

**Modules:**

astro830 **Elective Advanced Lectures**  
 astro850 **Modern Astrophysics**

**Course:**

## Physics of Supernovae and Gamma-Ray Bursts

**Course No.:** astro8502

| Category | Type                   | Language | Teaching hours | CP | Semester |
|----------|------------------------|----------|----------------|----|----------|
| Elective | Lecture with exercises | English  | 2+1            | 4  | WT       |

**Requirements:****Preparation:**

Introductory astronomy and cosmology lectures

**Form of Testing and Examination:**

Written or oral examination, successful exercise work

**Length of Course:**

1 semester

**Aims of the Course:**

The student will learn basic physics on supernova and gamma-ray burst, and will have an overview on their applications to various fields of astrophysics.

**Contents of the Course:**

Basic physics on stellar hydrodynamics, radiation processes, and stellar death.

Type Ia supernova: observations and theory. Application to cosmology

Core collapse supernova: observations and theory

Gamma-ray bursts: observations and theory.

Implications for massive star population and star-formation history

Supernova nucleosynthesis and chemical evolution of galaxies

Explosions of the first generations of stars

Some related issues: supernova remnants, neutrinos, shock break-out, etc.

**Recommended Literature:**

Lecture notes with key references for each topic will be provided.