

**Título/Title:**

Fitting MANGA galaxies

**Area:**

Astronomía/Astrofísica

**Orientador/Supervisor:**

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**Descrição/Description:**

Galaxy evolution is one of the biggest open questions in Astrophysics but, despite the huge effort of scientists, large uncertainties related to the interpretation of the observations are still present, together with oversimplification in the models. One of the biggest projects in the world tackling the issues related to the evolution of galaxies is the Sloan Digital Sky Survey (SDSS1: <https://www.sdss.org/dr15/>). It started twenty years ago and recently, in December 2018, the data taken by the fourth phase of SDSS have been released, Data Release Fifteen (DR15). The main difference with respect to the previous releases is that for the first time the database contains also the spectra of about 5000 galaxies obtained with the revolutionary instrument MANGA, the integral field spectrograph unit mounted on the 2.5 m optical telescope at Apache Point Observatory (New Mexico). This is a unique database, where instead of a spectrum collecting the light from the entire galaxies, as it was for the previous releases, 17 different 'integral field unit' (IFU) extract simultaneously different spectra from the same regions of the sky. The possibility to place the different IFU at small distances allows detailed studies of the chemical composition, the kinematic, and the stellar age distribution of each galaxies investigating its internal structure.

As already mentioned, previous SDSS releases extracted from each observed galaxy a single spectrum, sampling mostly the center of target galaxies. Despite these limitations, the SDSS data have been crucial to discover the fundamental relations between the stellar mass of a galaxy and its star formation rate, the so-called 'main sequence', and the link between the stellar mass and the mass of heavy elements available in a galaxy, also known as 'mass-metallicity relation'.

This project proposes a deep analysis of the 'MANGA' extended data-set in DR15, in order to investigate the physical processes that determine the galaxy scaling relations mentioned above, considering also the internal structure of the galaxies, available for these 5000 objects.