

Gravitational dynamics in the Higgs-dark matter sector

Thursday, 24 September 2020 11:25 (15 minutes)

During the talk the course and results of gravitational collapse within the Higgs-dark matter sector using the double null formalism will be presented. The employed model consists of two scalar fields non-minimally coupled to gravity, one of which is charged under a $U(1)$ gauge field and represents a stable dark matter candidate. The uncharged scalar may represent a real part of the Higgs doublet. There is another $U(1)$ gauge field which can be associated with the dark photon. Two coupling channels among the ordinary matter and dark sectors, namely the kinetic mixing among the $U(1)$ gauge fields and the Higgs portal coupling among scalars, were included in the model.

The structures of emerging spacetimes will be analyzed via locations of dynamically formed horizons and singularities. The dependence of the characteristics of forming objects, precisely dynamical black holes, on the parameters of the model of interest, will be presented. Additionally, a set of spacetime quantities as seen by an observer moving with the medium will be proposed to describe the outcomes of the processes.

Primary author: NAKONIECZNA, Anna (University of Warsaw)

Presenter: NAKONIECZNA, Anna (University of Warsaw)

Session Classification: Mathematical and Numerical Relativity