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Relativistic Jets from all angles

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Due to their strong beaming, relativistic jets are overwhelmingly more likely to be detected from viewing angles close to their jet axis. This makes the angular structure of the jets (and in particular the under-energetic 'wings' of the jet) difficult to explore in the majority of jet powered transient events. Nonetheless, jets viewed mildly off-axis should be commonly detected and the resulting multiwavelength light-curves have unique features. I will show how these considerations can (i) explain peculiar behaviors seen in TDE jet light-curves, (ii) re-frame our understanding of commonly observed phenomena in GRB afterglows, such as X-ray plateaus and flares, (iii) puts strong constraints on GRB prompt emission, and (iv) sets tests and expectations for future observations. For jets viewed far off-axis I will show that there are different types of light-curves that could be observed (single or double peaked) and outline how the underlying jet structure can be robustly recovered from their observations. I will also discuss the connection with the recently discovered GRB 221009A, the brightest detected GRB to date by some margin, which has exhibited an intriguing and highly constraining afterglow evolution.

Primary author: Dr BENIAMINI, Paz (Open University of Israel)

Co-authors: Prof. DAIGNE, Frederic (IAP); Prof. GRANOT, Jonathan (The Open University of Israel); Dr GILL, Ramandeep (UNAM); Dr DUQUE, Raphael (Institute für Theoretische Physik, Goethe Universität Frankfurt-am-Mai); Prof. MOCHKOVITCH, Robert (IAP); PIRAN, Tsvi (The Hebrew University); Prof. NAKAR, Ehud (TAU)

Presenter: Dr BENIAMINI, Paz (Open University of Israel)

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