

## Equations of boson-fermion star and the basic equation discussions under Newtonian approximation

*Sunday 9 September 2018 15:10 (20 minutes)*

There is accumulating evidence that scalar fields may exist in nature. The gravitational collapse of a boson cloud would lead to the formation of a boson star just like white dwarfs and neutron star. In generally, as one of candidates of dark matter, a boson star holds a stable configuration and has deserved intensive attention and extensive researches in the past 50 years. At first, we examined the properties of a complex-scalar-field boson star, and analyze the ground state solutions, then analyzed the configuration of a star composed of bosons and fermions, and gave coupling equations. At last, we considered the hydrostatic equilibrium equation of the boson-fermion star, and gave the virial equation with different orders and investigated how scale fields impact the virial equation.

**Primary authors:** GAO, Zhifu (Xinjiang Astronomical Observatory, Chinese Academy of Sciences, 150, Science 1-Street, Urumqi, Xinjiang 830011, China); LI, Xiangdong (Department of Astronomy, Institute of physics, University of Science and Technology of China, Hefei, Anhui, China); CHEN, Cixing (Department of Astronomy and Key Laboratory of Modern Astronomy and Astrophysics, Nanjing University, Jiangsu 210046, China); WANG, Na (Xinjiang Astronomical Observatory, Chinese Academy of Sciences, 150, Science 1-Street, Urumqi, Xinjiang 830011, China)

**Presenter:** GAO, Zhifu (Xinjiang Astronomical Observatory, Chinese Academy of Sciences, 150, Science 1-Street, Urumqi, Xinjiang 830011, China)