

ASTR 506
Stellar Populations
Spring 2022 Lectures
COR A132
Mondays and Wednesdays 9:00am-10:20am

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This is a one-semester graduate course in stellar populations. It will cover the following topics:

- An overview of the stellar evolution theory
- The stellar evolution computer code of MESA
- Transformations of theoretical effective temperatures and luminosities of stars to their observed colors and magnitudes
- Simple stellar populations: main methods of estimating distances, ages, and chemical composition
- Composite stellar populations
- The basics of the stellar population synthesis
- Stellar population diagnostics of galaxies
- Supernovae
- Chemical evolution of stellar populations

Making lecture notes and participating in discussions in the class will be enough for completion of both homework assignments and research projects.

For additional reading on the stellar evolution theory and stellar populations, the following textbooks are recommended:

“Stellar Structure and Evolution” by Rudolf Kippenhahn and Alfred Weigert
“Stellar Interiors - Physical Principles, Structure, and Evolution” by Carl J. Hansen, Steven D. Kawaler, and Virginia Trimble
“Evolution of Stars and Stellar Populations” by Maurizio Salaris and Santi Cassisi
“Stellar Populations: A User Guide From Low to High Redshift” by Laura Greggio and Alvio Renzini

Assesment

Homework assignments and research projects will be discussed in the class.

Usefull Databases and Codes:

https://users.astro.ufl.edu/~ata/public_hstgc/databases.html (HST ACS globular cluster photometry)

<http://www.cadc-ccda.hia-ih.nrc-cnrc.gc.ca/en/community/STETSON/standards/> (Peter Stetson’s photometry)

<http://www.cadc-ccda.hia-ihp.nrc-cnrc.gc.ca/community/VictoriaReginaModels/>
(Victoria/Regina models and isochrones)

<http://193.204.1.62/index.html> (a database of stellar evolution tracks and isochrones)

<http://mesa.sourceforge.net/> (MESA stellar evolution code)