Royal Astronomical Society

Fowler Award (A) 2022
Dr Matt Nicholl

The 2022 Fowler Award (A) is awarded to Dr Matt Nicholl.

Following his PhD, Dr. Matt Nicholl conducted the first systematic survey of hydrogen-poor superluminous supernovae observed years after explosion. With collaborators, he developed an open-source Bayesian modelling framework to interpret transients of quite different mechanisms with a consistent statistical technique, using it to conduct a comprehensive analysis of the model parameter space occupied by observed hydrogen-poor superluminous supernovae. In several publications as lead author, Dr. Nicholl convincingly demonstrated that these superluminous supernovae come from massive stars, with the signature of spin-down from a rapidly rotating magnetic neutron star, or 'magnetar', evident in their multi-wavelength emission.

A study led by Dr. Nicholl of the closest ever tidal disruption event, which utilized the Liverpool Telescope, the ESO VLT and the NTT, showed that the disruption launched an outflow that masked the hottest part of the flare, providing a solution to the long-standing mystery of why many tidal disruption events are faint in X-rays.

As a member of the DECAM team, Dr. Nicholl led the spectroscopic study of the first kilonova from a LIGO neutron star merger in which multiple ejection mechanisms of heavy-element-enriched matter were identified. Combining his Bayesian inference code with an analytical framework allowed Dr. Nicholl to predict kilonova emission from gravitational wave sources and, in combination with existing data, allowed the radius of a neutron star to be determined.

Dr. Nicholl has made transformative breakthroughs in our understanding of new, rare, and extreme types of astronomical transients, especially superluminous supernovae and kilonovae, and what they tell us about the physics of compact objects.

For these reasons, Dr. Matt Nicholl is awarded the Fowler prize.

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