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## Physical insights from multi-messenger observations of compact binary mergers and their afterglows

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Gamma-ray bursts (GRBs) associated with gravitational wave events are, and will likely continue to be, viewed at a larger inclination than GRBs without gravitational wave detections. As demonstrated by the afterglow of GRB 170817A, this requires an extension of the common GRB afterglow models where it typically used to be sufficient to assume that the observer was looking straight into a jet without significant lateral structure in its outflow geometry. In response to 170817, we have developed an updated modeling and interpretation framework that has been used from the X-ray afterglow discovery paper until the ongoing faint emission still observable to this day. Against this backdrop, I will present an overview of how multi-messenger events of this type present an opportunity to rethink our modeling. This includes approaches to model selection, to merging constraints from the different signals (gravitational waves, afterglow, very large baseline interferometry) and what physics is needed to interpret the long-term emission from GRBs seen off-axis and their aftermath including jets that may or may not emerge successfully from the merger debris carrying an imprint of the launching process.

**Primary author:** VAN EERTEN, Hendrik (University of Bath)

**Co-author:** Dr RYAN, Geoffrey (University of Maryland)

**Presenter:** VAN EERTEN, Hendrik (University of Bath)

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