Unknown objects in Andromeda Galaxy (M31)

Antonio Martin-Carrillo, Marina T. R. Silva

School of Physics, University College Dublin, Belfield, Dublin 4, Ireland

Introduction

When given region of space is observed through a telescope, the amount of information received is huge. Several objects are observed, even when the telescope is calibrated, but it is not always that all these objects can be analyzed.
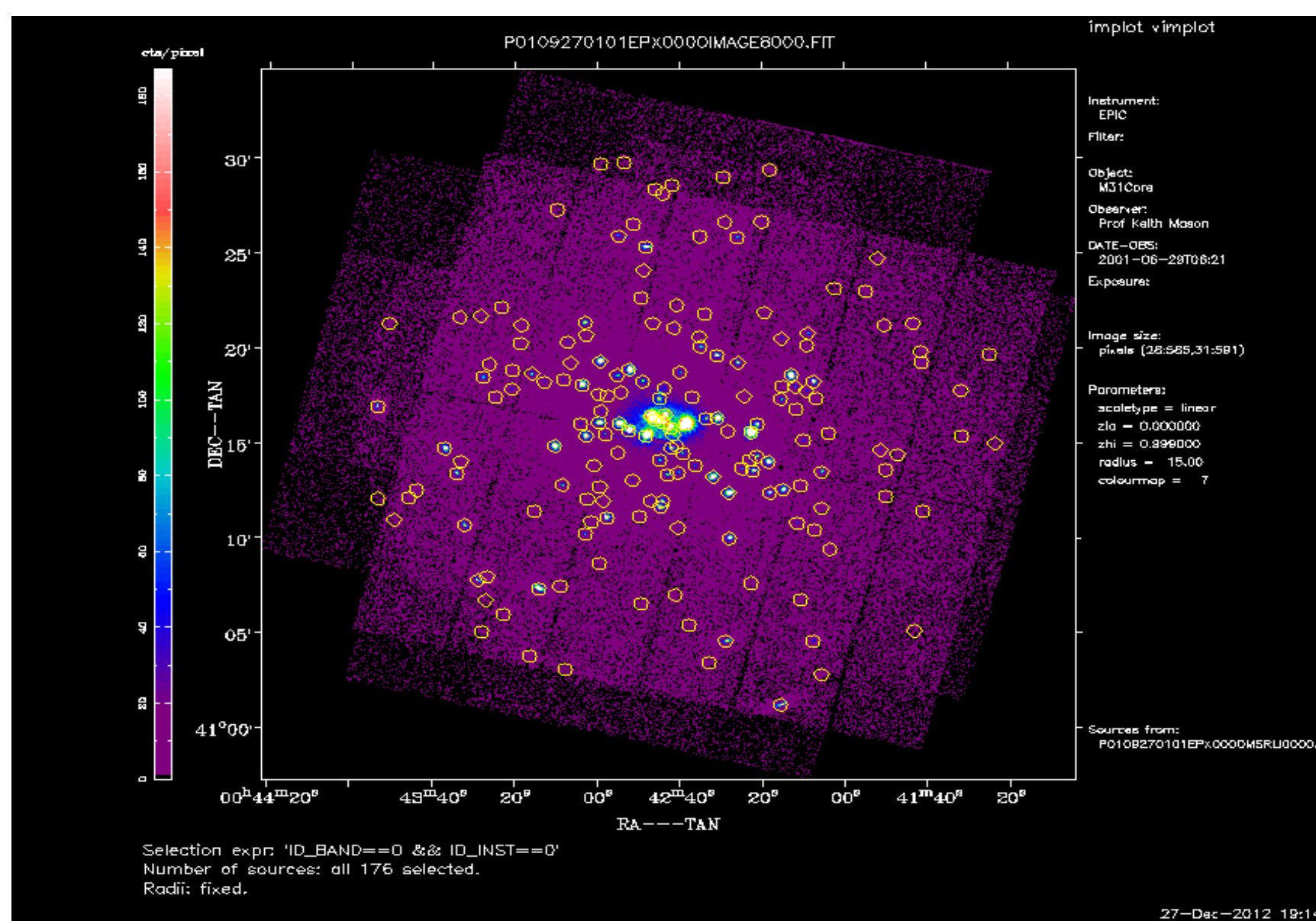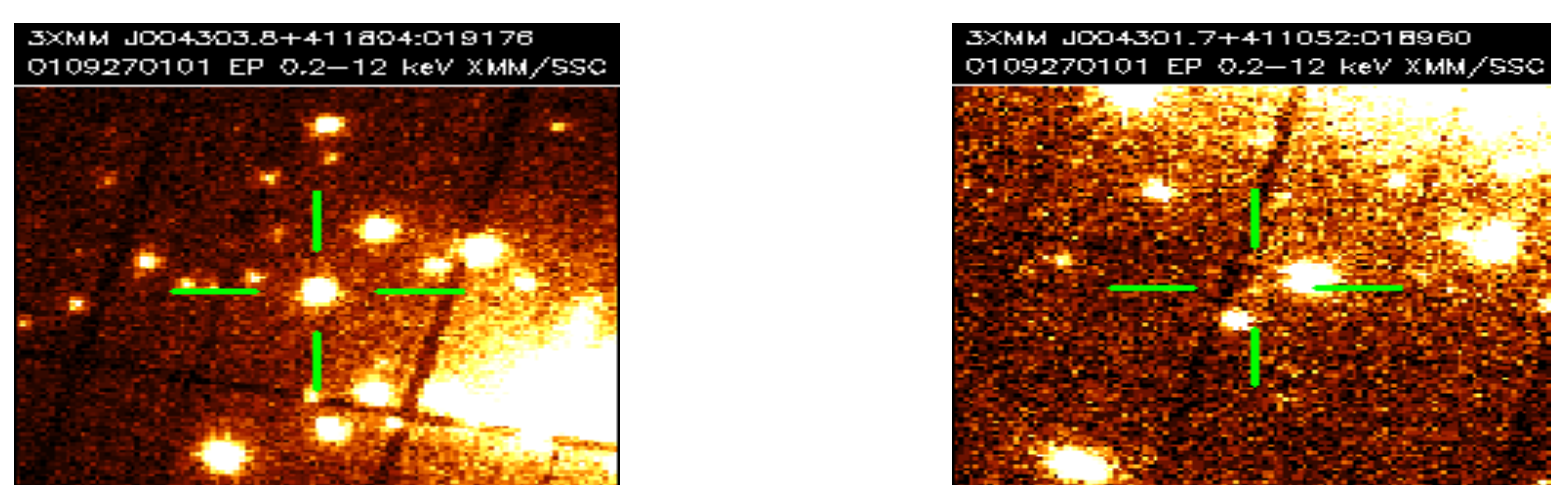

**Figure 1**: Image of M31 obtained by the XMM-Newton.[1]

Methods

Selecting good candidates

Using data from XMM-Newton 5 objects were selected out of more than 40000 other objects from different areas of Space. Our candidates for identification needed to have some qualifications such as: brightness, good photon count, not to be in the edge of the telescope, not to be faint.

Figures 2 and 3: Good and bad candidates to identification, respectively.[2]

All the 5 selected objects are from M31, mostly known as Andromeda Galaxy.
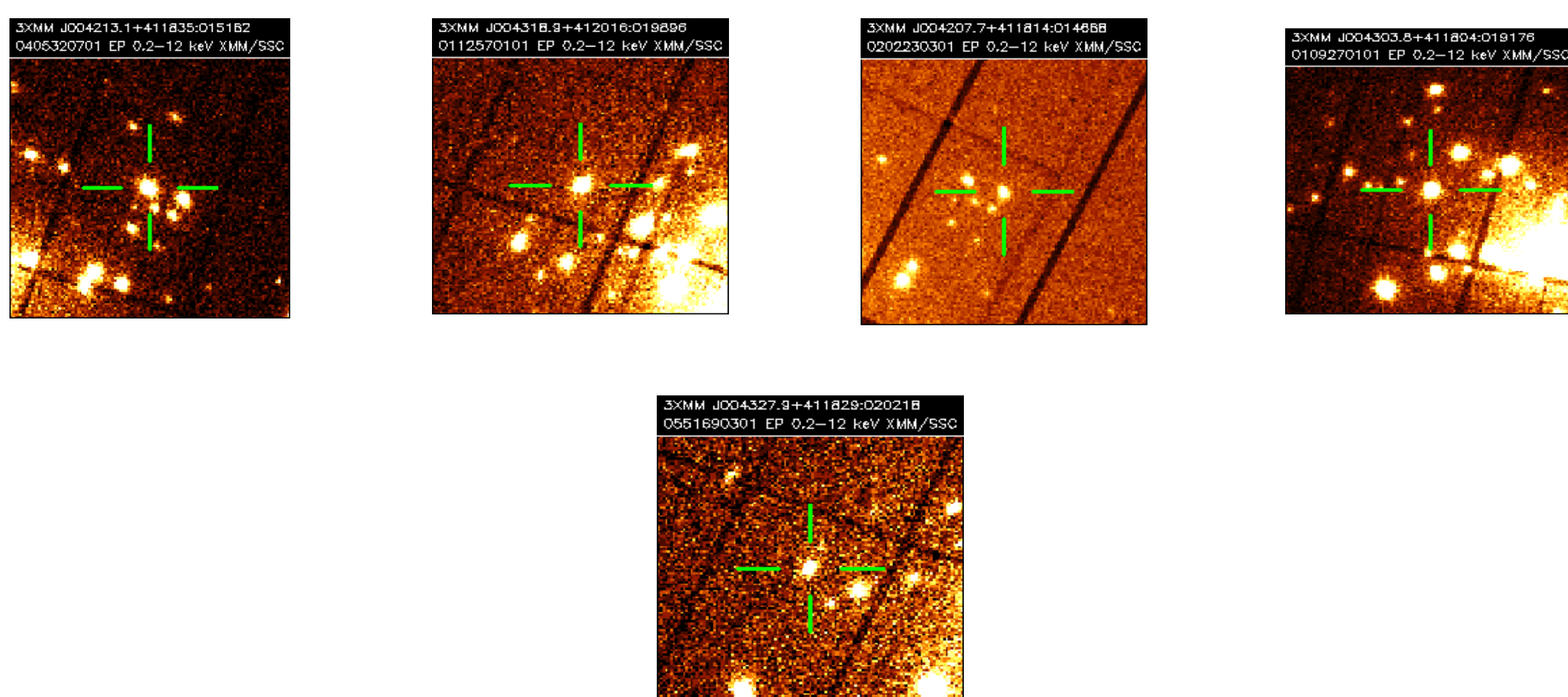
Figures 4 to 8: .Objects 1 to 5, respectively, in M31.[3]

Extracting information from the observations

Using the software Xquartz and the tables of information available in the official site of the XMM-Newton, the data collected in the observations was analyzed.

Taking spectra

In this part the NASA's software Xspec was used. The method consisted in provide the information to the software and then try to select the best model to plot spectra graphs.
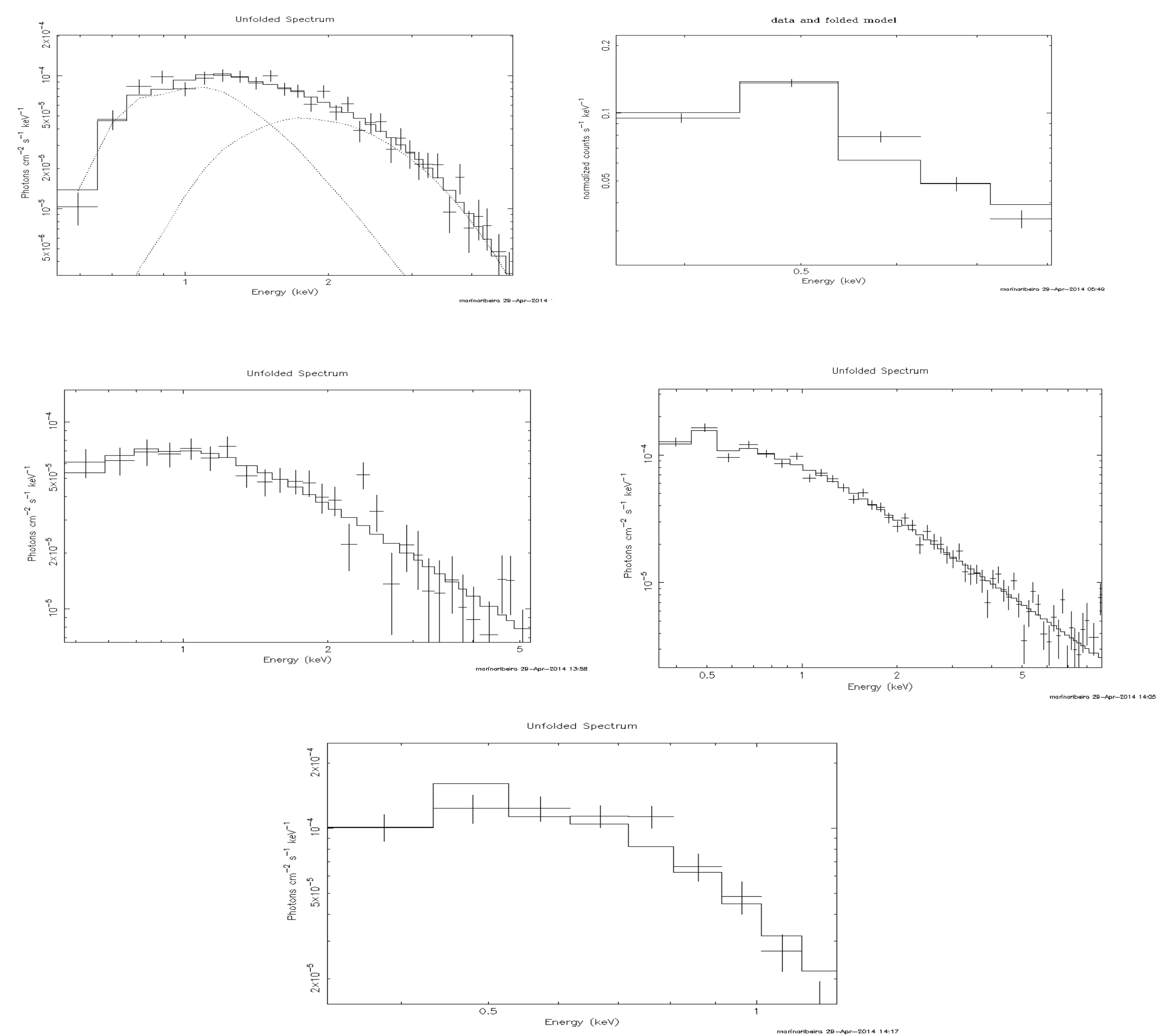
Figures 9 13: Spectra of the objects in M31 obtained using NASA's software Xspec .[4]

Results

Different spectra
Each object had a different spectrum compared to the others.

Impossibility of identification
The only way of identifying the objects is by comparing their spectra with other known spectra. It was not possible to find similar spectra for comparison.

Conclusions

o Taking Spectra is indispensable on the identification of the objects.

o The models used to plot the spectra give an idea of what the object may be.

o The choice of an X-ray observatory is very important, because they are perfect for observing high energy objects and XMM-Newton was the best choice for the project.

References

1. http://nxsa.esac.esa.int, XMM-Newton, ESA/ESAC/Science Archives Team, 2014.
2. http://nxsa.esac.esa.int, XMM-Newton, ESA/ESAC/Science Archives Team, 2014.
3. http://nxsa.esac.esa.int, XMM-Newton, ESA/ESAC/Science Archives Team, 2014.
4. Xspec, NASA, 2014.