



UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Astronomija
Course name:	Astronomy

Študijski program in stopnja Study program and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Fizika in Astrofizika I. stopnja	/	1	2
Physics and Astrophysics I. level	/	1	2

Vrsta predmeta / Course type	obvezni / mandatory
Univerzitetna koda predmeta / University course code:	1FAF05

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Indiv. work	ECTS
30	/	30	/	/	120	6

Nosilec predmeta / Lecturer:	prof. dr. Andreja Gomboc	
Jeziki / Languages:	Predavanja / Lectures:	slovenščina / English
	Vaje / Tutorial:	slovenščina / English

Pogoji za opravljanje študijskih obveznosti:

Vpis v tekoče študijsko leto.
Za študente v okviru študentskih izmenjav bo izpolnjevanje pogojev preverila Študijska komisija FN.

Prerequisites:

Enrollment into the current study year. For the exchange students, meeting of the course prerequisites will be checked by the Study committee of the school.

Vsebina:	Syllabus outline:
<ul style="list-style-type: none"> ➤ Zgodovina astronomije, osnovna orientacija po nebu, osnove astronomskih opazovanj, osnovne značilnosti teleskopov ➤ Keplerjevi zakoni ➤ Naše in druga osončja, Sonce ➤ Zvezde: osnovne lastnosti, HR diagram, kratek opis razvoja zvezd od nastanka do končnih stanj ➤ Galaksije: sestava, vrste in osnovne lastnosti ➤ Kozmologija: kratek opis nastanka in 	<ul style="list-style-type: none"> ➤ History of astronomy, basics of orientation and astronomical observations, main properties of telescopes ➤ Kepler laws ➤ Our and other solar systems, Sun ➤ Stars: basic properties, HR diagram, a brief description of the development of stars from birth to the final stage ➤ Galaxies: structure, types and basic properties ➤ Cosmology: a brief description of the



<p>razvoja vesolja</p> <ul style="list-style-type: none"> ➤ Opazovanja: delo s teleskopi, nastavitve teleskopov z ekvatorialno in alt-azimut montažo ➤ Osnove astrofotografije ➤ Načrtovanje, priprava in vodenje astronomskega opazovanja z računalniško vodenim teleskopom ➤ Analiza in obdelava astronomskih posnetkov ➤ Izvedba dveh opazovalnih vaj 	<p>origin and evolution of the universe</p> <ul style="list-style-type: none"> ➤ Observations, work with telescopes, equatorial and alt-azimuth mount ➤ Basics of astrophotography ➤ Planning, preparation and management of astronomical observations with a computer guided telescope ➤ Analysis and reduction of astronomical images ➤ Two observational exercises
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Temeljni literatura in viri / Basic readings:

- H. Karttunen et al: Fundamental Astronomy, Springer, 6th edition, 2017.
- B.W. Carroll, D.A. Ostlie: An Introduction to Modern Astrophysics, Addison-Wesley; 2nd edition, 2006.

Cilji in kompetence:	Objectives and competences:
<ul style="list-style-type: none"> ➤ poznavanje osnovnih astronomskih konceptov in objektov ter razvoja vesolja ➤ interdisciplinarno reševanje problemov ob astronomskih nalogah in opazovanjih 	<ul style="list-style-type: none"> ➤ knowledge of basic astronomical concepts and objects and evolution of the Universe ➤ interdisciplinary problem solving in astronomical tutorials and observations

Predvideni študijski rezultati:	Intended learning outcomes:
<p>Študenti bodo osvojili pojme in koncepte:</p> <ul style="list-style-type: none"> ➤ astronomske naprave ➤ razvoj poznavanja vesolja ➤ lastnosti astronomskih objektov ➤ izvedba astronomskih opazovanj s sodobnim teleskopom 	<p>Students will become familiar with:</p> <ul style="list-style-type: none"> ➤ astronomy instrumentation ➤ development of our understanding of the Universe ➤ properties of astronomical objects ➤ astronomical observations with a modern telescope

Metode poučevanja in učenja:	Learning and teaching methods:
<ul style="list-style-type: none"> ➤ predavanja ➤ eksperimentalne vaje ➤ računske vaje 	<ul style="list-style-type: none"> ➤ lectures ➤ laboratory work ➤ tutorial

Načini ocenjevanja:	Utež / Weight (%)	Assessment:
<ul style="list-style-type: none"> ➤ kolokviji, pisni izpit, poročilo o eksperimentalnih vajah 	<p>50 50</p>	<ul style="list-style-type: none"> ➤ written tests, written exam, experimental project report



➤ ustni izpit

➤ oral exam

Reference nosilca / references of the course principal:

Prof. dr. Andreja Gomboc se raziskovalno ukvarja z izbruhi sevanja gama, plimskim raztrganjem zvezd v bližini masivnih črnih lukenj, elektromagnetnimi dvojniki dogodkov gravitacijskih valov in relativističnim modeliranjem dinamike sistema satelitov. Doslej je objavila 90 znanstvenih člankov v mednarodnih referiranih revijah, vključno s 3 članki reviji *Nature*, 2 v *Science* in 1 v *Nature Astronomy*.

Prof. Dr. Andreja Gomboc is active in research of gamma-ray bursts, tidal distruption of stars by massive black holes, electromagnetic counterparts of gravitational wave events and relativistic modelling of a satellite system. She has published 90 scientific papers in international refereed journals including 3 papers in *Nature*, 2 in *Science* and 1 in *Nature Astronomy*.

Izbrane objave /selected publications:

1. S. Covino et al. (incl. A. Gomboc). The unpolarized macronova associated with the gravitational wave event GW 170817. *Nature Astronomy*, 1: 791-794, 2017.
2. K. Wiersema et al. (incl. A. Gomboc). Circular polarization in the optical afterglow of GRB 121024A. *Nature*, 509: 201-204, 2014.
3. A. Maselli et al. (incl. A. Gomboc). GRB 130427A: A Nearby Ordinary Monster. *Science*, 343: 48-51, 2014.
4. J. Japelj, et al. and A. Gomboc. Phenomenology of Reverse-Shock Emission in the Optical Afterglows of Gamma Ray Bursts. *The Astrophysical Journal*, 785: Issue 2, article id. 84, 22 pp., 2014.
5. C. Mundell et al. (incl. A. Gomboc). Highly Ordered Magnetic Field from GRB 120308A. *Nature*, 504, 119-121, 2013.
6. A. Gomboc. Unveiling the secrets of gamma ray bursts. *Contemporary Physics* 53: 339-355, 2012.
7. J. Japelj and A. Gomboc. Detectability of GRB Optical Afterglows with Gaia Satellite. *Publications of the Astronomical Society of the Pacific*, 123: 1034-1043, 2011.