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**DOMOSCHOOL**  
International Alpine School  
of Mathematics and Physics

15 – 19 JULY 2019 - Domodossola -Italy

EINSTEIN EQUATIONS: PHYSICAL AND MATHEMATICAL ASPECTS OF GENERAL RELATIVITY

## SHORT TALKS

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#### *On the linear instability of the wormhole of Ellis-Bronnikov-Morris-Thorne*

#### Abstract

In this talk I will present a proof of the linear instability of the wormhole of Ellis, Bronnikov, Morris and Thorne (EBMT), arising from Einstein's equations in presence of a phantom scalar field. After an overview of the geometry of wormholes and phantom scalar fields in the background of general relativity, I will decouple the linearized Einstein's equations for the perturbed EBMT wormhole, reducing them to a wave-type equation for the perturbing function of the wormhole radius: the proof of the linear instability is obtained by showing that the Schrödinger operator that appears in this equation has one negative eigenvalue. A comparison with the previous literature will be made.