FAULKES TELESCOPE

Galaxies

Measuring M87 Project Instructions

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Measuring M87

Project Instructions

Introduction

In this project you will produce a colour image of the giant elliptical galaxy, M87 and measure how far into space its jet extends. After downloading the raw FITS data for M87, you will process the images, and use SalsaJ to measure the extent of the jet.

Requirements

In order to carry out this project you will need to download the following:

- The pdf document, 'Active galaxies - Background Information'
- The FT M87 data (or make sure you have downloaded your own M87 images from the FT data archive, or have booked sessions on the telescope to obtain your own images)
- The image processing packages, The GIMP and Iris from the Faulkes website, *or* Photoshop with FITS Liberator
- The image processing instructions for either The GIMP and Iris, or Photoshop (depending which software package you intend to use)
- The image analysis package SalsaJ from the Faulkes website
- The pdf document, 'Measuring M87 with SalsaJ'

All FITS files are available from the Measuring M87 project web-page. The image processing software packages, The GIMP and Iris can be downloaded from the links on the following page:

http://faulkes-telescope.com/education/software/image_proc

as can information on Photoshop and the FITS Liberator.

The image processing instructions can be downloaded from:

http://faulkes-telescope.com/education/projects/imaging/colour

The image analysis package, SalsaJ, can be downloaded from the links on the following page:

http://faulkes-telescope.com/education/software/viewing_analysis/salsaj

Planning

For this project, you will need to either plan an observing session in order to obtain images of M87 with the Faulkes Telescopes, or you will use data available from the data archive or the project web-pages.

I don't have an observing session

If you don't have an observing session, you can obtain galaxy data in the following ways:

- From the Measuring M87 project web-pages - download the data files, 'M87_red.fits', 'M87_green.fits' and 'M87_blue.fits'.
- From the Faulkes Telescope data archive (http://faulkes-telescope.com/search/archive), search for images of M87 and download the FITS files you require (B, V and R).

I have an observing session

If you have an observing session planned on the telescope, make sure you observe M87 using the colour filter selection (so you have a red, visible/green and blue image). An exposure time of 120s or higher is best so that the jet is clearly visible in the images. Finally, to check when M87 is visible, you can use either the skycharts or planetarium software. Information for both methods can be found from the planning section of the Faulkes website:

http://faulkes-telescope.com/education/planning

Processing your images

Depending on which software package you are using, you should now follow the relevant instructions for image processing, and create a colour image of M87 and its jet.

Measuring the extent of the jet

Once you have produced your colour image of M87, follow the instructions given in the pdf document, 'Measuring M87 with SalsaJ', to find the distance the jet extends from the centre of the galaxy.