The two dimensional kinematic of ionized gas of edge-on galaxies from Herschel Reference Survey

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Edge-on galaxies

Figura : Image of M 101 from DSS. This is an example of a galaxy face-on (The ALADIN interactive sky atlas. 2000).

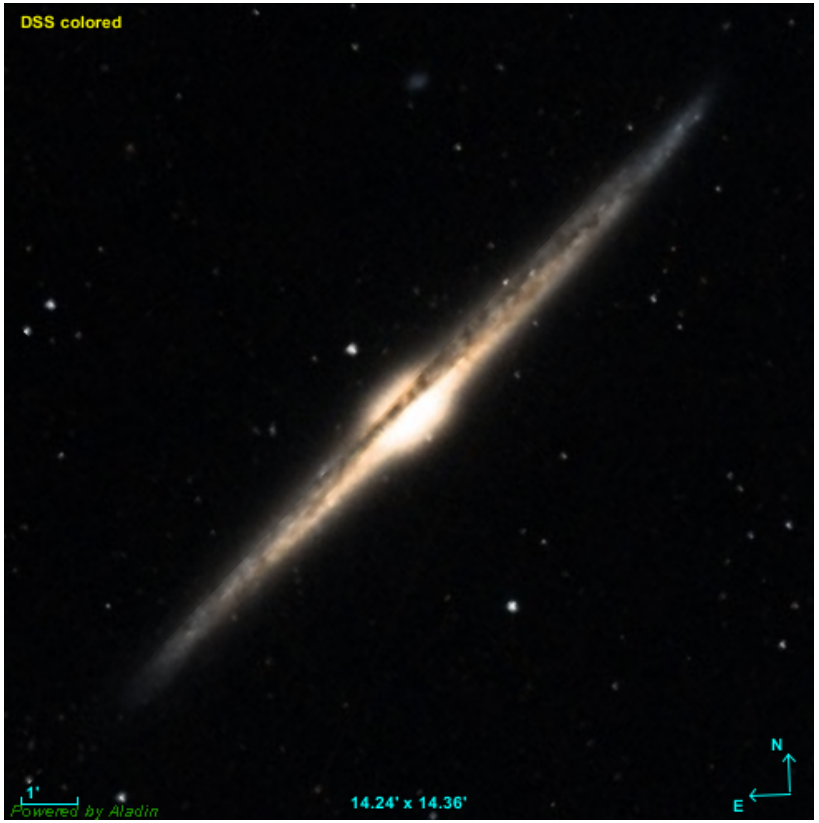

Figura : Image of NGC 4565 from DSS. This is an example of a galaxy edge-on (The ALADIN interactive sky atlas. 2000).

Extraplanar diffuse ionized gas

- The diffuse ionized gas (DIG) has scale heights of the order of 1 kpc.
- In galaxies viewed edge-on layers of DIG and HI are detected: extraplanar-DIG (e-DIG) reaching heights up to $8 - 10\mathrm{kpc}$.
- The kinematics of the thick disk component is a function of the height above or below the disk.
- The e-DIG kinematics is better studied with two-dimensional spectroscopy (Rosado et al. 2000).

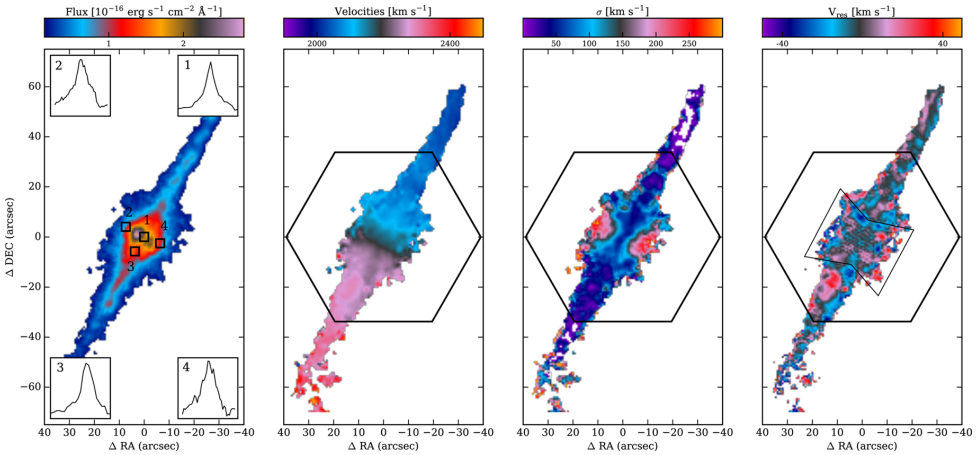

Figura : Results reported by López-Cobá et al. (2017) of the SFP observations in the [NII] emission line. From left to right: [NII] monochromatic map, line-of-sight velocity field, velocity dispersion map and map of line-of-sight velocities after substraction of the main rotation curve.

Dust in edge-on galaxies

- Dust grains absorb and scatter light in the optical and ultraviolet (UV) and help regulate the physics and chemistry of the interstellar medium, playing a crucial role in star and planet formation.
- The most straightforward way to trace the dust in galaxies is by looking at far-infrared (FIR) and sub-millimetre (sub-mm) wavelengths.
- The dust in edge-on spiral galaxies often shows up as a prominent dust lanes in optical images, which makes this class of galaxies among the only systems where dust can easily be studied both in extinction and emission.
- Edge-on galaxies are also the only systems where the vertical distribution of the dust can be studied (Verstappen et al. 2013).

Herschel Reference Survey (HRS)

HRS is a complete K-band-selected, volume-limited ($15 < d < 25\mathrm{Mpc}$) sample of 323 nearby galaxies spanning a wide range in morphologycal type (from E to Sd) and stellar mass ($10^8\ M_\odot < M_{star} < 10^{11}\ M_\odot$) (Boselli et al. 2010).

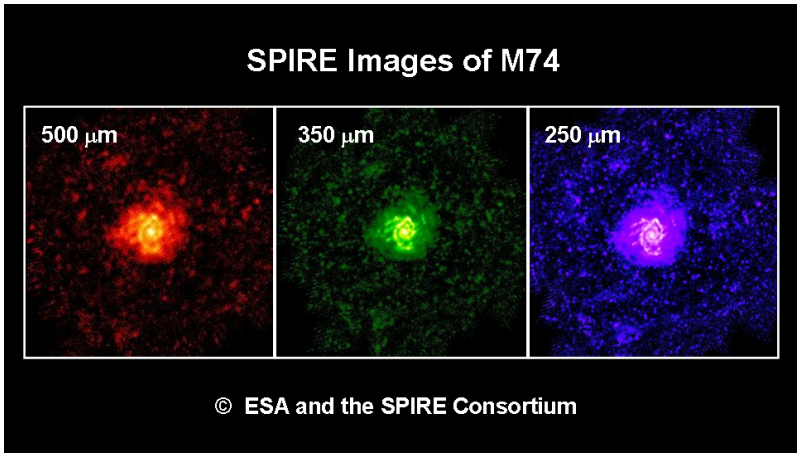

Figura : SPIRE images of M74 at all its three wavelengths (Kennicutt 2017).

Fabry-Perot interferometry

Fabry-Perot data are ideal for observing extended objects at high spatial and spectral resolutions. Fabry-Perot observations allow to get at once the complete 2-D Hα imagery of the galaxies and high-resolution spectra of the Hα line, tracing the kinematic of the ionized gas over the large field-of-view of nearby galaxies.

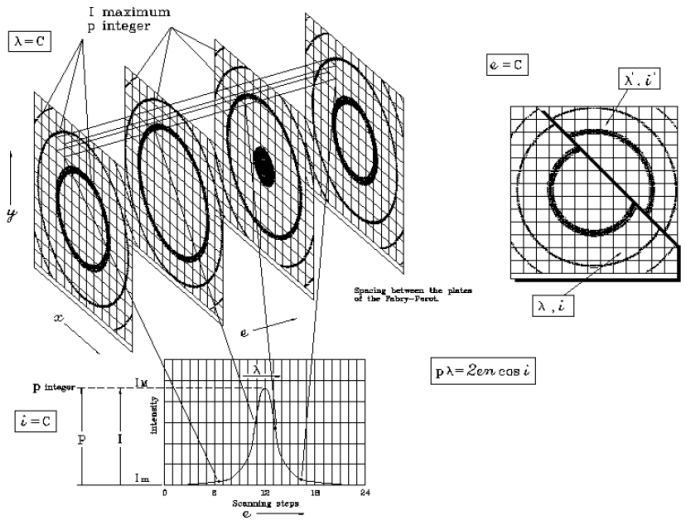

Figura : Emission profile produced by a scanning Fabry-Perot interferometer (Martínez et al. 2000).

The data nowadays

Since two years we are collecting the Fabry-Perot data for all the late-type HRS galaxies

- The 1.93-m telescope at the Observatoire de Haute Provence with the Fabry-Perot interferometer called GHASP, and
- The 2.1-m telescope in San Pedro Mártir, Baja California, México with the Fabry-Perot interferometer called PUMA.

Figura : The 2.1-m telescope in Observatorio Astronómico Nacional, Sierra de San Pedro Mártir, Baja California, México.

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