

Contributed Talk

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Title: Null hypersurfaces and conformal vector fields

Abstract: Null hypersurfaces of a Lorentzian manifold are interesting geometric objects both from a mathematical as a physic viewpoint. They present obvious difficulties since they do not inherit a useful metric tensor from the ambient, so new tools have to be developed to handle them. One of them is introduced in [Gutiérrez and Olea, *Mathematische Nachrichten*, 289 (2016)] and it allows us to construct a Riemannian metric on a null hypersurface. The usefulness of this Riemannian metric has been shown in several situations, [Gutiérrez and Olea, *Journal of Geometry and Physics*, 145, (2019)], [Atindogbe, Gutiérrez and Hounnonkpe, *Annali di Matematica Pura ed Applicata*, 199 (2020)]. In this talk we show how this Riemannian metric can be used to prove some results about null hypersurfaces in a Lorentzian manifold furnished with a conformal vector field. For example, we give conditions to ensure that a null hypersurface is contained in a null cone and we also give conditions to ensure that the null hypersurface is a Killing horizon.