Subject : Time-domain astronomy

Title : Stellar evolution, Supernovae, origin of elements, and multi-messenger astronomy

Lecturer : Nozomu Tominaga

Outline :

Supernova explosions are the origin of elements heavier than carbon and the driver of chemical evolution in the Universe. They are also known as one of the brightest objects in the Universe and the emitters of multi-messenger signals, including gravitational waves and neutrinos. This lecture reviews stellar evolution, supernova explosions, and origin of elements, and multi-messenger astronomy.

Learning objectives :

Understanding the theory of stellar evolution and supernovae
Understanding the observational studies of supernovae and multi-messenger sources

Textbooks and references :

Principles of stellar evolution and nucleosynthesis (Clayton)
Supernovae and nucleosynthesis (Arnett)
Radiative processes in astrophysics (Rybicki and Lightman)
Foundations of radiation hydrodynamics (Mihalas and Mihalas)
Stellar structure and evolution (Kippenhahn and Weigert)