The very high redshift component of the OTELO survey

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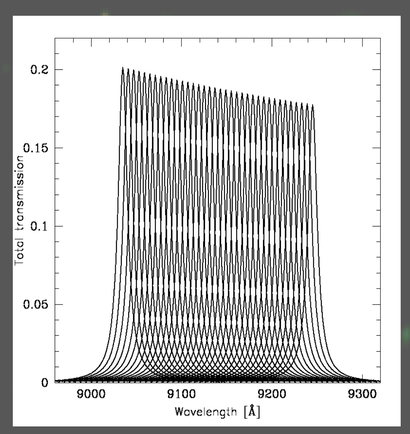
OTELO in a nutshell

The OSIRIS Tunable Filter Emission Line (OTELO) survey is a 2D-spectroscopic (R~700), blind tomography between Meinel bands in the NIR domain, on a selected 7.5 x 7.5 arcmin² field of the **Extended Groth Strip**.

The data-cube is defined by 36 slices with 12 Å of bandwidth each, sampled every 6 Å from 9280 Å towards the blue. Thus, each source accounts for a pseudo-spectrum with +36 spaxels of similar length.

Flux in each individual slice obeys the system transmission function as plotted beside. A multi-wavelength catalog with photo-z was concurrently built using ancillary data.



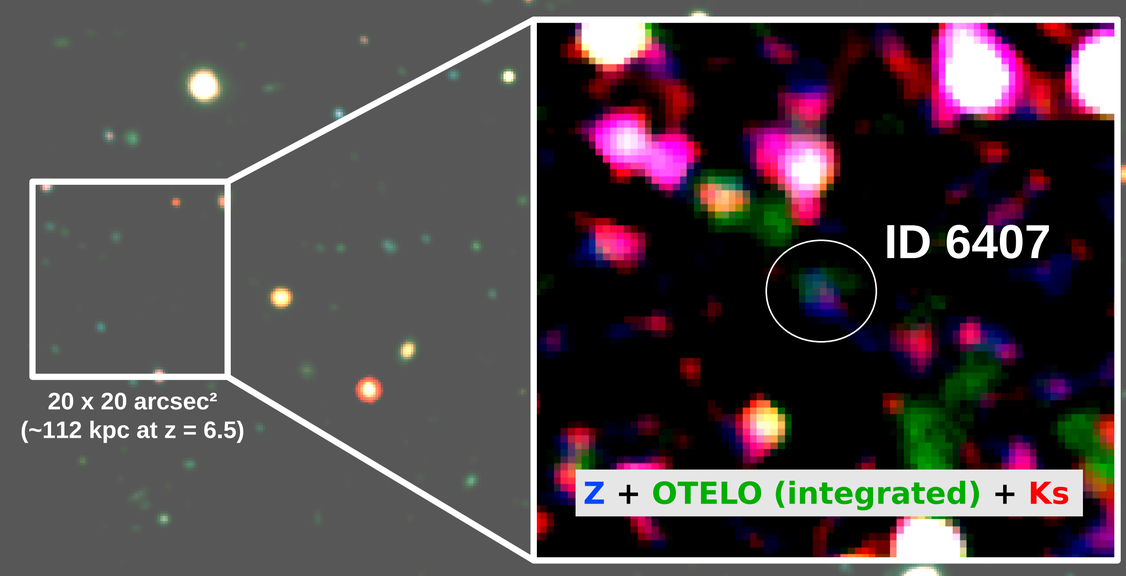
See the Posters of **Marina Ramón-Pérez** and **Jakub Nadolny**, or the Invited Talk of **Jordi Cepa** for more information about.

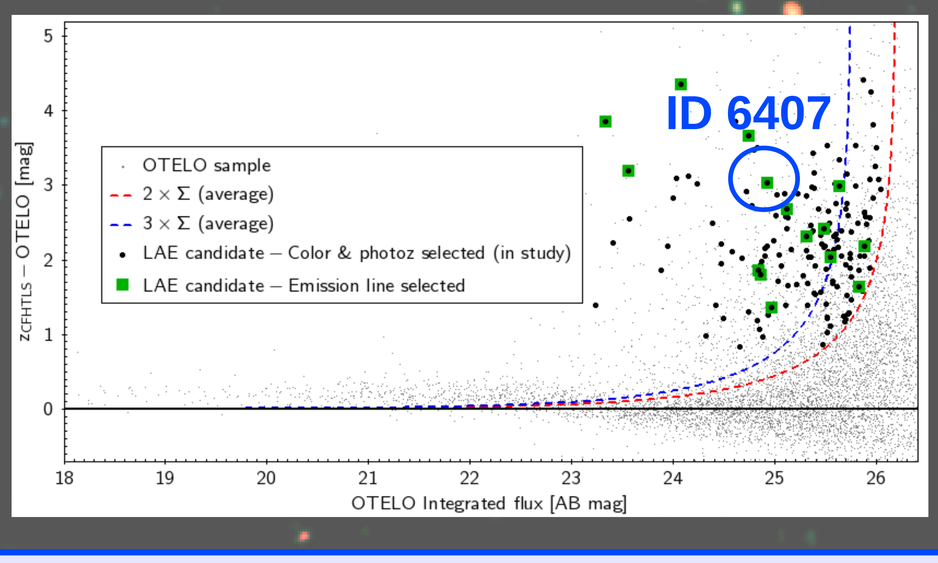
OTELO & LAEs at z~6.5

In the growing zoo of very high redshift sources, the **Lyman-α emitters (LAEs)** take up a singular niche. This emission is one of the most powerful tools to study galaxies during and after the reionization era.

Search of LAEs are mainly based on techniques as “dropout” (Steidel et al. 1996) or color excess in C-M diagrams, or by exploiting blind, slitless spectroscopic surveys. **OTELO is able to combine both techniques** in most cases.

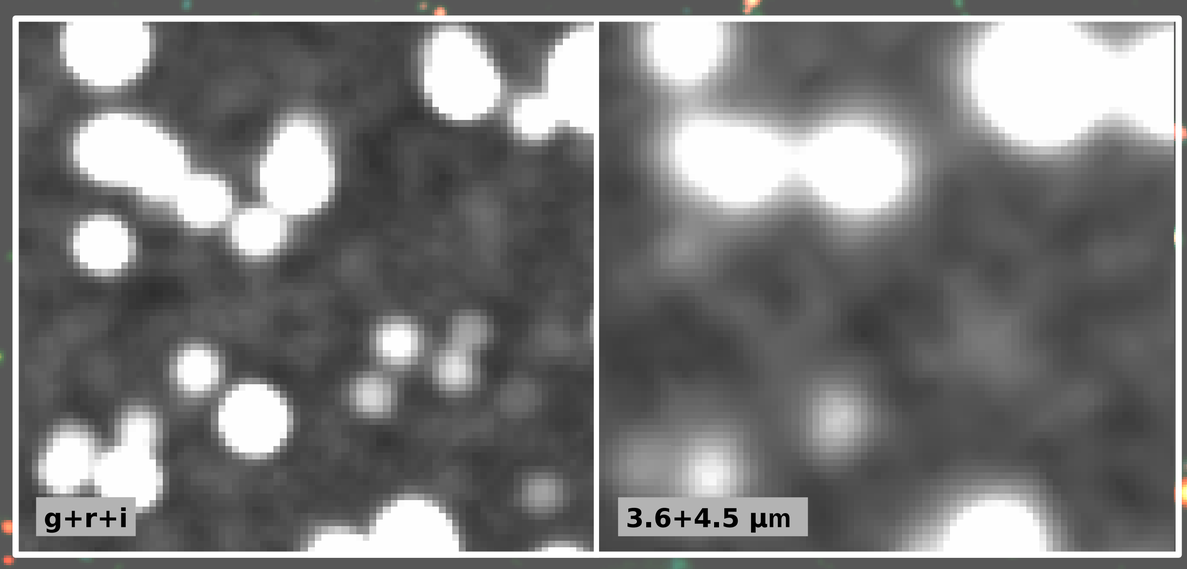
Currently, we are studying **a sample of 150+ candidates** to very high-redshift galaxies in the OTELO field. A large number of interlopers is expected (i.e. cool dwarfs in the Galactic Halo, Balmer-break & other lower redshift galaxies). **An example of a LAE candidate (ID 6407) from OTELO survey is shown below.**

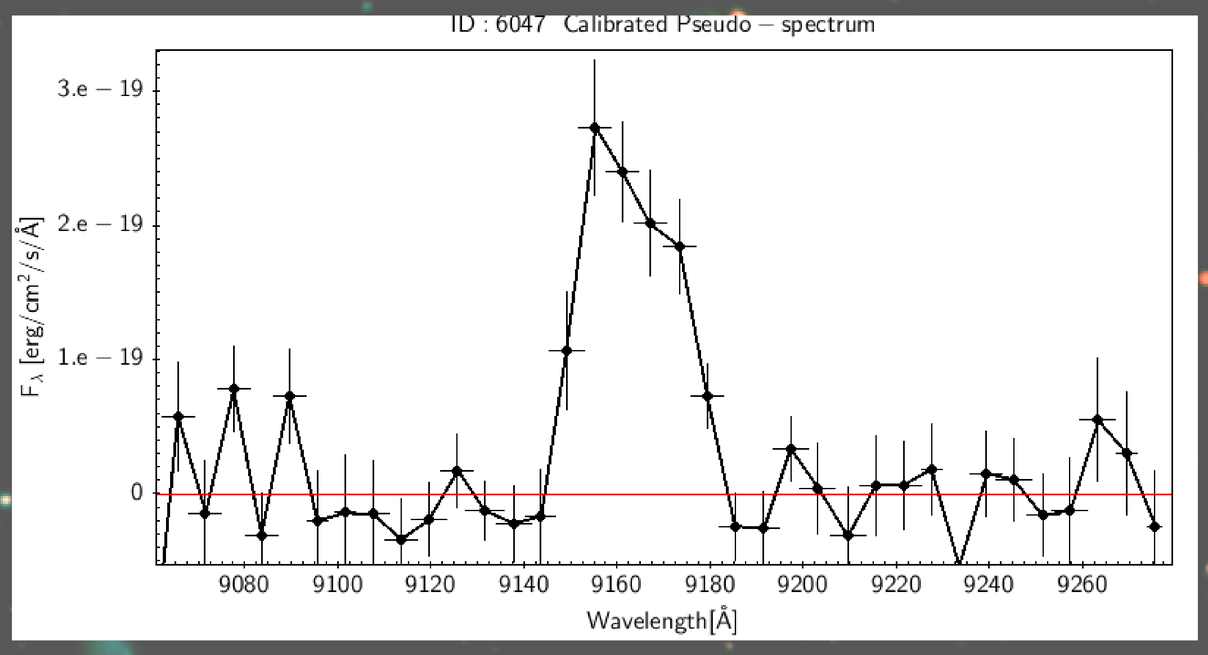




ID 6407 is a very faint object that subtends about 1.8 x 2.6 arcsec. Despite its low SNR, it can be seen in z (CFHTLS), OTELO and Ks (WIRDS) -bands. As expected, ID 6407 is a fair **“dropout”** in i-band (g+r+i image). Most LAEs are **very hard to detect in UV continuum** (Bacon et al. 2014), even in the deepest broad-band images (3.6+4.5 μm).

ID 6407 not only stands out as a candidate to line emitter in the corresponding C-M diagram, but **it exhibits a remarkable emission feature in the OTELO's pseudo-spectrum**. The line profile is consistent with predictions about the influence of the instrumental profile of tunable filters on the Ly-α line at high redshifts (de Diego et al. 2013). If the spectral feature shown corresponds to this line, **ID 6407 is a LAE at z_{spec}=6.531**, which is consistent with the first photo-z solution (z_{phot}=6.46). An upper limit in **rest-frame EW is ~18.6 ± 5.1 Å** if continuum is actually sampled, with a moderate **Ly-α luminosity of ~3.49 ± 0.9 x 10^{42} erg/s**.





The background image is a RGB composition of CFHTLS g & i-bands, and the OTELO integrated one.

References:

Bacon, R. et al. (2015) A&A 575, 75

de Diego, J.A. et al. (2013) AJ 146, 96

Steidel, C.C. et al. (1996) ApJL 462,17