

CURRICULUM VITAE - MARIO SPERA (SHORT VERSION)

Autorizzo il trattamento dei dati personali nelle modalità previste dal Regolamento UE 2016/679

PERSONAL DETAILS

Family name, First name: Spera, Mario
Researcher unique identifier(s): Orcid ID: 0000-0003-0930-6930; Scopus ID: 56623388700
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• Education and key qualifications

2010-2014 PhD in Astronomy - Sapienza University (Rome-IT)
2008-2010 Master's deg. in Astronomy & Astrophysics, Sapienza Univ. (Rome-IT), 110/100 cum laude
2005-2008 Bachelor's deg. in Physics and Astrophysics, Sapienza Univ. (Rome-IT), 110/100 cum laude

• Current positions

2023 (perm.) Associate Professor at International School for Advanced Studies (SISSA) – Trieste, IT

• Previous positions

2020-2023 Tenure-track Assistant Professor at SISSA (Italian type-B researcher) – through **direct appointment** (no public competition, italian “**chiamata diretta**”)
2018-2020 Marie Curie Global Individual fellow at Northwestern University, Chicago USA (outgoing)
2018-2019 Postdoctoral fellow at the University of Innsbruck – Austria
2017-2018 Postdoctoral fellowship (PI project ForCOB) at the University of Milan (Bicocca) – IT
2014-2017 Postdoctoral researcher at INAF – Astronomical observatory of Padova - IT

As a lead author, I have achieved internationally recognized results in the study of the astrophysics of compact objects across various astrophysical environments. I am also the primary developer of three significant codes to which I have devoted substantial time and effort, especially SEVN, which was recently publicly released (<https://gitlab.com/sevncodes/sevn>). I was also appointed as editor of a book whose coordinated chapters have collectively received over 2,000 citations (<https://www.sciencedirect.com/book/9780323956369/black-holes-in-the-era-of-gravitational-wave-astronomy>).

Publications

Overall, I have co-authored 137 peer-reviewed papers with >25,000 citations and with h-index of 57. Below, I list my top-5 publications most relevant to the topic of astrophysics of compact objects.

1. [Spera, M.](#), Mapelli, M., and Bressan, A., *The mass spectrum of compact remnants from the PARSEC stellar evolution tracks*, MNRAS, 451, 4, pp. 4086–4103, 2015. - **284 ADS citations**
2. [Spera, M.](#), Trani, A. A., and Mencagli, M., *Compact Binary Coalescences: Astrophysical Processes and Lessons Learned*, Galaxies, 10, 4, 76, 2022 – **32 ADS citations**
3. [Spera, M.](#), Mapelli, M., Giacobbo, N., [Trani, A. A.](#), Bressan, A., and [Costa, G.](#), *Merging black hole binaries with the SEVN code*, MNRAS, 485, 1, pp. 889–907, 2019 – **215 ADS citations**
4. [Spera, M.](#) and Mapelli, M., *Very massive stars, pair-instability supernovae and intermediate-mass black holes with the sevn code*, MNRAS, 470, 4, pp. 4739–4749, 2017 – **269 ADS citations**
5. Kremer, K., [Spera, M.](#), et al. *Populating the Upper Black Hole Mass Gap through Stellar Collisions in Young Star Clusters*, ApJ, 903, 1, 45, 2020 – **122 ADS citations**

Peer recognition

Fellowships, funding, honours, awards

2024: PNRR cascade funding – EUR 200,000; scientific advisor and reference: exploring N-body simulations using RISC-V-based processors and co-processors
2024: Top 2% scientists by composite/indicator score
<https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/6>
2022: CO-I of the DS4ASTRO - PRO3 proposal “Data Science methods for Multi-Messenger Astrophysics & Multi-Survey Cosmology” Awarded EUR 225,000
2021: INAF - Astronomical Observatory of Padova – permanent position - **declined**
2021: **Cesare Paris Prize** - Assigned once a year from Rotary Club international to an individual who has obtained remarkable achievements in their field
2020: **Young researchers prize** - **Success rate < 3%** - **category Astrophysics and Space.**

Awarded EUR 3000 for my work "Merging Black Hole Binaries with the SEVN Code" where I describe innovative formation channels for heavy black holes

- 2019: NVIDIA academic GPU grant** - awarded an NVIDIA Titan V GPU (> 4,500 \$) to develop GPU-accelerated codes
- 2018: Marie Skłodowska-Curie Global Fellowship** Awarded EUR 244,269.00. Project HOMERICS: "The History of Merging Compact-Object Binaries"
- 2017: Marie Skłodowska-Curie Actions Seal of Excellence Prize** Awarded because my "FEMCOs" project was scored as a high-quality project proposal (> 85/100) in a highly competitive evaluation process (Marie Curie Actions).
- 2017: Independent postdoctoral fellowship** Project: "Formation pathways of Compact-Object Binaries" (ForCOB) – University of Milan, Bicocca
- 2017: CINECA** - national supercomputing center: **6,000,000 CPU+GPU hours** as PI of the project "The impact of stellar dynamics on gravitational-wave sources". Computing hours to use on CINECA MARCONI-A2 and GALILEO supercomputers.

Invitations to international colloquia and conferences

I have given 27 invited talks and colloquia at international conferences and institutes, and 13 contributed talks. Below, I list the top 5 invited talks

- 2025:** Colloquium at Gran Sasso Science Institute (forthcoming)
- 2022:** Invited review talk at international conference: Riding the waves into the future: the unconventional thinking tank - Otranto – IT
- 2021:** XXXII IUPAP Conference on Computational Physics - CCP2021 - Coventry EN (online)
- 2020:** Spokeperson for GW190814 webinar - Ligo-Virgo special event
- 2020:** 235th meeting of the American Astronomical Society, Honolulu – Hawaii

ADDITIONAL INFORMATION

Academic supervision activity

Senior researchers: Ugo Niccolo' di Carlo (2022 -)

PhD students: Margherita Imbriani (2024 -), Giovanni Antinozzi (2024 -), Cristiano Ugolini (2021 -), Cecilia Sgalletta (2021 -), Francesco Gabrielli (2021 -), Mattia Mencagli (2020 - 2023, now permanent at CINECA as HPC expert), Natalia Nazarova (2020 - 2022), Dany Atallah (2018 – 2020, while in the US)

Master students: Jacopo Laurenti (2024), Enrico Montanari (2019), Nicola Giacobbo (2016)

Outside academia: Jenny Lynn Almerol - Software Engineer at E4 COMPUTER ENGINEERING Spa (PNRR cascade funding)

Research Experience for Undergraduates (while in the US): Devin Becker (now PhD student at Boston-MIT), Elena Gonzalez (now PhD student at CIERA-Northwestern), Melissa Cashion (now PhD student at Purdue University)

Conference organization

- 2024:** Astrophysics and Cosmos Observation: HPC and Big Data Management – New Results and Perspectives for the Community <https://pdp2025.org/astrophysics-and-cosmos-observation-hpc-and-big-data-management-new-results-and-perspectives-for-the-community/>
- 2018:** CIERA - Northwestern University: Post-Newtonian Dynamics in Stellar Clusters
- 2017:** Simons Center for Computational Astrophysics . Numerical Scattering simulations, New York - USA. I organized this conference to group the scientists interested in using and developing my TSUNAMI few-body code.
- 2016:** Sapienza - University of Rome. Perspective of GPU computing in Science, Rome - Italy.
- 2014:** Sapienza - University of Rome. Perspective of GPU computing in Physics and Astrophysics, Rome - Italy.
- 2014:** University of Pisa. GPU in High-Energy Physics, Pisa - Italy.

Teaching (currently ongoing)

2020 - yearly: Birth, Life, and Death of Binary Stars (for PhD students at SISSA but followed by other national students from different institutions). Primary Lecturer, 32 hours

2023 – yearly: N-Body Systems on GPUs for the students of master in high performance computing (<https://www.mhpc.it/person/mario-spera-474>)

Referee activities

Scientific manuscripts for major international journals, including ApJ, MNRAS, A&A, Physical review (D, Letters, X).

Responsibilities, Membership and Collaborations

- 2024 – 2027 Committee for HPC Resource Management in SISSA
- 2024 – 2027 Member of the scientific council of the Master in High Performance Computing – MHPC
- 2022 – Einstein Telescope - SISSA Research Unit Leader and member of the ET collab. board
- 2023 – Einstein Telescope – member of the Bylaws updating committee
- 2022 - National Center for Research in HPC, Big Data, and Quantum Comp.-Leader of Spoke3 WP2: design of innovative algorithms, methodologies and codes towards exascale and beyond.
- 2022 - Member of the Board of Professors, PhD in Astronomy and Astrophysics – SISSA
- 2022 - Member of the selection committee for the admission of PhD students in SISSA
- 2022 - Expert evaluator for the European Union - HORIZON-MSCA-2022/2023/2024
- 2022 - Expert evaluator for the National Science Centre Poland – SONATA
- 2022 - Expert evaluator for the Swiss National Science Foundation
- 2022 - Expert evaluator for the Italian Space Agency (ASI)
- 2021 - Referee for the Italian Ministry of Education, University and Research
- 2018 - Member of the LIGO-Virgo-KAGRA collaboration
- 2018 – Member of the Italian National Institute for Nuclear Physics – INFN (Trieste)
- 2015 – Member of the Italian National Institute for Astrophysics – INAF (Roma)
- 2015 – Member of the European Astronomical Society – EAS

Outreach activities

Since 2015, I have given 37 outreach talks including:

- 2020: at my hometown Avezzano (AQ) - IT - "Quattro passi tra le stelle" - <https://www.terremarsicane.it/quattro-passi-tra-le-stelle-con-lastrofisico-e-ricercatore-avezzanese-mario-spera/>;
- 2021: For the "associazione gastrofili" - <http://resc.deskline.net/documents/1/TRN/942c73db-562e-4fa4-8468-7156b8be6149/file.pdf> ;
- 2022: MARSEC - <https://www.facebook.com/www.marsec.org/photos/a.275134449166587/5585526364794009/> - <https://www.youtube.com/watch?v=cpYWXVnKnjg>

I am actively involved each year in events such as Trieste Next (e.g., <https://www.youtube.com/watch?v=CPugoQMwGcA>), SISSA 4 Schools, and the European Researchers' Night.

Career breaks, unconventional career paths and major life events

Since the birth of my son in May 2022 and due to significant family issues in 2023, I have had to considerably reduce my professional engagements, particularly travel to conferences. As a result, I declined numerous international invitations, delegating PhD students and researchers from SISSA to represent our work.

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Luogo e Data
Trieste, 03.12.2024

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