Natalie B. Hogg

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Postdoctoral researcher at the Instituto de Fisíca Teórica, Universidad Autónoma de Madrid

Employment

06/2021 – present **Postdoctoral researcher**, IFT UAM-CSIC
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 ΛCDM: 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 hons.**, 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)

Grants, awards and prizes

06/2021 **G-research quantitative research grant** £2000
Hardship grant from UK-based financial technology company
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.

05/2018 **Long Term Attachment** £3600
UK Science and Technology Facilities Council travel grant
Used visiting IFT UAM-CSIC, January – March 2020.
Visit curtailed by Covid-19 pandemic.

05/2018 **Santander Mobility Award** £500
University of Portsmouth and Santander Bank travel grant
Used for ICTP Summer School on Cosmology, Trieste, June 2018

01/2018 **Short Term Scientific Missions** €2150
Two CANTATA (EU COST Action) travel grants
Used visiting Lorentz Institute, Leiden, March and November 2018

07/2017 **Breen Prize** £2000
Best Master's dissertation in physics, Aberystwyth University

Recent and upcoming talks

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 after the conference

05/2021 **Constraints on the distance duality relation with standard sirens**
EuCAPT Symposium, CERN
Delivered virtually

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-ΛCDM 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

Service

ongoing 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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References

Dr Marco Bruni `marco.bruni@port.ac.uk`
Dr Matteo Martinelli `matteo.martinelli@uam.es`
Prof David Wands `david.wands@port.ac.uk`
Prof Robert Crittenden `robert.crittenden@port.ac.uk`
Prof Carsten van de Bruck `c.vandebruck@sheffield.ac.uk`

Publications

Interacting vacuum dark energy from a Shan–Chen equation of state
Natalie B. Hogg, Marco Bruni
in prep., 2021.

Strongly lensed supernovae as a self-sufficient probe of the distance duality relation
Fabrizio Renzi, **Natalie B. Hogg**, Matteo Martinelli, Savvas Nesseris
arXiv: 2010.04155, Physics of the Dark Universe, 32, 100824, 2021.

Constraints on the distance duality relation with standard sirens
Natalie B. Hogg, Matteo Martinelli, Savvas Nesseris
arXiv: 2007.14335, Journal of Cosmology and Astroparticle Physics, 12, 019, 2020.

Latest evidence for a late time vacuum – geodesic CDM interaction
Natalie B. Hogg, Marco Bruni, Robert Crittenden, Matteo Martinelli, Simone Peirone
arXiv: 2002.10449, Physics of the Dark Universe, 29, 100583, 2020.

Constraints on the interacting vacuum – geodesic CDM scenario
Matteo Martinelli, **Natalie B. Hogg**, Simone Peirone, Marco Bruni, David Wands
arXiv: 1902.10694, Monthly Notices of the Royal Astronomical Society, 488, 3, 2019.