Benjamin Paul Gompertz

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ABOUT

I am a post-doctoral research fellow at the University of Birmingham, with 7 years of experience. I received my PhD from the University of Leicester in 2015. My research primarily focuses on astrophysical transients, in particular those associated with mergers that produce gravitational-wave (GW) emission like short gamma-ray bursts (GRBs) and kilonovae. I model the progenitors, environments and emission physics of these sources and perform follow-up observations of interesting targets. I am a member of GW and GRB follow-up groups like the GOTO team (where I coordinate the GRB working group) and the ENGRAVE, ePESSTO+ and STARGATE collaborations. I am also involved in future facilities, both short-term (Rubin/LSST) and looking ahead to the 2030s (THESEUS).

EMPLOYMENT HISTORY

Postdoctoral Research Fellow **Birmingham, UK**
University of Birmingham *April 2021 - present*

- Identified the first kilonova from a 'long' GRB (Rastinejad, Gompertz et al. 2022).
- Published the astrophysical implications of the first confirmed neutron star – black hole binary mergers (Gompertz et al. 2022a).
- Discovered the physical processes driving short GRBs with 'extended emission' (Gompertz et al. 2022b).
- Developing GW-informed kilonova models for neutron star – black hole mergers.

Postdoctoral Research Fellow **Coventry, UK**
University of Warwick *September 2017 - March 2021*

- First to show the diversity of kilonova emission following GW170817 (Gompertz et al. 2018a).
- Identified candidate neutron star – black hole mergers in the short GRB population (Gompertz et al. 2020a).
- Lead analyst and author of the GOTO GW follow-up paper for O3 (Gompertz et al. 2020b).
- Performed real-time follow-up of GW triggers with GOTO during O3, including the identification and reporting of candidate EM counterparts (e.g. Ackley et al. 2019, GCN 25337).

Postdoctoral Research Associate **Baltimore, USA**
Space Telescope Science Institute *June 2015 - August 2017*

- Demonstrated a possible need for two types of long GRB progenitor (Gompertz et al. 2018b).
- Published the first self-consistent model of the magnetar-driven GRB 111209A/SN2011kl (Gompertz et al. 2017).
- Participated in the time allocation committee of the *Hubble Space Telescope*.

EDUCATION

PhD Astrophysics **Leicester**
University of Leicester *2011-2015*

MSci Physics with Astrophysics **Birmingham**
University of Birmingham *2006-2010*

PUBLICATIONS IN BRIEF

- Lead author of 10 peer-reviewed or submitted research papers, with 409 citations.
- Contributing author on 219 academic papers and research notes, with 3,953 citations.
- Full publication history available on NASA's Astrophysics Data System (ADS).[a]
- Outreach publications in "How it Works" magazine, "All About Space" magazine and on the University of Warwick astro blog.
- Gompertz et al. (2018a) was a featured research highlight of the American Astronomical Society.[b]
- Active peer-reviewer, demonstrating academic citizenship.

[a] `https://tinyurl.com/bgompertz-publications`
[b] `https://aasnova.org/2018/07/02/piecing-together-the-light-from-colliding-stars/`

AWARDS AND ACHIEVEMENTS

- Awarded an RAS Undergraduate Summer Bursary for 2022.
- 16 hours of PI observing time awarded on the Very Large Array (VLA) for short GRB follow-up.
- 20 hours of PI observing time awarded on the Isaac Newton Telescope (INT) to follow up GW triggers.
- 37 hours of PI observing time awarded on the Liverpool Telescope (LT) to observe short GRBs and kilonovae.
- 120 ks of PI observing time awarded on the *Chandra* X-ray Observatory for short GRB studies.
- Further observing time awarded as a co-investigator on the *Hubble Space Telescope* (HST), the *James Webb Space Telescope* (JWST), the Very Large Telescope (VLT), and the Atacama Large Millimetre Array (ALMA).
- Invited speaker at five international conferences, seminars and meetings.
- Contributing speaker at a further 13 international conferences.
- Principal proposer and chair of the "Optimising O4" session at the UK National Astronomy Meeting (NAM) 2022. Co-proposer of accepted GRB and GW-EM sessions at NAM 2021, 2022 and EAS 2021.
- Elected fellow of the Royal Astronomical Society.

TEACHING

- Supervised 4^{th} year masters student projects at Birmingham.
- Provided a support and advisory role for PhD students through my career (see e.g. publications by Eyles, Gibson and Mandhai in my publications list).
- Organised transient workshop learning experience for secondary school pupils.
- Tutor and laboratory demonstrator for undergraduate students at the University of Leicester.
- Supervised masters student projects at the University of Leicester.
- Former GCSE physics tutor.

REFERENCES

Professor Andrew Levan — **a.levan@astro.ru.nl**
Former Employer — *Radboud University, Nijmegen, The Netherlands*

Professor Paul O'Brien — **pto2@leicester.ac.uk**
PhD Advisor — *University of Leicester, Leicester, UK*

Professor Danny Steeghs — **d.t.h.steeghs@warwick.ac.uk**
Former Supervisor & GOTO PI — *University of Warwick, Coventry, UK*

Dr Matt Nicholl — **m.nicholl.1@bham.ac.uk**
Current Employer — *University of Birmingham, Birmingham, UK*

Professor Nial Tanvir — **nrt3@leicester.ac.uk**
Collaborator — *University of Leicester, Leicester, UK*

Dr Andrew Fruchter — **fruchter@stsci.edu**
Former Employer — *Space Telescope Science Institute, Baltimore, USA*

PUBLICATIONS LIST

A Kilonova Following a Long-Duration Gamma-Ray Burst at 350 Mpc
*Rastinejad, J. C.; **Gompertz, B. P.**; et al. (2022), arXiv:2204.10864 (Submitted to Nature)*

Constraints on Compact Binary Merger Evolution from Spin-Orbit Misalignment in Gravitational-Wave Observations
***Gompertz, B. P.**; et al. (2022a), MNRAS, 511, 1454*

A Minute-Long Merger-Driven Gamma-Ray Burst from Fast-Cooling Synchrotron Emission
***Gompertz, B. P.**; et al. (2022b), arXiv:2205.05008 (Submitted to Nature)*

The Birth of a Relativistic Jet after a Star is Disrupted by a Black Hole at $z \approx 1.2$
*Pasham, D.; Lucchini, M.; Laskar, T.; **Gompertz, B. P.**; et al. (2022), Submitted to Nature Astronomy*

Towards an Understanding of Long Gamma-Ray Burst Environments Through Circumstellar Medium Population Synthesis Predictions
*Chrimes, A.; **Gompertz, B. P.**; et al. (2022), Submitted to MNRAS*

The Gravitational-Wave Optical Transient Observer (GOTO): Prototype Performance and Prospects for Transient Science
Steeghs, D.; et al. (2022), MNRAS, 511, 2405

VLBI Observations of GRB 201015A, a Relatively Faint GRB with a Hint of Very High Energy Gamma-Ray Emission
Giarratana, S.; et al. (2022), arXiv:2205.12750 (Accepted to A&A)

Searching for Fermi GRB Optical Counterparts with the Prototype Gravitational-Wave Optical Transient Observer (GOTO)
Mong, Y. -L.; et al. (2021), MNRAS, 507, 5463

Exploring Compact Binary Merger Host Galaxies and Environments with zELDA
Mandhai, S.; et al. (2021), arXiv:2109.09714 (Accepted to MNRAS)

Transient-Optimized Real-Bogus Classification with Bayesian Convolutional Neural Networks - Sifting the GOTO Candidate Stream
Killestein, T. L.; et al. (2021), MNRAS, 503, 4838

A Search for Neutron Star-Black Hole Binary Mergers in the Short Gamma-Ray Burst Population
***Gompertz, B. P.**; Levan, A. J. & Tanvir, N. R. (2020a), ApJ, 895, 58*

Searching for Electromagnetic Counterparts to Gravitational-Wave Merger Events with the Prototype Gravitational-wave Optical Transient Observer (GOTO-4)
***Gompertz, B. P.**; et al. (2020b), MNRAS, 497, 726*

Observational Constraints on the Optical and Near-Infrared Emission from the Neutron Star–Black Hole Binary Merger S190814bv
ENGRAVE Collaboration (2020), A&A, 643, 113

An Unusual Transient Following the Short GRB 071227
Eyles, R. A. J.; et al. (2019), MNRAS 489, 13

Short GRB 160821B: A Reverse Shock, a Refreshed Shock, and a Well-Sampled Kilonova
Lamb, G. P.; et al. (2019), ApJ 883, 48

A Comparison between Radio Loud and Quiet Gamma-Ray Bursts, and Evidence for a Potential Correlation between Intrinsic Duration and Redshift in the Radio Loud Population
Lloyd-Ronning, N. M.; ***Gompertz, B. P.****; et al. (2019), ApJ 871, 118*

The Optical Afterglow of GW170817 at One Year Post-Merger
Lamb, G. P.; et al. (2019), ApJ 870, 15

The Diversity of Kilonova Emission in Short Gamma-Ray Bursts
Gompertz, B. P.*; et al. (2018a), ApJ 860, 62*

The Environments of the Most Energetic Gamma-Ray Bursts
Gompertz, B. P.*; Fruchter, A. S. & Pe'er, A. (2018b), ApJ 866, 162*

Fallback Accretion on to a Newborn Magnetar: Long GRBs with Giant X-ray Flares
Gibson, S. L.; Wynn, G. A., ***Gompertz, B. P.*** *& O'Brien, P. T. (2018), MNRAS 478, 4323*

The Optical Afterglow of the Short Gamma-Ray Burst Associated with GW170817
Lyman, J. D.; et al. (2018), NatAs 2, 751

The Unpolarized Macronova Associated with the Gravitational Wave Event GW 170817
Covino, S.; et al. (2017), NatAs 1, 791

Fallback Accretion on to a Newborn Magnetar: Short GRBs with Extended Emission
Gibson, S. L.; Wynn, G. A., ***Gompertz, B. P.*** *& O'Brien, P. T. (2017), MNRAS 470, 4925*

The Environment of the Binary Neutron Star Merger GW170817
Levan, A. J.; et al. (2017), ApJ 848, 28

The Emergence of a Lanthanide-Rich Kilonova Following the Merger of Two Neutron Stars
Tanvir, N. R.; et al. (2017), ApJ 848, 27

Multi-Messenger Observations of a Binary Neutron Star Merger
Abbott, B. P.; et al. (2017, ApJ 848, 12)

Magnetars in Ultra-Long Gamma-Ray Bursts and GRB 111209A
Gompertz, B. P. *& Fruchter, A. S. (2017), ApJ 839, 49*

Broad-Band Modelling of Short Gamma-Ray Bursts with Energy Injection from Magnetar Spin-Down and its Implications for Radio Detectability
Gompertz, B. P.*; et al. (2015), MNRAS 448, 629*

Constraining Properties of GRB Magnetar Central Engines Using the Observed Plateau Luminosity and Duration Correlation
Rowlinson, A.; ***Gompertz, B. P.****; et al. (2014), MNRAS 443, 1779*

Magnetar Powered GRBs: Explaining the Extended Emission and X-ray Plateau of Short GRB Light Curves
Gompertz, B. P.*; O'Brien, P. T.; & Wynn, G. A. (2014), MNRAS 438, 240*

Can Magnetar Spin-Down Power Extended Emission in Some Short GRBs?
Gompertz, B. P.*; O'Brien, P. T.; Wynn, G. A. & Rowlinson, A. (2013), MNRAS 431, 1745*