



UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet	Izbrana poglavja iz višje matematike
Course name	Advanced mathematical topics

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

Vrsta predmeta / Course type	obvezni / mandatory
Univerzitetna koda predmeta / University course code	2FAF01

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Indiv. work	ECTS
45	/	45	/	/	180	9

Nosilec predmeta / Lecturer	doc. dr. Luigi Giacomazzi	
Jeziki / Languages	Predavanja / Lectures	slovenščina / English
	Vaje / Tutorial	slovenščina / English

Pogoji za opravljanje študijskih obveznosti	Prerequisites
/	/

Vsebina	Syllabus outline
Izbrane matematične teme, ki so v tistem trenutku najbolj aktualne na področju astrofizike, astrofizike osnovnih delcev in/ali trdne snovi. Podajali jih bodo domači in vabljeni vodilni strokovnjaki z izbranih področij.	Selected mathematical topics that are relevant in astrophysics, astroparticle physics and/or solid state physics at a given moment. Topics will be presented by both local and invited leading experts from their respective fields.

Temeljni literatura in viri / Basic readings
Po dogovoru z nosilcem predavanj in vabljenimi predavatelji, glede teme predavateljev. To be defined in agreement with the course principal and the lecturers; related to topics presented by the lecturers.

Cilji in kompetence	Objectives and competences
Cilj predmeta je študente soočiti z izbranimi matematičnimi temami, ki so aktualne za njihov študij fizike, in ki jim jih bodo podali domači in vabljeni predavatelji.	The objective of the course is to face students with selected mathematical topics that are relevant for their studies in physics / astrophysics and that will be presented to them by local and invited experts.



Študenti bodo dobili paleto specializiranih znanj s precej ozko usmerjenih področij, ki pa jih bodo s pomočjo nosilca predmeta združili v izboljšano in poglobljeno razumevanje problematike. Pridobljeno znanje o sintezi ekspertnih znanj lahko študenti uporabijo na vseh področjih znanosti.	Students will acquire specialized knowledge from very specific mathematical fields. With the help of the course principal, they will transform this knowledge into an improved and in-depth understanding. Students can apply the obtained understanding of the synthesis of expert knowledge in all fields of science.
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Predvideni študijski rezultati	Intended learning outcomes
Študenti bodo spoznali matematična orodja in prijeme, relevantne za reševanje sodobnih problemov v astrofiziki in fiziki.	Students will learn mathematical tools and approaches, relevant for solving open problems of astrophysics and physics.

Metode poučevanja in učenja	Learning and teaching methods
- predavanja	- lectures

Načini ocenjevanja	Utež / Weight (%)	Assessment
- ustni izpit	100	- oral exam

Reference nosilca / references of the course principal
Dr. luigi Giacomazi je docent za področje fizike na Univerzi v Novi Gorici. Dr. Luigi Giacomazi is an Assistant professor of physics at the University of Nova Gorica.
Izbrane objave / selected publications:
<p>1. GIACOMAZZI, Luigi, MARTIN-SAMOS, Layla, BOUKENTER, A., OUERDANE, Y., GIRARD, S., RICHARD, Nicolas. Ge(2), Ge(1) and Ge-E' centers in irradiated Ge-doped silica : a first-principles EPR study. <i>Optical materials express</i>, ISSN 2159-3930. [Online ed.], 2015, vol. 5, iss. 5, str. 1054-1064, ilustr. http://dx.doi.org/10.1364/OME.5.001054, doi:10.1364/OME.5.001054. [COBISS.SI-ID 4028923]</p> <p>2. GIACOMAZZI, Luigi, MARTIN-SAMOS, Layla, RICHARD, Nicolas. Paramagnetic centers in amorphous GeO2. V: DRIUSSI, Francesco (ur.). <i>Insulating films on semiconductors 2015</i>, INFOS 2015 Conference held in Udine, Italy, from 29 June to 2 July, 2015, (Microelectronic engineering, ISSN 0167-9317, vol. 147). Amsterdam: North-Holland. 2015, vol. 147, str. 130-133, ilustr., doi: 10.1016/j.mee.2015.04.036. [COBISS.SI-ID 4028155]</p> <p>3. GIACOMAZZI, Luigi, MARTIN-SAMOS, Layla, RICHARD, Nicolas. Paramagnetic H-related defects in silica : a first-principles investigation. V: <i>Proceedings of the 16th International Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE 2016, July 4th - 8th, 2016, Cádiz, Spain</i>. [S. l.]: CMMSE. 2016, str. 570-573, ilustr. [COBISS.SI-ID 5248251]</p>

4. GIRARD, Sylvain, GIACOMAZZI, Luigi, MARTIN-SAMOS, Layla, et al. Radiation effects on optical fibers and fiber-based sensors. V: BAGATIN, Marta (ur.). *Ionizing radiation effects in electronics : from memories to imagers*, (Devices, circuits, and systems). Boca Raton; London; New York: CRC Press. cop. 2016, str. 355-377, ilustr. [COBISS.SI-ID [5254907](#)]
5. WINKLER, Blaž, MARTIN-SAMOS, Layla, RICHARD, Nicolas, GIACOMAZZI, Luigi, ALESSI, Antonino, GIRARD, Sylvain, BOUKENTER, Aziz, OUERDANE, Youcef, VALANT, Matjaž. Correlations between structural and optical properties of peroxy bridges from first principles. *The journal of physical chemistry. C, Nanomaterials and interfaces*, ISSN 1932-7447, 2017, vol. 121, no. 7, str. 4002-4010, doi: [10.1021/acs.jpcc.6b11291](https://doi.org/10.1021/acs.jpcc.6b11291). [COBISS.SI-ID [4786939](#)]
6. GIACOMAZZI, Luigi, MARTIN-SAMOS, Layla, BOUKENTER, Aziz, OUERDANE, Youcef, GIRARD, Sylvain, ALESSI, Antonino, GIRONCOLI, Stefano de, RICHARD, Nicolas. Photoactivated processes in optical fibers : generation and conversion mechanisms of twofold coordinated Si and Ge atoms. *Nanotechnology*, ISSN 0957-4484, 2017, vol. 28, no. 19, str. 1-13, ilustr., doi: [10.1088/1361-6528/aa693b](https://doi.org/10.1088/1361-6528/aa693b). [COBISS.SI-ID [5245179](#)]
7. GIACOMAZZI, Luigi, MARTIN-SAMOS, Layla, VALANT, Matjaž, KRISHNA CHAITANYA, Gunturu, et al. Optical absorption spectra of P defects in vitreous silica. *Optical materials express*, ISSN 2159-3930. [Online ed.], 2018, vol. 8, iss. 2, str. 385-400, ilustr. <https://doi.org/10.1364/OME.8.000385>, doi: [10.1364/OME.8.000385](https://doi.org/10.1364/OME.8.000385). [COBISS.SI-ID [5077499](#)]
8. WHITTAKER, Dean A. J., GIACOMAZZI, Luigi, ADROJA, Devashibhai, BENNINGTON, Stephen M., PASQUARELLO, Alfredo, SALMON, Philip S. Partial vibrational density of states for amorphous solids from inelastic neutron scattering. *Physical review. B*, ISSN 2469-9950, Aug. 2018, vol. 98, iss. 6, str. 064205-1-064205-10, ilustr., doi: [10.1103/PhysRevB.98.064205](https://doi.org/10.1103/PhysRevB.98.064205). [COBISS.SI-ID [5238267](#)]