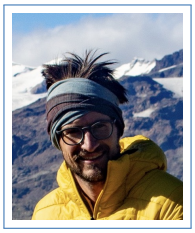

Adrien Kuntz

Curriculum Vitae

Positions

2024–?? **FCT Investigator (grant)**, *Center for Astrophysics and Gravitation (CENTRA), Lisbon*
Title: Gravitational waves as a new probe of fundamental physics and astrophysics

2023–2024 **Postdoctoral researcher**, *Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste*, with Enrico Barausse
Title: Tests of Effective Field Theory of Dark Energy with binary pulsars

2020–2023 **Postdoctoral researcher**, *Scuola Normale Superiore, Pisa*, with Enrico Trincherini
Title: Effective field theories in gravity and cosmology

Education

2016–2017 **Master of Physics**, *Ecole Normale Supérieure*, Paris, *M2 ICFP Theoretical Physics*
obtained with honors

2015–2016 **Bachelor of Mathematics**, *Ecole Normale Supérieure*, Paris
obtained with honors

2014–2015 **Master of Physics**, *Ecole Normale Supérieure*, Paris, *M1 ICFP*
obtained with honors

2013–2014 **Bachelor of Physics**, *Ecole Normale Supérieure*, Paris
obtained with honors

PhD thesis

Title *Testing gravity with the two-body problem*
Dates 2017-2020
Supervisor Federico Piazza
Description My PhD focuses on tests of gravity, notably with gravitational waves observations

Publications

[1] Ramiro Cayuso, Adrien Kuntz, Miguel Bezares, and Enrico Barausse. Scalar emission from neutron star-black hole binaries in scalar-tensor theories with kinetic screening. 10 2024, 2410.16367.

[2] Bruno Bucciotti, Leonardo Juliano, Adrien Kuntz, and Enrico Trincherini. Amplitudes and polarizations of quadratic quasi-normal modes for a Schwarzschild black hole. *JHEP*, 09:119, 2024, 2406.14611.

[3] Bruno Bucciotti, Leonardo Juliano, Adrien Kuntz, and Enrico Trincherini. Quadratic Quasi-Normal Modes of a Schwarzschild Black Hole. 5 2024, 2405.06012.

[4] Clemente Smarra et al. Constraints on conformal ultralight dark matter couplings from the European Pulsar Timing Array. *Phys. Rev. D*, 110(4):043033, 2024, 2405.01633.

[5] Sophia Yi, Adrien Kuntz, Enrico Barausse, Emanuele Berti, Mark Ho-Yeuk Cheung, Konstantinos

Kritos, and Andrea Maselli. Nonlinear quasinormal mode detectability with next-generation gravitational wave detectors. *Phys. Rev. D*, 109(12):124029, 2024, 2403.09767.

[6] Adrien Kuntz and Enrico Barausse. Angular momentum sensitivities in scalar-tensor theories. *Phys. Rev. D*, 109(12):124001, 2024, 2403.07980.

[7] Bruno Bucciotti, Adrien Kuntz, Francesco Serra, and Enrico Trincherini. Nonlinear quasi-normal modes: uniform approximation. *JHEP*, 12:048, 2023, 2309.08501.

[8] Adrien Kuntz and Konstantin Leyde. Transverse Doppler effect and parameter estimation of LISA three-body systems. *Phys. Rev. D*, 108(2):024002, 2023, 2212.09753.

[9] Adrien Kuntz. Supplementary radiation-reaction force between two binaries. *Phys. Rev. D*, 107(6):064066, 2023, 2302.08518.

[10] Adrien Kuntz, Francesco Serra, and Enrico Trincherini. Effective two-body approach to the hierarchical three-body problem: Quadrupole to 1PN. *Phys. Rev. D*, 107(4):044011, 2023, 2210.13493.

[11] Adrien Kuntz. Precession resonances in hierarchical triple systems. *Phys. Rev. D*, 105:024017, Jan 2022.

[12] Adrien Kuntz. Cross-correlation of CFHTLenS galaxy catalogue and Planck CMB lensing using the halo model prescription. *Astron. Astrophys.*, 584:A53, 2015, 1510.00398.

[13] Adrien Kuntz, Riccardo Penco, and Federico Piazza. Extreme Mass Ratio Inspirals with Scalar Hair. *JCAP*, 08:023, 2020, 2004.10772.

[14] Adrien Kuntz. Half-solution to the two-body problem in General Relativity. *Phys. Rev. D*, 102(6):064019, 2020, 2003.03366.

[15] Ehsan Hatefi and Adrien Kuntz. On Perturbation Theory and Critical Exponents for Self-Similar Systems. *Eur. Phys. J. C*, 81(1):15, 2021, 2010.11603.

[16] Adrien Kuntz, Francesco Serra, and Enrico Trincherini. Effective two-body approach to the hierarchical three-body problem. *Phys. Rev. D*, 104(2):024016, 2021, 2104.13387.

[17] Philippe Brax, Anne-Christine Davis, and Adrien Kuntz. Disformally Coupled Scalar Fields and Inspiralling Trajectories. *Phys. Rev.*, D99(12):124034, 2019, 1903.03842.

[18] Adrien Kuntz, Federico Piazza, and Filippo Vernizzi. Effective field theory for gravitational radiation in scalar-tensor gravity. *JCAP*, 1905(05):052, 2019, 1902.04941.

[19] Adrien Kuntz. Two-body potential of Vainshtein screened theories. *Phys. Rev.*, D100(2):024024, 2019, 1905.07340.

[20] Philippe Brax, Lavinia Heisenberg, and Adrien Kuntz. Unveiling the Galileon in a three-body system : scalar and gravitational wave production. *JCAP*, 05:012, 2020, 2002.12590.

Teaching

2021-2022 **Effective field theories**, *M2, Scuola Normale Superiore*, Pisa, 4h
I was teaching one session on the use of EFT in gravity inside the EFT Master course at SNS

2018-2019 **Experimental challenges**, *M1 Fundamental Physics*, Marseille, 32h
The students are asked to set up their own experimental project

July 2018 **Effective field theories**, *l'Agape summer school*, 3h
This 3h course is an introduction to EFT intended for PhD students in theoretical physics. It can be found on my website.

2017-2019 **Exercices pour Mathématiques pour Physiciens**, *L2 Physique*, Aix-en-Provence, Marseille, 126h
The exercices cover linear algebra, series, differential equations and probabilities

2017-2018 **Introduction à Python**, *L2 Physique*, Aix-en-Provence, 30h
This course is a first introduction to Python for bachelor students

2015-2017 **Colles**, *PCSI*, Lycée Saint-Louis, Paris, 168h
'Colles' are oral exams in classe préparatoire. I based my exercises mainly on Feynman's exercises book.

Awards

- *FCT grant*: I obtained the prestigious FCT grant, a 6-year research position in Portugal
- *PRD Editor's Suggestion* for my article "Effective two-body approach to the hierarchical three-body problem: Quadrupole to 1PN"
- *Shortlisted*: I was shortlisted ("admissible") for CNRS section 1 and 2, and ranked for associate professor ("maître de conférences") positions in Montpellier (2nd), Annecy (3rd) and Paris (2nd).
- *PhD Prize*: I got the Aix-Marseille prize of excellence for my PhD obtained in 2020
- *COST action GWVerse*: I got a funding for a one-month Short-Term Scientific Mission at CENTRA (Lisbon), to work with Vitor Cardoso on superradiance.

Talks

You can find my presentations on my website

Invited seminars or conferences

- GdR Formes d'ondes, IAP, Paris, 24 September 2023, *Nonlinearities in Black Hole Ringdown*
- IAP, Paris, 23 September 2023, *Supplementary radiation-reaction force between two binaries*
- Fundamental Physics Meets Waveforms with LISA, AEI, Potsdam, 03 September 2024, *Nonlinearities in Black Hole Ringdown*
- APC, Paris, 17 May 2024, *Nonlinearities in Black Hole Ringdown*
- SISSA, Trieste, 19 October 2023, *Nonlinearities in Black Hole Ringdown*
- IJCLAB, Bures-sur-Yvette, France, 29 March 2023, *The two-body problem in modified gravity*
- SYRTE, Observatoire de Paris, France, 1 December 2022, *Relativistic three-body problem*
- GRACES team, Laboratoire de Physique de l'École Normale Supérieure, France, 30 November 2022, *The two-body problem in modified gravity*
- SISSA, Trieste, Italy, 28 September 2022, *Relativistic three-body problem*
- Laboratoire d'Annecy-le-Vieux de Physique Théorique, France, 14 October 2021, *Relativistic three-body problem*
- Laboratoire Univers et Particules de Montpellier, France, 8 October 2021, *Relativistic three-body problem*
- Laboratoire d'Annecy-le-Vieux de Physique Théorique, France, 30 March 2021, *The two-body problem in modified gravity*
- Laboratoire Univers et Particules de Montpellier, France, 30 March 2021, *The two-body problem in modified gravity*
- ETH Zurich, Switzerland, 25 February 2020, *The two-body problem in modified gravity*
- Carnegie Mellon University, Pittsburg, USA, 15 November 2019, *The two-body problem in modified gravity*
- Perimeter Institute, Waterloo, Canada, 7 November 2019, *The two-body problem in modified gravity*
- GRIT at CENTRA, Lisbon, 3 October 2019, *The two-body problem in modified gravity*

Workshops

- TEONGRAV, Roma, 16 September 2024, *Nonlinearities in Black Hole Ringdown*
- Theory of Gravitational Waves, Roma, 16 February 2024, *Interference of gravitational waves*
- TEONGRAV meeting, Napoli, 21 December 2023, *Measuring supermassive black hole properties from binary inspirals in LISA*
- Fourth European Physical Society Conference on Gravitation: Black Holes, Valencia, 13 November 2023, *Nonlinearities in Black Hole Ringdown*
- Progress on Old and New Themes in cosmology, Avignon, 2 May 2023, *Measuring supermassive black hole properties from binary inspirals in LISA*
- GdR Gravitational Waves, Toulouse, France, 11 October 2022, *Relativistic three-body problem*
- Théorie, Univers et Gravitation, Montpellier, 4 October 2022, *Precession resonances*
- Erice School of Subnuclear Physics, Erice (Sicily), 20 June 2022, *Relativistic three-body problem*
- Théorie, Univers et Gravitation, Institut Henri Poincaré, 13 December 2021, *Relativistic three-body problem*
- Paris-Saclay AstroParticle Symposium 2021, online meeting, 23 November 2021, *Relativistic three-body problem*
- GdR Gravitational Waves, Annecy, France, 12 October 2021, *Precession resonances*
- GdR gravitational waves, online meeting, 30 March 2021, *Relativistic three-body problem*
- Dark Energy colloquium, online meeting, 25 May 2020, *Extreme mass ratio inspirals with scalar hair*
- GdR gravitational waves, Paris Meudon observatory, 04 February 2020, *Extreme mass ratio inspirals with scalar hair*
- L'Agape summer school, Meyzérac, 20 July 2019, *Gravitational waves*
- National Dark Energy meeting, IAP, Paris, 20 May 2019, *Two-Body potential of Vainshtein screened theories*
- Hot topics in Modern Cosmology, Cargese (Corsica), 9 May 2019, *Effective field theory for gravitational radiation in scalar-tensor gravity*
- Working group "GR and alternative theories tests", CEA Saclay, Paris, 31 January 2019, *Effective field theory for gravitational radiation in scalar-tensor gravity*
- National Dark Energy colloquium, IAP, Paris, 24 October 2018, *Effective field theory for gravitational radiation in scalar-tensor gravity*

Outreach talks

- KBE+SISSA, Trieste, 24 April 2024, *Gravitational waves*
- Centre de Physique Théorique, Marseille, 21 March 2019, *Gravitational waves*
- Centre de Physique Théorique, Marseille, 13 June 2018, *Gravitational waves*
- Centre de Physique Théorique, Marseille, 14 March 2018, *Gravitational waves*

Referees

Federico Piazza, *Federico.Piazza@cpt.univ-mrs.fr*

Filippo Vernizzi, *filippo.vernizzi@ipht.fr*

Enrico Barausse, *barausse@sissa.it*

Enrico Trincherini, *enrico.trincherini@sns.it*

Philippe Brax, *philippe.brax@ipht.fr*

Miscellaneous

Referee, *for the following journals*

JCAP, Physical Review D, European Physical Journal C, Physics Letters B, General Relativity and Gravitation, International Journal of Modern Physics, Physics of the Dark Universe, Journal of Geometry and Physics

Outreach

Participation to outreach events:

- Fête de la science
- Déclics (Link)
- Nuit des Sciences et des Lettres (Link)
- University radio in Pisa (Link)

Feb 2018 **FPT**, *French Physicists Tournament*

The french selection for the International Physicist Tournament evolved into a national tournament of its own. This year I was team leader of the Aix-Marseille team and also part of the jury. More information : http://france.iptnet.info/

Sept-Dec 2013 **IPT**, *International Physicists Tournament*
During this tournament, two teams of eight people compete to propose a solution to various problems in Physics (for example : what is the optimal diameter of a ball composed only of rubber bands ?)