

Reader in Astrophysics

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Interests and expertise

Astrophysics of transient sources; extreme/luminous supernovae; tidal disruption events, quasi-periodic eruptions, and supermassive black hole accretion; kilonovae and multi-messenger astronomy; rapidly evolving transients; transient host galaxies; time-domain surveys; optical, near-infrared, UV and X-ray observations; optical spectroscopy; semi-analytic light curve modelling; machine learning

Appointments

2023– Reader in Astrophysics · *Queen's University Belfast*
2022–2023 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 PGCE (Distinction) · *University of Birmingham*
2012–2015 PhD, Astrophysics · *Queen's University Belfast*
2008–2012 MPhys (First Class), Physics · *Oxford University*

Awards and major personal grants

2025 European Astronomical Society MERAC Prize · For best early-career researcher (10 years post-PhD) in observational astrophysics
2022 Fowler Award of the Royal Astronomical Society · For significant contributions to astronomy within 10 years of PhD
2021–2022 Turing Fellowship, The Alan Turing Institute
2021–2026 European Research Council Starting Grant · €1.5m
2018–2021 RAS Research Fellowship · Only 1 Fellowship awarded per year
2016 RAS Michael Penston Prize · For best UK thesis in astronomy or astrophysics

Bibliometrics

- All papers: 257 · Citations: >20000 · H-index: 67 · [Full publication list](#)
- Lead author: 24 · Citations: >2600 · H-index: 23

Observing programs and collaborations

Since 2017 I have obtained ~ 500 hours of PI Observing time on major facilities at all wavelengths, including multiple programs (**standard** and **Target of Opportunity**) with world-class facilities such as *HST*, *Chandra*, VLT, VLA, Gemini, SOAR, *Swift* and LT

I am currently a full member of the ATLAS, Pan-STARRS and LS4 (**wide-field** optical time-domain surveys) and ePESSTO+, 4MOST/TiDES and SoXS (**spectroscopic** follow-up) collaborations, and an invited external member of ZTF. I lead science working groups in many of these (see Professional Responsibilities). I have full Rubin Observatory LSST data rights as a LSST:UK Affiliate PI

Talks and seminars

I have given > 70 conference talks and colloquia around the world. About half of these are invited talks, including **plenary talks** at some of the largest astrophysics conferences: the annual European Astronomical Society meeting and biannual International Cosmic Rays Conference (both 2025)

Selected professional responsibilities

2024–	STFC Astronomy Grants Panel member
2024–	Pastoral Support Coordinator, LINAS Doctoral Training Centre
2023–	ATLAS and Pan-STARRS transients groups builder status
2023–	Leader of SoXS Fast and Luminous transients working group
2023–	Coordinator of LS4 survey massive black hole working group
2023–	Elected member of LSST:UK Executive Committee
2022–	UK representative for CASTOR space telescope time-domain 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
2020–	Proposal reviewer for STFC and ERC grants panels
2020–	Leader of ePESSTO+ superluminous supernova science group
2016–	Proposal reviewer/panellist for JWST, Gemini, HST, Liverpool Telescope TACs
2015–2023	Phase 3 Data Reduction manager, ePESSTO(+)
2014–	Referee for ApJ, MNRAS, A&A, PRD, Nature, Nature Astronomy, Science

PhD students supervised

2025–	Adam Smith, QUB	2023–2025	Thomas Moore, QUB
2024–	Dylan Magill, QUB	2021–2025	Xinyue Sheng, QUB/UoB
2023–	Josh Weston, QUB	2021–2025	Aysha Aamer, QUB/UoB
2022–	Paige Ramsden, UoB	2020–2025	Evan Ridley, UoB

Selected teaching

2024–	Cosmology (Year 4), QUB · lecturer / module coordinator
2023–	Database & Programming Fundamentals (PGT), QUB · lecturer / module coordinator

2020–2023 Observatory Laboratory (Year 3), UoB · module lead
2020–2022 Personal academic tutorials (Year 1), UoB
2019– MSci projects (Year 4), UoB/QUB · supervised 15+ research students

Open Source Software

- Modular Open Source Fitter for Transients ([MOSFiT](#)) · the first open source Bayesian code for physical modelling of transient light curves, widely used in the community for many years. One of the original developers, and lead maintainer since 2019 ([Guillochon, Nicholl et al., 2018](#))
- [SuperBol](#) · Popular code for making bolometric light curves from unevenly-sampled multi-band photometry ([Nicholl 2018](#))
- Photometry Sans Frustration ([PSF](#)) · Flexible and interactive Python code for PSF and aperture photometry, including image subtraction and zero point calibration ([Nicholl et al., 2023](#))
- Kilonova [model library](#) · Grid of semi-analytic kilonova models based on initial binary properties ([Nicholl et al., 2021](#))

Public outreach and media highlights

- My press releases have appeared in BBC, [New York Times](#), The Independent, The Times, NBC, CBC, Scientific American ++
- I regularly provide expert comment in the media, e.g. 5+ contributions to New Scientist
- TV appearances include [BBC The Sky at Night](#), BBC Midlands Today, ITV News and SFI ‘Curious Minds’ children’s show
- Regular speaker at astronomical society meetings, including keynote speaker at UK Federation of Astronomical Societies annual Convention (Nov 2021) and British Astronomical Association annual residential weekend (Apr 2023)
- Keynote speaker at the 2019 Northern Ireland Physics teachers annual conference

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. Mark Sullivan · University of Southampton · Collaborator
- Prof. Nial Tanvir · University of Leicester · Collaborator
- Prof. Stefano Benetti · Osservatorio Astronomico di Padova · Collaborator

Selected publications

First author publications

- [1] [Electromagnetic follow-up of gravitational waves: review and lessons learned](#)
Nicholl, M., Andreoni, I., *et al.*, 2025, PTRSA, 383, 20240126 (invited review)
- [2] [Quasi-periodic X-ray eruptions years after a nearby tidal disruption event](#)
Nicholl, M., Pasham, D. R., Mummery, A., *et al.*, 2024, Nature, 634, 804
- [3] [AT2022aedm and a new class of luminous, fast-cooling transients in elliptical galaxies](#)
Nicholl, M., Srivastav, S., Fulton, M. D., *et al.*, 2023, ApJL, 954, 28
- [4] [Systematic light curve modelling of TDEs: statistical differences between the spectroscopic classes](#)
Nicholl, M., Lanning, D., Ramsden, P., *et al.*, 2022, MNRAS, 515, 5604
- [5] [Superluminous supernovae: an explosive decade](#)
Nicholl, M., 2021, Astronomy & Geophysics, 62, 34 (invited review)
- [6] [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
- [7] [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
- [8] [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
- [9] [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
- [10] [Nebular-phase spectra of superluminous supernovae: physical insights from observational and statistical properties](#)
Nicholl, M., Berger, E., Blanchard, P. K., *et al.*, 2019, ApJ, 871, 102
- [11] [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
- [12] [SuperBol: A User-friendly Python Routine for Bolometric Light Curves](#)
Nicholl, M., 2018, RNAAS, 2, 230
- [13] [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
- [14] [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
- [15] [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

- [16] [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
- [17] [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
- [18] [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
- [19] [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
- [20] [Seeing double: the frequency and detectability of double-peaked superluminous supernova light curves](#)
Nicholl, M. & Smartt, S. J., 2016, MNRAS Letters, 457, 79
- [21] [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
- [22] [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
- [23] [Superluminous supernovae from PESSTO](#)
Nicholl, M., Smartt, S. J., Jerkstrand, A., *et al.*, 2014, MNRAS, 444, 2096
- [24] [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

- [25] [The Type I superluminous supernova catalogue – II. Spectroscopic evolution in the photospheric phase, velocity measurements, and constraints on diversity](#)
Aamer, A., **Nicholl, M.**, Gomez, S., *et al.*, 2025, MNRAS, 541, 2674
- [26] [The case of AT2022wtn: a tidal disruption event in an interacting galaxy](#)
Onori, F., **Nicholl, M.**, Ramsden, P., *et al.*, 2025, MNRAS, 540, 498
- [27] [Super-SNID: An Expanded Set of SNID Classes and Templates for the New Era of Wide-field Surveys](#)
Magill, D., Fulton, M. D., **Nicholl, M.**, *et al.*, 2025, RNAAS, 9, 78
- [28] [SN 2023zaw: the low-energy explosion of an ultra-stripped star, with non-radioactive heating](#)
Moore, T., Gillanders, J., **Nicholl, M.**, *et al.*, 2025, ApJL, 980, 44
- [29] [Double “acct”: a distinct double-peaked supernova matching pulsational pair-instability models](#)
Angus, C. R., Woosley, S. E., Foley, R. J., **Nicholl, M.**, *et al.*, 2024, ApJL, 977, 41
- [30] [The Type I Superluminous Supernova Catalog I: Light Curve Properties, Models, and Catalog Description](#)
Gomez, S., **Nicholl, M.**, Berger, E., *et al.*, 2024, MNRAS, 535, 471

- [31] [NEural Engine for Discovering Luminous Events \(NEEDLE\): identifying rare transient candidates in real time from host galaxy images](#)
Sheng, X., **Nicholl, M.**, Smith, K. W., *et al.*, 2024, *ApJL*, 531, 2474
- [32] [Time-varying double-peaked emission lines following the sudden ignition of the dormant galactic nucleus AT2017bcc](#)
Ridley, E., **Nicholl, M.**, Ward, C. A., *et al.*, 2024, *MNRAS*, 531, 1905
- [33] [GW190425: Pan-STARRS and ATLAS coverage of the skymap and limits on optical emission associated with FRB190425](#)
Smartt, S. J., **Nicholl, M.**, Srivastav, S., *et al.*, 2024, *MNRAS*, 528, 2299
- [34] [A Precursor Plateau and Pre-Maximum \[O II\] Emission in the Superluminous SN2019szu: A Pulsational Pair-Instability Candidate](#)
Aamer, A., **Nicholl, M.**, Jerkstrand, A., *et al.*, 2024, *MNRAS*, 527, 11970
- [35] [Swift/UVOT discovery of Swift J221951-484240: a UV luminous ambiguous nuclear transient](#)
Oates, S. R., Kuin, N. P. M., **Nicholl, M.**, *et al.*, 2024, *MNRAS*, 530, 1688
- [36] [SN 2022jli: a type Ic supernova with periodic modulation of its light curve and an unusually long rise](#)
Moore, T., Smartt, S. J., **Nicholl, M.**, *et al.*, 2023, *ApJL*, 956, 31
- [37] [Unprecedented early flux excess in the hybrid 02es-like type Ia supernova 2022ywc indicates interaction with circumstellar material](#)
Srivastav, S., Moore, T., **Nicholl, M.**, *et al.*, 2023, *ApJL*, 956, 34
- [38] [Delayed appearance and evolution of coronal lines in the TDE AT2019qiz](#)
Short, P., Lawrence, A., **Nicholl, M.**, *et al.*, 2023, *MNRAS*, 525, 1568
- [39] [Evidence for a luminosity-decay correlation in GRB GeV light curves](#)
Hinds, K. R., Oates, S. R., **Nicholl, M.**, *et al.*, 2023, *MNRAS*, 526, 3400
- [40] [The Luminosity Function of Tidal Disruption Events from Fallback-powered Emission: Implications for the Black Hole Mass Function](#)
Coughlin, E. R. & **Nicholl, M.**, 2023, *ApJL*, 948, 22
- [41] [A multi-messenger model for neutron star - black hole mergers](#)
Gompertz, B. P., **Nicholl, M.**, Smith, J. C., *et al.*, 2023, *MNRAS*, 526, 4585
- [42] [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*, 519, 891
- [43] [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*, 7, 67
- [44] [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
- [45] [Legacy Survey of Space and Time cadence strategy evaluations for active galactic nucleus time-series data in Wide-Fast-Deep field](#)
Sheng, X., Ross, N. P., **Nicholl, M.**, *et al.*, 2022, *MNRAS*, 512, 5580

- [46] [An elliptical accretion disk following the tidal disruption event AT 2020zso](#)
Wevers, T., **Nicholl, M.**, Guolo, M., *et al.*, 2022, A&A, 666, 6
- [47] [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
- [48] [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
- [49] [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
- [50] [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
- [51] [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*
- [52] [Bright Type IIP Supernovae in Low-metallicity Galaxies](#)
Scott, S., **Nicholl, M.**, Blanchard, P. K., *et al.*, 2018, ApJL, 870, L16
- [53] [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
- [54] [Superluminous Supernovae in LSST: Rates, Detection Metrics, and Light Curve Modeling](#)
Villar, V. A., **Nicholl, M.**, Berger, E., *et al.*, 2018, ApJ, 869, 166
- [55] [MOSFiT: Modular Open-Source Fitter for Transients](#)
Guillochon, J., **Nicholl, M.**, Villar, V. A., *et al.*, 2018, ApJS, 236, 6
- [56] [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
- [57] [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
- [58] [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
- [59] [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
- [60] [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

- [61] [The supernova CSS121015:004244+132827: a clue for understanding super-luminous supernovae](#)
Benetti, S., **Nicholl, M.**, Cappellaro, E., *et al.*, 2014, MNRAS, 441, 289