GALACTIC AND EXTRAGALACTIC ASTRONOMY

- Introduction (stars - galaxies)
- Galactic Morphology (Photometry - Relation between morphological features and underlying dynamical mechanisms)
- Mapping the Milky Way (Stellar Dynamics, Gas Dynamics, the role of Dust - Galactic rotation - Dark Matter - Rotation curves)
- Introduction to Potential theory (Spherical Systems – Flattened Systems)
- Local Group (Formation of the Local Group - Galactic types - Interactions - Collisions - Mergers)
- Stellar Orbits (Stellar motions in galaxies - Collisionless Boltzmann Equation - Epicyclic motion - Resonances)
- Stability of Periodic Orbits and Introduction to Chaos (Stability in 2D and 3D Systems - Poincare sections - Escapes)
- Galactic Systems (Groups - Clusters - Dark Matter in clusters - Gravitational Lenses)
- Theories of Spiral Structures Distribution of galaxies in the Universe (Large scale structure of the universe - Galaxies in the Early Universe - Formation and Evolution of galactic structures)
- Elliptical galaxies (Photometry - Stellar motions)
- Secular Evolution of galaxies (Gas inflow - Bars and Black Holes in galactic nuclei - Pseudo-bulges)