

**2nd Valencia Winter
Workshop on Theoretical
Physics**

Report of Contributions

Contribution ID : 1

Type : **not specified**

Global monopoles in Palatini gravity

Tuesday, 11 December 2018 10:30 (60)

I'll present some recent results and new ideas on the effects that global monopoles combined with modified gravity à la Palatini could have for black holes and Hawking radiation.

Presenter(s) : Dr. OLMO, Gonzalo J. (UV-IFIC)

Contribution ID : 2

Type : **not specified**

TBA

Tuesday, 11 December 2018 11:30 (60)

Presenter(s) : Prof. AFONSO, Victor I. (UFCG (Brazil))

Contribution ID : 3

Type : **not specified**

Inflation beyond GR

Tuesday, 11 December 2018 12:30 (60)

Scalar-tensor theories of gravity have become a very rich framework from which one can construct viable phenomenological models of early- and late-time cosmology. In particular for inflation, previous models constructed using the Horndeski Lagrangian give predictions which are now in tension with CMB data. On the other hand, by trying to fit the observations, one would find instabilities at the level of the quantum perturbations. Furthermore, computing the standard inflationary observables in a semi-analytical way is a nontrivial task. In this talk, first I will introduce a novel scalar-vector-tensor framework (SVT) from which Horndeski is a subclass theory. I will show a simple inflationary model using the SVT Lagrangian and, then, using the standard G-inflation parametrization, a new mechanism to avoid instabilities with a phenomenological model which fits CMB predictions, this by computing observables using the Generalized and Optimized Slow-Roll techniques.

Presenter(s) : Mr. RAMÍREZ, Héctor (IFIC)

Contribution ID : 4

Type : **not specified**

TBA

Wednesday, 12 December 2018 10:30 (60)

Presenter(s) : Dr. BEJARANO, Cecilia (IAFE - U. Buenos Aires (Argentina))

Contribution ID : 5

Type : **not specified**

Electromagnetism induced by projective symmetry in metric-affine gravity

Wednesday, 12 December 2018 11:30 (60)

TBA

Presenter(s) : Mr. JIMÉNEZ CANO, Alejandro (U. Granada)

Contribution ID : 6

Type : **not specified**

Nice, clean and easy: how spacetime singularities can be resolved within Palatini gravity.

Wednesday, 12 December 2018 12:30 (60)

We review the trouble with space-time singularities within General Relativity and how gravitational theories formulated in metric-affine spaces and with a nice analogy with crystalline structures can have the key to their resolution. Focusing on spherically symmetric black holes by simplicity, we shall see the simple economy of these models in getting rid of such singularities. Some elements of the extension of this result to the axisymmetric scenario will also be discussed.

Presenter(s) : Dr. RUBIERA-GARCIA, Diego (Instituto de Astrofísica, Lisboa)

Contribution ID : 7

Type : **not specified**

Particle creation by wormholes

Thursday, 13 December 2018 10:30 (60)

Following the valuable technique of 2D moving mirror model, used to mimic Black Holes spacetime geometry, quantum modeling of a 1+1 wormhole and possible particle production is being analyzed. Application to viability of a time machine is also discussed.

Presenter(s) : Mr. GURREA , Gonzalo (UPV (Valencia))

Contribution ID : 8

Type : **not specified**

Dynamical formation of Proca stars and quasi-stationary solitonic objects.

Thursday, 13 December 2018 11:30 (60)

The dawn of gravitational-wave astronomy opens up an observational window to probe the true nature of astrophysical black hole candidates. These are widely believed to be well described, when near equilibrium, by the Kerr metric. But more exotic theoretical possibilities have been put forward, including horizonless compact objects. Such objects have the theoretical appeal of avoiding conceptual issues related to event horizons and spacetime singularities and could, in some circumstances, mimic the phenomenology of black holes. A notable example of these exotic compact objects are boson stars (BSs), which are self-gravitating, everywhere non-singular, horizonless Bose-Einstein condensates of massive scalar (scalar boson stars) or vector field (Proca stars). Two important questions can be raised about their dynamics. We may ask if they are stable, and more fundamentally if they may form dynamically. We perform fully non-linear numerical simulations within the spherically symmetric Einstein-(complex)Proca system. Starting with Proca field distributions that obey the Hamiltonian, momentum and Gaussian constraints, we show that the self-gravity of the system induces the formation of compact objects, known as Proca stars.

Presenter(s) : Mr. DI GIOVANNI, Fabrizio (UV)

Contribution ID : 9

Type : **not specified**

Magnetized accretion disks around Kerr black holes with scalar hair

Thursday, 13 December 2018 12:30 (60)

Testing the true nature of black holes – the no-hair hypothesis – will become increasingly more precise in the next few years as new observational data is collected in both the gravitational wave channel and the electromagnetic channel. In this talk we will consider numerically generated spacetimes of Kerr black holes with synchronised scalar hair and build stationary models of magnetized thick disks (or tori) around them. Our approach assumes that the disks are not self-gravitating, they obey a polytropic equation of state, the distribution of their specific angular momentum is constant, and they are marginally stable. Moreover, contrary to existing approaches in the literature, our models are thermodynamically relativistic, as the specific enthalpy of the fluid can adopt values significantly larger than unity. We study the dependence of the morphology and properties of the accretion tori on the type of black hole considered, from purely Kerr black holes with varying degrees of spin parameter. Comparisons between the disk properties for both types of black holes are presented. The sequences of magnetized, equilibrium disks models discussed in this study can be used as initial data for numerical relativity codes to investigate their dynamical (non-linear) stability and used in tandem with ray-tracing codes to obtain synthetic images of black holes (i.e. shadows) in astrophysically relevant situations where the light source is provided by an emitting accretion disk.

Presenter(s) : Mr. GIMENO-SOLER, Sergio (UV)

Contribution ID : **10**

Type : **not specified**

TBA

Thursday, 13 December 2018 15:00 (60)

Presenter(s) : Mr. DELHOM-LATORRE, Adrià (UV-IFIC)

Contribution ID : **11**

Type : **not specified**

TBA

Thursday, 13 December 2018 16:00 (60)

Presenter(s) : Mr. MORA, Gerardo (UV)

Contribution ID : 12

Type : **not specified**

Generalized Geometry and supersymmetric Sigma-models

Tuesday, 11 December 2018 15:00 (60)

Generalized Complex Geometry was introduced by the British mathematician Nigel Hitchin and further developed by his PhD students Gil Cavalcanti and specially Marco Gualtieri. The aim of Generalized Geometry is to combine symplectic and complex geometries in a single structure. In this talk, I will introduce the basic concepts for this theory and how it arises in a natural way in supersymmetric non-linear Sigma-models.

Presenter(s) : Mr. ORTS ROMERO, Javier (IFIC-UV)

Contribution ID : 13

Type : **not specified**

Conformal and projective superspaces in $N=2$ supersymmetry

Tuesday, 11 December 2018 16:00 (60)

Presenter(s) : Mrs. GUERRERO MENKARA, Adriana (IFIC-UV)