

Séminaire de matrices, cordes et géométries aléatoires

Mercredi 19/02/2020, 14:15-15:15

Orme des Merisiers Salle Claude Itzykson, Bât. 774

Some physics behind supertranslations and superrotations

Geoffrey Compère

Université Libre de Bruxelles

I will first provide a bird-eye view upon the infrared structure of gravity. I will shortly describe the relationship between BMS symmetry, soft theorems and memory effects at leading and sub-leading orders in the large radius expansion, while emphasizing the specificities of super-Lorentz symmetries. Secondly, I will present a no-go result on the soft hair conjecture: supertranslations induced by matter creating and falling inside black holes do not affect Hawking radiation, though they do affect scattering amplitudes. I will start by proving that Unruh radiation is unaffected by supertranslations induced by a shockwave and then show that Hawking radiation is mathematically related to this system, as a consequence of the principle of equivalence. Third, I will explain how BMS symmetry is associated to flux-balance laws that provide constraints upon the motion of binary compact mergers. Finally, I will present the extension of the BMS group to asymptotically de Sitter spacetimes.
