

**Course title:**

The Transient Universe: Cosmic Explosions

**Duration** [number of hours]: **12**

**PhD Program** [MERC/MPS/SPACE]: **SPACE**

**Name and Contact details of unit organizer(s):**

Prof: Massimo della Valle  
Affiliation: Capodimonte Observatory, INAF, Naples  
Email: massimo.dellavalle@inaf.it

**Course Description** [max 150 words]:

We will deal with the study of the transient Universe. Particular emphasis will be given to the final stages of stellar evolution, such as: *Nova*, *Supernova*, *Gamma-ray Burst* and *Kilonova* events. We will briefly describe the mechanisms of energy production in these stellar explosions and the use of this class of astrophysical objects to measure cosmic distances.

**Syllabus:**

1. Late stages of stellar evolution: Novae, Supernovae, Gamma-rays bursts and Kilonovae
2. Distance scale: Novae, Supernovae-Ia, GRBs
3. Hubble constant tension
4. Supernova and GRB measurements of  $\Omega_m$

**Assessment:** Presentation on a topic, related to the lectures, chosen by the course participants.

**Suggested reading and online resources:**

1. Lectures slides
2. Proposed literature references