

Alessandro Santini

PHD CANDIDATE IN GRAVITATIONAL PHYSICS

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Education

Ph.D. in Physics

Potsdam, Germany

MAX PLANCK INSTITUTE FOR GRAVITATIONAL PHYSICS

2023–present

- **Supervisors:** Dr. Jonathan Gair, Prof. Dr. Alessandra Buonanno

Master's Degree in Astrophysics and Space Physics

Milan (MI), Italy

UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

2021–2023

- **final degree grade:** 110/110 with distinction (cum laude)
- **Thesis:** Black-hole mergers in disk-like environments could explain the observed $q - \chi_{\text{eff}}$ correlation
- **Thesis advisors:** Prof. Davide Gerosa, Dr. Roberto Cotesta

Bachelor's Degree in Physics

Milan (MI), Italy

UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

2018–2021

- **final degree grade:** 110/110 with distinction (cum laude)
- **Thesis:** Resolution of the Euler equations using the Athena++ code
- **Thesis advisor:** Prof. Bruno Giacomazzo

High School Diploma

Lissone (MB), Italy

LICEO SCIENTIFICO STATALE FEDERIGO ENRIQUES

2013–2018

- **Final degree grade:** 97/100

INTERNSHIPS

Erasmus+ Scholarship

Baltimore (MD), USA

JOHNS HOPKINS UNIVERSITY

April–July 2023

Skills

Programming Python (proficient) – GPU computing (CUDA, Cupy, Numba, JAX) – Bash – Mathematica (basic) – C, C++ (basic)

Other tools Latex (proficient), Git, Microsoft Office suite

Languages Italian (Native), English (Fluent)

Publication record

1. Speri, L.; Duque, F.; Barsanti, S.; **Santini, A.**; Kejriwal, S.; Burke, O.; Chapman-Bird, C. E. A.
“Quantifying the Scientific Potential of Intermediate and Extreme Mass Ratio Inspirals with the Laser Interferometer Space Antenna”,
ArXiv preprint
2. De Santi, F.; **Santini, A.**; Toubiana, A.; Karnesis, N.; Gerosa, D.
“Inferring the population properties of galactic binaries from LISA’s stochastic foreground”, ArXiv preprint
3. **Santini, A.**; Muratore, M.; Gair, J.; Hartwig, O.
“A flexible, GPU-accelerated approach for the joint characterization of LISA instrumental noise and Stochastic Gravitational Wave
Backgrounds”, Phys.Rev.D 112, 084050
4. Chapman-Bird, C. E. A. et al (including **Santini, A.**)
“The Fast and the Frame-Dragging: Efficient waveforms for asymmetric-mass eccentric equatorial inspirals into rapidly-spinning

black holes”, Phys.Rev.D 112, 104023

5. Fabbri, C. M.; Gerosa, D.; **Santini, A.**; Mould, M.; Toubiana, A.; Gair, J.
“*Reconstructing parametric gravitational-wave population fits from non-parametric results without refitting the data*”, Phys.Rev.D 111, 104053
6. Khalvati, H.; **Santini, A.**; Duque, F.; Speri, L.; Gair, J.; Yang, H.; Brito, R.
“*Impact of relativistic waveforms in LISA’s science objectives with extreme-mass-ratio inspirals*”, Phys.Rev.D 111, 082010
7. **Santini, A.**; Gerosa, D.; Cotesta, R.; Berti, E.
“*Black-hole mergers in disk-like environments could explain the observed $q - \chi_{\text{eff}}$ correlation*”, Phys.Rev.D 108, 083033

Talks, conferences & workshops

CONTRIBUTED TALKS

26th SIGRAV Meeting

Milan, Italy

A flexible, GPU-accelerated approach for the joint characterization of LISA instrumental noise and Stochastic Gravitational Wave Backgrounds

September 2025

EMRI Search and Inference within the LISA Global Fit - Part I

Paris, France

Don’t reinvent the wheel: including Extreme Mass Ratio Inspirals in the LISA global fit

June 2025

Amaldi15

Online

Black-hole mergers in disk-like environments could explain the observed $q - \chi_{\text{eff}}$ correlation

July 2023

APS April Meeting

Minneapolis, USA

Migration traps in AGN disks and hierarchical mergers as promising origin of the observed $q - \chi_{\text{eff}}$ correlation

April 2023

CONTRIBUTED POSTERS

15th LISA Symposium

Dublin, Ireland

A flexible approach for the joint characterization of LISA instrumental noise and Stochastic Gravitational-Wave Backgrounds

July 2024

Public Outreach

Berlin Science Week

Berlin, Germany

Deciphering black hole symphonies: The new world of gravitational wave astronomy.

November 2024

Speaker at one of the highlight, invited events of Berlin Science Week 2024 (webpage here), presenting the current status of gravitational-wave astronomy together with 7 other researchers from the Max Planck Institute for Gravitational Physics. Audience: > 200 people.