

Black holes all over the Universe

Tuesday 8 October 2024 10:20 (40 minutes)

We were quite fortunate with John Wheeler introducing the concept of Black Hole (BH) and more important using the Kerr mathematical solution to find the BH mass energy formula with Christodoulou and Hawking. We have been equally fortunate to participate in developing the largest observational effort extending to the earliest million years from the Big Bang and observing BH in all range of Masses from 10 to 10^{11} Solar masses (SMBH). In all this the development of the Binary Driven Hypernova model based on a simple CO core of 10 M_{sun} and a companion binary NS, with its seven Episodes, is guiding to establishing new physical laws in yet unobserved extragalactic systems and, equally important in challenging and were appropriate, dismantling some of the acquired astrophysical knowledge in our Galaxy. We are further expanding the understanding of the BDHN model at earlier times. We are using this acquired knowledge in:

- 1) probing how to extend these results to SMBH in active galactic nuclei
- 2) in identifying one of the most elusive components to identify the origin of SMBH. We proceed by accurately studying the physics ongoing in our galactic Center
- 3) we need to further comprehend the fundamental role of the 4 parameters of a BH : mass, charge, angular momentum and irreducible mass which severely limit the possibility of extracting energy from a BH or a SMBH using gravitational non linear interactions while allowing the, same processes, to proceed with more elementary linear interactions. This is crucial to understand the inner structure of our Universe

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Session Classification: GRBs and SNe