

Andrea Antonelli

Department of Physics and Astronomy, Johns Hopkins University, 3400 N. Charles Street

✉ andrea.antonelli@aei.mpg.de • [GitHub](#), [Website](#)

Gravitational-wave astrophysicist: interested in gravity, astrophysics of black holes, and statistical analyses.

Employment

- **Johns Hopkins University** **Baltimore, Maryland, USA**
Postdoctoral Fellow 01/2022 -
 - Mentor: Prof. Dr. Berti, Emanuele.

Education

- **Max Planck Institute for Gravitational Physics (Albert Einstein Institute)** **Potsdam, Germany**
PhD student (affiliated to the University of Potsdam) 09/2017 - 12/2021
 - Thesis: "Accurate waveform models for gravitational-wave astrophysics: synergetic approaches from analytical relativity" (*magna cum laude*). Supervisor: Prof. Buonanno, Alessandra.
 - Developed analytical and semi-analytical tools to improve templates used in LIGO-Virgo analyses.
 - Published findings in high-impact journals and presented them at several international conferences.
- **University of Oxford** **Oxford, United Kingdom**
MSc student 09/2016 - 07/2017
 - Dissertation: "A journey into the dark sector" (on dark matter searches). Supervisor: Prof. Sarkar, Subir.
- **University of Tokyo** **Tokyo, Japan**
UTRIP Fellow 06/2015 - 07/2015
 - Carried out research in Prof. Tachikawa's group in anomaly cancellations in string theories.
 - Posted final report of fellowship to the arXiv (e-Print: 1507.08642).
- **King's College, London** **London, United Kingdom**
BSc student 09/2013 - 07/2016
 - Thesis: "Theory and Phenomenology of cosmological Inflation". Supervisor: Prof. Mavromatos, Nick.

Publications

Metrics for my publications can be found [at the inspire database](#).

5. "Noisy neighbours: inference biases from overlapping gravitational-wave sources", [A. Antonelli](#), O. Burke, J.R. Gair, Mon. Not. Roy. Astron. Soc. 507 (2021). Code available [here](#).
4. "Gravitational spin-orbit and aligned spin1–spin2 couplings through third-subleading post-Newtonian order", [A. Antonelli](#), C. Kavanagh, M. Khalil, J. Steinhoff, and J. Vines. Phys. Rev. D 102 (2020) 124024 [arXiv:2010.02018].
3. "Gravitational spin-orbit coupling through third-subleading post-Newtonian order: from first-order self-force to arbitrary mass ratios", [A. Antonelli](#), C. Kavanagh, M. Khalil, J. Steinhoff, and J. Vines, **Phys. Rev. Lett.** 125, 011103 (2020), arXiv:2003.11391 [gr-qc]. **Read about it [here](#) or [here](#).**
2. "Quasicircular inspirals and plunges from nonspinning effective-one-body Hamiltonians with gravitational

self-force information", A. Antonelli, M. van de Meent, A. Buonanno, J. Steinhoff, and J. Vines, Phys. Rev. D101, 024024 (2020), arXiv:1907.11597 [gr-qc].

1. "Energetics of two-body Hamiltonians in post-Minkowskian gravity", A. Antonelli, A. Buonanno, J. Steinhoff, M. van de Meent, and J. Vines, Phys. Rev. D99, 104004 (2019), arXiv:1901.07102 [gr-qc].

Others:

- o "Accurate waveform models for gravitational-wave astrophysics: synergistic approaches from analytical relativity", A. Antonelli, PhD thesis.
- o "An Analysis of Anomaly Cancellation for Theories in $D=10$ ", A. Antonelli, e-Print: 1507.08642 [hep-th]. (Final report for the UTRIP fellowship; invitation to submit it to the arXiv by Prof. Tachikawa).

Talks

* refers to invited talks.

***GW/Cosmo Journal Club** **Johns Hopkins University (virtual)**
03/2021

Title: Noisy neighbours: inference biases from overlapping gravitational-wave sources

***HopBHAM Workshop** **University of Birmingham (virtual)**
02/2021

Title: Noisy neighbours: inference biases from overlapping gravitational-wave sources

***Strong Gravity Seminars** **Perimeter Institute (virtual)**
12/2020

Title: The accurate characterisation of gravitational-wave signals: lessons for ground-based and spaceborne detectors.

23rd Capra Meeting **University of Texas, Austin (virtual)**
06/2020

Title: Gravitational spin-orbit coupling through third-subleading post-Newtonian order: from first-order self force to arbitrary mass ratios.

30th Texas Symposium **University of Portsmouth, United Kingdom**
12/2019

Title: Quasi-circular inspirals and plunges from non-spinning effective-one-body Hamiltonians with gravitational self-force information.

GR22/Amaldi 13 **Universitat de València, Spain**
07/2019

Title: Energetics Of Two-Body Hamiltonians In Post-Minkowskian Gravity.

22nd Capra Meeting **CBPF, Rio de Janeiro, Brazil**
06/2019

Title: A non-spinning effective-one-body Hamiltonian for small-mass-ratio binaries.

21st Capra Meeting **AEI, Potsdam, Germany**
06/2018

Title: Progress at the interface between Effective One Body and the Small Mass Ratio approximation.

Awards, Grants & Fellowships

Travel grant to attend 2019 DPG meeting. 2019

Distinction for academic achievement at the University of Oxford 2017

Nikon prize for best final year thesis in Physics at King's College, London, (mark: 96/100) 2016

UTRIP Fellowship 2015

Fellowship granted yearly to applicants across all scientific disciplines to carry out research at the University of Tokyo. Acceptance rate $\sim 3.5\%$. I was granted one of only two fellowships ever awarded to a project in Mathematical Physics.

First Class honours at King's College, London, each year in my undergraduate studies 2013-2016

Skills

I make an effort to include all the codes I develop at my [GitHub page](#).

Programming languages: Mathematica, Python.

Scientific tools: GIT, LaTeX.

Languages: Italian (native), English (proficient), Spanish (proficient), German (basic).

Teaching

- TA for Prof. Harald Pfeiffer's *GW astrophysics*, University of Potsdam, summer semester 2020.
- TA for Prof. Martin Wilkens' *General Relativity*, University of Potsdam, winter semester 2019/2020.
- TA for the Jürgen Ehlers Spring School, 2018.

Service and Memberships

Group meetings @ Albert Einstein Institute Potsdam, Germany
Organizer 2020 - 2021

Diversity & Inclusion Potsdam, Germany
Representative 2020

Tasks: coordinating a series of seminars on multiple facets of unconscious bias.

Symposium: "Extreme matter meets extreme gravity" Munich, Germany
Organizer 03/2019

Hosted by the German Physical Society (DPG). Symposium co-organized with 4 more PhD students.

LISA meetings @ Albert Einstein Institute Potsdam, Germany
Founder 2018 - 2020

Proposed, developed and oversaw a program for monthly meetings broadly related to LISA topics, now a regular feature at the Albert Einstein Institute.

Associate member of the LISA Consortium (2019-)

Member of the LIGO Collaboration (2017-2021)

Referee:

- Physical Review D.

References

Prof. Dr. Alessandra Buonanno

alessandra.buonanno@aei.mpg.de

Max Planck Institute for Gravitational Physics (Albert Einstein Institute)

Am Mühlenberg 1, D-14476 Potsdam-Golm, Germany

Prof. Dr. Jonathan Gair

jonathan.gair@aei.mpg.de

Max Planck Institute for Gravitational Physics (Albert Einstein Institute)
Am Mühlenberg 1, D-14476 Potsdam-Golm, Germany

Prof. Dr. Emanuele Berti

berti@jhu.edu

Department of Physics and Astronomy, Johns Hopkins University,
3400 N. Charles Street, Baltimore, Maryland, 21218, USA

Dr. Justin Vines

justin.vines@aei.mpg.de

Max Planck Institute for Gravitational Physics (Albert Einstein Institute)
Am Mühlenberg 1, D-14476 Potsdam-Golm, Germany