

## **Nonlinear interaction of multiple impulsive gravitational waves**

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Impulsive gravitational waves are (weak) solutions to the Einstein vacuum equations for which the curvature tensor has a delta singularity supported on a null hypersurface. Explicit, highly symmetric, solutions featuring propagation of one impulsive gravitational wave and interaction of two impulsive gravitational waves have been constructed since the influence works of Penrose, Szekeres and Khan-Penrose. In this talk, I will discuss a mathematical theory for the propagation and interaction of impulsive gravitational waves in general. In particular, I will present a recent joint work with Maxime Van de Moortel (Princeton) regarding the interaction of three (or more) impulsive gravitational waves.