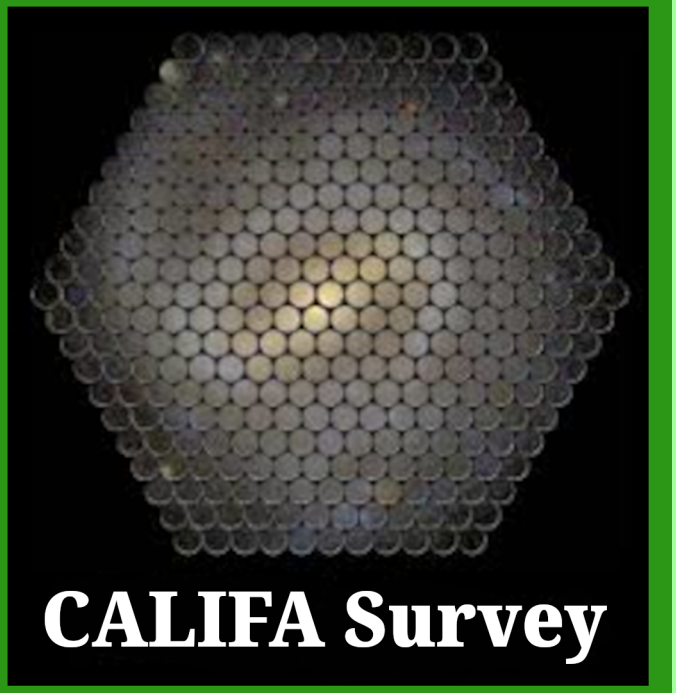
#NAMposter2021

Physical Properties of HII regions in the CALIFA survey



CALIFA Survey

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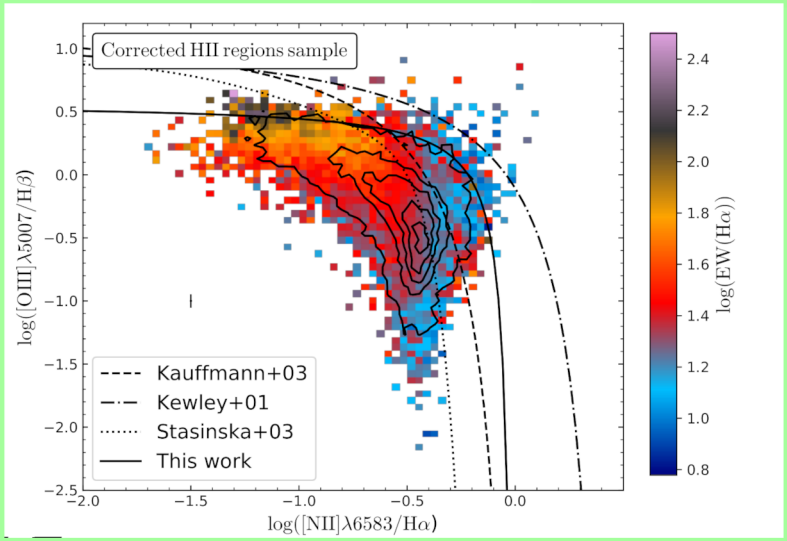
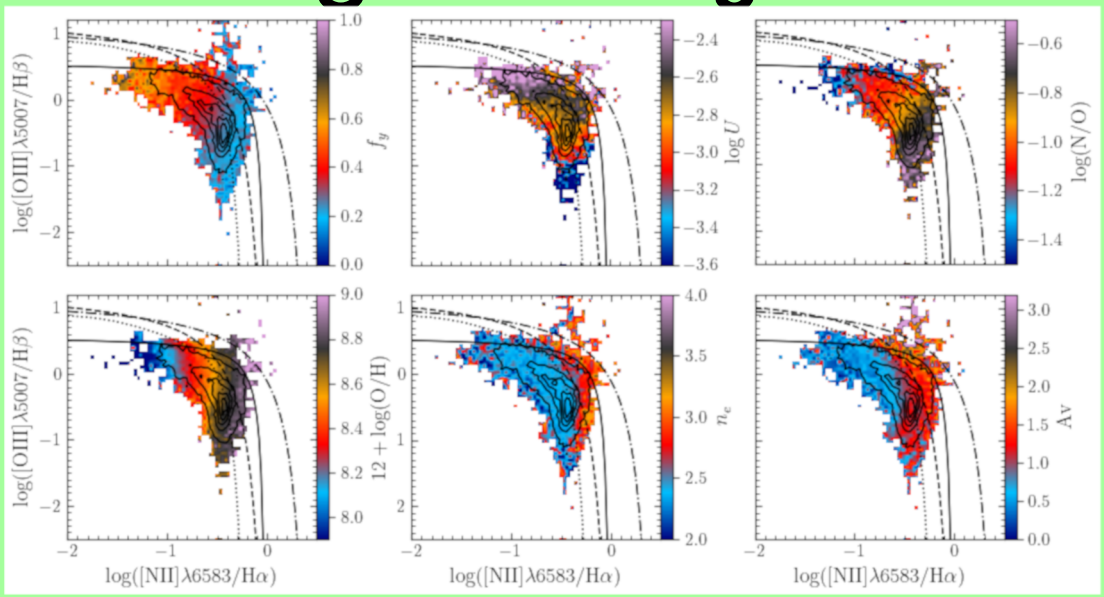
HII regions Catalog

We used the last catalog of HII region based on CALIFA data.
This catalog provides the spectroscopic information of ~26,000 individual regions.
The catalog includes the flux intensities and the equivalent widths of 51 emission lines in the optical spectral range.

(Espinosa-Ponce, C, et al, 2020 2020MNRAS.494.1622E)



HII regions Physical Properties



(Espinosa Ponce, C, *in prep*)

We calculate the physical properties of HII regions using strong-lines calibrators:

- Fraction of young stars (*fy*)
- Oxygen Abundance
- Ionization Parameter
- N-O ratio
- Electronic density
- Dust extinction

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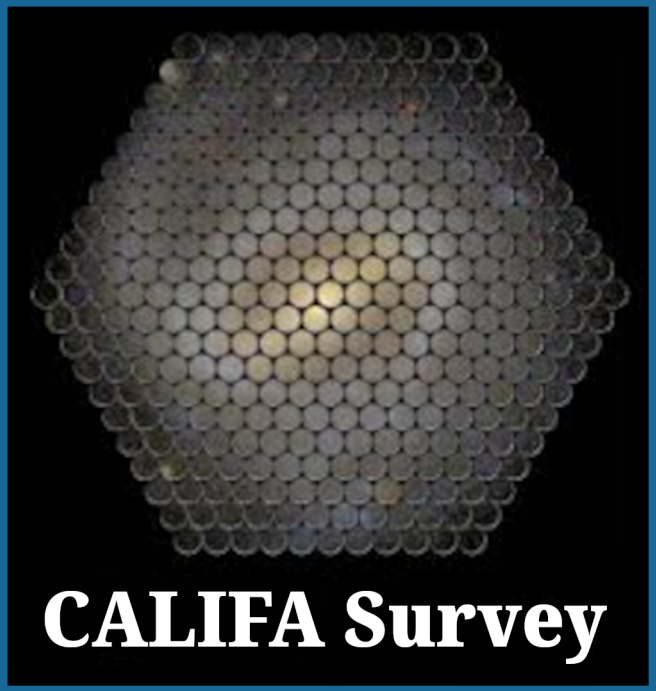

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Radial gradients of physical properties

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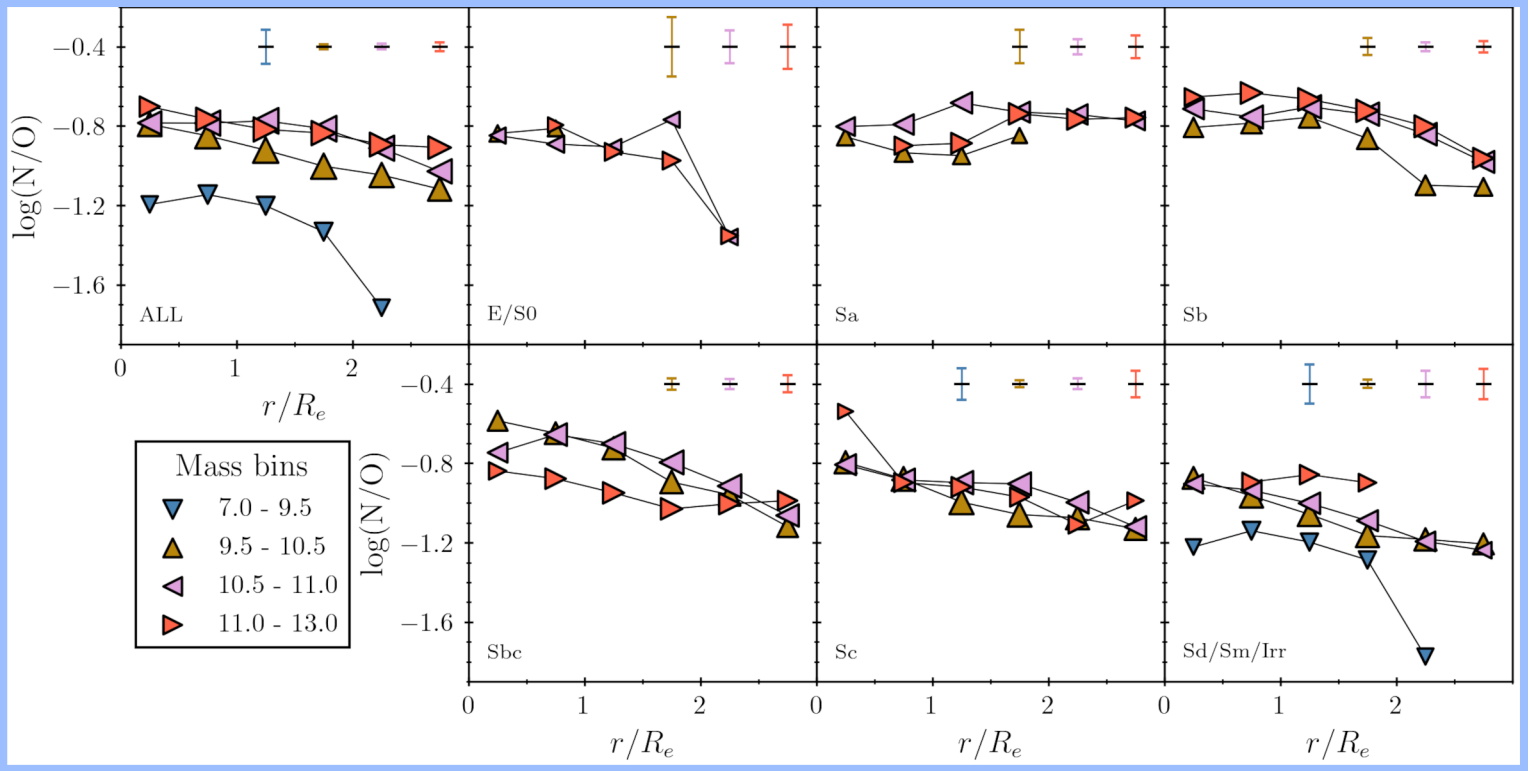
We calculate radial gradients for each physical property.
We present the radial gradient for N/O ratio for the whole sample of HII.
Each color represents a different mass bin of the respective host galaxies.
In order to further evaluate how the properties of galaxies affect these properties, we can separate the sample into morphology bins.
We present a different morphology bin in each panel.
The complete study with other physical properties listed here and the relations of each one with others will be published soon, so stay in tune.



(Espinosa Ponce, C, *in prep*)

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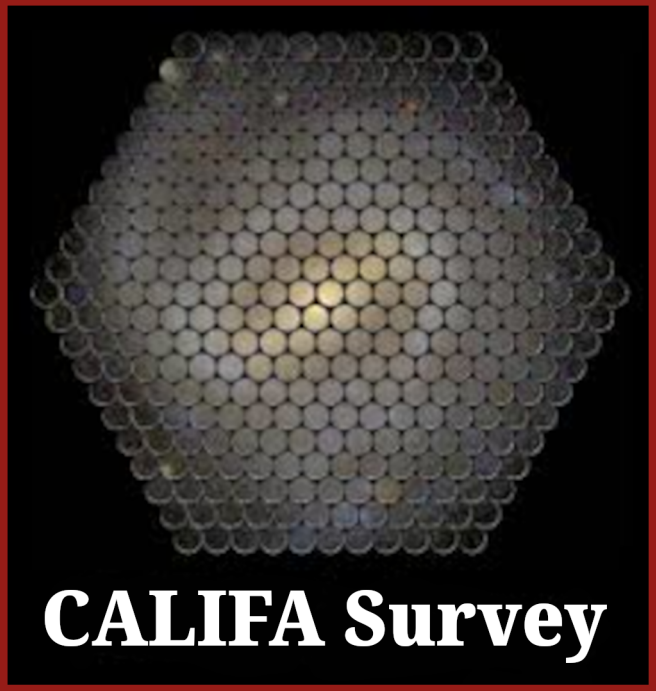

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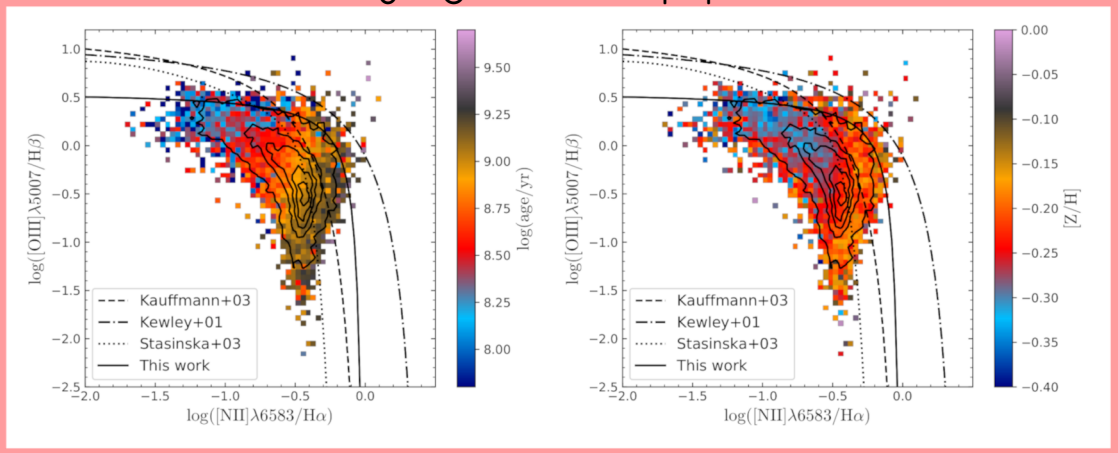
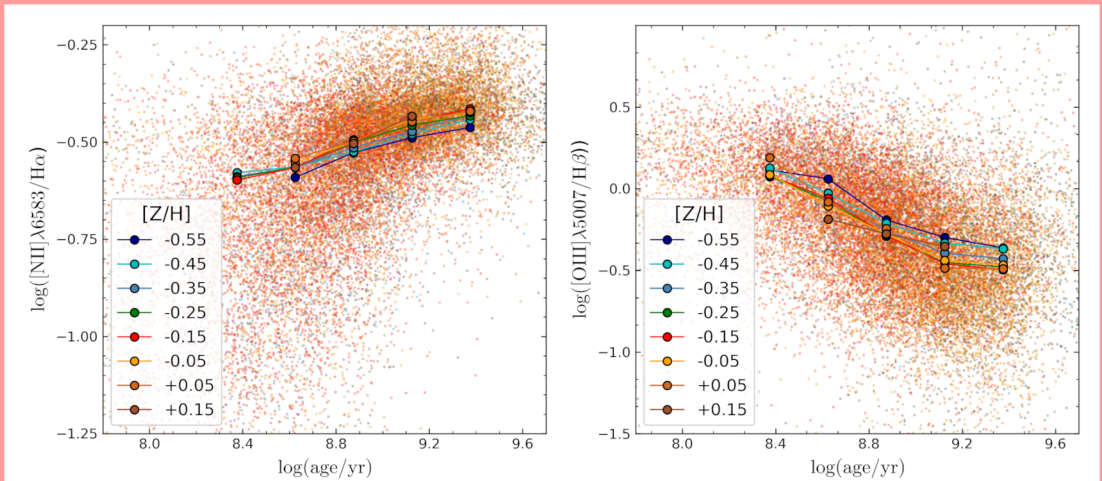
Stellar properties and physical properties of HII regions

(Espinosa-Ponce, C, et al, 2020 2020MNRAS.494.1622E)

We compare the distribution of the age and metallicity of underlying stellar populations.We show the distribution of HII regions across the BPT diagram with a color code representing properties of the underlying stellar population



Also, we study the distribution of nitrogen and oxygen line ratios along with the luminosity-weighted age of the corresponding underlying stellar population at the location of each HII region.



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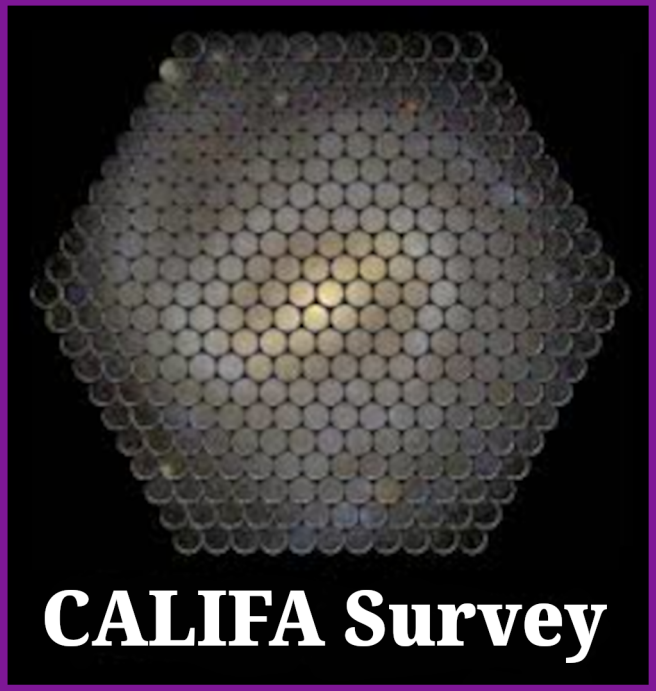
Physical Properties of HII regions in the CALIFA survey



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Stellar properties and physical properties of HII regions

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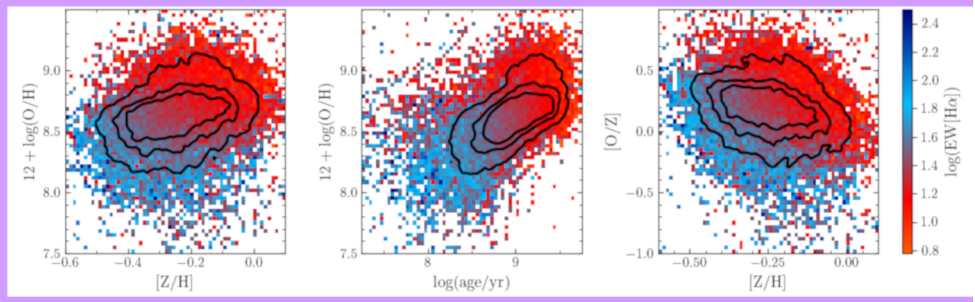
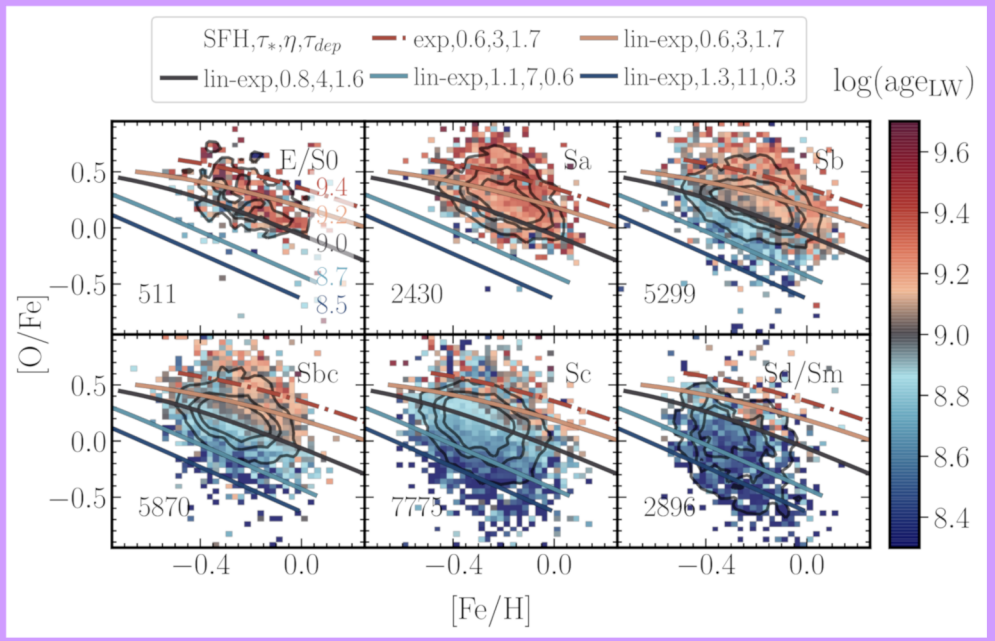
We compare the oxygen abundance with the metallicity and age of the underlying stellar population.
We found a correlation between oxygen abundance and the underlying stellar populations.



(Espinosa Ponce, C, *in prep*)

We study the distribution of the relative oxygen to iron abundance, as a function of iron abundance.
The oxygen to iron abundance is constructed from the gas phase abundance transformed to oxygen abundance adopting a solar oxygen abundance and the iron abundance.



Sánchez, S.F. et al, submitted
2021arXiv210606833S

We can remark that:
- The ratio between both parameters, defined as oxygen to iron abundance, is a good proxy of the alpha-enhancement.
- [O/Fe] presents a decline with iron abundance similar to the one observed for alpha in the milky way and early-type galaxies.
- The absolute scale of oxygen to iron abundance depends on both the stellar mass and morphology of the galaxy, with a much weaker variation of the slope.
-And we reproduce the observed trends using chemical evolution models