

シラバス参照

講義名	天文学特別講義 X II		
講義開講時期	通年(前期開始) Whole Year		
基準単位数	1		
代表曜日		代表時限	
研究科等	物理科学研究科		
専攻・プログラム	天文科学専攻		
科目区分	共通		
授業を担当する教員	Paolo Mazzali, Elena Pian		

担当教員

氏名
◎ 守屋 堯

授業の概要	The course covers theoretical and observational aspects of Supernovae and other astrophysical transients related to the end of stellar life. The course also covers high-energy aspects, from both an observational and theoretical point of view, that are relevant for supernova theory: detection of keV-to-TeV energy radiation, gamma-ray bursts, relativistic jets and afterglows, gravitational waves, kilonovae.
到達目標	This course aims at providing students with a broad overview of Supernovae and other astrophysical transients. The students will also get a broad picture of high energy phenomena related to stellar explosions, by learning the methods, experiments and theory used to extract the physical information.

成績評価基準

	成績評価基準
成績評価基準	01:A, B, C, Dの4段階評価

成績評価方法	80% attendance, 20% report
--------	----------------------------

授業計画	<p>Lecture 1. Supernovae. (Mazzali) Here we introduce Supernovae as the final event in the life of different types of stars, discussing the evolutionary paths that may lead to stellar explosions.</p> <p>Lecture 2. Supernovae: Observed properties. (Mazzali) This lecture deal with the observational properties of Supernovae, and how they can be used to infer the propeties of the progenitor stars.</p> <p>Lecture 3. Type Ia Supernovae. (Mazzali) In this lecture discuss some current aspects of research in Type Ia Supernovae.</p> <p>Lecture 4. (Pian) X-ray and gamma-ray detectors and satellites Multiwavelength imaging Cosmic air showers Cherenkov radiation Cherenkov detectors The TeV Sky Long and short Gamma-ray bursts GRB localizations: BATSE vs BeppoSAX</p> <p>Lecture 5. (Pian) observations of multi-wavelength Afterglows Optical spectra of afterglows and redshifts optical flashes and robotic telescopes theory of afterglows Jet breaks and collimation</p>
------	--

	<p>GRB host galaxies</p> <p>Lecture 6. Gamma-ray Bursts and Supernovae. (Mazzali) Here we discuss the properties of GRB/SNe, other stripped-envelope SNe and their relation to the explosion of massive stars.</p> <p>Lecture 7. (Pian) Gravitational waves The case of PSR1913+16 Sources of GWs Laser interferometry GW150914: first GW direct detection GW170817/GRB170817A/AT2017gfo: the first electromagnetic counterpart to GW signal the thermal (kilonova) and non-thermal (GRB jet) components</p>
実施場所	国立天文台三鷹キャンパス
使用言語	英語
教科書・参考図書	<p>A useful resource for the material is Gray's book: The Observation and Analysis of Stellar Photospheres Author David F. Gray; Andrew King (Contribution by); Douglas Lin (Contribution by); Stephen Maran (Contribution by); Jim Pringle (Contribution by); Martin Ward (Contribution by) ISBN 978-0-521-40868-4 Publisher Cambridge University Press Publication Date 04 June 1992</p> <p>Rybicki & Lightman 1979 Radiation Processes in Astrophysics</p> <p>Shapiro & Teukolsky 1983, Black Holes, White Dwarfs and Neutron Stars, The Physics of Compact Objects</p> <p>Kajino et al. 2019: Current status of r-process nucleosynthesis, Progress in Particle and Nuclear Physics, Volume 107, p. 109-166</p> <p>Pian et al. 2017, Nature, 551, 67: Spectroscopic identification of r-process nucleosynthesis in a double neutron-star merger</p> <p>Pian 2021, Binary neutron star mergers: a multi-messenger revolution Frontiers in Astronomy and Space Sciences, Volume 7, id.108 (2020) 10.3389/fspas.2020.609460</p> <p>Reviews on TeV Astronomy: http://tevcat.uchicago.edu/reviews.html</p> <p>R. Giacconi 2003: Nobel Lecture: The dawn of X-ray astronomy Reviews of Modern Physics 75, 995</p>

[ウインドウを閉じる](#)