SEMPARIS – Séminaires en région parisienne
http ://string.lpthe.jussieu.fr/semparis/

Astronomy and Cosmology at ENS

Jeudi 27 Fevrier 2020, 16 :00
LPENS, L357/359
Domaines : astro-ph

Titre : *The Origin of Lensed Binary Black Holes*

Orateur : **Tom Broadhurst (Ikerbasque Research Professor, UPV/EHU)**

Résumé : *Normal stellar black holes, with masses like those in the Milky Way are detectable at high redshift, z 2, due to lensing and can dominate over unlensed events at the current LIGO/Virgo sensitivity. We argue that most BBH detections to date originate at 1 ¡ z ¡ 4, with intrinsic chirp masses typically 3 times smaller than reported because of the reduction in frequency by 1+z. Furthermore, examples of repeated lensed events may be present in the data. This is good news for LIGO/Virgo as lensing allows the evolution of binary black holes to be compared over most of cosmic history. We exclude a primordial black hole origin for the dark matter composed of LIGO-like black holes using light curves of individual high redshift stars traversing the critical curves of Hubble "Frontier Field" clusters. Instead we favour a dense star cluster origin that accounts for the rapid evolution in event rate favoured by our lens model and the lack of detected spin. Finally we show how the detection rate of BBH events is boosted in the context of "Wave Dark Matter" as a light axion, which causes a complex corrugation of critical curves.*