

Dr Matt Nicholl

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Reader in Astrophysics

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Interests

Astrophysics of transient sources, superluminous supernovae, kilonovae and gravitational waves, tidal disruption events, fast radio bursts, gamma-ray bursts, time-domain surveys, optical, near-infrared, UV and X-ray observations, spectral analysis, light curve modelling, transient host galaxies

Appointments

2023– Reader in Astrophysics · *Queen's University Belfast*
2022– Associate Professor · *University of Birmingham*
2019–2022 Lecturer and RAS Research Fellow · *University of Birmingham*
2018–2019 Royal Astronomical Society Research Fellow · *University of Edinburgh*
2015–2018 Postdoctoral Research Fellow · *Harvard-Smithsonian Center for Astrophysics*

Education and Qualifications

2020–2022 PGCHE (Distinction) · *University of Birmingham*
2012–2015 PhD, Astrophysics · *Queen's University Belfast*
2008–2012 MPhys (First Class), Physics · *Oxford University*

Awards and Grants

2022 Fowler Award of the Royal Astronomical Society · For significant contributions to astronomy within 10 years of PhD
2021 Turing Fellowship, The Alan Turing Institute
2021 Research England Quality Assurance grant to upgrade the UoB Observatory · £10k
2020 European Research Council Starting Grant · €1.5m over 5 years
2018 Royal Astronomical Society Research Fellowship · 3 years salary and research budget · Only 1-2 Fellowships awarded per year
2016 RAS Michael Penston Prize · For best UK thesis in astronomy or astrophysics

Telescope time obtained as Principal Investigator

Hubble Space Telescope 12 orbits over 5 programs, Cycle 24-30 (2016-2022)

Chandra X-ray Observatory	160ks over 3 programs, Cycle 20-24 (2017-2022)
ESO Very Large Telescope	21 hours over 3 programs, Period 104-108 (2019-2021)
Liverpool Telescope	136 hours over 5 programs (2019-2022)
Swift	Multiple approved ToO triggers (2019–)
SOAR	10 nights equivalent over 3 programs (2017-2019)
Gemini	8 hours over several programs (2016-2018)
Very Large Array	4 hours, 2017

Selected professional responsibilities

2022–	UK representative for CASTOR space telescope TDA working group
2022	Scientific Organising Committee: National Astronomy Meeting
2021–2023	Director, University of Birmingham Observatory
2021–2023	Accessibility Lead for EDI Committee in School of Physics and Astronomy
2021	Deliverables Review, LSST:UK Phase B
2020–	Proposal reviewer for STFC and ERC grants panels
2020–	Leader of ePESSTO+ SLSN science group
2019–	Phase 3 Data Reduction manager, ePESSTO(+)
2016–	Telescope proposal review: JWST, Gemini, HST, Liverpool Telescope and others
2014–	Referee for ApJ, MNRAS, Nature, Nature Astronomy

Recent invited talks

Nov 2022	University of Nottingham
Nov 2022	University of Lancaster
May 2022	SN/Dust webinar series
Apr 2022	University of Hertfordshire
Mar 2022	DTU Space
Oct 2021	SuperVirtual conference
Apr 2021	ENGRAVE webinar series
Dec 2020	University of Glasgow
Nov 2020	Queens University Belfast
May 2020	University of Warsaw
Mar 2020	Liverpool John Moores University
Feb 2020	University of Southampton
Aug 2019	Hot-wiring the Transient Universe, Northwestern University
Apr 2018	EAS Symposium on GRB-SN connection, Liverpool

Teaching

2020–2023	Observatory Laboratory (Year 3 module, lead from 2021), University of Birmingham
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2020–2022 Personal academic tutorials (Year 1), University of Birmingham
2019–2023 Research project supervisor (Year 4), University of Birmingham
2018–2019 Introductory Astrophysics problem-solving workshops, University of Edinburgh
2012–2015 Computer lab demonstrator, Queen’s University Belfast

PhD students

2022– Paige Ramsden, University of Birmingham
2021– Aysha Aamer, University of Birmingham
2021– Xinyue Sheng, University of Birmingham
2020– Evan Ridley, University of Birmingham
2018–2022 Phil Short, University of Edinburgh (lead supervisor: Prof A. Lawrence)
2015–2018 Peter Blanchard, Harvard University (lead supervisor: Prof E. Berger)

Public outreach and media highlights

- Invited speaker at British Astronomical Association annual residential weekend (Apr 2023)
- Regular speaker at astronomical society meetings, including keynote speaker at UK Federation of Astronomical Societies annual Convention (Nov 2021)
- Appeared on [BBC The Sky at Night](#) and BBC Midlands Today to talk about my work on the supernova with the highest total luminosity measured to date (2020)
- Press release on outflow signatures in the closest ever tidal disruption event covered by global publications such as the [New York Times](#). The [explanatory video](#) was the most-viewed ESO webcast of the year (2020)
- Keynote speaker at the 2019 Northern Ireland Physics teachers annual conference
- Media campaign on the first gravitational wave source with a visible counterpart, through new website [kilonova.org](#), social media, and [press interviews](#) (2017)

Personal references

- Prof. Andy Lawrence · University of Edinburgh · Fellowship advisor
- Prof. Edo Berger · Harvard University · Postdoc advisor
- Prof. Stephen Smartt · Queen’s University Belfast · PhD supervisor
- Prof. Nial Tanvir · University of Leicester · Collaborator
- Prof. Brian Metzger · Columbia University · Collaborator
- Prof. Mark Sullivan · University of Southampton · Collaborator
- Prof. Stefano Benetti · Osservatorio Astronomico di Padova · Collaborator

Publication Summary and selected highlights

- Total / as first author: 153 / 21
- Citations: >11900 / >1700
- h-index: 52 / 19

See all my papers on the [NASA Astrophysics Data System](#)

First author publications

- [1] [Systematic light curve modelling of TDEs: statistical differences between the spectroscopic classes](#)
Nicholl, M., Lanning, D., Ramsden, P., *et al.*, 2022, MNRAS, 515, 5604
- [2] [Superluminous supernovae: an explosive decade](#)
Nicholl, M., 2021, Astronomy & Geophysics, 62, 34 (invited review)
- [3] [Tight multi-messenger constraints on the neutron star equation of state from GW170817 and a forward model for kilonova light curve synthesis](#)
Nicholl, M., Margalit, B., Schmidt, P., *et al.*, 2021, MNRAS, 505, 3016
- [4] [An outflow powers the optical rise of the nearby, fast-evolving tidal disruption event AT2019qiz](#)
Nicholl, M., Wevers, T., Oates, S. R., *et al.*, 2020, MNRAS, 499, 482
- [5] [An extremely energetic supernova from a very massive star in a dense medium](#)
Nicholl, M., Blanchard, P. K.; Berger, E., *et al.*, 2020, Nature Astronomy, 4, 893
- [6] [The tidal disruption event AT2017eqx: spectroscopic evolution from hydrogen rich to poor suggests an atmosphere and outflow](#)
Nicholl, M., Blanchard, P. K., Berger, E., *et al.*, 2019, MNRAS, 488, 1878
- [7] [Nebular-phase spectra of superluminous supernovae: physical insights from observational and statistical properties](#)
Nicholl, M., Berger, E., Blanchard, P. K., *et al.*, 2018, ApJ, 871, 102
- [8] [One Thousand Days of SN2015bn: HST Imaging Shows a Light Curve Flattening Consistent with Magnetar Predictions](#)
Nicholl, M., Blanchard, P. K., Berger, E., *et al.*, 2018, ApJL, 866, L24
- [9] [SuperBol: A User-friendly Python Routine for Bolometric Light Curves](#)
Nicholl, M., 2018, RNAAS, 2, 230
- [10] [The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. III. Optical and UV Spectra of a Blue Kilonova From Fast Polar Ejecta](#)
Nicholl, M., Berger, E., Kasen, D. *et al.*, 2017, ApJL, 848, L18
- [11] [The magnetar model for Type I superluminous supernovae I: Bayesian analysis of the full multi-colour light curve sample with MOSFiT](#)
Nicholl, M., Guillochon, J., Berger, E., 2017, ApJ, 850, 55
- [12] [The Superluminous Supernova SN 2017egm in the Nearby Galaxy NGC 3191: A Metal-rich Environment Can Support a Typical SLSN Evolution](#)
Nicholl, M., Berger, E., Margutti, R., *et al.*, 2017, ApJL, 845, L8

- [13] [Empirical constraints on the origin of fast radio bursts: volumetric rates and host galaxy demographics as a test of millisecond magnetar connection](#)
Nicholl, M., Williams, P. K. G., Berger, E., *et al.*, 2017, *ApJ*, 843, 84
- [14] [An Ultraviolet Excess in the Superluminous Supernova Gaia16apd Reveals a Powerful Central Engine](#)
Nicholl, M., Berger, E., Margutti, R., *et al.*, 2017, *ApJL*, 835, L8
- [15] [Superluminous supernova 2015bn in the nebular phase: evidence for the engine-powered explosion of a stripped massive star](#)
Nicholl, M., Berger, E., Margutti, R., *et al.*, 2016, *ApJL*, 828, L18
- [16] [SN 2015BN: A Detailed Multi-wavelength View of a Nearby Superluminous Supernova](#)
Nicholl, M., Berger, E., Smartt, S. J., *et al.*, 2016, *ApJ*, 826, 39
- [17] [Seeing double: the frequency and detectability of double-peaked superluminous supernova light curves](#)
Nicholl, M. & Smartt, S. J., 2016, *MNRAS Letters*, 457, 79
- [18] [On the diversity of superluminous supernovae: ejected mass as the dominant factor](#)
Nicholl, M., Smartt, S. J., Jerkstrand, A., *et al.*, 2015, *MNRAS*, 452, 3869
- [19] [LSQ14bdq: A Type Ic Super-luminous Supernova with a Double-peaked Light Curve](#)
Nicholl, M., Smartt, S. J., Jerkstrand, A., *et al.*, 2015, *ApJL*, 807, 18
- [20] [Superluminous supernovae from PESSTO](#)
Nicholl, M., Smartt, S. J., Jerkstrand, A., *et al.*, 2014, *MNRAS*, 444, 2096
- [21] [Slowly fading super-luminous supernovae that are not pair-instability explosions](#)
Nicholl, M., Smartt, S. J., Jerkstrand, A., *et al.*, 2013, *Nature*, 502, 346
- Second or supervising author*
- [22] [Mechanisms for high spin in black-hole neutron-star binaries and kilonova emission: inheritance and accretion](#)
Steinle, N., Gompertz, B. P., **Nicholl, M.**, *et al.*, 2022, *MNRAS*, submitted
- [23] [A minute-long merger-driven gamma-ray burst from fast-cooling synchrotron emission](#)
Gompertz, B. P., Ravasio, M. E., **Nicholl, M.**, *et al.*, 2022, *Nature Astronomy*, accepted
- [24] [The bulge masses of TDE host galaxies and their scaling with black hole mass](#)
Ramsden, P., Lanning, D., **Nicholl, M.**, *et al.*, 2022, *MNRAS*, 515, 1146
- [25] [An elliptical accretion disk following the tidal disruption event AT 2020zso](#)
Sheng, X., Ross, N. P., **Nicholl, M.**, *et al.*, 2022, *MNRAS*, 512, 5580
- [26] [An elliptical accretion disk following the tidal disruption event AT 2020zso](#)
Wevers, T., **Nicholl, M.**, Guolo, M., *et al.*, 2022, *A&A*, accepted
- [27] [Constraints on compact binary merger evolution from spin-orbit misalignment in gravitational-wave observations](#)
Gompertz, B. P., **Nicholl, M.**, Schmidt, P., *et al.*, 2021, *MNRAS*, 511, 1454
- [28] [Extremely energetic supernova explosions embedded in a massive circumstellar medium: the case of SN 2016aps](#)

- Suzuki, A., **Nicholl, M.**, Moriya, T. J., *et al.*, 2020, ApJ, 908, 99
- [29] [The Tidal Disruption Event AT 2018hyz II: Light-curve modelling of a partially disrupted star](#)
Gomez, S., **Nicholl, M.**, Short, P., *et al.*, 2019, ApJ, 497, 1925
- [30] [The tidal disruption event AT 2018hyz: I. Double-peaked emission lines and a flat Balmer decrement](#)
Short, P., **Nicholl, M.**, Lawrence, A., *et al.*, 2020, MNRAS, 498, 4119
- [31] [Follow-up of the Neutron Star Bearing Gravitational Wave Candidate Events S190425z and S190426c with MMT and SOAR](#) *
Hosseinzadeh, G., Cowperthwaite, P. S., Gomez, S., Villar, V. A., **Nicholl, M.**, Margutti, R., *et al.*, 2019, ApJL, 880, L4
* *The first six authors contributed equally to this work*
- [32] [Bright Type IIP Supernovae in Low-metallicity Galaxies](#)
Scott, S., **Nicholl, M.**, Blanchard, P. K., *et al.*, 2018, ApJL, 870, L16
- [33] [A Hydrogen-Poor Superluminous Supernova with Enhanced Iron-Group Absorption: A New Link Between SLSNe and Broad-Lined Type Ic SNe](#)
Blanchard, P. K., **Nicholl, M.**, Berger, E., *et al.*, 2018, ApJ, 872, 90
- [34] [Superluminous Supernovae in LSST: Rates, Detection Metrics, and Light Curve Modeling](#)
Villar, V. A., **Nicholl, M.**, Berger, E., *et al.*, 2018, ApJ, 869, 166
- [35] [MOSFiT: Modular Open-Source Fitter for Transients](#)
Guillochon, J., **Nicholl, M.**, Villar, V. A., *et al.*, 2018, ApJS, 236, 6
- [36] [Systematic Investigation of the Fallback Accretion-powered Model for Hydrogen-poor Superluminous Supernovae](#)
Moriya, T., **Nicholl, M.**, Guillochon, J., *et al.*, 2018, ApJ, 867, 113
- [37] [The Type I Superluminous Supernova PS16aqv: Lightcurve Complexity and Deep Limits on Radioactive Ejecta in a Fast Event](#)
Blanchard, P. K., **Nicholl, M.**, Berger, E., *et al.*, 2018, ApJ, 865, 9
- [38] [PS16dtm: A Tidal Disruption Event in a Narrow-line Seyfert 1 Galaxy](#)
Blanchard, P. K., **Nicholl, M.**, Berger, E., *et al.*, 2017, ApJ, 843, 106
- [39] [Complexity in the light curves and spectra of slow-evolving superluminous supernovae](#)
Inserra, C., **Nicholl, M.**, Chen, T.-W., *et al.*, 2017, Monthly Notices of the Royal Astronomical Society, 468, 4642
- [40] [The evolution of superluminous supernova LSQ14mo and its interacting host galaxy system](#)
Chen, T.-W., **Nicholl, M.**, Smartt, S. J., *et al.*, 2017, A&A, 602, A9
- [41] [The supernova CSS121015:004244+132827: a clue for understanding super-luminous supernovae](#)
Benetti, S., **Nicholl, M.**, Cappellaro, E., *et al.*, 2014, MNRAS, 441, 289