

Bộ môn Tin Vật lý thuộc Khoa Vật lý, trường Đại học Khoa học Tự nhiên Hà Nội trân trọng kính mời quý vị đến dự seminar khoa học tháng 8/2017 do Khoa Vật lý tài trợ. Seminar tháng 8/2017 sẽ được tổ chức theo lịch như sau:

Ngày: 07/8/2017 (Thứ 2)

Giờ: từ 4 giờ 30 chiều đến 5 giờ 30 chiều

Địa điểm: Phòng 408F, nhà T1, 334 Nguyễn Trãi, Thanh Xuân, Hà Nội

Speaker: Joseph M. Fedrow (Yukawa Institute for Theoretical Physics, Kyoto University, Japan)

Title: Gravitational Waves from Binary Black Hole Mergers Inside of Stars

Abstract: We present results from a controlled numerical experiment investigating the effect of stellar density gas on the coalescence of binary black holes (BBHs) and the resulting gravitational waves (GWs). This investigation is motivated by the proposed stellar core fragmentation scenario for BBH formation and the associated possibility of an electromagnetic counterpart to a BBH GW event. We employ full numerical relativity coupled with general-relativistic hydrodynamics and set up a 30+30 solar mass BBH (motivated by GW150914) inside gas with realistic stellar densities. Our results show that at densities $\rho \approx 10^6 - 10^7 \text{ g cm}^{-3}$ dynamical friction between the BHs and gas changes the coalescence dynamics and the GW signal in an unmistakable way. We show that for GW150914, LIGO observations conclusively rule out BBH coalescence inside stellar gas of $\rho \approx 10^7 \text{ g cm}^{-3}$. Typical densities in the collapsing cores of massive stars are in excess of this density. This excludes the fragmentation scenario for the formation of GW150914.

Trân trọng,

Bộ môn Tin Vật lý.