Andrea Antonelli

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✉ andrea.antonelli@aei.mpg.de • My GitHub page.

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:

- "Accurate waveform models for gravitational-wave astrophysics: synergistic approaches from analytical relativity", A. Antonelli, PhD thesis.
- "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 ∼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 for the projects I am involved in in 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
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Max Planck Institute for Gravitational Physics (Albert Einstein Institute)
Am Mülhenberg 1, D-14476 Potsdam-Golm, Germany

Prof. Dr. Jonathan Gair
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Max Planck Institute for Gravitational Physics (Albert Einstein Institute)
Am Mülhenberg 1, D-14476 Potsdam-Golm, Germany

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

Dr. Justin Vines
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