

Metallicity gradients of galaxies in the *Herschel* Reference Survey

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Abstract. We introduce a pilot project to measure metallicity gradients for a sample of twenty nearby galaxies drawn from the *Herschel* Reference Survey (HRS), representative of normal, star-forming spiral galaxies. We have obtained optical spectroscopic observations using the Very Large Telescope with the FORS2 instrument in multi-object mode, targeting individual HII and star-forming regions across the galaxy discs (P. I.: L. Cortese). From the ratios of the strong emission lines, we estimate the local gas-phase oxygen abundance and construct metallicity gradients. Combining these new data with *Herschel* PACS/SPIRE far-infrared photometric observations and HI 21 cm line maps, to trace the cold dust and gas respectively, will allow the study of the relationships between stars, gas, dust and metals on sub-kiloparsec scales.

Keywords. cosmology: observations galaxies: spiral galaxies: evolution

1. Preliminary reduction of VLT/FORS2 observations

In Fig. 1, we show two example spectra from slits covering HII regions in NGC 5669 (aka HRS 319; Boselli *et al.* 2010), extracted with the ESO Reflex pipeline. Using emission lines observed in each spectra at each position in our twenty galaxies, we apply the method of Hughes *et al.* (2013) and calibrations of Kewley & Ellison (2008) to estimate gas-phase oxygen abundance gradients. We will then investigate, amongst other things, how strong metallicity gradients may bias global metallicity estimates derived from the integrated spectra of gas-stripped galaxies (see Hughes *et al.* 2013; Boselli *et al.* 2013).

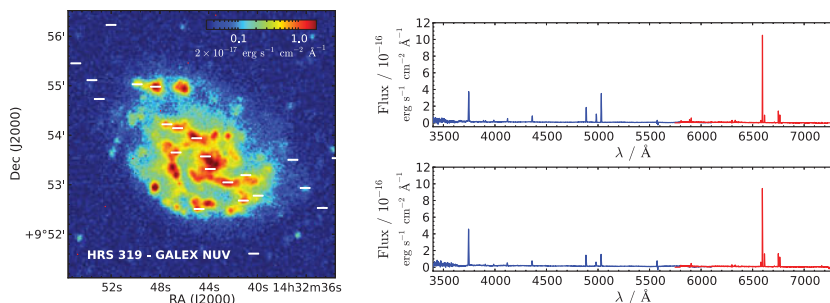


Figure 1. FORS2 MXU slit positions (white rectangles) covering HRS 319's HII regions, traced here via NUV emission (*left*), are presented alongside two example optical spectra extracted from the observations using the ESO Reflex standard data reduction pipeline (*right*).

References

- Boselli, A., Eales, S., Cortese, L., Bendo, G., & Chaniel, P. *et al.* 2010, *PASP*, 122, 261
Boselli, A., Hughes, T. M., Cortese, L., Gavazzi, G., & Buat, V., 2013, *A&A*, 550, 114
Hughes, T. M., Cortese, L., Boselli, A., Gavazzi, G., & Davies, J. I., 2013, *A&A*, 550, 115
Kewley, L. & Ellison, S., 2008, *ApJ*, 681, 1183