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国台学术报告 NAOC COLLOQUIUM

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Time: Wed. 2:30 PM, June 8 Location: A601, NAOC

Planets and Stellar Remnants in and out of Globular Clusters

Dr. Rosanne Di Stefano

Harvard-Smithsonian Center for Astrophysics, Harvard Univesity, USA

Rosanne Di Stefano is a Senior Astrophysicist in the Harvard-Smithsonian Center for Astrophysics. Her PhD addressed supersymmetric field theories in the context of formulations of gravity; her career then moved from high-energy physics towards high-energy astrophysics. She has since made significant contributions to astronomy, especially in the field of understanding the evolution of binary stars. Rosanne's interests have included models for the formation of type Ia supernova, the natures of luminous supersoft X-ray sources and quasisoft X-ray sources, and applications of gravitational microlensing to the study of binary stars and planets.

Abstract

Planets almost certainly orbit white dwarfs and black holes, although such planets have not yet been discovered. We will describe an observing program with the potential to discover white-dwarf planets. The prospects for success are high, because during recent years it has become well established that white dwarfs tidally disrupt asteroids. We will explore an unavoidable consequence: collisions between planetoids and white dwarfs. Some of these events are expected to produce transients that can be detected by LSST or by X-ray surveys, even when they occur in other galaxies. We also show that close passages between the Oort Clouds of stars in the Galactic disk and compact objects can be an important source of planetoids for stellar remnants. These passages are analogous to even closer and more frequent stellar passages that occur in the dense environments of globular clusters. The high density of stars in globular clusters has consequences for any planetary systems they host, potentially destroying many. We will show, however, that planets can survive in the habitable zones of globular cluster M dwarfs, and that free floating planets are also likely to inhabit globular clusters. We also show that, if planets in globular clusters host communicating civilizations, similar to that on present-day earth, they may be ideal places to search for signs of extraterrestrial intelligent life.

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