

# NATALIE WILLIAMS

Postdoctoral Researcher - Gravitational Waves from Binary Neutron Star Mergers

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## EDUCATION

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**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

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**Universität Potsdam, Institut für Physik und Astronomie** 2025 - Present

Postdoctoral Researcher

Manager: Tim Dietrich

## LIST OF PUBLICATIONS

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### First Author Publications

- **N. Williams**, A. Puecher, G. Grams, C. V. Flores, T. Dietrich, "*Investigating the impact of quasi-universal relations on neutron star constraints in third-generation detectors*" arXiv:2602.14659 [gr-qc] (2026)
- **N. Williams**, P. Schmidt, G. Pratten, "*Phenomenological model of gravitational self-force enhanced tides in inspiralling binary neutron stars*" Phys. Rev. D 110, 104013 (2024)
- **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)

## CONTRIBUTED TALKS AND POSTERS

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**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 Nov. 2023

*"Dynamical tides in binary neutron stars inspirals with 3G gravitational-wave detectors"*

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

## MEMBERSHIPS

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

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<b>Introduction to Python for Astrophysics</b> , University of Potsdam Lecturer	<i>Winter 2025 – Summer 2026</i>
<b>Science Communication for Astrophysics</b> , University of Potsdam Lecturer	<i>Winter 2025 – Summer 2026</i>
<b>Bayesian Statistics for Astronomy</b> , University of Potsdam Lecturer	<i>Summer 2025</i>
<b>Introduction to C++</b> , University of Potsdam Demonstrator	<i>Summer 2025</i>
<b>Staying Up to Date</b> , University of Potsdam Seminar Leader	<i>Summer 2025</i>
<b>Python Programming Demonstrating</b> , University of Birmingham	<i>2022 - 2025</i>

## OUTREACH

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<b>Planetarium Presenter</b> , University of Birmingham Portable dome shows throughout the year for Astronomy in the City	<i>2021 - Present</i>
<b>Cardiff Astronomical Society Seminar</b> , Cardiff University Invited Seminar: <i>Star Warps: Gravitational Waves from Neutron Stars</i>	<i>Oct. 2023</i>
<b>Stargazing Lates</b> , London Science Museum Freelance Stargazing Workshop	<i>Sep. 2023</i>
<b>Be Festival</b> , Birmingham Invited Talk: <i>From Sunset to Sunrise</i>	<i>Oct. 2022</i>
<b>Planetarium Presenter &amp; Science Communicator</b> , Glasgow Science Centre Full time planetarium presenter, science content creator	<i>2018 - 2020</i>