

# Lorenzo Pompili

## Curriculum Vitae

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Max Planck Institute for Gravitational Physics (Albert Einstein Institute)  
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[lorenzopompili00.github.io](https://github.com/lorenzopompili00)

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**Research interests** Gravitational-wave (GW) astronomy and data analysis. GW modelling for compact binaries. Tests of General Relativity with GW sources. GW accuracy requirements for current and next-generation detectors.

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## Education

Jun 2021 – **PhD Student.**

Present *Max Planck Institute for Gravitational Physics, Potsdam (Germany)*

PhD Thesis: Ever more accurate effective-one-body waveforms for gravitational-wave astrophysics.  
Supervisor: Prof. Alessandra Buonanno (Max Planck Institute for Gravitational Physics)

Sep 2018 – **Master Degree in Theoretical Physics - 110/110 cum laude.**

Apr 2021 *Università degli Studi di Perugia, Perugia (Italy)*

Master Thesis: *Near-extreme Kerr magnetospheres*. Supervisor: Prof. Marta Orselli (Università degli Studi di Perugia, Niels Bohr Institute)

Sep 2015 – **Bachelor Degree in Physics - 110/110 cum laude.**

Sep 2018 *Università degli Studi di Perugia, Perugia (Italy)*

Bachelor Thesis: *Relativistic hydrodynamics*. Supervisor: Prof. Gianluca Grignani (Università degli Studi di Perugia)

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## Memberships

2023– LISA Consortium full member

2022– Einstein Telescope Collaboration member

2021– LIGO Scientific Collaboration member

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## Publications

List of selected publications in reversed chronological order. As a member of the LIGO Scientific Collaboration, I am a co-author on several full-collaboration papers. Highlighted below are those to which I have made a direct personal contribution. See [INSPIRE](#) for a full list.

- [12] Félix-Louis Julié, **Lorenzo Pompili**, Alessandra Buonanno *Inspiral-merger-ringdown waveforms in Einstein-scalar-Gauss-Bonnet gravity within the effective-one-body formalism*  
Submitted to Phys.Rev.D., arXiv:2406.13654
- [11] Alessandra Buonanno, Gustav Mogull, Raj Patil, **Lorenzo Pompili**, *Post-Minkowskian Theory Meets the Spinning Effective-One-Body Approach for Bound-Orbit Waveforms*  
Submitted to Phys.Rev.Lett., arXiv:2405.19181

- [10] Anuradha Gupta et al. (inc. **Lorenzo Pompili**), *Possible Causes of False General Relativity Violations in Gravitational Wave Observations*  
Submitted to SciPost Physics Community Reports, arxiv:2405.02197
- [9] Arnab Dhani et al. (inc. **Lorenzo Pompili**), *Systematic Biases in Estimating the Properties of Black Holes Due to Inaccurate Gravitational-Wave Models*  
Submitted to Phys.Rev.X, arXiv:2404.05811
- [8] LIGO-Virgo-KAGRA Collaboration (inc. **Lorenzo Pompili**), *Observation of Gravitational Waves from the Coalescence of a  $\sim 2.5 - 5M_{\odot}$  Compact Object and a Neutron Star*  
Astrophys.J.Lett. 970 (2024) 2, L34, arXiv:2404.04248
- [7] LISA Consortium Waveform Working Group (inc. **Lorenzo Pompili**), *Waveform Modelling for the Laser Interferometer Space Antenna*  
Submitted to Living Rev.Rel., arXiv:2311.01300
- [6] Alexandre Toubiana, **Lorenzo Pompili** et al., *Measuring source properties and quasi-normal-mode frequencies of heavy massive black-hole binaries with LISA*  
Phys. Rev. D 109 (2024) 10, 104019, arXiv:2307.15086
- [5] Deyan P. Mihaylov et al. (inc. **Lorenzo Pompili**), *pySEOBNR: a software package for the next generation of effective-one-body multipolar waveform models*  
Submitted to SoftwareX, arXiv:2303.18203
- [4] Maarten van de Meent et al. (inc. **Lorenzo Pompili**), *Enhancing the SEOBNRv5 effective-one-body waveform model with second-order gravitational self-force fluxes*  
Phys.Rev.D 108 (2023) 12, 124038, arXiv:2303.18026
- [3] Antoni Ramos-Buades et al. (inc. **Lorenzo Pompili**), *SEOBNRv5PHM: Next generation of accurate and efficient multipolar precessing-spin effective-one-body waveforms for binary black holes*  
Phys.Rev.D 108 (2023) 12, 124037, arXiv:2303.18046
- [2] Mohammed Khalil et al. (inc. **Lorenzo Pompili**), *Theoretical groundwork supporting the precessing-spin two-body dynamics of the effective-one-body waveform models SEOBNRv5*  
Phys.Rev.D 108 (2023) 12, 124036, arXiv:2303.18143
- [1] **Lorenzo Pompili** et al., *Laying the foundation of the effective-one-body waveform models SEOBNRv5: improved accuracy and efficiency for spinning non-precessing binary black holes*  
Phys.Rev.D 108 (2023) 12, 124035, arXiv:2303.18039

## Talks

Invited talks marked with \*.

- 09/2024 LIGO-Virgo-KAGRA Collaboration Meeting, Barcelona. Title: XXX
- 09/2024 TEONGRAV Workshop, Rome. Title: *Inspiral-merger-ringdown waveforms in Einstein-scalar-Gauss-Bonnet gravity within the effective-one-body formalism*
- 09/2024 \* Fundamental Physics Meets Waveforms With LISA, Potsdam. Title: *SEOBNRv5: advancements in effective-one-body gravitational waveforms towards LISA*
- 09/2024 \* Fundamental Physics Meets Waveforms With LISA, Potsdam. Panel member: *Effect of systematics on parametrized tests of GR*
- 07/2024 \* PAX IX Workshop, London. Panel member: *Waveform challenges and Numerical Relativity*
- 03/2024 LIGO-Virgo-KAGRA Collaboration Meeting, Baton Rouge. Title: *Inspiral-merger-ringdown waveforms in Einstein-scalar-Gauss-Bonnet gravity within the effective-one-body formalism*

- 09/2023 LIGO-Virgo-KAGRA Collaboration Meeting, Toyama. Title: *Accounting for numerical relativity calibration uncertainty in modeling and inference of gravitational waves*
- 07/2023 26th Capra Meeting on Radiation Reaction in General Relativity, Copenhagen. Title: *Enhancing the SEOBNRv5 effective-one-body waveform model with second-order gravitational self-force fluxes*
- 09/2022 LIGO-Virgo-KAGRA Collaboration Meeting, Cardiff. Title: *Update on SEOBNR waveform development for O4a*
- 03/2022 DPG Spring Meeting, Heidelberg (virtual). Title: *New generation effective-one-body waveforms for binary black-holes with non-precessing spins*

## Teaching experience

- 2022 Teaching assistant for Prof. Alessandra Buonanno's course on Gravitational Waves, *Humboldt University, Berlin*

## Referee experience

- 2023- Referee for Phys. Rev. D

## Organizational duties

- 09/2024 Fundamental Physics Meets Waveforms With LISA Workshop  
*Local organizing committee*
- 2023- AEI LIGO meeting organizer  
*Organized weekly meetings dedicated to LIGO science at the AEI*
- 2021- AEI EOB meeting organizer  
*Organized weekly meetings dedicated to EOB waveform modeling at the AEI*

## IT Skills

Python, Cython, Mathematica, C/C++  
Git, LaTeX, HTCondor, Slurm, Linux

Open source software

- 2021- [pySEOBNR](#)  
*Accurate and efficient gravitational wave models for compact binary coalescences using the effective-one-body (EOB) approach.*