

# 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

- 2019– 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

- 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”
- 2014 SET for Britain finalist · Presented my work at the Houses of Parliament

## Recent invited talks

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 colloquium
Aug 2019	Hot-wiring the Transient Universe, Northwestern University
Apr 2018	EWASS Symposium on GRB-SN connection, Liverpool
Mar 2018	University of Rochester
Oct 2017	Oscar Klein Centre colloquium, Stockholm University
May 2017	Max Planck Institute for Extraterrestrial Physics seminar
Apr 2017	<a href="#">Harvard-Smithsonian CfA colloquium</a>
Feb 2017	Royal Astronomical Society ordinary meeting

## 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	15 hours over 2 programs, Period 104-106 (2019-2020)
Liverpool Telescope	46 hours over 2 programs (2019-2021)
SOAR	10 nights equivalent over 3 programs, 2017-2019
Gemini	8 hours over several programs, 2016-2018
Very Large Array	4 hours, 2017

## Scientific responsibilities held

2021–	James Webb Space Telescope Cycle One review panel
2020–	Lead ePESSTO+ SLSN scientific working group
2019–	Phase 3 Data Reduction manager for Advanced PESSTO survey
2019	Local Organising Committee: Quasars in Crisis conference
2016–	Proposal review panels: Gemini, HST, Liverpool Telescope and others
2014–	Referee for ApJ, MNRAS, Nature and 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

- 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 2021, rescheduled from 2020 due to COVID-19)
- 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)
- Qualified as a UK STEM (Science, Technology, Engineering and Maths) Ambassador

## 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: 114 / 19
- Citations: >8700 / >1300
- h-index: 46 / 17

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

### *First author publications*

- [1] [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, submitted
- [2] [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
- [3] [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
- [4] [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
- [5] [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
- [6] [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
- [7] [SuperBol: A User-friendly Python Routine for Bolometric Light Curves](#)  
**Nicholl, M.**, 2018, Research Notes of the American Astronomical Society, 2, 230
- [8] [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
- [9] [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
- [10] [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

- [11] [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
- [12] [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
- [13] [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
- [14] [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
- [15] [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
- [16] [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
- [17] [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
- [18] [Superluminous supernovae from PESSTO](#)  
**Nicholl, M.**, Smartt, S. J., Jerkstrand, A., *et al.*, 2014, *Monthly Notices of the Royal Astronomical Society*, 444, 2096
- [19] [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*
- [20] [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*, accepted
- [21] [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
- [22] [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
- [23] [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*

- [24] [Bright Type IIP Supernovae in Low-metallicity Galaxies](#)  
Scott, S., **Nicholl, M.**, Blanchard, P. K., *et al.*, 2018, *The Astrophysical Journal Letters*, 870, L16
- [25] [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
- [26] [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
- [27] [MOSFiT: Modular Open-Source Fitter for Transients](#)  
Guillochon, J., **Nicholl, M.**, Villar, V. A., *et al.*, 2018, *The Astrophysical Journal Supplement Series*, 236, 6
- [28] [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
- [29] [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
- [30] [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
- [31] [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
- [32] [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
- [33] [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