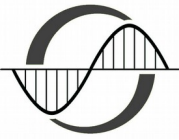




UNIVERSITÀ  
degli STUDI  
di CATANIA



DIPARTIMENTO DI FISICA E  
ASTRONOMIA  
"ETTORE MAJORANA"

DOTTORATO DI RICERCA IN FISICA  
ANNO ACCADEMICO 2021/2022

## STELLAR EVOLUTION

2 CFU

**Teaching staff:** Maria Letizia Piera PUMO

**Email:** [marialetizia.pumo@unict.it](mailto:marialetizia.pumo@unict.it) or [mlpumo@oact.inaf.it](mailto:mlpumo@oact.inaf.it)

**Office:** Department of Physics and Astronomy "Ettore Majorana" - room 358 (*Cittadella universitaria*, Building 6) or Catania Astrophysical Observatory - room 89

**Telephone:** +390953785237 (DFA - room 358) or +390957332319 (OACt - room 89)

**Reception hours:** by appointment via email

---

### Program of the course:

- 1. Introduction:** general view of the research field, equations of stellar evolution and numerical techniques, regimes of the stellar evolution and transition masses (brief overview);
- 2. Stellar evolution (and associated nucleosynthesis) as a function of the initial stellar mass:** low- and intermediate-mass stars (brief overview), so-called Super-AGB stars, massive stars (brief overview);
- 3. Supernovae from Super-AGB and massive stars:** electron-capture supernovae, iron-core-collapse supernovae, post-explosive evolution of the ejected material and its radiation-hydrodynamical modelling;
- 4. Selected current issues:** convective overshooting in stellar evolution, supernovae progenitors, peculiar explosive events, electromagnetic counterparts of gravitational wave sources.

---

### Bibliography:

- [–] Kippenhahn R. & Weigert A., 1990, *Stellar Structure and Evolution*, Springer-Verlag
  - [–] Herwig F., 2005, *Annu. Rev. Astron. Astrophys.*, 43, 435
  - [–] Woosley S.E., Heger A., Weaver T.A., 2002, *Rev. Mod. Phys.*, 74, 1015
- P.S. Other research papers will be suggested to cover specific topics