

Tom Kimpson

Education

- 2016–Present **PhD., Theoretical Astrophysics**, Mullard Space Science Laboratory, University College London, UK.
Thesis: Multimessenger astrophysics of pulsars in EMRI/IMRI systems
Supervisors: Prof. Kinwah Wu, Prof. Silvia Zane
- 2012–2016 **MPhys., Physics and Astronomy**, Durham University, UK, .
First Class Honours.
Supervisor: Prof. Paula Chadwick.

Publications

- Kimpson, T.**, Wu, K., Zane, S. (–). *The Post-Keplerian approximation in the strong-field regime*. IN PREP.
- Kimpson, T.**, Wu, K., Zane, S. (2019). *Pulsar timing in extreme mass ratio binaries: a general relativistic approach.*, MNRAS [doi:10.1093/mnras/stz845](https://doi.org/10.1093/mnras/stz845)
- Kimpson, T.**, Wu, K., Zane, S. (2019). *Spatial Dispersion of light rays propagating through cold plasma in Kerr spacetime*. MNRAS [doi:10.1093/mnras/stz138](https://doi.org/10.1093/mnras/stz138)
- Kimpson, T.**, Spera, M. , Mapelli, M., Ziosi, B., (2016). *Hierarchical black hole triples in young star clusters: impact of Kozai-Lidov resonance on mergers*. MNRAS [doi:10.1093/mnras/stw2085](https://doi.org/10.1093/mnras/stw2085)

Research Interests

Multimessenger astrophysics and strong-field General Relativity. Recent work has examined the use of Extreme Mass Ratio Pulsar-Black hole binaries for tests of fundamental physics and astrophysics, and dynamical effects in triple systems with implications for gravitational wave emission. Future work includes gravitational astrophysics of Extreme Mass Ratio Inspirals and pulsar orbital parameterization in strong-field environments.

Additional Research Experience

- March 2018 **Scientific Visit**, INAF CAGLIARI, Italy.
- June – Sept **Research Scientist**, PACE, London.
- 2016 Early-hire at start-up using machine learning methods for dynamic pricing and revenue optimization. Independently researched and implemented Bayesian machine learning and reinforcement learning algorithms.
- June – Sept **Research Associate**, INAF PADOVA & PADOVA UNIVERSITY, Italy.
- 2015 Research within the Formation and Dynamics of Stars group investigating the formation and evolution of triple systems, the merger of compact objects, the effects of Kozai-Lidov oscillations on the merger rate and the implications for gravitational wave emission.

Talks

- July 2019 22nd International Conference on General Relativity and Gravitation, Valencia
Multimessenger astrophysics of Pulsar EMRBs. Abstract accepted.
- July 2019 National Astronomy Meeting, Lancaster
Pulsar Timing in Extreme Mass Ratio Binaries. Abstract accepted.
- June 2019 Computational Sciences in the 21st Century, London
Modelling in the gravitational strong field. Abstract submitted.
- May 2019 Science Possibilities Investigating Neutron Stars, London
Pulsars as probes of strong-field GR. Abstract submitted.
- Jan 2019 Mullard Space Science Laboratory, UCL
General Relativistic Pulsar Timing.
- March 2018 INAF Cagliari, Italy
Spatial dispersion in the strong-field: implications for PSR timing

Grants & Awards

- 2019 MSSL Travel Award (declined)
- 2019 UCL Studentship Award
Competitive application for additional PhD funding
- 2018 PHAROS Grant
European Cooperation in Science and Technology
- 2018 Finalist
UCL Research Images as Art
- 2016 STFC PhD Studentship
Science and Technology Facilities Council
- 2015 Erasmus+ Grant
Erasmus+ & European Commission

Service and Memberships

- Full Member LISA Consortium
- Fellow Royal Astronomical Society
- Full Member SPINS-UK Consortium
- May 2019 **Local Organizing Committee.**
- SPINS-UK Conference, London Jan 2018 – **Seminar Organizer**
- MSSL,UCL Jan 2018 – **Journal Club Organizer**
- MSSL,UCL Present

Teaching

- Sept 2018 **Primary Supervisor**, Aimi Kusudo, Visiting Undergraduate.
- June – Sept 2018 **Secondary Supervisor**, Adam Moon, Nuffield Research Student.

Sept 2017 – **Teaching Assistant**, *High Energy Astrophysics*, UCL.
Present

Additional Conferences and Courses

Nov 2018 LISA Consortium Conference, Marseille
May 2018 SPINS-UK Conference, Norwich
July 2018 ICE Gravitational Wave Summer School, Barcelona
May 2018 The Gravitational Wave Binary Black Hole and Neutron Star Opportunity for Astronomy, London
Sept 2017 The Promises of Gravitational-Wave Astronomy, London
March 2017 Green Bank Telescope Observer Training Workshop, West Virginia.

Computer skills

Languages FORTRAN, PYTHON, Mathematica
Scientific OpenMP, GNU Parallel, Git, TEMPO, \LaTeX
Tools