

Nuclear Astrophysics with the next generation extremely large telescope TMT

Wako Aoki

National Astronomical Observatory of Japan, Osawa, Mitaka, Tokyo 181-8588, Japan

Astronomical observations of early generations of stars in the Milky Way have been contributing to the understanding of nucleosynthesis in individual astrophysical objects and events including first generation massive stars and their explosions. Recently, follow-up optical and infrared observations following gravitational wave events demonstrated their importance in understanding of production of heavy elements by the r-process in merging events of binary neutron stars. Such observations will be significantly enhanced by the next generation large telescopes by their spectroscopic capability using the enormous light collecting power. The Thirty Meter Telescope (TMT), which will have the primary mirror of 30 m diameter, will achieve light collecting power more than ten times larger than the current telescopes and very high sensitivity in infrared observations using Adaptive Optics (AO) systems. I will present expected science cases of TMT for nuclear astrophysics, focusing on spectroscopic studies for stars in the Milky Way and its satellite galaxies and follow-up studies for explosive events including neutron star mergers.