Introduction to the compact objects astrophysics - course description

General information

Course name	Introduction to the compact objects astrophysics
Course ID	13.7-WF-FizP-ICOA-S17
Faculty	Faculty of Physics and Astronomy
Field of study	Physics
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2017/2018

Course information

Semester	6
ECTS credits to win	2
Course type	obligatory
Teaching language	english
Author of syllabus	

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Exam

Aim of the course

Presentation of the basic problems of astrophysics of compact objects. Transfer news from physics to enable a basic level of understanding of most of the phenomena and processes of compact objects.

Prerequisites

General knowledge of astronomy and fundamental physics.

Scope

- Compact objects as the last stages of stellar evolution
- Observations of neutron stars and white dwarfs
- Observational evidence of existence of black holes
- Properties of degenerate matter
- Construction of white dwarfs and neutron stars
- Models of neutron stars
- The stability of neutron stars and white dwarfs
- Black holes
- Accretion in systems with compact objects

Teaching methods

Conventional lecture

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
The student is able to characterize the class of compact objects and describe the differences between stars and compact objects. He has knowledge of the theory and observations of white dwarfs, neutron stars and black holes. Can describe the properties of matter and the structure of degenerate compact stars, depending on the density inside them. Student explains the mass-radius relation for white dwarfs nierotujących and neutron stars, and gives the reason for the existence of upper limits on the gravitational mass. Explains the phenomenon of accretion on compact objects.		• an exam - oral, descriptive, test and other	• Lecture
Student can introduce gained popular science news in a way.		• an exam - oral, descriptive, test and other	• Lecture
Student can use the English-language literature.		• an exam - oral, descriptive, test and other	• Lecture

Assignment conditions

Lecture: Oral examination, Condition Assessment - a positive evaluation of the test.

Recommended reading

[1] F. Shu, Galaktyki, gwiazdy, życie, Prószyński i S_ka, 2003.

[2] S. Shapiro, S. Teukolsky, Black Holes, White Dwarfs and Neutron Stars, Wiley-VCH 2004.

Further reading

[1] M. Camenzind, Compact objects in astrophysics, Springer, 2007.

[2] S. Rossweg, M. Brueggen, Introduction to High-Energy Astrophysics, Cambridge, 2007.

[3] W. H. G. Lewin, M. van der Klis, Compact Stellar X-ray Sources, Cambridge Uni. Press, 2006.

Notes

Modified by dr hab. Maria Przybylska, prof. UZ (last modification: 31-07-2018 00:39)