Study programmes: Astronomy and Astrophysics - PhD Studies

Course name: Selected topics of extragalactic astronomy

Lecturers: Luka Popović

Status: Optional

ECTS: 9

Attendance prerequisites: none

Course aims: Obtaining advanced and specific knowledge in the field of extragalactic astronomy

Course outcome: After completing the course, the student has advanced knowledge in the field of extragalactic astronomy. First of all, student knows the distance scale, the Universe large scale structure, the emission and absorption of extragalactic objects, the phenomenon of gravitational lenses, the observational aspects the extragalactic astronomy, the search and classification of extragalactic objects, and is also capable of independent scientific research in the above-mentioned field.

Course content: Extragalactic astronomy - an historical overview (emission nebulae and galaxies, the first knowledge of the Milky Way, Hubble's law).
Extragalactic distance scale (photometric distance, determination of the angular distance and the comoving distance, the cosmological redshift , the cosmological redshift and distance, the cosmological distance). Structure of the universe on large scales (galaxies - properties, morphology and evolution, active galactic nuclei, black holes, galaxy clusters, intergalactic matter, dark matter). The emission and absorption in the extragalactic objects (reddening, the origin of emission and absorption of extragalactic objects, the nature of the emission and absorption lines in AGN). The phenomenon of gravitational lensing (gravitational lensing - the nature of the phenomenon, the strong and weak gravitational lensing, micro and milli gravitational lenses, the applications of the gravitational lensing in the research of extragalactic objects, gravitational lensing and cosmology). Observational aspects of extragalactic astronomy (background radiation, galaxies at large cosmological redshift, galaxy clustering on large scales). Search and classificvastion of extragalactic objects (introduction to large databases such as the SDSS, HYPERLEDA, NED, etc., using data from large databases, the method of classification of extragalactic objects, the photometric redshift determination, the determination of the redshift from the absorption and emission lines).

Literature:

1. Binney, J. & Merrifield, M. 1998, Galactic Astronomy, Princeton Univerity Press, Princeton, New Jersey
2. Sparke, L.S., Gallagher, J.S 2000, Galaxies in the Universe: An Introduction, Cambridge University Press, Cambridge
3. Peacock, J.A. 1999, Cosmological Physics, Cambridge University Press, Cambridge
4. Zakharov, A. F. 1997, Gravitacioni linzi, Yunis, Moskva
5. Jovanovic, P. 2006, Uticaj gravitacionih sociva na spektre kvazara, Zaduzbina Andrejevic, Beograd

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

Teaching and learning methods:
Frontal, group

Assessment (maximal 100 points)

Course assignments	points	Final exam	points
Lectures	-	Written exam	-
Excercises / Tutorials	-	Oral exam	60
Colloquia	-	Written-oral exam	-
Essay/Project	40		