queries to ADS and INSPIRE databases to fill LaTex bibliography.*
D. Gerosa, M. Vallisneri.
The Journal of Open Source Software 2 (2017) 13.
• Open source code.

1. *Rival families: waveforms from resonant black-hole binaries as probes of their astrophysical formation history*
D. Gerosa.
Astrophysics and Space Science Proceedings, 40 (2015) 137-145

Full presentation list

Invited talks marked with *.

Talks at conferences:

29.* *Black-hole kicks: how and where.*
Taipei Gravitational Wave Group (TGWG) Conference, Taipei, Taiwan, Oct 2018.

28.* *Forming binary black holes out of stars.*
Taipei Gravitational Wave Group (TGWG) Conference, Taipei, Taiwan, Oct 2018.

27.* *Getting ready: exploit LISA to improve LIGO's tests of General Relativity.*
Einstein Fellows Symposium 2018, Cambridge MA, USA, Oct 2018.

26. *Runaways: recoiling black holes and their gravitational-wave sig..natures.*
COSPAR 2018 42nd assembly, Pasadena CA, USA, July 2018.

25. *An unprecedented opportunity: black-hole spectroscopy with LISA forewarnings and LIGO optimizations.*
12th LISA Symposium, Chicago IL, USA, July 2018.

24.* *What do LIGO's black holes remember?*
April APS Meeting, Columbus OH, USA, Apr 2018.

23. *Modeling black hole kicks with waveform approximants.*
34rd Pacific Coast Gravity Meeting, Pasadena CA, USA, Mar 2018.

22. *Black holes from other black holes?*
Gravity@Malta2018, Valletta, Malta, Jan 2018.

21.* *The gravitational-wave astronomy revolution.*
2nd Milan Christmas Workshop, Milan, Italy, Dec 2017.

20. *Reanalysis of LIGO black-hole coalescences with alternative prior assumptions.*
IAU Symposium 338, Baton Rouge LA, USA, Oct 2017.

19.* *Careful with the priors: a reanalysis of LIGO black-hole coalescences.*
Einstein Fellows Symposium 2017, Cambridge MA, USA, Oct 2017.

18. *Empty galaxies to constrain black-hole superkicks.*
3rd Swinburne-Caltech Galaxy Workshop, Pasadena CA, USA, Sept 2017.

17.* *Surprises from the spins: astrophysics and relativity with detections of spinning black-hole mergers.*
12th Edoardo Amaldi Conference, Pasadena CA, USA, Jul 2017 (plenary talk).
Proceedings published by IoP (Mar 2018).

16. *Core collapse and compact-object formation to test General Relativity.*
LIGO Core Collapse Supernova Workshop, Pasadena CA, USA, Mar 2017.

15. *The curious and simple limit of equal-mass precessing black-hole binaries.*
33rd Pacific Coast Gravity Meeting, Santa Barbara CA, USA, Mar 2017.

14.* *Spins remember: spin signatures of astrophysical black hole formation mechanisms.*
Strong Gravity and Binary Dynamics with Gravitational Wave Observations, Oxford MS, USA, Feb 2017.

13. *The kick is in the waveform: detection of black-hole recoils.*
The Dawning Era of Gravitational-Wave Astrophysics, Aspen CO, USA, Feb 2017.

12. *Kicked waveforms: prospects for direct detection of black hole recoils.*
"April" APS Meeting, Washington DC, USA, Jan 2017.

11.* *Getting the most out of gravitational-wave observations: kicks and spin precession.*
Einstein Fellow Symposium 2016, Cambridge MA, USA, Oct 2016.

10. *Averaging the average: multi-timescale analysis of precessing black-hole binaries.*
21st International Conference on General Relativity and Gravitation (GR21), New York NY, USA, Jul 2016.

9. *Differential accretion means differential alignment.*
BritGrav 16, Nottingham, UK, Apr 2016.

8. *A new instability to black-hole spin precession.*
28th Texas Symposium on Relativistic Astrophysics, Geneva, Switzerland, Dec 2015.

7. *Binary black-hole spin precession: a tale of three timescales.*
One Hundred Years of Strong Gravity, Lisbon, Portugal, Jun 2015.

6. *Giant and empty: black-hole occupation fraction in brightest cluster galaxies.*
BritGrav 15, Birmingham, UK, Apr 2015.

5.* *Not so fast: gas-driven spin alignment in merging black-hole binaries.*
Milan Christmas Workshop, Milan, Italy, Dec 2014.

4. *Missing black holes in brightest cluster galaxies as evidence for the occurrence of superkicks.*
99 years of Black Holes, Potsdam, Germany, May 2014.

3. *Rival families: waveforms from resonant black-hole binaries as probes of their astrophysical formation history.*
3rd Session of the Sant Cugat Forum on Astrophysics, Sant Cugat, Spain, Apr 2014.
Proceedings published by Springer (Jan 2015).

2. *Gravitational-wave signals from stellar-mass black-hole binaries in resonant configurations.*
BritGrav 14, Cambridge, UK, Mar 2014.

1. *Spin alignment effects in stellar mass black hole binaries.*
22nd Midwest Relativity Meeting, Chicago IL, USA, Sep 2012.

Talks at department seminars:

25.* *How to kick black holes out of their galaxies.*
Strong Gravity Seminars, Perimeter Institute for Theoretical Physics, Waterloo, Canada, Sep 2018.

24.* *(Astro)physical consequences of black-hole recoils.*
CITA Seminars, Canadian Institute for Theoretical Astrophysics, Toronto, Canada, Sep 2018.

23.* *Black-hole spins and the astrophysics of LIGO's sources.*
AEI seminars, Albert Einstein Institute, Hannover, Germany, Apr 2018.

22.* *Dynamics of spinning black-hole binaries as a tool to uncover their formation pathway.*
AEI seminars, Albert Einstein Institute, Potsdam, Germany, Mar 2018.

21.* *Runaways: phenomenology and detectability of black-hole recoils.*
Theoretical Astrophysics seminars, University of Florida, Gainsville FL, USA, Mar 2018.

20.* *Testing relativity with past and future supernova explosions.*
Physics colloquia, Montana State University, Bozeman MT, USA, Feb 2018.

19.* *More astrophysics out of the first gravitational wave detections.*
GSSI seminars, Gran Sasso Science Institute, L'Aquila, Italy, Jan 2018.

18.* *Where do binary black holes come from? How do we find out?*
Theory seminars, Sapienza Università di Roma, Rome, Italy, Jan 2018.

17.* *Monopole radiation, hyper scalarization and inverse chirps: the promise of testing gravity with stellar collapse.*
Steward Observatory lunch seminars, University of Arizona, Tucson AZ, USA, Nov 2017.

16.* *Black-hole binary spin precession: from relativity to astronomy.*
GRITTS seminars, Massachusetts Institute of Technology LIGO Lab, Cambridge MA, USA, Oct 2017.

15.* *Constraining the astrophysics behind the first LIGO detections.*
Physics colloquia, University of Texas at Dallas, Richardson TX, USA, Sep 2017.

14.* *Binary black hole astrophysics with the first gravitational-wave events.*
Theory group seminars, Universitat de Barcelona, Barcelona, Spain, May 2017.

13.* *Astrophysics with the first gravitational-wave events: from supernova asymmetries to multiple black-hole generations.*
GR seminars, Department Applied Mathematics and Theoretical Physics, Cambridge, UK, May 2017.

12.* *Black-hole binaries on the road to merger.*
Oskar Klein Center colloquia, Stockholms Universitet, Stockholm, Sweden, Jan 2017.

11.* *A tale of astronomy and relativity: formation and evolution of black-hole binaries.*
Department seminar series, Università degli Studi di Milano, Milan, Italy, Apr 2016.

10.* *A new paradigm for black-hole spin precession.*
Astrophysics seminars, University of Birmingham, Birmingham, UK, Feb 2016.

9.* *New insights on binary black-hole spin precession.*
Relativity division seminars, Albert Einstein Institute, Potsdam, Germany, Feb 2016.

8.* *Spontaneous scalarization: a promising avenue for gravitational-wave astronomy.*
GReCO seminars, Institut d'Astrophysique de Paris, Paris, France, Jan 2016.

7.* *Innovative multi-timescale approach to binary black holes.*
Theoretical Astrophysics seminars, Università degli Studi di Milano, Milan, Italy, Dec 2015.

6.* *Stellar collapse in scalar-tensor theories of gravity: prospects for gravitational-wave astronomy.*
Gravity and Particles seminar, University of Nottingham, Nottingham, UK, Dec 2015

5.* *Core collapse and relativistic stars in scalar-tensor theories of gravity.*
Gravity seminars, STAG Research Center, Southampton, UK, Oct 2015.

4.* *Binary black-hole spin alignment: gas-driven and relativistic inspiral.*
Wednesday seminars, Institute of Astronomy, Cambridge, UK, Jun 2015.

3.* *Spin-orbit resonances: unveiling black-hole binary dynamics on both stellar-mass and supermassive scale.*
Gravitational Physics seminars, Cardiff University, Cardiff, UK, May 2014.

2.* *Spin-orbit resonances: unveiling black-hole binary dynamics on both stellar-mass and supermassive scale.*
GR seminars, Department Applied Mathematics and Theoretical Physics, Cambridge, UK, May 2014.

1.* *Spin alignment and resonant plane in stellar mass black hole binaries.*
Lunch talks, Leiden Observatory, Leiden, The Netherlands, Jan 2012.

Posters at conferences:

7. *PRECESSION: efficient black-hole binary evolution with python.*
Mathematics and Big Data Showcase, Cambridge, UK, Apr 2016.

6.* *Numerical relativity group at University of Cambridge.*
Einstein's Legacy: celebrating 100 years of general relativity, London, UK, Nov 2015.

5.* *Formation and evolution of compact objects in relativity and modified gravity.*
5th DiRAC Science Day, Cambridge, UK, Sep 2015.

4. *New analytic solutions to binary black-hole dynamics: from spin precession to inspiral.*
Eurostrings 2015, Cambridge, UK, Mar 2015.

3.* *Analytic solutions to binary black-hole spin precession: recalling Kepler's two-body problem.*
Compact Objects as Astrophysical and Gravitational Probes, Leiden, The Netherlands, Jan 2015.
Best young presentation award.

2. *Efficient precession-averaged evolution of spinning black-hole binaries.*
Towards gravitational-wave astronomy: data analysis techniques and challenges, London, UK, Dec 2014.

1. *Morphologies and binary transfer: a new approach to the post-newtonian dynamics of precessing black-holes binaries.*
DPG Physics School "General Relativity @99", Bad Honnef, Germany, Sep 2014.