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国台学术报告 NAOC COLLOQUIUM

2014 年 第 47 次 / Number 47 2014

Time: Wednesday 2:30PM, Dec. 10 Location: A601 NAOC

Direct collision of white dwarfs as a major channel for type Ia supernovae explosions

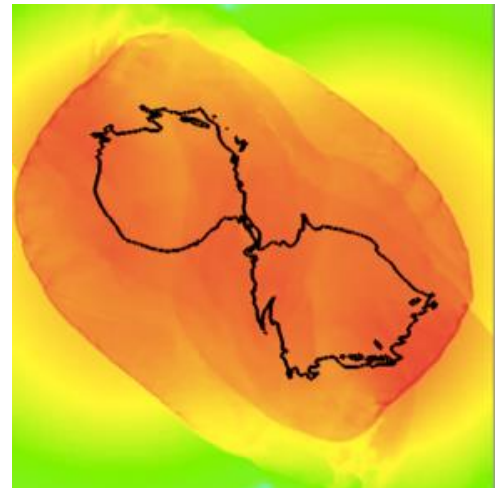
Dr. Subo Dong (KIAA)



Dr. Subo Dong is a Youth Qianren Research Professor at the Kavli Institute for Astronomy and Astrophysics (KIAA), Peking University. He got his bachelor's degree in astronomy from Nanjing University and Ph.D. in astronomy from the Ohio State University. Before joining KIAA, he was a Sagan postdoc fellow at the Institute for Advanced Study. He works on extrasolar planets, microlensing, dynamics, type Ia supernovae and time-domain astronomy.

Abstract

Type Ia supernovae (SNe Ia) are believed to be thermonuclear explosions of white dwarfs (WDs), but to date the explosion mechanism and progenitor systems remain elusive. I will present our works on a new channel that could possibly explain the majority of type Ia supernovae. In this scenario, a SN Ia is produced from a direct, "head-on" collision of two WDs in a common field triple system. Such collisions are shown to lead to successful detonations from strong shocks. We show that the



collision models reproduce several robust observational features of SNe Ia, especially establishing that the full range of Ni56 necessary for all SNe Ia can be produced by direct collisions of typical WDs. By systematically studying the SNe Ia nebular-phase spectra, we discover that bi-modal velocity distributions in Ni56 ejecta are common, which are naturally expected from the direct collision models due to the existence of two centres of explosions.

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