

NATALIE WILLIAMS

Postdoctoral Researcher - Gravitational Waves from Binary Neutron Star Mergers

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EDUCATION

University of Birmingham, Institute for Gravitational Wave Astronomy 2021 - 2025

Ph.D. Physics and Astronomy

Thesis working title: *"Gravitational Waves from Binary Neutron Star Mergers"*

Supervisor: Prof. Patricia Schmidt

University of Glasgow 2014 - 2019

MSci Physics with Astrophysics, First Class Honours

Dissertation: *Mapping the Galaxy with LISA: A Study of Galactic Parameters Effect on Gravitational Wave Confusion Noise*

Supervisors: Prof. Chris Messenger and Dr. John Veitch

EMPLOYMENT

Universität Potsdam, Institut für Physik und Astronomie 2025 - Present

Postdoctoral Researcher

Manager: Time Dietrich

LIST OF PUBLICATIONS

First Author Publications

- **N. Williams**, P. Schmidt, G. Pratten, *"PhenomGSF: A phenomenological tidal phase model for nonspinning binary neutron stars with unequal masses"* in Prep.
- **N. Williams**, P. Schmidt, G. Pratten, *"Prospects for distinguishing dynamical tides in inspiralling binary neutron stars with third generation gravitational-wave detectors"* Phys. Rev. D 105, 123032 (2022)

Short Author Publications

- K. Krishna et al. (inc **N. Williams**), *"Accelerated parameter estimation in Bilby with relative binning"* arXiv:2312.06009 [gr-qc] (2023)
- A. Klein et al. (inc **N. Williams**), *"The last three years: multiband gravitational-wave observations of stellar-mass binary black holes"* arXiv:2204.03423 [gr-qc] (2022)
- G. Pratten, P. Schmidt, **N. Williams**, *"Impact of Dynamical Tides on the Reconstruction of the Neutron Star Equation of State"* Phys. Rev. Lett. 129, 081102 (2022)

LVK Collaboration Papers

- R. Abbott et al. (inc **N. Williams**), *"Observation of Gravitational Waves from the Coalescence of a 2.5 — 4.5 M_{\odot} Compact Object and a Neutron Star"* arXiv:2404.04248 (2024)
- R. Abbott et al. (inc **N. Williams**), *"GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo during the Second Part of the Third Observing Run"* Phys. Rev. X 13, 041039 (2023)

CONTRIBUTED TALKS AND POSTERS

LIGO-Virgo-Kagra Meeting, Louisiana State University - Poster Mar. 2024

"PhenomGSF: A phenomenological model of GSF tides for inspiralling binary neutron stars with unequal masses"

Science opportunities enabled by next generation gravitational-wave observatories, Royal Astronomical Society - Talk <i>"Dynamical tides in binary neutron stars inspirals with 3G gravitational-wave detectors"</i>	<i>Nov. 2023</i>
SPINS UK, Jodrell Bank - Talk <i>"Prospects for distinguishing dynamical tides in inspiralling binary neutron stars with third generation gravitational-wave detectors"</i>	<i>Nov. 2022</i>
Pulsar Coffee, University of Oxford - Invited Seminar <i>"Getting Information about the components of coalescing neutron-star binaries"</i>	<i>Jun. 2022</i>
Seminar Series, University of Birmingham - Seminar <i>"Picking up Good Vibrations: Dynamical tides in binary neutron star waveforms"</i>	<i>Apr. 2022</i>
BritGrav, University of Glasgow - Talk <i>"Prospects for distinguishing dynamical tides in inspiralling binary neutron stars with third generation gravitational-wave detectors"</i>	<i>Apr. 2022</i>
LIGO-Virgo-Kagra Meeting, Virtual - Poster <i>"Measuring the f-mode frequency in inspiralling binary neutron stars with third generation gravitational-wave detectors"</i>	<i>Sep. 2021</i>

SERVICE

LVK internal reviewer NRTidalv3 waveform code and documentation, Bilby O4 parameter estimation	<i>2023 - Present</i>
Phys Rev D reviewer	<i>2023 - Present</i>
GW Journal Club Organiser	<i>2022 - Present</i>

MEMBERSHIPS

LVK, GEO LISA, ET	<i>2021 - Present</i>
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TEACHING EXPERIENCE

Python Programming Demonstrating	<i>2022 - Present</i>
Physics Problem Sheet Marking	<i>2021 - Present</i>

OUTREACH

Planetarium Presenter , University of Birmingham Portable dome shows throughout the year for Astronomy in the City	<i>2021 - Present</i>
Cardiff Astronomical Society Seminar , Cardiff University Invited Seminar: <i>Star Wars: Gravitational Waves from Neutron Stars</i>	<i>Oct. 2023</i>
Stargazing Lates , London Science Museum Stargazing Workshop	<i>Sep. 2023</i>
Astronomy in the City Seminar , University of Birmingham <i>Aliens, Galaxies and the Big Bang: Introducing the James Webb Space Telescope</i>	<i>Nov. 2021</i>
Be Festival , Birmingham Invited Talk: <i>From Sunset to Sunrise</i>	<i>Oct. 2022</i>
Planetarium Presenter & Science Communicator , Glasgow Science Centre Full time planetarium presenter, science content creator	<i>2018 - 2020</i>