Lorenzo Speri

PhD Student
in Gravitational-Wave Physics

Albert Einstein Institute
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Born: 26/01/1996

Education

September 2020 - **PhD**, *Max Planck Institute for Gravitational Physics (Albert Einstein Institute)*, supervisor: Jonathan R. Gair, jonathan.gair@aei.mpg.de.
Waveform modeling of Extreme Mass Ratio Inspirals.
Statistical methods for LISA gravitational wave observations as probes for cosmology.
Development of robust statistical tools for Pulsar Timing Array analysis.

2018 - 2020 **Master of Theoretical Physics MSc**, *University of Heidelberg*.
Master thesis: *Effective Resonance Model: a small step for the constants of motion, a giant leap for biases in EMRI parameter estimation* jointly supervised by Prof. Jonathan Gair (Max Planck Institute for Gravitational Physics) and Prof. Matthias Bartelmann (University of Heidelberg).
Degree examination: 1 (Very good).

2015 - 2018 **Bachelor of Physics BSc**, *University of Trento*.
Erasmus+ Programme Scholarship: 10 months as an exchange student at the University of Oslo (2017/2018).
Thesis: *Analyzing Gravitational Waves through Numerical Simulations of Compact Binaries* under the supervision of Prof. Bruno Giacomazzo.
Degree examination: 110/110

2010 - 2015 **High School Diploma**, *Institute L. Calabrese - P. Levi*, San Pietro in Cariano (VR), Italia.
Scientific High School Diploma.

Publications

09/04/2021 **FastEMRIWaveforms: New tools for millihertz gravitational-wave data analysis**, M. L. Katz, A. J. K. Chua, L. Speri, N. Warburton, S. A. Hughes.
`https://arxiv.org/abs/2104.04582`

12/03/2021 **Assessing the impact of transient orbital resonances**, L. Speri and J. R. Gair.
`https://arxiv.org/abs/2103.06306`

20/10/2020 **Testing the Quasar Hubble Diagram with LISA Standard Sirens**, L. Speri, N. Tamanini, R.R. Caldwell, J.R. Gair and B. Wang.
Phys. Rev. D 103, 083526 (2021)

Talks

23/04/2021 **Pulsar selection methods**, *EPTA spring meeting*.

21/04/2021 **Assessing the impact of transient orbital resonances**, *University of Southampton*.

27/02/2020 **Transient resonances and Gravitational Waves from EMRIs**, *Heidelberg Institute for Theoretical Studies HITS*.

25/02/2020 **Effects of transient resonances on Gravitational Waves from EMRIs**, *University of Heidelberg*.

Awards and Scholarship

September 2019 **Merit Award**, *University of Trento*.
Students who have achieved remarkable results at the end of their degree

2017 **Erasmus+ Programme Scholarship**, *University of Oslo*.
4000 euros to suport the exchange programme.

Teaching Experience

Winter Semester 2020/2021 **Teaching assistant of Prof. Dr. Alessandra Buonanno for the course of Gravitational Waves**, *Humboldt University*.

Memberships and Organisational Duties

2020 - **LISA Consortium member**.

2020 - **EPTA member**.

2020 - **AEI LISA meeting organiser**.
In charge of organising monthly meetings related to LISA science at the Max Planck Institute for Gravitational Physics (Albert Einstein Institute).

Conferences, Workshops and Schools

3-7/05/21 **Workshop on Gravitational Wave Astrophysics for Early Career Scientists**, *Online*.

7-11/10/20 **Writing About Science**, *Online*.

1-3/09/20 **LISA Symposium XIII**, *Online*.

25-27/05/20 **BHPToolkit Spring 2020 workshop**, *Online*.

20-24/05/19 **The Mysterious Universe: Dark Matter - Dark Energy - Cosmic Magnetic Fields**, *Mainz Institute for Theoretical Physics, Johannes Gutenberg University*.

13-15/05/19 **LISA Waveform Working Group Meeting**, *Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam*.

8-12/04/19 **Advanced Workshop on Accelerating the Search for Dark Matter with Machine Learning**, *ICTP, Trieste*.

11-22/03/19 **Theoretical Aspects of Astroparticle Physics, Cosmology and Gravitation**, *Galileo Galilei Institute, Firenze*.

09/2018 **Gaia Data & Science**, *University of Heidelberg*.

04/2018 **Spring workshop in nuclear and particle physics**, *CERN*.

09/2014 **Discovering high-mass particles with CMS**, *University of Padova*.

IT Skills

C/C++, Python, Matlab for Scientific Programming.
Numerical simulations of Extreme Mass Ratio Inspirals, prediction of Hubble expansion function with measurements of SuperNovae TypeIa using function basis series, parallelized Monte Carlo sampling, Crank-Nicolson algorithm for solving 2d diffusion equation, ODE solvers.

EinsteinToolkit, Cactus Framework.
Numerical relativistic simulations of compact binaries.

Language Skills

Italian Native language

English Fluent

German B2

Other

Academic Website, `https://www.aei.mpg.de/person/102224`.

GitHub Website, `https://github.com/lorenzsp`.

Personal Interests.
I play piano and I love listening to classical music. I have played rugby for six years, but I also like swimming, skiing and climbing.