

STELLAR PHYSICS

- Thermodynamic state of the stellar interior: Mechanical pressure of a perfect gas, quasistatic changes of state, the ionized real gas, polytropes
- Energy transport in the stellar interior: Energy balance, radiative transfer, opacity of stellar matter, conduction, convective instability of the temperature gradient, neutrino emission
- Thermonuclear reaction rates: Kinematics and energetics, cross section and reaction rates, penetration factors
- Major nuclear burning stages in stellar evolution: The proton-proton reaction, PPI, PPII and PPIII chains, the CNO cycle, He burning, advanced burning stages, photodisintegration
- Calculation of stellar structure: Boundary conditions, composition changes, numerical techniques, contraction to the main sequence, the main sequence, red giant and horizontal branch phases, rotation, mass loss, pulsation
- Synthesis of the heavy elements