Study programmes: PhD studies – Astronomy and Astrophysics

Course name: Visual double and multiple stars

Lecturer: dr Zorica Cvetković

Status: Optional

ECTS: 9

Attendance prerequisites: None

Course aims: Acquiring of general and specific knowledge about double and multiple stars

Course outcome: After finishing the course, PhD student will have basic knowledge about double and multiple stars and become qualified for future research in this field.

Course content: History. Beginning of studying double stars. Classes of double stars: visual double stars, spectroscopic double stars, eclipsing double stars and close binaries. Observational methods: micrometric measurements, photographic measurements, interferometric observations, CCD measurements, observations by using high angular resolution techniques. Component magnitudes of double stars. Orbit calculation. Relative positions of visual double stars. Apparent orbits. True orbits. Geometric elements. Dynamic elements. Calculation of orbital elements of binaries and rectilinear elements of double stars. Ephemerides calculation. Orbit corrections. Mass calculation. Dynamical parallaxes. Calculation of absolute magnitudes for system components. Use of mass-luminosity relation. Elements of spectroscopic orbits. Combination spectroscopic-visual orbit. Methods of orbit determination: Kovalsky, Thiele-Innes-van den Boss, Docobo, Eichhorn, Pourbaix, spectroscopic and photometric. Reference data and catalogues. Databases: The Sixth Catalog of Orbits of Visual Binary Stars, The Washington Visual Double Star Catalogue, The Fourth Catalog of Interferometric Measurements of Binary Stars, The Photometric Magnitude Difference Catalog. Multiple systems. Systems of special interest. Importance of studying double stars. Parameters determination: masses, radii, temperatures. Studies of evolution and stability of double and multiple systems.

Literature:

Heintz, W.D., 1978, Double Stars, D. Reidel Publishing Company
Couteau, P., 1978, L'observation des etoiles doubles visuelles, Flammarion
Субботин, М.Ф., 1968, Введение в теоретическую астрономию, Наука, Москва, 341-365
Most recent papers according to agreement

Number of hours: **10**	**Lectures**: **4**	**Tutorials**: **6**

Teaching and learning methods: Frontal, Exercises

Assessment (maximal 100 points)

Course assignments	points	Final exam	points
Lectures	10	Written exam	
Exercises / Tutorials	10	Oral exam	60
Colloquia	20		
Seminars			