

Dr Matt Nicholl

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Lecturer (Assistant Professor) in Gravitational Wave Astronomy

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Interests

Astrophysics of transient sources, superluminous supernovae, gravitational wave follow-up, tidal disruption events, fast radio bursts, time-domain surveys, optical and near-infrared observations, spectral analysis, light curve modelling, transient host galaxies

Appointments

2021– Lecturer
University of Birmingham

2019–2021 Lecturer and Royal Astronomical Society 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

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 early career achievement in astronomy

2021 Turing Fellowship, The Alan Turing Institute

2020 European Research Council Starting Grant · €1.5m over 5 years

2019 Hubble Space Telescope General Observer grant, Cycle 27

2018 Royal Astronomical Society Research Fellowship · 3 years salary and research budget
· Only 1-2 Fellowships awarded per year

2018 NASA Chandra Observer grant, Cycle 20

2017	Hubble Space Telescope General Observer grants (2), Cycle 25
2016	Hubble Space Telescope General Observer grant, Cycle 24
2016	RAS Michael Penston Prize · “Best UK thesis in astronomy or astrophysics”

Recent invited talks

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

Telescope time as Principal Investigator

Hubble Space Telescope	9 orbits over 4 programs, Cycle 24-27
Chandra X-ray Observatory	60ks over 2 programs, Cycle 20
ESO Very Large Telescope	21 hours over 3 programs, Period 104-106 (2019-2021)
Liverpool Telescope	99 hours over 4 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	Scientific Organising Committee: National Astronomy Meeting
2021–	Director, University of Birmingham Observatory
2021–	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–	Proposal review panels: JWST, Gemini, HST, Liverpool Telescope and others
2014–	Referee for ApJ, MNRAS, Nature, Nature Astronomy

Teaching

- 2020– Observatory Laboratory (Year 3 module, lead from 2021), University of Birmingham
- 2020– Personal academic tutorials (Year 1), University of Birmingham
- 2019– 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

- 2021– Aysha Aamer, University of Birmingham
- 2021– Xinyue Sheng, University of Birmingham
- 2020– Evan Ridley, University of Birmingham
- 2018– 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

- Regular speaker at astronomical society meetings, including keynote speaker at UK Federation of Astronomical Societies national 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)
- Speaker at Science Summer School with Prof Brian Cox (Summer 2022)
- 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. Brian Metzger · Columbia University · Collaborator
- Prof. Avishay Gal-Yam · Weizmann Institute of Science · Collaborator
- Prof. Philipp Podsiadlowski · Oxford University · MPhys supervisor
- Prof. Stefano Benetti · Osservatorio Astronomico di Padova · Collaborator

Publication Summary and selected highlights

- Total / as first author: 142 / 21
- Citations: >10800 / >1600
- h-index: 51 / 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, Monthly Notices of the Royal Astronomical Society (submitted)
- [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, Monthly Notices of the Royal Astronomical Society, 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, Monthly Notices of the Royal Astronomical Society, 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, Monthly Notices of the Royal Astronomical Society, 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, The Astrophysical Journal, 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, The Astrophysical Journal Letters, 866, L24
- [9] [SuperBol: A User-friendly Python Routine for Bolometric Light Curves](#)
Nicholl, M., 2018, Research Notes of the American Astronomical Society, 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, The Astrophysical Journal Letters, 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, *The Astrophysical Journal*, 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, *The Astrophysical Journal Letters*, 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, *The Astrophysical Journal*, 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, *The Astrophysical Journal Letters*, 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, *The Astrophysical Journal Letters*, 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, *The Astrophysical Journal*, 826, 39
- [17] [Seeing double: the frequency and detectability of double-peaked superluminous supernova light curves](#)
Nicholl, M. & Smartt, S. J., 2016, *Monthly Notices of the Royal Astronomical Society 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, *Monthly Notices of the Royal Astronomical Society*, 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, *The Astrophysical Journal Letters*, 807, 18
- [20] [Superluminous supernovae from PESSTO](#)
Nicholl, M., Smartt, S. J., Jerkstrand, A., *et al.*, 2014, *Monthly Notices of the Royal Astronomical Society*, 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
- Joint-first/ Second author*
- [22] [An elliptical accretion disk following the tidal disruption event AT 2020zso](#)
 Wevers, T., **Nicholl, M.**, Guolo, M., *et al.*, 2022, *Astronomy & Astrophysics*, accepted
- [23] [Constraints on compact binary merger evolution from spin-orbit misalignment in gravitational-wave observations](#)
 Gompertz, B., **Nicholl, M.**, Schmidt, P., *et al.*, 2021, *Monthly Notices of the Royal Astronomical Society*, 511, 1454
- [24] [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, *The Astrophysical Journal*, 908, 99
- [25] [The Tidal Disruption Event AT 2018hyz II: Light-curve modelling of a partially disrupted star](#)
Gomez, S., **Nicholl, M.**, Short, P., *et al.*, 2019, *The Astrophysical Journal*, 497, 1925
- [26] [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, *Monthly Notices of the Royal Astronomical Society*, 498, 4119
- [27] [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, *The Astrophysical Journal Letters*, 880, L4
* *The first six authors contributed equally to this work*
- [28] [Bright Type IIP Supernovae in Low-metallicity Galaxies](#)
Scott, S., **Nicholl, M.**, Blanchard, P. K., *et al.*, 2018, *The Astrophysical Journal Letters*, 870, L16
- [29] [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, *The Astrophysical Journal*, 872, 90
- [30] [Superluminous Supernovae in LSST: Rates, Detection Metrics, and Light Curve Modeling](#)
Villar, V. A., **Nicholl, M.**, Berger, E., *et al.*, 2018, *The Astrophysical Journal*, 869, 166
- [31] [MOSFiT: Modular Open-Source Fitter for Transients](#)
Guillochon, J., **Nicholl, M.**, Villar, V. A., *et al.*, 2018, *The Astrophysical Journal Supplement Series*, 236, 6
- [32] [Systematic Investigation of the Fallback Accretion-powered Model for Hydrogen-poor Superluminous Supernovae](#)
Moriya, T., **Nicholl, M.**, Guillochon, J., *et al.*, 2018, *The Astrophysical Journal*, 867, 113
- [33] [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, *The Astrophysical Journal*, 865, 9
- [34] [PS16dtm: A Tidal Disruption Event in a Narrow-line Seyfert 1 Galaxy](#)
Blanchard, P. K., **Nicholl, M.**, Berger, E., *et al.*, 2017, *The Astrophysical Journal*, 843, 106
- [35] [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
- [36] [The evolution of superluminous supernova LSQ14mo and its interacting host galaxy system](#)
Chen, T.-W., **Nicholl, M.**, Smartt, S. J., *et al.*, 2017, *Astronomy & Astrophysics*, 602, A9
- [37] [The supernova CSS121015:004244+132827: a clue for understanding super-luminous supernovae](#)
Benetti, S., **Nicholl, M.**, Cappellaro, E., *et al.*, 2014, *Monthly Notices of the Royal Astronomical Society*, 441, 289