CV & Publication list

TobyRodel | Toby Rodel | tobyrodel.github.io | trodel01@qub.ac.uk | +447860205787

Education

October 2023 - March 2027	PhD (Astrophysics) at **Queen's University Belfast**	(In progress)
October 2022 - October 2023	MSc by Research (Physics) at **University of Warwick**	(Completed)
October 2019 - June 2022	BSc (Physics) at **University of Warwick**	(2:1)

Research Experience

PhD (Queen's University Belfast with Prof Christopher Watson) 2023 - present

- Characterisation of long-period transiting planets and eclipsing binary systems including NGTS-EB-7 (Rodel et al. 2025) and TIC-65910228 / NGTS-38 (Rodel et al. 2026).
- Used PAWS/iSpec and isochrones to characterise host stars and Allesfitter to fit orbital solutions to transit and radial velocity data.
- Submitted succesful ESO proposal for multiband transit observations with ULTRACAM for validation.
- Continuation of MSc work predicting survey yields, including upgrades to custom pipeline.

MSc by research (University of Warwick with Dr Daniel Bayliss) 2022 - 2023

- Developed the Transit Investigation and Recoverability Application (`TIaRA`) and used it to predict exoplanet discovery yields from *TESS*-SPOC data (Rodel et al. 2024).
- Participated in eyeballing and vetting of *TESS* monotransit candidates.

BSc project (University of Warwick with Dr Matteo Brogi) 2021-2022

- Developed code to detect and fit secondary eclipses of known hot Jupiters in *TESS* data.
- Attempted albedo and heat redistribution factor determination.

Skills & Expertise

Research expertise: exoplanets, transits, radial velocities, wide field photometric surveys, long-period, low mass eclipsing binaries, stellar characterisation, survey yield prediction, occurrence rates.

Instruments: *TESS*, NGTS, ULTRACAM, CORALIE, HARPS, FEROS, LCOGT

Software: TIaRA (custom pipeline), Allesfitter, PAWS, iSpec, isochrones, Specmatch-emp, AstroAriadne

Programming languages: Python, SQL, HTML, CSS, LaTeX, markdown

Other: public speaking and engagement, poster design, mentoring, acronym invention

Service & Leadership

ESO DPR reviewer P114 & P115

NGTS communications chair 2023 - 2025

- First chair of NGTS communications group to manage consortium promotion and outreach.
- Managed consortium social media and maintained webpage.
- Procured customised pins and stickers for consortium members.

QUB Equitea committee member 2023 - present

– Planned seminars and discussion sessions on Equity, Diversity and Inclusion topics and their relations to Astronomy

QUB ARC seminar committee member 2024-2025

– Arranged for external speakers to give seminars and hosted them.

Teaching and Mentoring

Co-supervisor of summer intern June-September 2026

– Helped design cross-disciplinary project extracting SNe lightcurves from NGTS data.
– On recruitment committee to rank of 14 applicants.
– Supervisor duties focussed on working with NGTS data and liasing with consortium.

Postgraduate teaching assistant - Queen's University Belfast 2023-2024

– Problem class tutor for modules MTH1021 and PHY1002.

Mentoring of research students 2023 - Present

– Assisted and mentored QUB MSci students with software, proofreading of reports and presentation practice.
– Assisted and mentored external students through the NGTS early careers group.

Outreach

Planetarium programmes 2022 - Present

– Setup and take-down of inflatable dome as well as presentation of shows using Stellarium and Universe Sandbox at various festivals and school visits.
– Volunteered at Warwick, cofounded new programme in Belfast.

Festivals and events Various

– **QUB Astronomy day: Volunteer 2024 & 2025**, on organising committee for 2026.
– **Astronomy on Tap Belfast** Speaker and Organiser / MC.
– **Big Bang Science Festival Birmingham:** Volunteer at Warwick booth.

Public talks and Lectures Various

Referees

Prof Christopher Watson	PhD supervisor - Queen's University Belfast	c.a.watson@qub.ac.uk
Dr Daniel Bayliss	MSc supervisor - University of Warwick	d.bayliss@warwick.ac.uk
Dr Sarah Casewell	Collaborator - University of Leicester	slc25@leicester.ac.uk
Dr Matteo Brogi	BSc supervisor - University of Turin	matteo.brogi@unito.it

First authored publications

Rodel, Toby et al. (June 2026). "TIC-65910228 b/NGTS-38 b, a 180 day transiting warm super-Jupiter". In: MNRAS. DOI: 10.1093/mnras/stag1061.

Rodel, Toby et al. (Feb. 2025). "NGTS-EB-7, an eccentric, long-period, low-mass eclipsing binary". In: MNRAS 537.1, pp. 35–55. DOI: 10.1093/mnras/stae2799.

Rodel, Toby et al. (Mar. 2024). "TIARA TESS 1: estimating exoplanet yields from Years 1 and 3 SPOC light curves". In: MNRAS 529.1, pp. 715–731. DOI: 10.1093/mnras/stae474.

Co-authored publications

Apergis, Ioannis et al. (Jan. 2026). "High-precision photometry with a scientific CMOS camera: II on-sky testing of the Marana camera at the NGTS facility". In: *RAS Techniques and Instruments* 5, rzag022. DOI: 10.1093/rasti/rzag022.

Kendall, Alicia et al. (Apr. 2026). "A 43 d transiting Neptune and two 25 d Saturns from TESS, NGTS, and ASTEP". In: MNRAS 547.2, staf2189. DOI: 10.1093/mnras/staf2189.

O'Brien, Sean M. et al. (Dec. 2025). "NGTS-EB-8: A Double-lined Eclipsing M+M Binary Discovered by Citizen Scientists". In: AJ 170.6, p. 316. DOI: 10.3847/1538-3881/ae0e0d.

Ulmer-Moll, S. et al. (Nov. 2025). "Detection and characterisation of a 106-day transiting Jupiter: TOI-2449 b/NGTS-36 b". In: A&A 703, A258. DOI: 10.1051/0004-6361/202555168.

Doyle, Lauren et al. (Apr. 2024). "The TESS-SPOC FFI target sample explored with Gaia". In: MNRAS 529.2, pp. 1802–1813. DOI: 10.1093/mnras/stae616.

Eschen, Yoshi Nike Emilia et al. (Dec. 2024). "Viewing the PLATO LOPS2 field through the lenses of TESS". In: MNRAS 535.2, pp. 1778–1795. DOI: 10.1093/mnras/stae2427.

Hawthorn, Faith et al. (Feb. 2024). "TESS duotransit candidates from the Southern Ecliptic Hemisphere". In: MNRAS 528.2, pp. 1841–1862. DOI: 10.1093/mnras/stad3783.

Conference presentations

"Finding hidden long-period planets with TESS", *UK Exoplanet Meeting*, University of Bristol, April 2026, Contributed talk

"How good is TESS at detecting long-period exoplanets", *From Transits to Trends: the Next Decade of Long-Period Exoplanets*, University of New Mexico, August 2025, Contributed talk

"NGTS-EB-7: One of the longest period EBLM systems ever found", *Binary stars in the space era*, University of Keele, July 2025, Poster and pop-up talk

"NGTS-EB-7: One of the longest period EBLM systems ever found", *UK Exoplanet Meeting*, University of Leeds, April 2025, Poster and pop-up talk

"Long period planets from TESS and NGTS", *Irish National Astronomy Meeting*, University of Galway, August 2024, Contributed talk

"Putting a TIaRA on SPOC", *TESS Science Conference 3*, Massachusetts Institute of Technology, August 2024, Contributed talk and poster

"Predicting the yield of long-period Planets in TESS", *UK Exoplanet Meeting*, University College London, August 2023, Poster and pop-up talk

"Putting a TIaRA on SPOC: Predicting long-period planet yields from TESS", *UK Exoplanet Meeting*, University of Birmingham, April 2024, Poster and pop-up talk

Observing Programmes

as PI: "Probing puffy exoplanet atmospheres with ULTRACAM" ESO, 118.25EL, ULTRACAM on NTT (19h)

As Co-I: "Characterising transiting warm and temperate Jupiters to shed light on their formation" HARPS-N ITP 2026B & 2027A, HARPS-N (15N), RISE (70h), HiperCam (11h)