

Spiral Galaxy in 3D as Seen with SpIOMM

Laurie Rousseau-Nepton, Carmelle Robert and Laurent Drissen

Université Laval & Centre de Recherche en Astrophysique du Québec, Québec, Canada

Abstract. Using the imaging Fourier transform spectrograph (FTS) SpIOMM we study 7 nearby spiral galaxies. The large database of spectra obtained around $H\alpha$ and $H\beta$ is ideal to study the star forming regions and warm ionized medium (WIM) with a high spatial resolution (~ 50 -150 pc).

Keywords. galaxies: nearby spiral, galaxies: evolution - galaxies: star formation

1. SpIOMM

SpIOMM, the imaging FTS of the Mont-Mégantic Observatory, offers a large FOV ($12' \times 12'$), a good spatial resolution of $1.1''$ (435 500 pixels and spectra), and a spectral coverage in selected bandpasses of the visible with an adjustable resolution from 1 to 20 000. Two data cubes have been obtained (~ 5 hrs/cube) for each galaxy covering the spectral domains of 4750-5150 Å ($R \sim 650$) and 6500-6800 Å ($R \sim 2000$).

2. HII Regions and the WIM

HII regions (HII R) are detected over the whole galactic disks. For example, we identified 566 HII R with a SNR > 8 on NGC 628. Also, emission from a WIM (Haffner & al. 1999; Blanc & al. 2009) can be detected beyond the HII R boundaries (Fig. 1). The WIM can be related to the HII R escaping photons, but also to SNe, PNe, and other sources including AGB stars, AGN, and shocks. These ionizing sources are not necessarily physically linked together and produce very different physical conditions in the surrounding gas. For NGC 628, the metallicity gradient calculated after taking into account the effect of the WIM becomes steeper (Fig. 2; Rousseau-Nepton *et al.* in prep).

References

- Blanc, G. A., *et al.* 2009, *ApJ*, 704, 842
Haffner, L. M., *et al.* 1999, *ApJ*, 523, 223

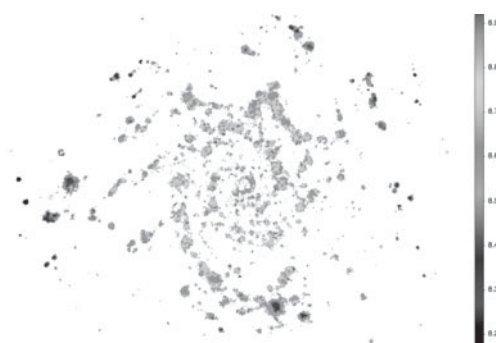


Figure 1. NGC 628 metallicity map using the O3N2 indicator for all spaxels above 4σ .

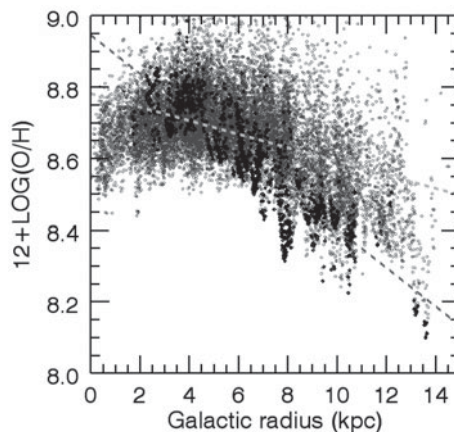


Figure 2. NGC 628 metallicity gradient. Blue dots and the orange dashed line are measurement in all spaxels above 4σ . Black dots and the red dashed line are from selected pixels in HII regions.