

Identification and multi-filter photometry of HII regions from nearby galaxies with J-PLUS

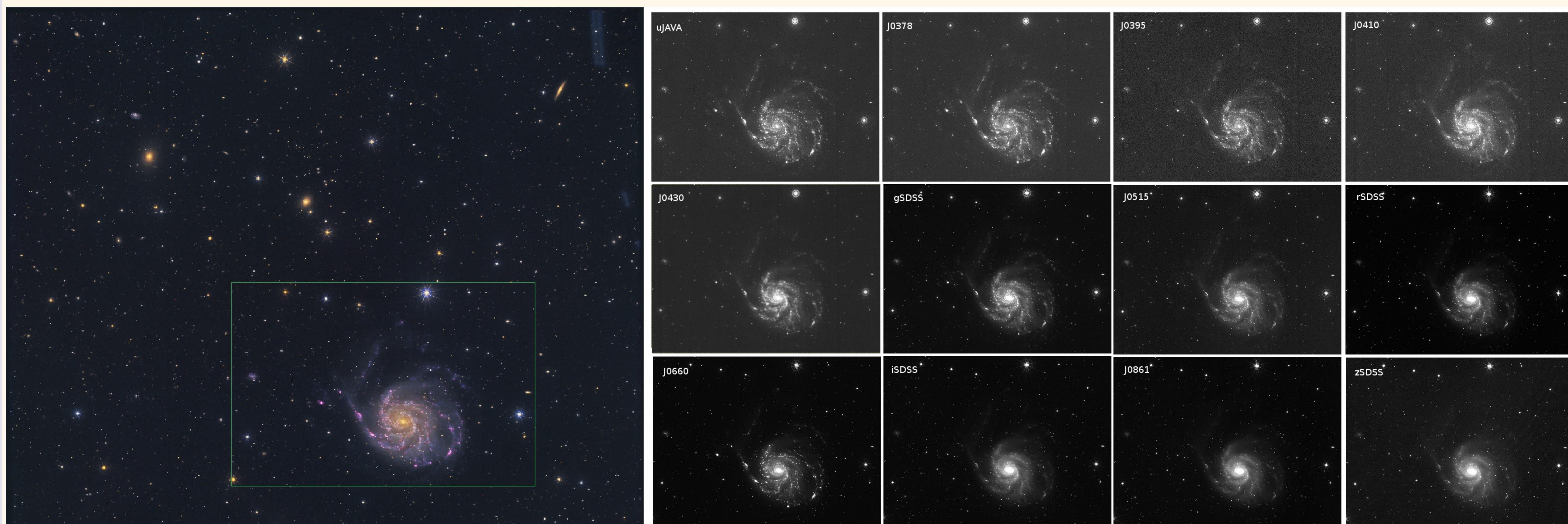
R. Logroño-García, G. Vilella-Rojo, C. López-Sanjuan, J. Varela, D. Muniesa, J. L. Lamadrid and the J-PLUS team

Centro de Estudios de Física del Cosmos de Aragón (CEFCA), Teruel, Spain



J-PLUS: Filters & Field of View

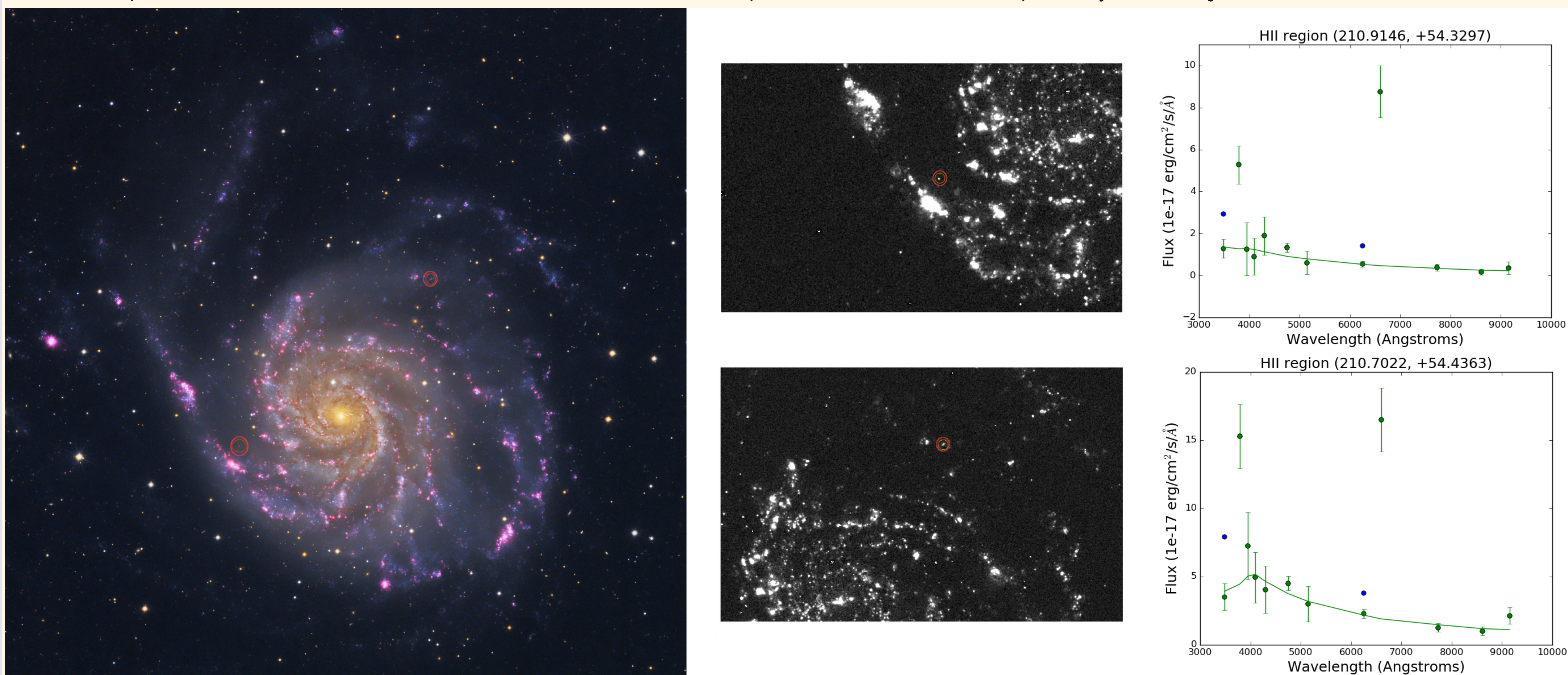
The Javalambre Photometric Local Universe Survey (J-PLUS) has already started the data acquisition phase at the Observatorio Astrofísico de Javalambre (OAJ) in Teruel, Spain. Benefiting from the large field of view (2 deg^2) and the 12 filters set of the T80Cam at the T80/JAST telescope, we aim to study the properties of HII regions in nearby galaxies ($z < 0.015$). In this poster, we apply our procedures to the galaxy Messier 101.



On the left part of the image we see the large field of view of the T80Cam at the T80/JAST telescope. On the right part, a mosaic with the 12 images of the J-PLUS filters is displayed, arranged by central wavelength and matched in scale. More information about J-PLUS can be found at j-plus.es and in the poster by Vilella-Rojo et al.

Identification and characterization of HII regions

We have developed a fully automatized pipeline to identify and characterize the nearby universe HII regions. This pipeline: (1) Homogenizes the PSF in the 12 images of the different filters. (2) Estimates realistic photometric errors following Molino et al. (2014) method. (3) Constructs a detection image showing the excess of $H\alpha + [NII]$, following Vilella-Rojo et al. (2015) prescriptions. (4) Performs the photometry in the 12 J-PLUS bands using as reference the $H\alpha + NII$ detection image. (5) Constructs the photo-spectra for each identified HII region. We demonstrate the capabilities of this method by comparing synthetic aperture photometry from SDSS spectra with the $H\alpha$ flux measured with J-PLUS data. Such comparison can be found in the poster by Vilella-Rojo et al.



Examples of the J-PLUS photo-spectra of 2 HII regions placed in M101, with their locations in the $H\alpha + [NII]$ detection image showed in the middle panels. The green line is the best-fitting model for the continuum of the HII region data, the green points show the corrected flux according to it (see Vilella-Rojo et al. 2015, for details.)

Science

Once the pipeline is implemented, we will generate a catalog of nearby HII regions at $z < 0.015$ in the 8500 deg^2 of J-PLUS. With this catalog, we will study the impact of environment in the 2D star formation properties of nearby galaxies, taking advantage of the unprecedented large contiguous area that J-PLUS will offer.

Contact

rlgarcia@cefca.es, gvilella@cefca.es, clsj@cefca.es, jvarela@cefca.es

References

- [1] Vilella-Rojo et al., 2015. A&A, 580, A47.
- [2] Molino A. et al., 2014. MNRAS, 441, 2891-2922.

Acknowledgements

This work has mainly been funding by the FITE (Fondos de Inversiones de Teruel), the project AYA2015-66211-C2-1-P, Aragón research group E103 and Spanish MINECO (FCDD10-4E-867). RLG is funded by Fundación Ibercaja Banco. RLG thanks to his thesis supervisors and colleagues, for all they have taught and the support given, also to the UPAD for working and reducing the data.