Introduction to MUSE Integral field spectroscopy and data analysis.

The Multi Unit Spectroscopic Explorer (MUSE) is a second-generation instrument installed on the Nasmyth focus of UT4 at the Very Large Telescope (VLT) of the European Southern Observatory (ESO). It is a panoramic integral-field spectrograph operating in the visible wavelength range. It combines a wide field of view with fine spatial sampling and a large simultaneous spectral range. It is the most powerful optical 3D spectrograph for astrophysics to date. With only one sky image, MUSE can simultaneously register more than 90,000 spectra of astronomical objects. It is designed to take advantage of the improved spatial resolution provided by the adaptive optics facility (AOF). Various science objectives, from the formation of galaxies to the solar system, can be studied with the help of MUSE. In the tutorial, we will see how to extract images and spectra from the 3D data and use them for the primary analyses. We will also see how MUSE can help in discovering new galaxies.

1 Ds9
Install : https://sites.google.com/cfa.harvard.edu/saoimageds9/download

2 Anaconda
The following step will install python, numpy, scipy, matplotlib and jupyter notebook
Download and Install: (https://www.anaconda.com/products/distribution)
Installation: https://www.geeksforgeeks.org/how-to-install-anaconda-on-linux/

OR
if you want to install separately you can follow step 3 to 8. If you have installed anaconda skip step 3 to 8.

3 Python
Install: https://phoenixnap.com/kb/how-to-install-python-3-ubuntu

4 Astropy
Install: https://docs.astropy.org/en/stable/install.html

5 Numpy
Install: https://pypi.org/project/numpy/

6 **Scipy**
Install: https://pypi.org/project/scipy/

7 Matplotlib
Install: https://matplotlib.org/stable/users/installing/index.html

8 **Jupyter notebook**
Install: https://jupyter.org/install

9 **MPDAF**
Install : https://mpdaf.readthedocs.io/en/latest/installation.html

10 **Pymuse**
Install: https://pypi.org/project/PyMUSE/
Documentation: https://pymuse.readthedocs.io/en/latest/#
Link to Access muse data : http://archive.eso.org/scienceportal/home
Note: The filesize of muse data is around 10GB or more.
11 Gist Pipeline
https://abittner.gitlab.io/thegistpipeline/documentation/download/
download.html
Download GitLab Repository
    •Example Working Directory