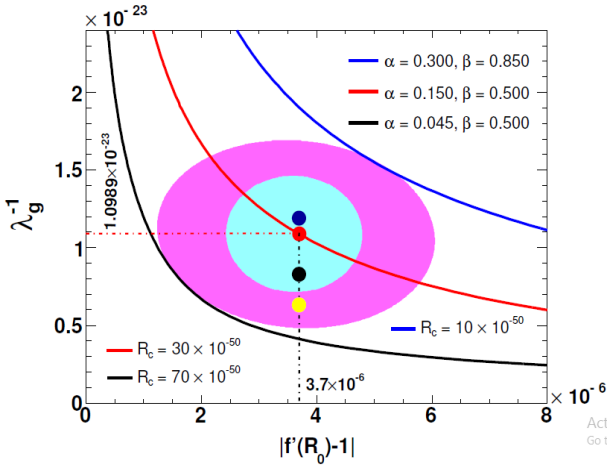
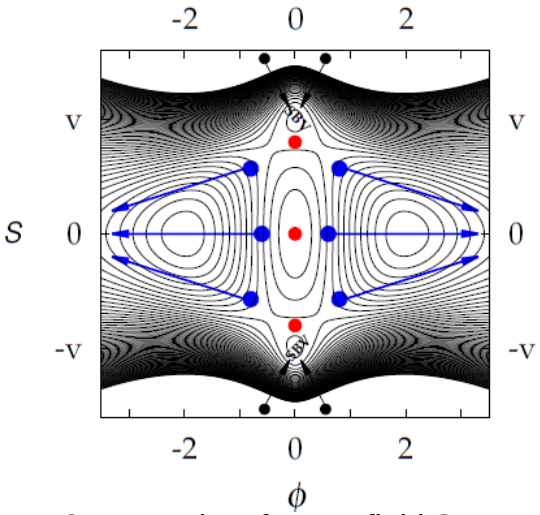
Astrophysics, Cosmology and HEP Group

Areas of Research:

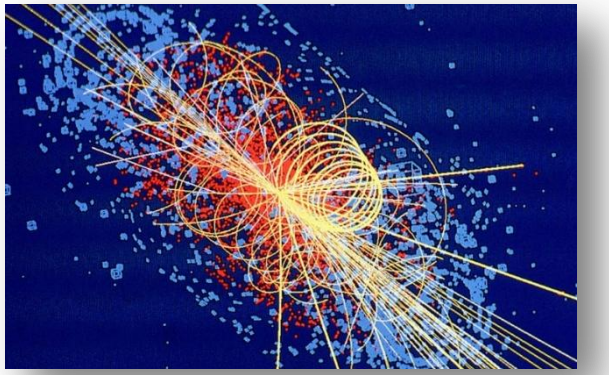
- Gravitational Wave Astrophysics (GWA)
- Astrophysics
- Cosmology
- Gamma-Ray Astronomy (GRA)
- High Energy Physics (HEP)



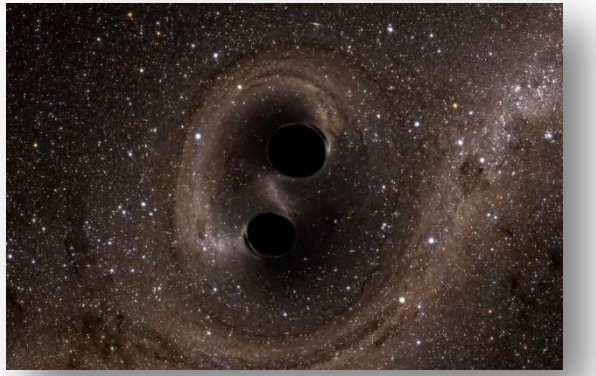
Confidence level plot of Compton Wavelength of gravitron vs |f'(R_0)-1|



Contour plot of super field S vs inflation



Simulation of the particle tracks produced when a Higgs boson is created in proton–proton collisions at the LHC. (Courtesy: CERN)



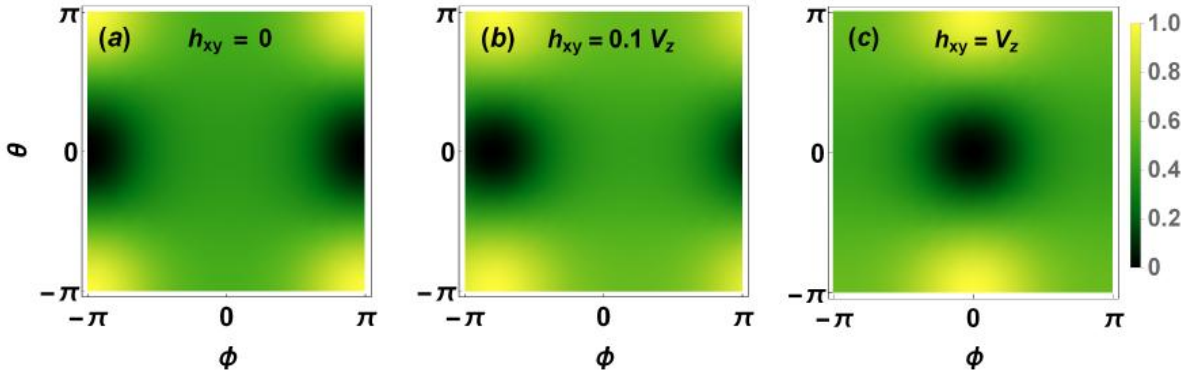
Simulated image of the two merging black holes detected by LIGO

- GWA works are related with the study of properties of gravitational waves in modified theories of gravity from different sources.
- In Astrophysics, the works are related with study of dark matter and compact star's oscillations.
- Cosmology works are based on supersymmetric hybrid inflation as well as on understanding of dark energy from the aspects of modified gravity and scalar field models.
- GRA works are basically related with gamma-hardon separation techniques of gamma-ray experiments.
- In HEP, works are related to simulation and study of extensive air showers data initiated by very high energy cosmic/gamma rays from astrophysical sources..

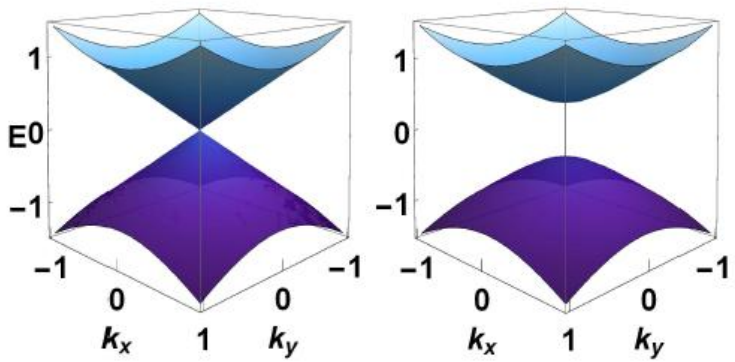
Research on Spintronic devices and Superconductivity

The key objectives of the research of the group are:

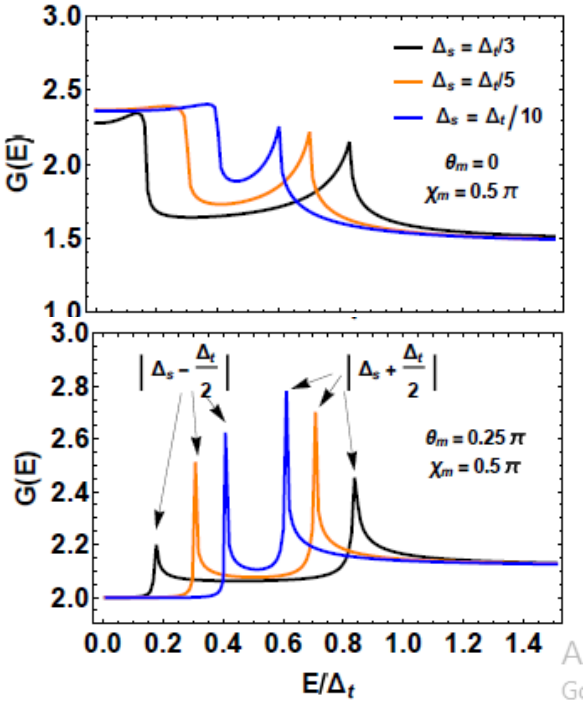
- Ferromagnetic Superconductor heterostructures applicable to spintronic devices.
- Different aspects of topological superconductivity.



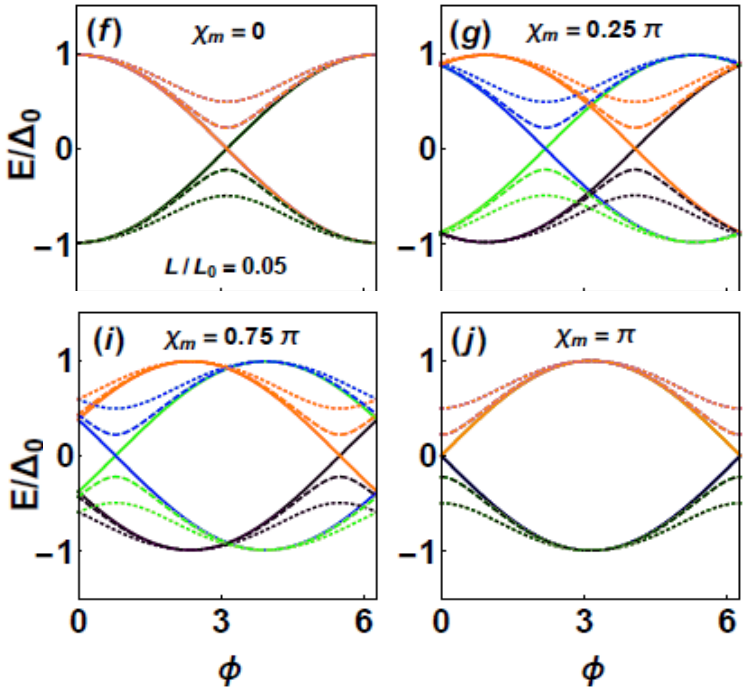
ABS energy levels E as a function of incident angle and phase .



Energy band spectrum at the surface of TI



Tunnelling Charge Conductance at F|NCSC junction



ABS energy levels E as a function of phase Φ