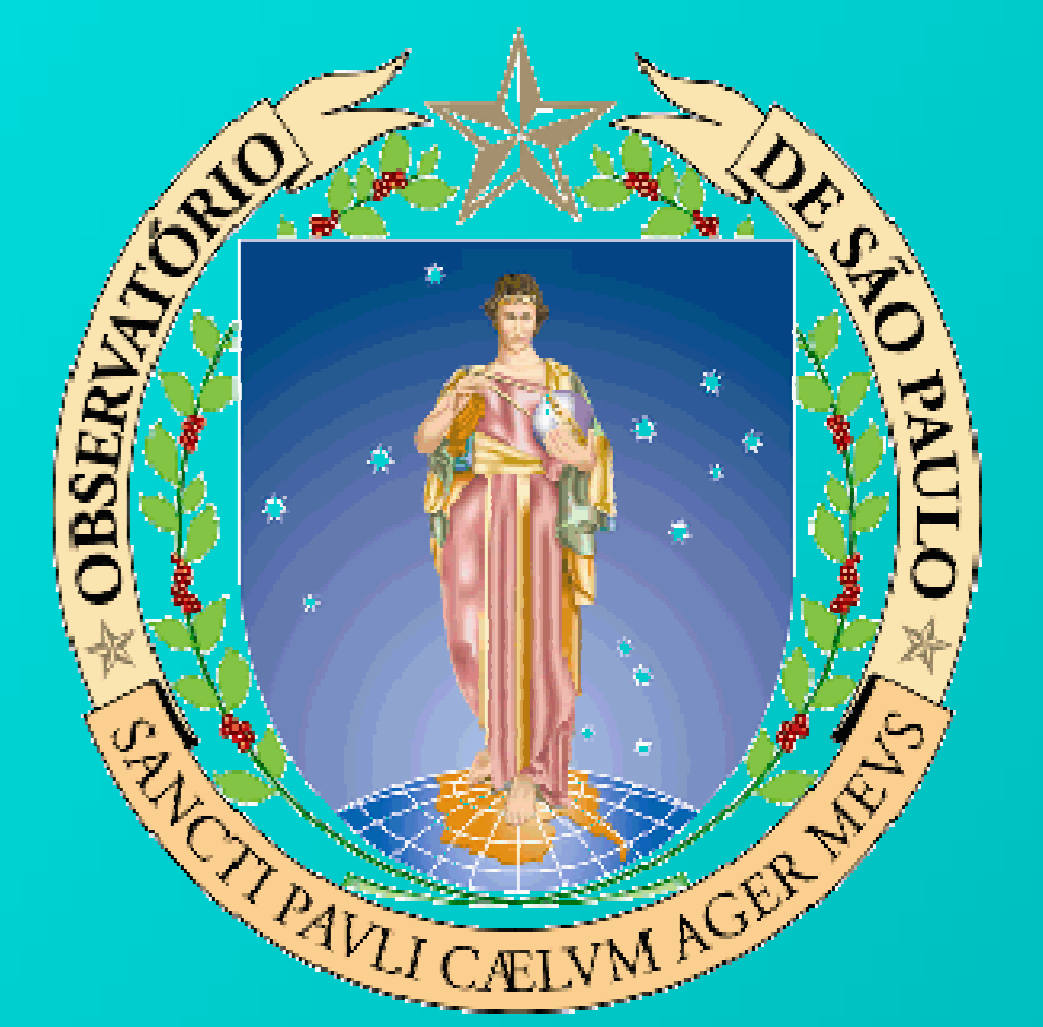




# The stellar populations in the AGN/Starburst galaxy NGC 7582

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## I - Introduction

•NGC 7582 was defined as a AGN/starburst galaxy, since its optical spectrum reveals features of both Seyfert and star formation at the center. The X-ray spectra shows characteristics of the AGN as well.

•In this work, our goal is to analyze the features of the stellar populations located in the 3.5 x 5 arcsec central region of NGC 7582.

## II - Observations and methodology

- Observations were made using the GMOS-IFU at the Gemini South.
- We used the B600 - G5323 grating, producing a spectral range of 4230-7070Å with R = 2400. Three exposures of 720 s were averaged.
- The final datacubes were flux calibrated. We also corrected for the atmospheric differential refraction effect. Richardson-Lucy deconvolution was performed with 6 iterations in each spectral pixel image of the datacube.
- We adjusted stellar population models, using the *starlight* code (Cid Fernandes et al, 2005), in each spectrum of the datacube, with a spatial sampling of 0.05"x0.05". Maps of different population were constructed, revealing age and metallicity structures.

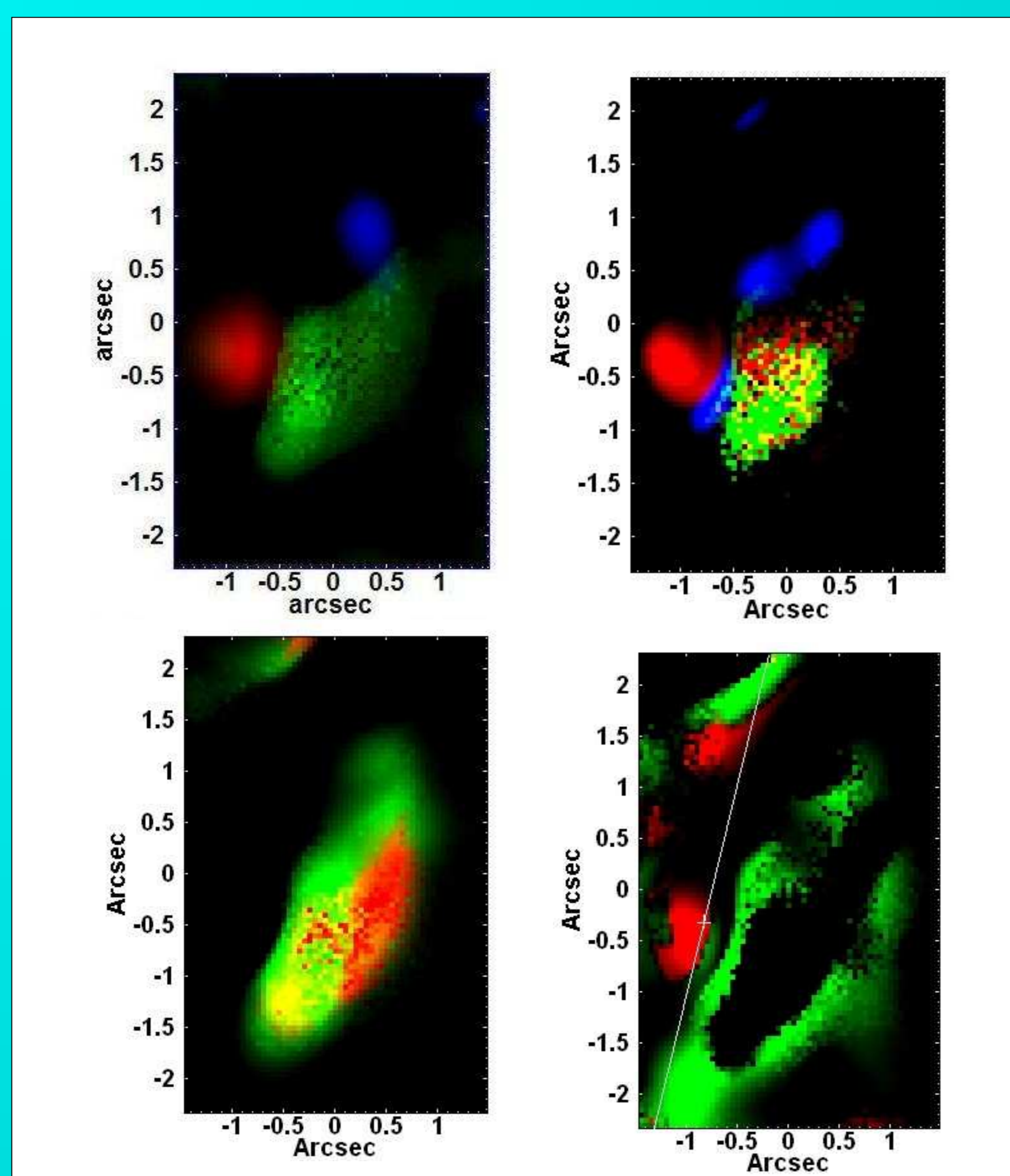


Figure 2 - a) (top left) Image from the broad H $\alpha$  wing (red), broad H $\beta$  (green) and the WR 4640-60 feature (blue); b) (top right): Young metal-rich population (red), young metal-poor population (green), young solar metallicity population (blue); c) (bottom left) Intermediate age population. Red is metal-rich and green is metal-poor; d) (bottom right): Old population. Colors are the same as in c).

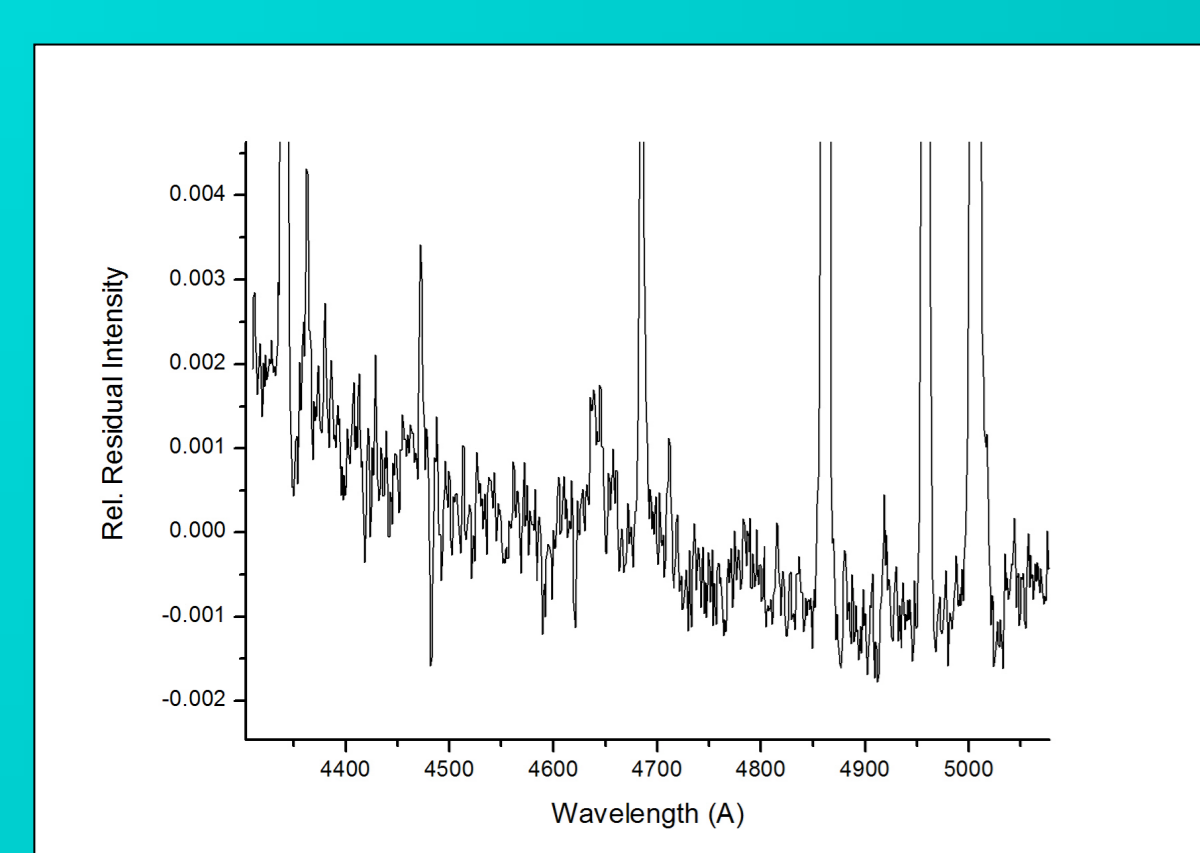


Figure 3: Spectrum extracted from the WR Cluster region, showing the feature at 4640-60 Å.

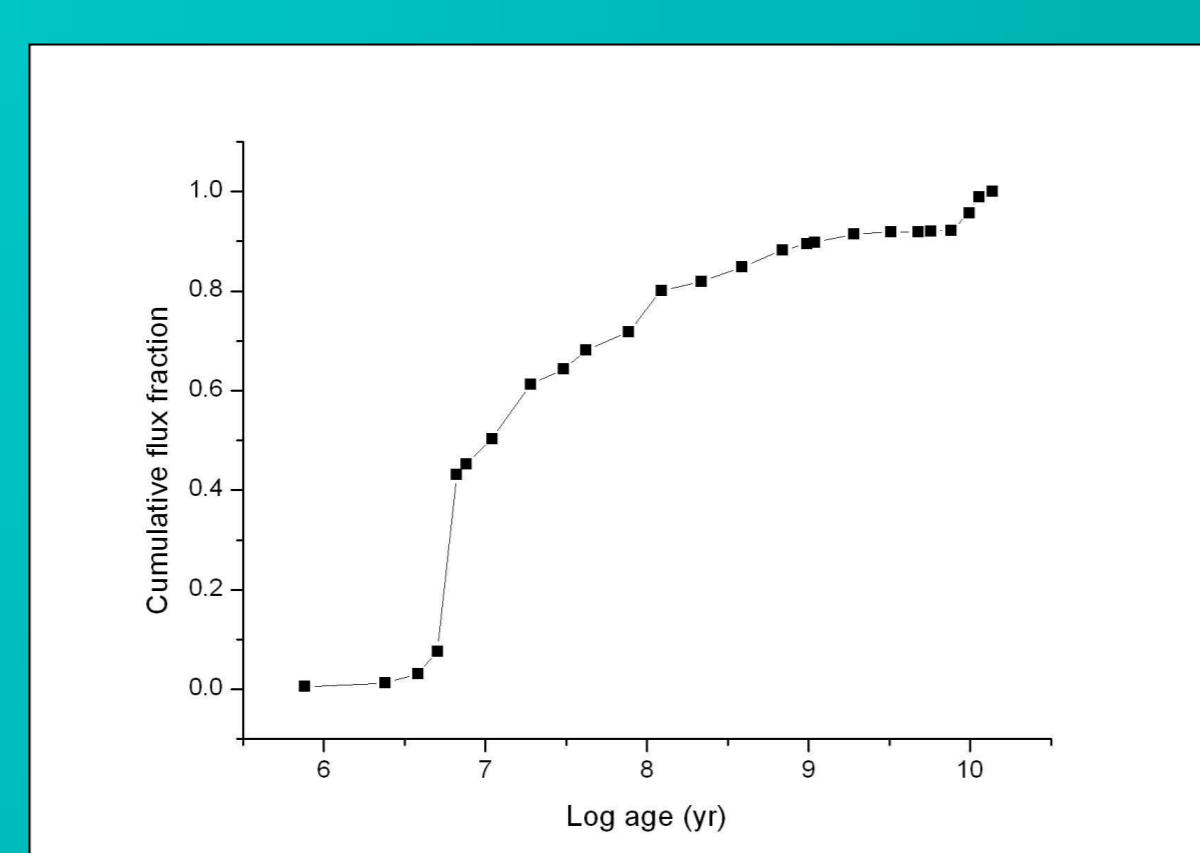
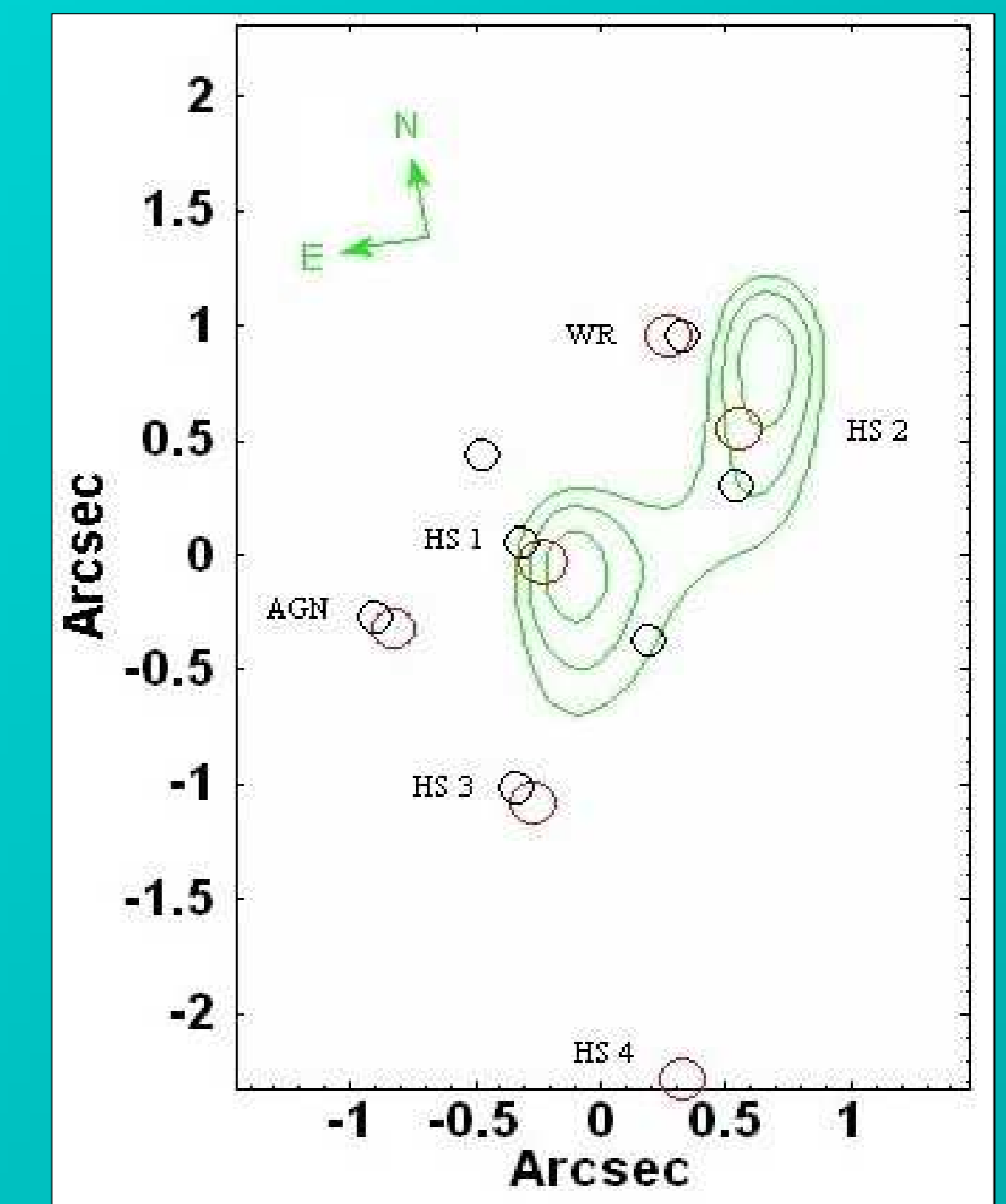


Figure 4: Star formation history in the FoV. The sudden increase at  $5.7 \times 10^6 - 10^7$  yr suggests that a burst of star formation happened at this epoch.

Figure 1 - Scheme of the objects found in NGC 7582. The isophotes are two H II Regions. The AGN, WR Cluster and 4 hot spots are indicated in the figure.



## III - Results and conclusions

•We detected three H II regions, four hot spots (HS), a Wolf-Rayet feature and the AGN. Figure 1 shows a scheme of the object distribution, together with point-like sources detected by HST.

•The solar metallicity young population map reveals the WR cluster and two others; they are probably the ionizing sources of the H II regions. The metal-rich and metal-poor young pseudo-populations are due to the featureless continuum of the AGN. The extended source (green) is light from the AGN, scattered by electrons, molecules and dust present in the ionization cone. Figure 2a and 2b compare the results from the stellar synthesis and images made from emission lines of the datacube.

•Intermediate age and old populations are also present in the central region of NGC 7582. Part of the light of the intermediate age population still comes from the featureless continuum. The metal-rich old population seems to be present at the galactic bulge and the metal-poor population encircles the one of intermediate age (Fig. 2c and 2d)

•In fig 4 we show the history of star-formation over the FoV. A sudden increase at  $5.7 \times 10^6 - 10^7$  yr suggests a burst in this epoch.

•Figure 5 shows the spectra and stellar synthesis of three positions in the FoV.

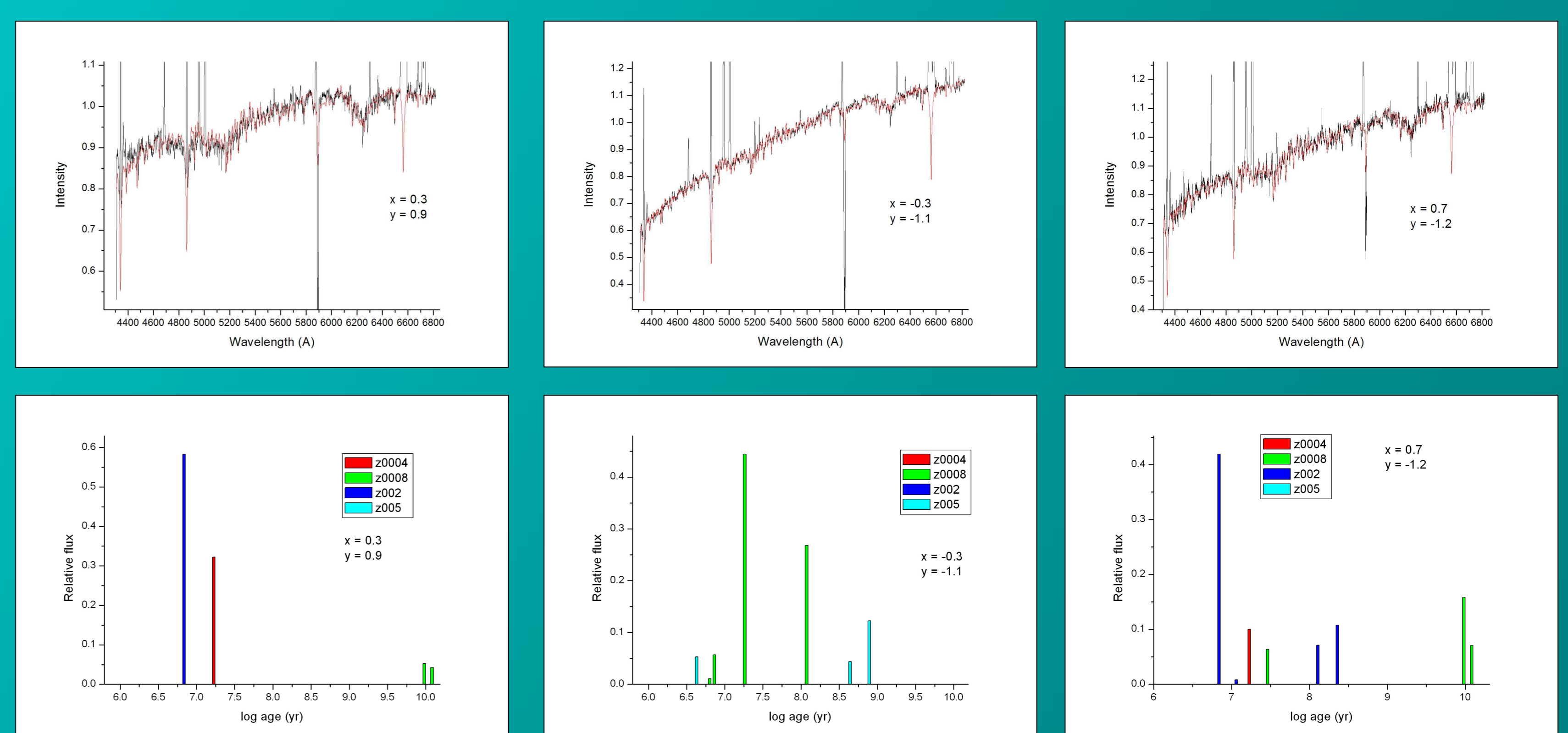


Figure 5: Spectra extracted from different positions in the FoV (black) with the stellar models (in red). Below each spectrum, the correspondent stellar populations. Left: The WR Cluster region, middle: the hot spot 3 region; right: region with no special optical feature.

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