

SPEAKER:

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TITLE:

Weak Null Structures for Multiple-Speed Systems of Wave Equations

ABSTRACT:

In three spatial dimensions, solutions to the Cauchy problem for wave equations with quadratic nonlinearities may not exist globally in time. In order to ensure global existence, one must impose additional structure on the nonlinearities. In this talk, we'll present a natural weak null condition that can be placed on the nonlinearities of a system of wave equations with multiple speeds and the proof that systems satisfying this condition admit global solutions. We will need slightly different tools than may be used in the single speed case, in part because multiple-speed systems are not Lorentz invariant. Our proof will be based on a new local energy estimate combined with a commuting vector field argument that avoids the use of Lorentz boosts. This is joint work with Jason Metcalfe.