



Adam Mickiewicz University in Poznań

Doctoral School of Exact Sciences AMU

Advanced problems of modern astrophysics

Dr Oleksyi Golubov, Kharkiv University, Ukraine

Field of science	Natural sciences (astronomy, physical sciences)	
Teaching method	Lecture	
Language	English	
Numbers of hours	15	
Aims of the course	Show how to use physical laws in order to explain selected problems of modern astrophysics	
Course contents	<p>The storyline revolves around the discoveries awarded by the Nobel Prize. During the lecture the following problems are discussed:</p> <ul style="list-style-type: none"> • Black-body radiation and stellar atmospheres • Dimensional analysis and supernova shocks • Degenerate gas and white dwarfs • Order-of-magnitude estimates and black holes • Eddington luminosity and AGNs • Ideal gas and stellar dynamics • Particle physics and cosmic rays • Numerical simulations and cosmological structure formation <p>Some practical exercises will be solved.</p>	
Prerequisites and co-requisites	Knowledge of astronomy or physics at master's level	
Learning outcomes		
	On completion of the course PhD candidates will be able to:	Assessment mode
	Know some of the most important achievements of modern astronomy, as well as the paradigms and directions of development of this discipline.	Oral questioning
	Use their knowledge to better solve problems in theoretical astrophysics.	Homework problems
	Critically evaluate the new research in the field of astronomy and better understand its context.	Oral questioning
Literature	<ul style="list-style-type: none"> • Schneider, P. Extragalactic astronomy and cosmology: an introduction. Second edition. Springer. Berlin, Heidelberg. 2015. ISBN 978-3-642-54082-0 • Kippenhahn, R., Weigert, A., Weiss, A. Stellar Structure and Evolution. Second edition. Springer. Berlin, Heidelberg. 2012. ISBN 978-3-642- 	

	30255-8 <ul style="list-style-type: none">Griffiths, D. Introduction to elementary particles. Second edition. WILEY-VCH. Weinheim. 2008. ISBN 978-3-527-40601-2
Additional information	E_W01; E_W02; E_U01; E_U02; E_U06; E_K05