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Time: Wed. 2:30 PM, Nov. 16 Location: Multi-Function Hall, NAOC

Planting seeds for gravitational wave generators around active galactic nuclei: Analog of planetary systems around massive black holes

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Prof. Douglas N. C. Lin got B.S. from McGill University and got Ph.D from Cambridge University. Now he is the professor of Astronomy and Astrophysics in the University of California, Santa. Douglas Lin's principal research interests are in the origin of the solar system, star formation, astrophysical fluid dynamics, dynamics of stellar clusters, structure of galaxies, active galactic nuclei, and galaxy formation. He has developed a comprehensive theory for the structure and evolution of the primordial solar nebula and carried out extensive numerical simulations to study the growth of planetesimals and gas accretion by protogiant planets. Another area of Lin's research is development of a theory for the formation of first-generation stars in globular clusters and galaxies In the context of stellar dynamics, Lin is investigating the tidal disruption of satellite dwarf galaxies in the Local Group. In close collaboration with observational colleagues Burton Jones and Arnold Klemola, Lin is evaluating the extent of the galactic halo from the proper motion of the Magellanic Clouds. They are also examining the possibility that the satellite dwarf galaxies may be the debris of tidal interaction between the Magellanic Cloud and the Milky Way.

Abstract

Advanced LIGO event GW150914 has been attributed to the coalescence of two black holes with masses more than double that of most known stellar black holes. Formation of such stellar black holes directly through supernova explosions requires massive, metal-deficient progenitors. This requirement and their nearly equal masses may not be compatible with its occurrence in the local Universe. I consider an alternative possibility which may lead to the robust production of binary black holes with masses up to a hundred solar masses in the proximity of active galactic nuclei (AGN's). I will describe some relevant mechanisms which are analogous to the astrophysics of planet formation. I will discuss the implications of this scenario in the context of structure and evolution of AGN disks including the cause of their super solar metallicity, duty cycle of their active phase, and the rapid growth of their central massive black holes.

All are welcome! Tea, coffee, biscuits will be served at 2:15 PM.