

Metrology of horizons

Raúl Carballo-Rubio^{1,2,3}

¹SISSA - International School for Advanced Studies, Via Bonomea 265, 34136
Trieste, Italy

²INFN Sezione di Trieste, Via Valerio 2, 34127 Trieste, Italy

³IFPU - Institute for Fundamental Physics of the Universe, Via Beirut 2, 34014
Trieste, Italy

March 5, 2019

One of the most striking predictions of general relativity is the formation of horizons, surfaces that act as one-way membranes for energy, matter and information. Testing this prediction is particularly subtle due to specific features in the precise mathematical definition of these surfaces, the strength of the surrounding gravitational fields, or a combination of both. At the same time, the formation of these membranes has critical implications for the nature and internal structure of black holes in classical general relativity, and is also important for theoretical scenarios beyond general relativity that postulate the existence of significant deviations in the near-horizon region. In this talk, I will discuss the theoretical arguments and astrophysical observations that can be used to improve our understanding of these regions of spacetime.

References

- [1] Raúl Carballo-Rubio, Pawan Kumar and Wenbin Lu, *Seeking observational evidence for the formation of trapping horizons in astrophysical black holes*, Phys.Rev. D97 (2018) no.12, 123012 [arXiv:1804.00663]
- [2] Raúl Carballo-Rubio, Francesco Di Filippo, Stefano Liberati and Matt Visser, *Phenomenological aspects of black holes beyond general relativity*, Phys.Rev. D98 (2018) no.12, 124009 [arXiv:1809.08238]