



Workshop on Practical X-ray Astronomy



This lecture series gives an introduction to X-ray astronomy with a hands-on tutorial, where participants learn how to reduce and analyze the X-ray data. The course is tailored for physics and astrophysics master and PhD students who want to get a practical introduction into this field or who even plan to start working in it. The lectures will start with a short overview of X-ray optics, basic detector physics and CCDs, before focusing on data reduction and analysis which represent the bulk of the course.

The lectures will be structured in 4 different blocks:

Characterization of the X-ray mirrors and detectors

I will explain the most common telescope configurations and the different X-ray detectors (e.g. proportional counters, microchannels plates, CCDs, gratings, micro-calorimeters) highlighting advantages and disadvantages in terms of energy, spatial, and time resolution.

X-ray facilities

I will give an overview of the current X-ray facilities with a focus on the instruments on board of XMM-Newton and Chandra. I will discuss how to choose the best suited instrument to fulfill a project.

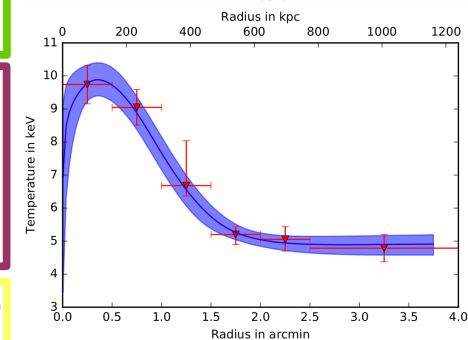
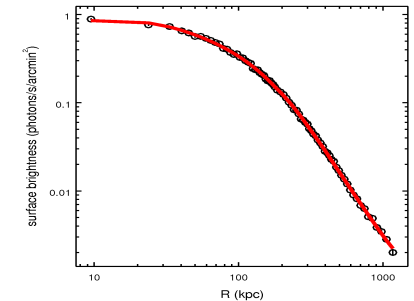
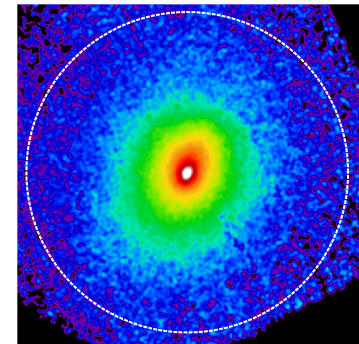
Data reduction of the X-ray data

I will explain the main features of the Science Analysis System (SAS) which is the software designed for the analysis of the XMM-Newton data. The students will learn how to get started with SAS and how to download and reduce the X-ray data. After that, the students will process the raw data to obtain the files of scientific interest that will be then used for the analysis.

Data analysis of the X-ray data

Each student (or team of students) will use the cleaned events files to:

- produce an image of the object corrected for the vignetting effect, derive the surface brightness profile, and fit a double β -model to it.
- extract and fit a spectrum to determine the interesting parameters (e.g. temperature and metallicity).



Lecturer:

Dr. Lorenzo Lovisari

SAO fellow at the Harvard-Smithsonian
Center for Astrophysics

Where & when:

Alfa, Auf dem Hügel 71, Bonn

Part 1: Wed. Dec 13th, 9:00-12:00

Part 2: Fri. Dec 15th, 10:00-13:00

Part 3: Sat. Dec 16th, 9:00-16:00

Registration: One of the lecture rooms (i.e. CIP-Pool) can accommodate max 18 people. To register, please send an email to lorenzo.lovisari@cfa.harvard.edu before Dec 6th with the following information: Name, Affiliation, Email, Status (e.g., master/PhD student).