

Thesis subject

Name of the laboratory: Laboratoire d'Astrophysique de Marseille

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Subject's title: AGN contribution to high-redshift galaxies emission lines in preparation for PFS

Subject description:

Black holes activity has a strong influence on the star-formation activity of galaxies over cosmic times. Black holes accretion disk in Active Galactic Nuclei (AGN) radiate from gamma-rays to radio and induces a response from the surrounding interstellar medium (ISM) which is different from young stars in star forming galaxies. The aim of this PhD is to model the panchromatic emission of galaxies hosting AGNs to implement them in the CIGALE (Code Investigating GALaxy Emission) (<https://cigale.lam.fr/>).

The student will use the CLOUDY photoionization code (<https://www.nublado.org>) to model AGNs atomic and molecular emission lines (from X ray to radio) to generate a library of synthetic spectra templates that will be implemented in CIGALE. The emission lines templates will depend on several parameters: the black-hole accretion disk radiation field shape and intensity, the ISM density and metallicity, and the AGN viewing angle, using the recently developed CIGALE AGN nebular module. The multi-wavelength galaxy emission studies will be compared to the first data of PFS to reconstruct the star formation history of the host high-redshift galaxies.

Bibliography:

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- Groves et al. (2004), Dusty, Radiation Pressure-Dominated Photoionization. I. Model Description, Structure, and Grids, The Astrophysical Journal Supplement Series, Volume 153, Issue 1, pp. 9-73.
- Spinoglio et al. (2021) Mid-IR cosmological spectrophotometric surveys from space: Measuring AGN and star formation at the cosmic noon with a SPICA-like mission , Publications of the Astronomical Society of Australia, Volume 38, article id. e021