

Natalie B. Hogg

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Postdoctoral researcher at the Institut de Physique Théorique, CEA Paris-Saclay

Employment

06/2021 – present **Postdoctoral researcher**
IFT UAM–CSIC (06/2021 – 01/2022) & IPHT CEA Paris-Saclay (02/2022 – present)
Developing novel observables in strong and weak gravitational lensing.
Investigating the use of gravitational waves as a probe of cosmology.
Supervisors: Dr Pierre Fleury, Dr Matteo Martinelli

Education

10/2017 – 02/2021 **PhD in Cosmology**, University of Portsmouth
Thesis: Beyond Λ CDM: current and future constraints on alternative cosmological models
Supervisors: Dr Marco Bruni, Prof David Wands, Prof Robert Crittenden

09/2013 – 07/2017 **MPhys Astrophysics 1st class hon.**, Aberystwyth University
with **Breen Prize** for best Master's dissertation in physics
Master's dissertation: Dynamical models of dark energy & their background cosmological evolution
Supervisor: Prof Carsten van de Bruck (University of Sheffield)

Major awards and prizes

06/2021	G-Research quantitative research grant Hardship grant from UK-based financial technology company <i>Used to support my research in the gap between finishing my PhD and starting my contract at the IFT, which was delayed due to the Covid-19 pandemic and the UK's withdrawal from the European Union.</i>	£2000
05/2018	Long Term Attachment UK Science and Technology Facilities Council travel grant <i>Used visiting the IFT, January – March 2020. Visit curtailed by Covid-19 pandemic.</i>	£3600
05/2018	Santander Mobility Award University of Portsmouth and Santander Bank travel grant <i>Used for ICTP Summer School on Cosmology, Trieste, June 2018</i>	£500
01/2018	Short Term Scientific Missions Two CANTATA (EU COST Action) travel grants <i>Used visiting Lorentz Institute, Leiden, March and November 2018</i>	€2150
07/2017	Breen Prize Best Master's dissertation in physics, Aberystwyth University	£2000

Selected recent talks

- 06/2022 **Dancing in the dark: detecting a population of distant primordial black holes**
Dutch Theoretical Cosmology meeting, Leiden
Invited talk
- 04/2022 **The distance duality relation: violations, constraints and biases**
GRCo Seminar, IAP Paris
Invited talk
- 10/2021 **The distance duality relation: violations, constraints and biases**
Centre for Astronomy and Particle Theory seminar, University of Nottingham
Invited talk, delivered virtually
- 07/2021 **Novel probes of the distance duality relation**
Cosmology group seminar, Lorentz Institute, Leiden
Invited talk, delivered virtually
- 07/2021 **Constraints on the distance duality relation with standard sirens**
Cosmology from Home conference
Pre-recorded, available on Youtube
- 04/2021 **Is the standard model of cosmology wrong?**
Physics department seminar, Aberystwyth University
Invited talk, delivered virtually
- 04/2021 **Constraints on the distance duality relation with standard sirens**
Britgrav21, University College Dublin
Delivered virtually
- 04/2020 **New constraints on beyond- Λ CDM cosmologies**
Cosmology group seminar, Queen Mary University of London
Invited talk, delivered virtually
- 12/2019 **Interacting vacuum dark energy**
TEXAS Symposium, University of Portsmouth
Awarded best talk in session prize
- 12/2019 **Interacting vacuum dark energy**
Cosmology and relativity group seminar, University of Sheffield
Invited talk

Selected outreach and public engagement

- 02/2022 **The Universe Howling — What are Standard Sirens?**
Outreach video made for the IFT Youtube channel with over 14,000 views
- 05/2018 **British Federation of Women Graduates annual meeting**
Gave a talk on dark energy and cosmology research to a general audience
- 01/2018, 01/2019 **Stargazing Live**
Demonstrator for various activities at this annual Portsmouth Historic Dockyard public event
- 03/2018 **Night Sky Live**
Demonstrator for various activities at this public event at Winchester Science Centre
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Service

- 2022 – present **Organiser**, IPhT cosmology & gravity journal club
- 2020 – present **Referee** for Monthly Notices of the Royal Astronomical Society, Physics of the Dark Universe, Astronomy and Computing
- 2020 **Chair**, local organising committee, South Coast Cosmology meeting, University of Portsmouth
- 2019 **Member**, local organising committee, A History of the Universe in Redshift conference
- 2018/19 **PhD student representative**, ICG management committee, University of Portsmouth
PhD student representative, Faculty of Technology research degrees committee, University of Portsmouth
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Publications

- [1] Matteo Martinelli, Francesca Scarcella, **Natalie B. Hogg**, Bradley J. Kavanagh, Daniele Gaggero and Pierre Fleury, *Dancing in the dark: detecting a population of distant primordial black holes*, 2205.02639.
- [2] Fabrizio Renzi, **Natalie B. Hogg** and William Giarè, *The resilience of the Etherington–Hubble relation*, *Monthly Notices of the Royal Astronomical Society* (2022) 4004 [2112.05701].
- [3] **Natalie B. Hogg** and Marco Bruni, *Shan–Chen interacting vacuum cosmology*, *Monthly Notices of the Royal Astronomical Society* (2022) 4430 [arxiv:2109.08676].
- [4] Fabrizio Renzi, **Natalie B. Hogg**, Matteo Martinelli and Savvas Nesseris, *Strongly lensed supernovae as a self-sufficient probe of the distance duality relation*, *Physics of the Dark Universe* (2021) 100824 [arxiv:2010.04155].
- [5] **Natalie B. Hogg**, Matteo Martinelli and Savvas Nesseris, *Constraints on the distance duality relation with standard sirens*, *Journal of Cosmology and Astroparticle Physics* (2020) 019 [arxiv:2007.14335].
- [6] **Natalie B. Hogg**, Marco Bruni, Robert Crittenden, Matteo Martinelli and Simone Peirone, *Latest evidence for a late time vacuum – geodesic CDM interaction*, *Physics of the Dark Universe* (2020) 100583 [arxiv:2002.10449].
- [7] Matteo Martinelli, **Natalie B. Hogg**, Simone Peirone, Marco Bruni and David Wands, *Constraints on the interacting vacuum – geodesic CDM scenario*, *Monthly Notices of the Royal Astronomical Society* (2019) 3423 [arxiv:1902.10694].
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References

Dr Marco Bruni marco.bruni@port.ac.uk
Dr Matteo Martinelli matteo.martinelli@uam.es
Dr Pierre Fleury pierre.fleury@uam.es
Prof Carsten van de Bruck c.vandebruck@sheffield.ac.uk
