Characterization of Fornax galaxies with S-PLUS

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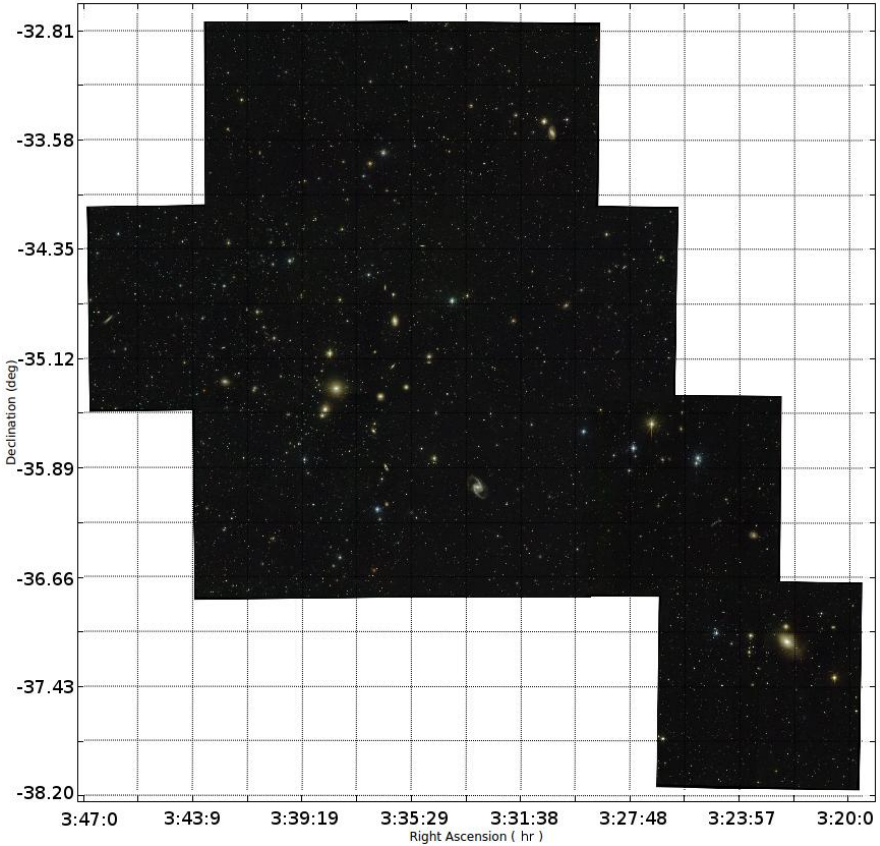
16th S-PLUS Collaboration Meeting - December 1st 2021

S-PLUS Fornax Project

Goal

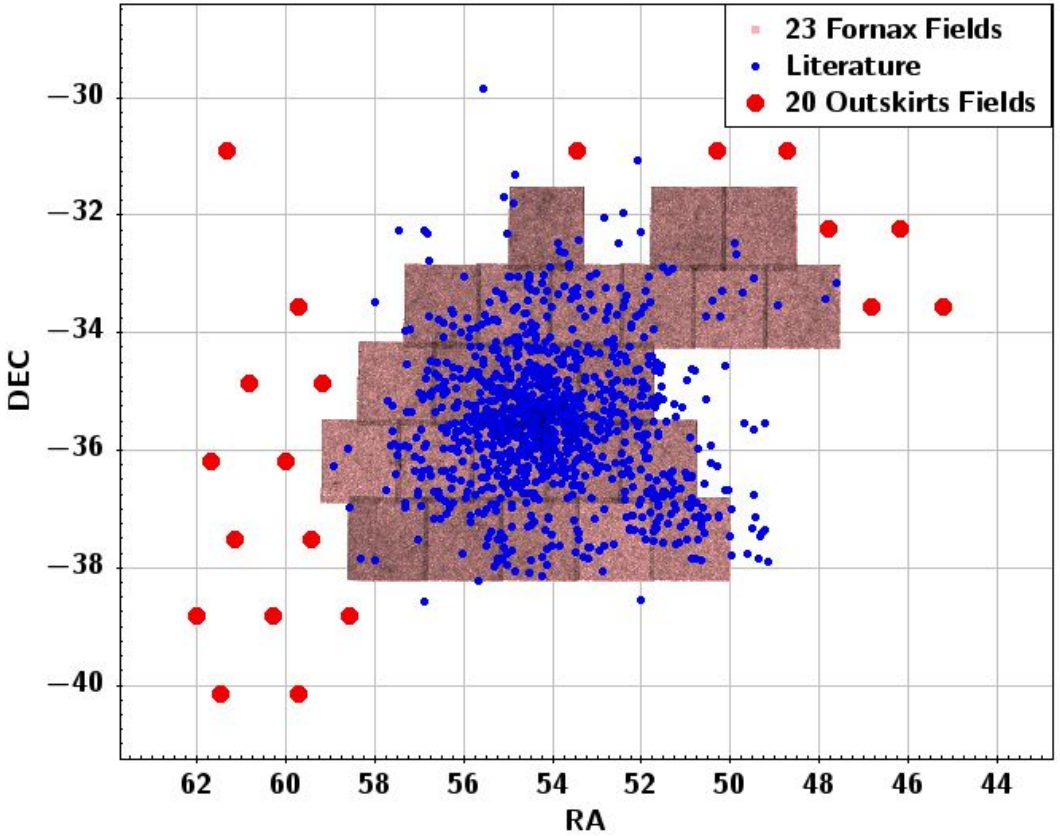
To provide new information about the Fornax galaxy cluster through the novel filter set of S-PLUS and the wide FOV of the images



S-PLUS Fornax Project

Data

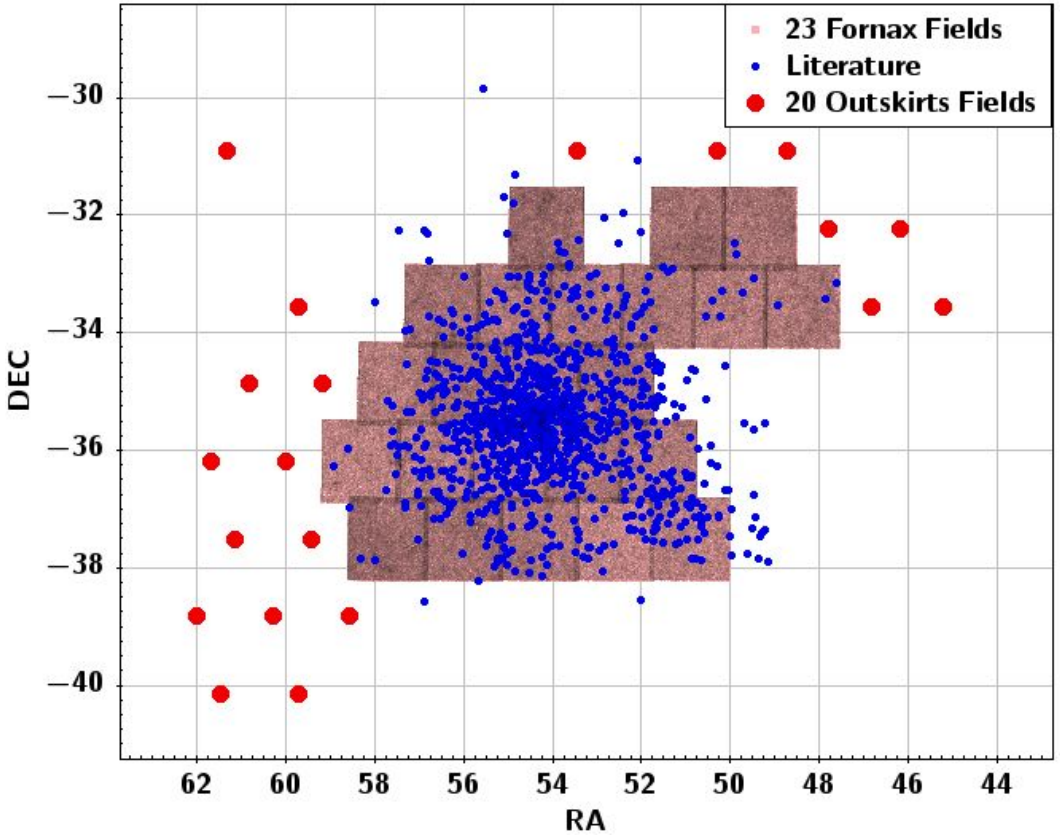
- 23 S-PLUS fields (1.4° x 1.4°) covering 1057 Fornax galaxies reported in the literature (15 literature catalogs)
- 20 S-PLUS fields in the outskirts of the Fornax cluster



S-PLUS Fornax Project

Catalogs

- SExtractor: ~660.000 objects detected in the 23 Fornax fields (point and extended sources)
- 258 Fornax galaxies from the literature with confident S-PLUS photometry (good SExtractor detection apertures)
- Compilation of ~20.700 spectroscopic z in the 23 Fornax fields

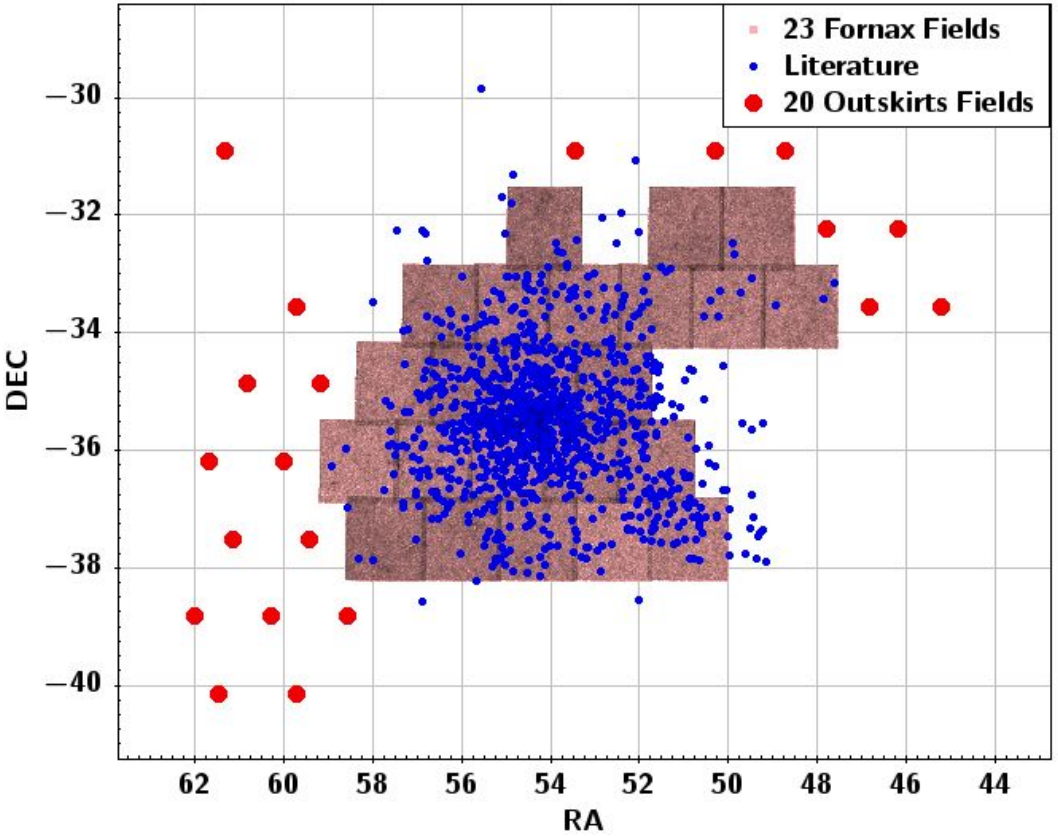


S-PLUS Fornax Project

Topics

Among others and in this meeting:

- **Photo-zs** for Fornax galaxies (see Laerte Sodre's talk)
- **Morphology** (see Paola Dimauro's talk)
- **Hα emitters** (see Amanda Reis Lopes' poster)
- **Detection of faint galaxies** (see Favio Faifer's poster)
- **Star-forming S0 galaxies** (see Arianna Cortesi's poster)



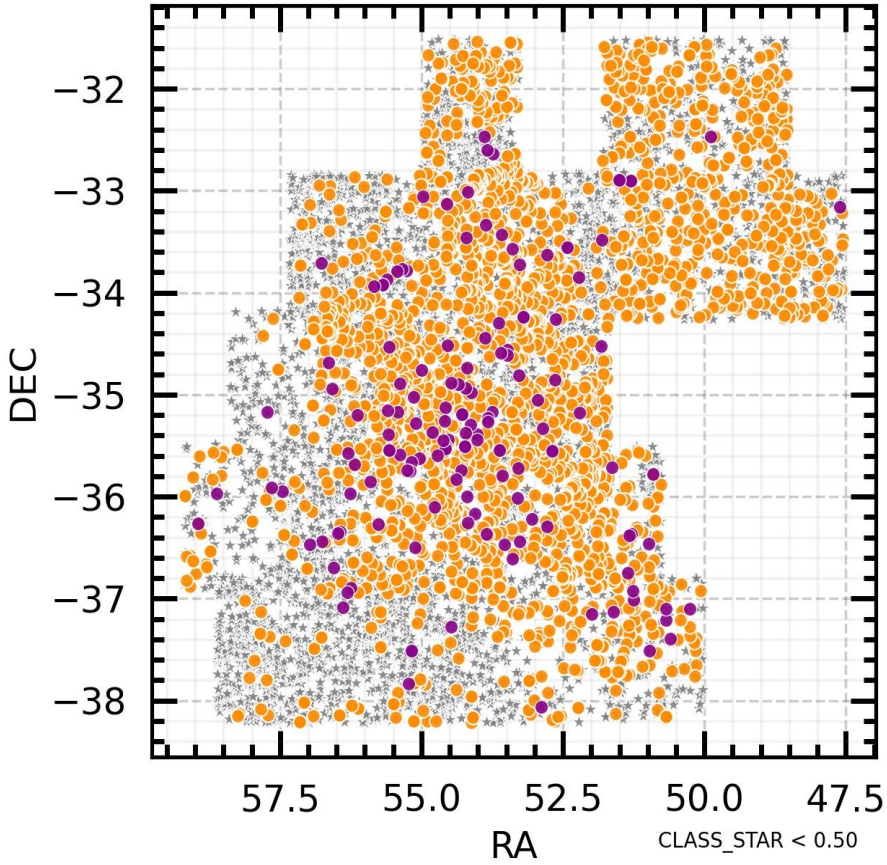
In this talk

Preliminary efforts to characterize the Fornax galaxy population from the galaxy population in the background using apparent photometric and structural parameters

Sample

- **~150 Fornax literature galaxies** with reliable S-PLUS photometry and radial velocities (spectroscopically confirmed Fornax members)

- **~2700 background galaxies** with confident S-PLUS photometry and radial velocities located in the 23 Fornax fields (spectroscopically confirmed background galaxies)



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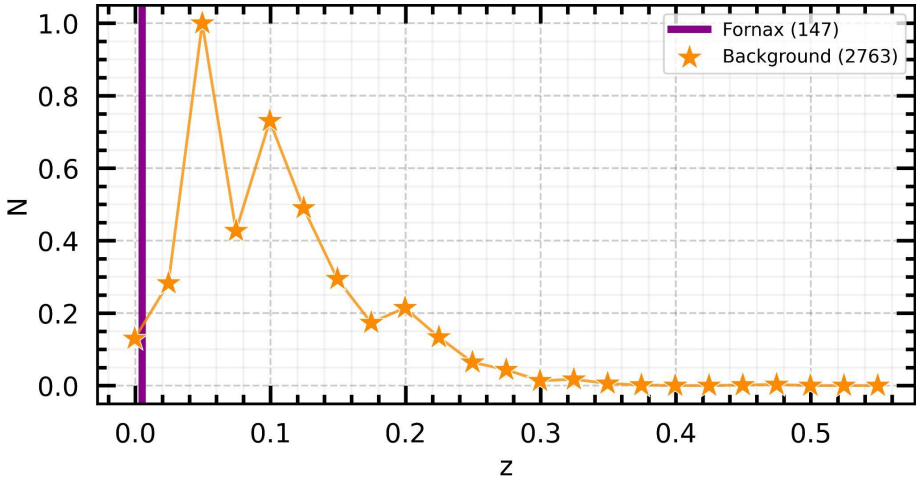
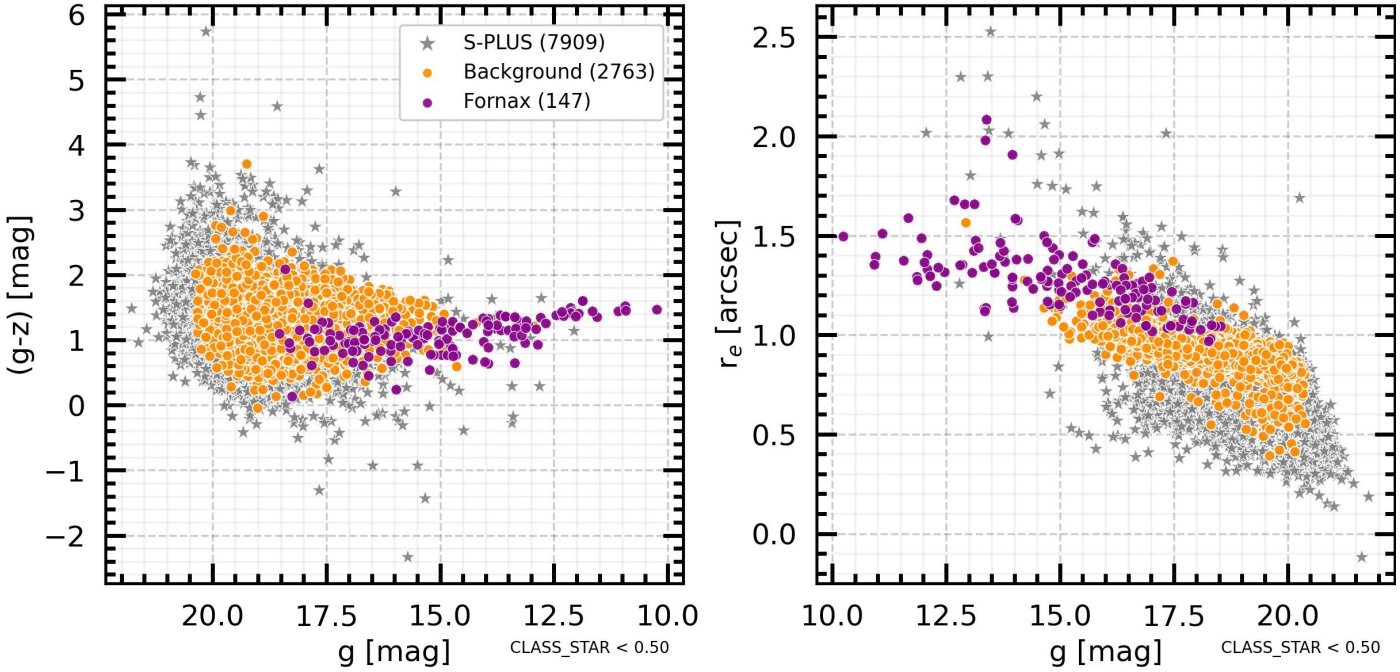


Motivation

In some well known photometric diagrams, the Fornax galaxy population detach from the galaxies in the background



Is it possible to use those diagrams to identify new Fornax members?

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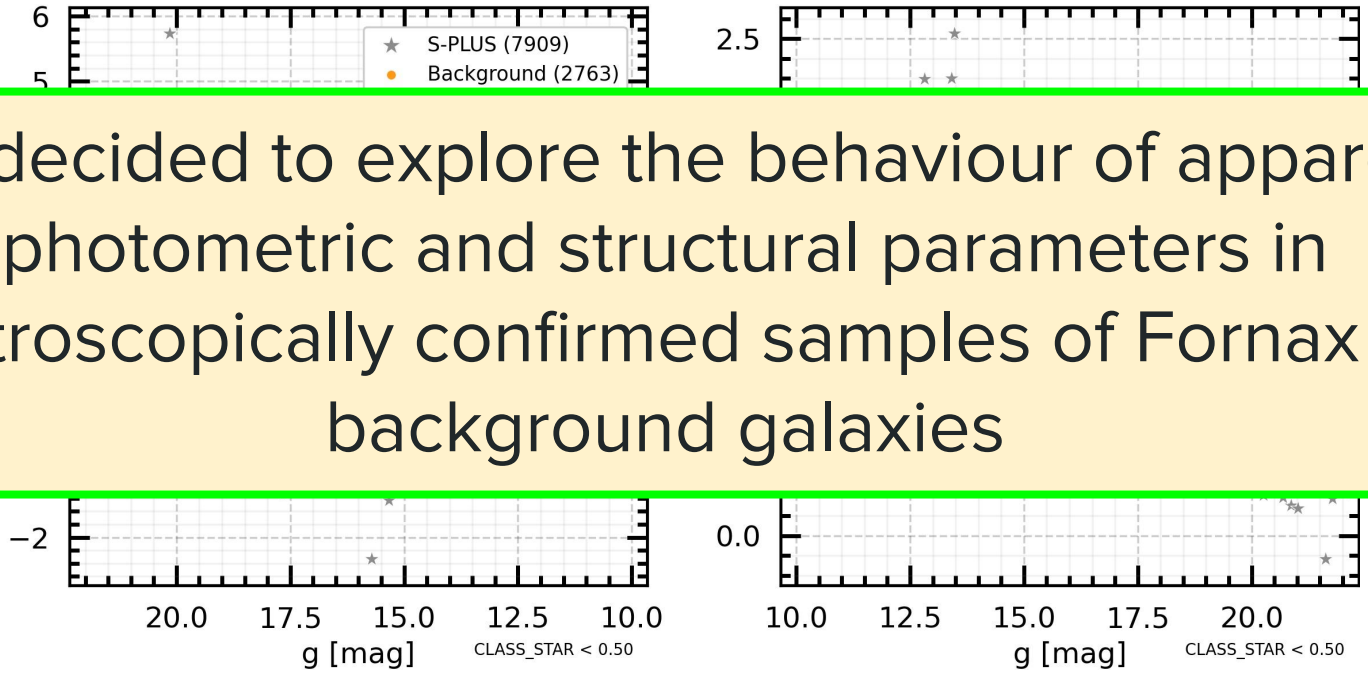
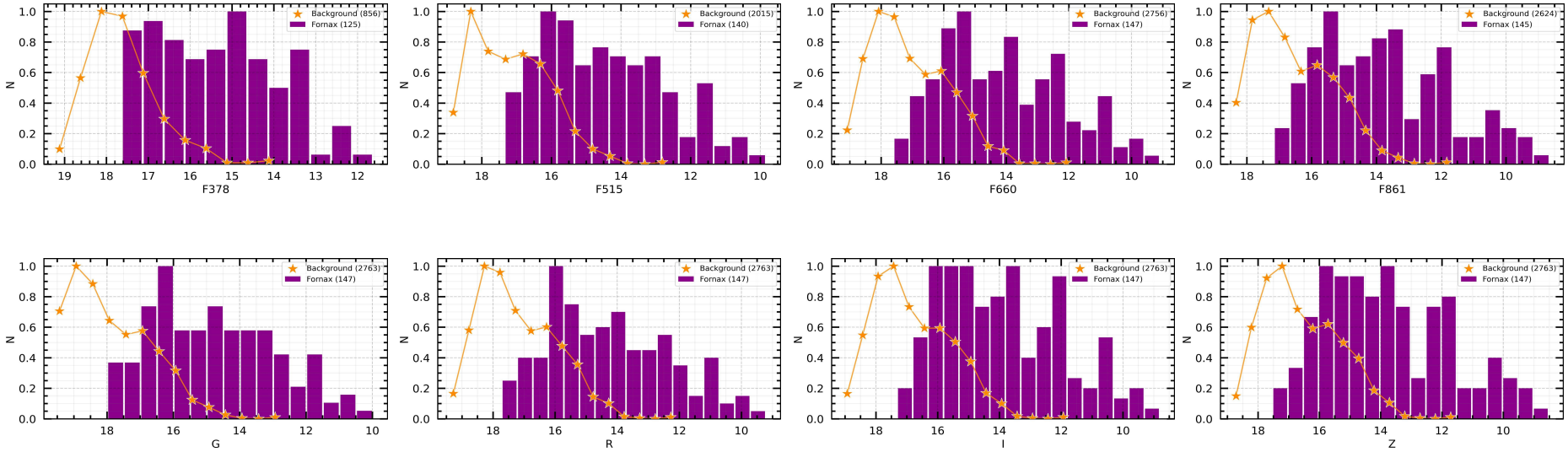


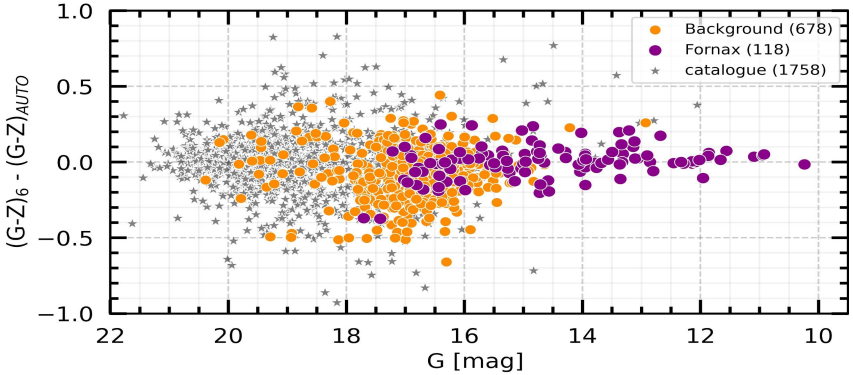
We decided to explore the behaviour of apparent photometric and structural parameters in spectroscopically confirmed samples of Fornax and background galaxies

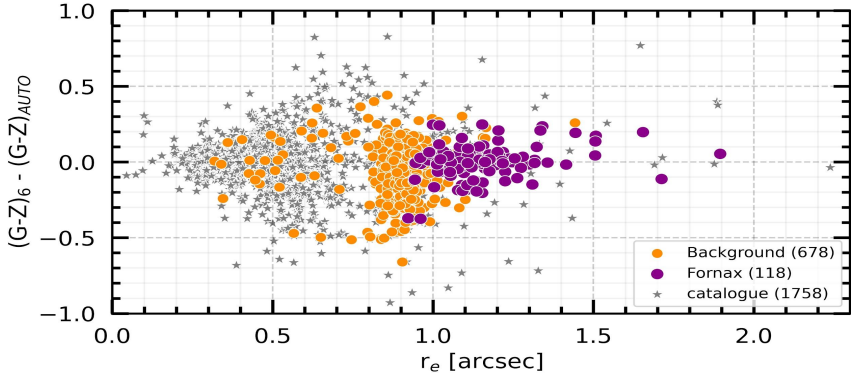
Is it possible to use those diagrams to identify new Fornax members?

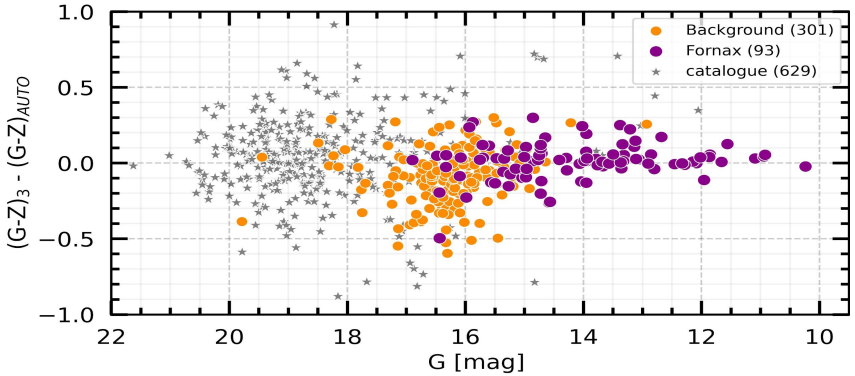
Apparent brightnesses in broad and narrow band filters seem to help to detach both populations

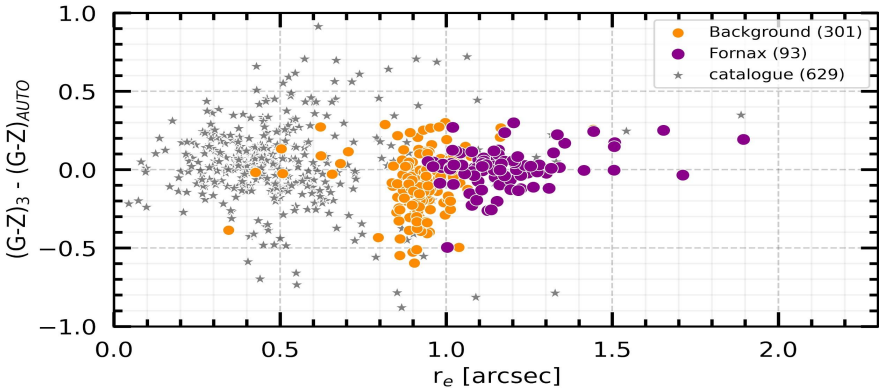


The difference between apparent (not k-corrected) central and total colors combined with apparent total luminosities and apparent Reff seem to help as well ...









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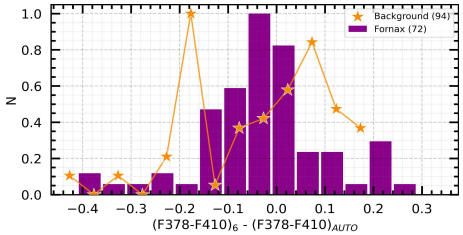

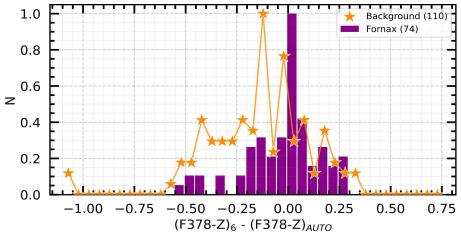

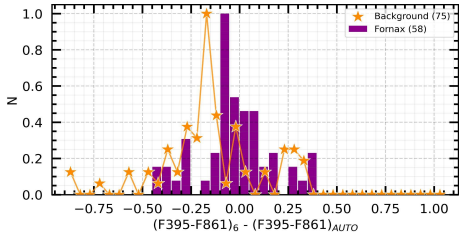

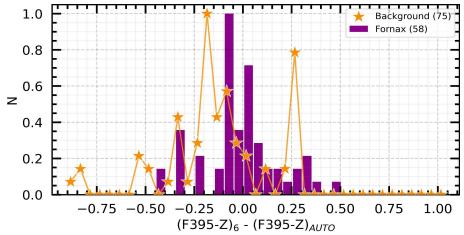

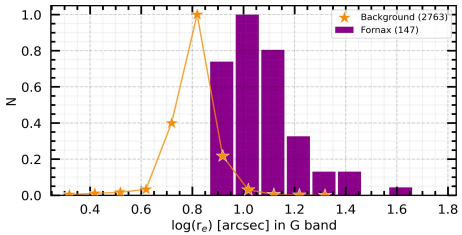

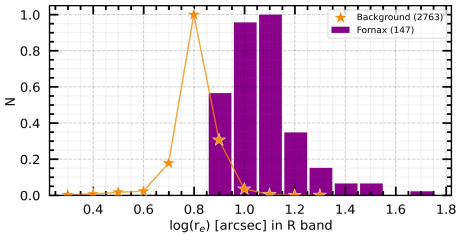

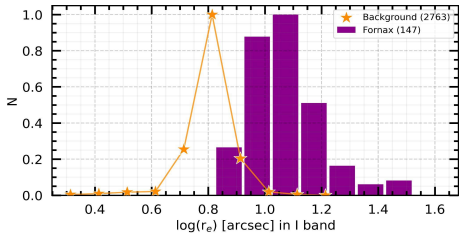

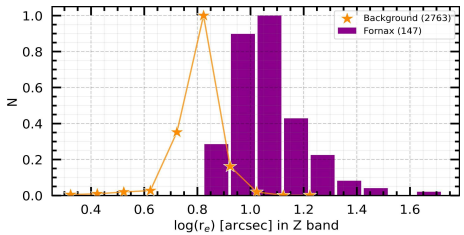

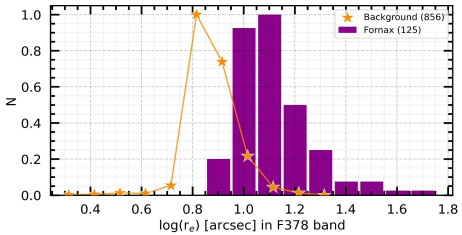

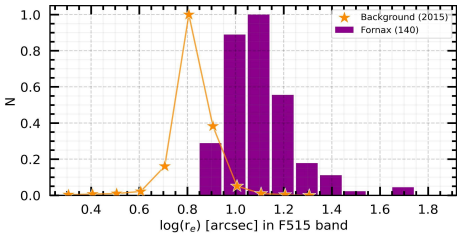

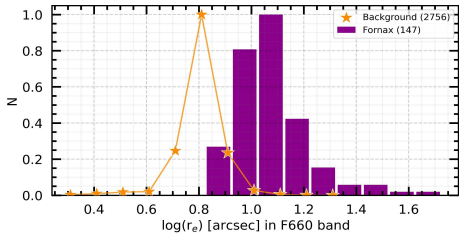

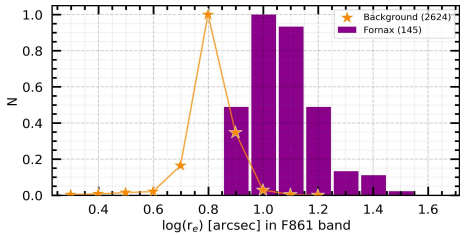

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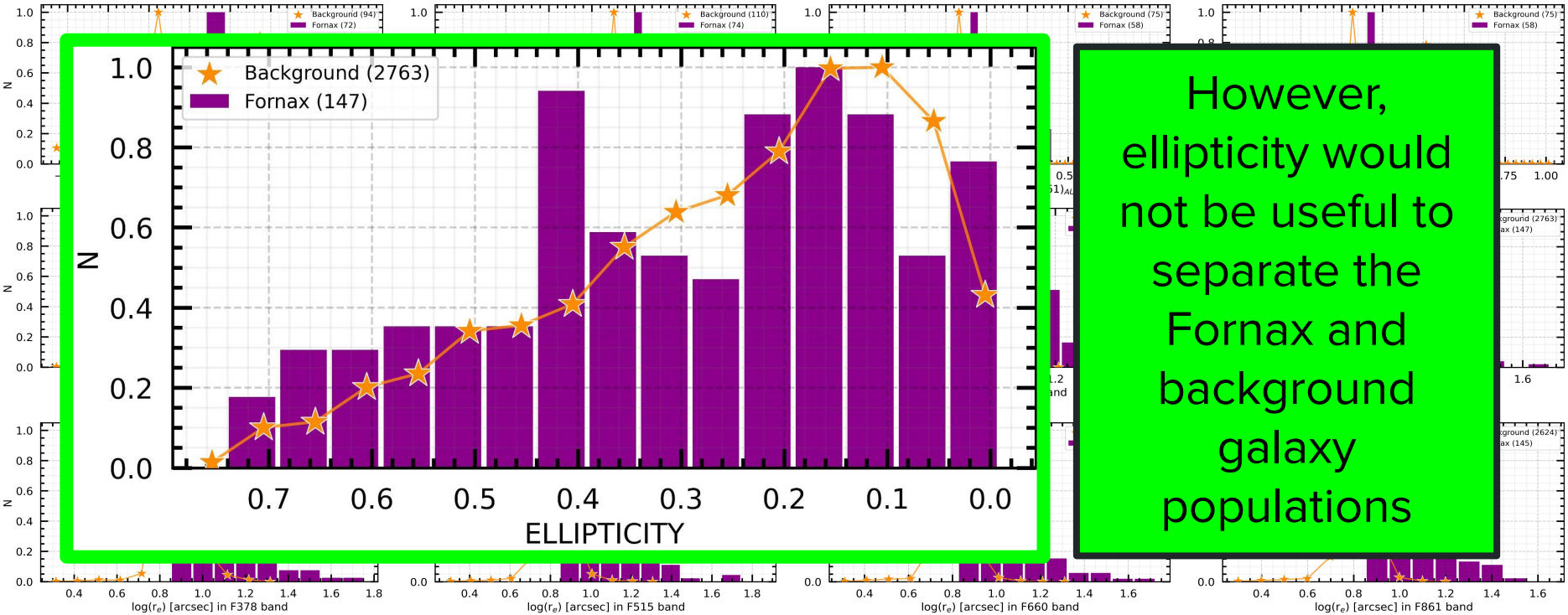
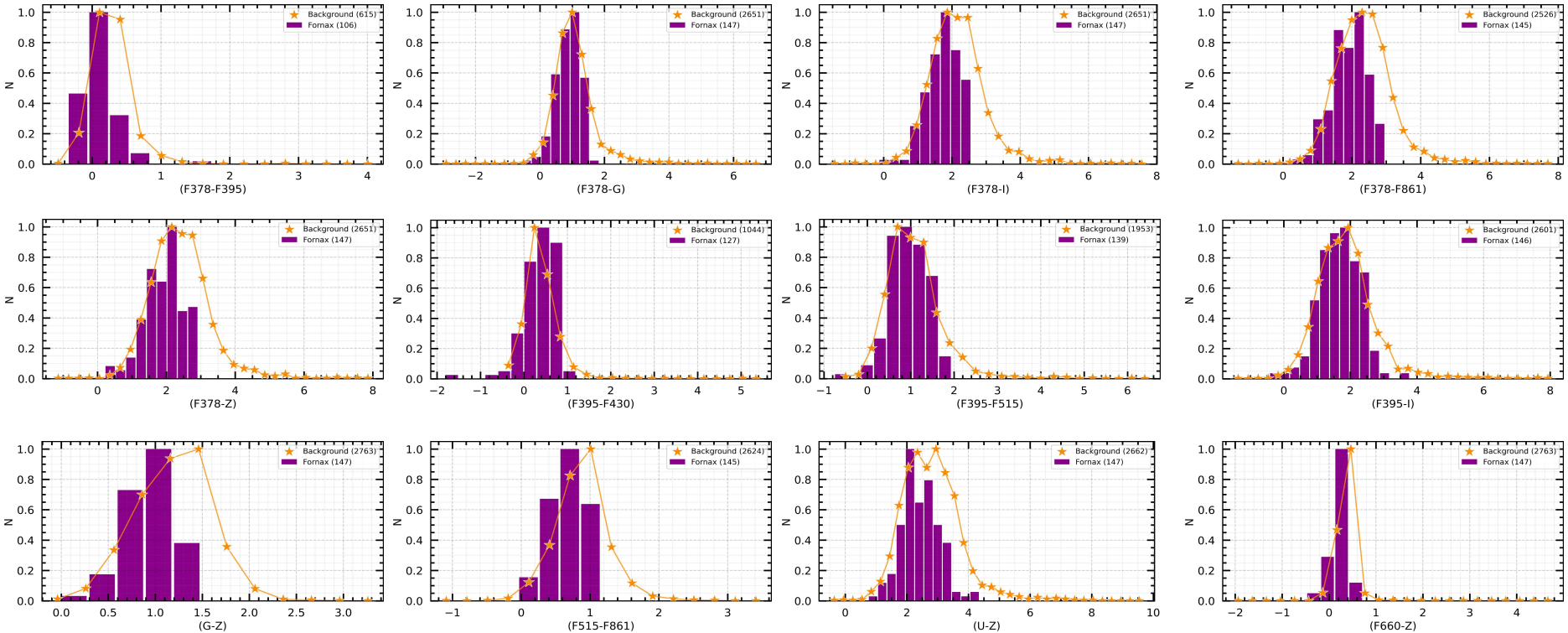


However, ellipticity would not be useful to separate the Fornax and background galaxy populations

Apparent total colors by themselves might help in some cases and not in others



Preliminary Result

Using the combination of some apparent photometric and structural parameters we expect that, at least, we can reduce the background contamination in a sample of Fornax galaxy candidates

Future work

- Explore additional parameters (e.g. position angle) and define a set of apparent photometric and structural parameters that, all together, work as selection criteria to identify new Fornax candidates in the 23 Fornax fields.

- Apply our criteria to the galaxies located in the 20 S-PLUS fields surrounding Fornax to try to identify new Fornax members in that unexplored region.

You are welcome to join the Fornax discussion session tomorrow at 15:00 (AR/BR time)

Comments or suggestions: jpcalderon@fcaglp.unlp.edu.ar

THANK YOU!