The Universe in X-rays, Telescopes, Observations and Theory
COURSE SYLLABUS

1. ***Course title:*** The Universe in X-rays, Telescopes, Observations and Theory

2. ***Course lecturer:*** prof. dr hab. Agata Różańska

3. ***Discipline, field, year of studies:*** astronomy, high energy astrophysics, all years of study

4. ***Course character:*** monographic lecture

5. ***Teaching method:*** personal contact consisting of lecture together with hands-on sessions

6. ***Language:*** English

7. ***Course type and number of hours:*** lecture, 30h

8. ***Estimated amount of student's independent work:*** 15 h (hands-on sessions and homeworks)

9. ***Total workload and number of ECTS points:*** 3 ECTS

10. Short description and main focus of the course:

The intent of the lecture is to summarize the present status of the X-ray Astronomy. This field of research become quite challenging, and it has evolved with enormous pace. The number of known sources has increased by a factor of thousand, but more important, they now comprise almost all classes of astronomical objects - from planets, moons, and comets, out to clusters of galaxies and quasars. In the era of multi-wavelength astronomy X-ray observations provide insight into extreme physical conditions prevailing in all these sources. I will start with a discussion of instruments and methods, and then continue with the status of galactic and extragalactic X-ray astronomy respectively. I plan to introduce "hands-on" sessions during the lecture.

11. ***References, literature, online resources:***

- Trimper, J.E.; Hasinger, G., The Universe in X-Rays, Astronomy and Astrophysics Library, 2008, Springer
- Camenzind, M., Compact Objects in Astrophysics White Dwarfs, Neutron Stars and Black Holes, Astronomy and Astrophysics Library, 2007, Springer

- Beysens, D.; Carotenuto, L.; van Loon, J.J.W.A.; Zell, M., Laboratory Science with Space Data, Accessing and Using Space-Experiment Data, 1st Edition, 2011, Springer
- Glendenning, N.K., Special and General Relativity with Applications to White Dwarfs, Neutron Stars and Black Holes, Astronomy and Astrophysics Library, 2007, Springer
- Arnaud, K., Smith, R., Siemiginowska, A., Handbook of X-ray Astronomy, 2011, Cambridge University Press

12. Educational outcomes including PQF level 8 codes:

P8S_WG, P8S_UW, P8S_UK, P8S_KK

13. ***Evaluation of the educational outcomes:*** hands-on exam plus presentation

14. ***Criteria to complete the course:*** at least 80% of attendance, and the participation in the final exam and discussion.