

Athanasios Bakopoulos (NTUA Athens) “Compact Objects in Scalar-Tensor theories”

jeudi 9 novembre 2023 10:00 (30 minutes)

We analyse in all generality beyond Horndeski theories of shift symmetry in a static and spherically symmetric spacetime. By introducing four auxiliary functions, we write the field equations in a particularly compact form. We show that assuming additionally parity symmetry renders the system directly integrable giving multiple families of black-hole solutions. These have typically an asymptotically-flat Reissner-Nordstrom behaviour, and emerge in the presence of a canonical kinetic term for the scalar field. In the absence of parity symmetry, we present a general method which allows us to integrate the field equations by choosing the form of only one coupling function and an auxiliary quantity. This method leads to asymptotically flat and AdS black hole solutions with differing properties. We finally discuss disformal transformations within this context as a means of obtaining wormhole and black hole solutions in different theories.

Philippe Grandclement (LUTH Meudon)

“Fully consistent rotating black holes in the cubic Galileon theory”

Previous attempts to construct numerically rotating black holes in the cubic Galileon theory were based on the use of quasi-circular coordinates. However it was noticed at that time that this choice was inconsistent with the properties of the theory thus leading to (small) violations of some components of Einstein’s equations. A formalism based on the maximal slicing condition and a spatial harmonic gauge enables to cure this problem and to obtain, for the first time, fully consistent rotating black hole solutions in this context. I will present the formalism that describes the black hole as an apparent horizon in equilibrium. The resulting system of equations is solved numerically using spectral methods. The properties of the obtained configurations will be discussed, in particular the violation of the zeroth-law of black hole thermodynamics.