Physical concepts of stellar evolution

Thursday 27 February 2025 - Tuesday 13 May 2025

ELI-NP Office Building

Scientific Programme

Week 1: (class on Thursday): Measuring the Universe with stars, Scales and nomenclatures, star classifications.
Week 2: Measuring the Universe with stars, Scales and nomenclatures, star classifications.
HWK*: Venus transit, the astronomical unit (AU), Sun's Bolometric Magnitude.*

Week 3: Reaction theory of stars.
Week 4: Reaction theory of stars.
Week 5: Reaction theory of stars.
HWK*: Calculate stellar lifetime of 12C, 14N, the CNO cycle (age of oldest, M5).*

Week 6: Stellar burning: hydrogen burning, the standard solar model, solar neutrinos and Neutrino detections.
HWK*: Solar neutrino flux.*

Week 7: Stellar Burning, helium burning, C/O ratio, UConn-ELINP laboratory measurements.
Week 8: Big Bang Nucleosynthesis, Critical Density, Dark Matter, Neutrino families, Primordial Deuterium and Lithium.
HWK*: HR diagram of M5 (age of the oldest stars).*

Week 9 (class on Thursday): Stellar Burning and supernova (SNeIa), neutrino cooling, URCA process.
Week 10: Super nova remnants. The Chandrasekhar and Oppenheimer-Volkoff limits.

Week 11: Students' 10 minutes presentation of a topic of their choice.