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**Abstract:** The ERC «ASSESS» project aims to determine whether episodic mass loss is a dominant process in the evolution of the most massive stars by conducting the first extensive, multi-wavelength survey of evolved massive stars in the nearby Universe. The project hinges on the fact that mass-losing stars form dust and are bright in the mid-infrared. We investigate the properties of evolved targets, selected by mid-infrared archival photometry from Spitzer, in ~25 nearby galaxies and estimate the amount of ejected mass, which will constrain evolutionary models. In this work we present our first results from the northern hemisphere survey, which includes the galaxies NGC 6822 and IC 10.

## SELECTION CRITERIA

The targets were selected with a priority system based on their magnitudes at 3.6 and 4.5  $\mu\text{m}$  and whether optical or NIR photometry is available in any band (Table 1)

	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	Priority 6
$m_{3.6\mu\text{m}} - m_{4.5\mu\text{m}}$	$\geq 0.5$	$\geq 0.25$	$\geq 0.5$	$\geq 0.25$	N/A	N/A
$M_{3.6\mu\text{m}}$	$\leq -9.75$	$\leq -9.75$	$\leq -9.75$	$\leq -9.75$	N/A	N/A
Optical / NIR	Yes	Yes	No	No	Yes	No
NGC 6822	4 (7)	3 (3)	1 (1)	-	18 (29)	1 (1)
IC10	1 (1)	2 (2)	1 (2)	-	11 (14)	5 (12)

Table 1: Priority system indicating the cuts on the classification and the targets detected and pre-selected (in brackets)

## GALAXIES

	Type of galaxy	Distance [Mpc]	[Fe/H]
NGC 6822	Dwarf	0.50 [1]	-0.32 [2]
IC10	Dwarf	0.79 [3]	-1.28 [4]

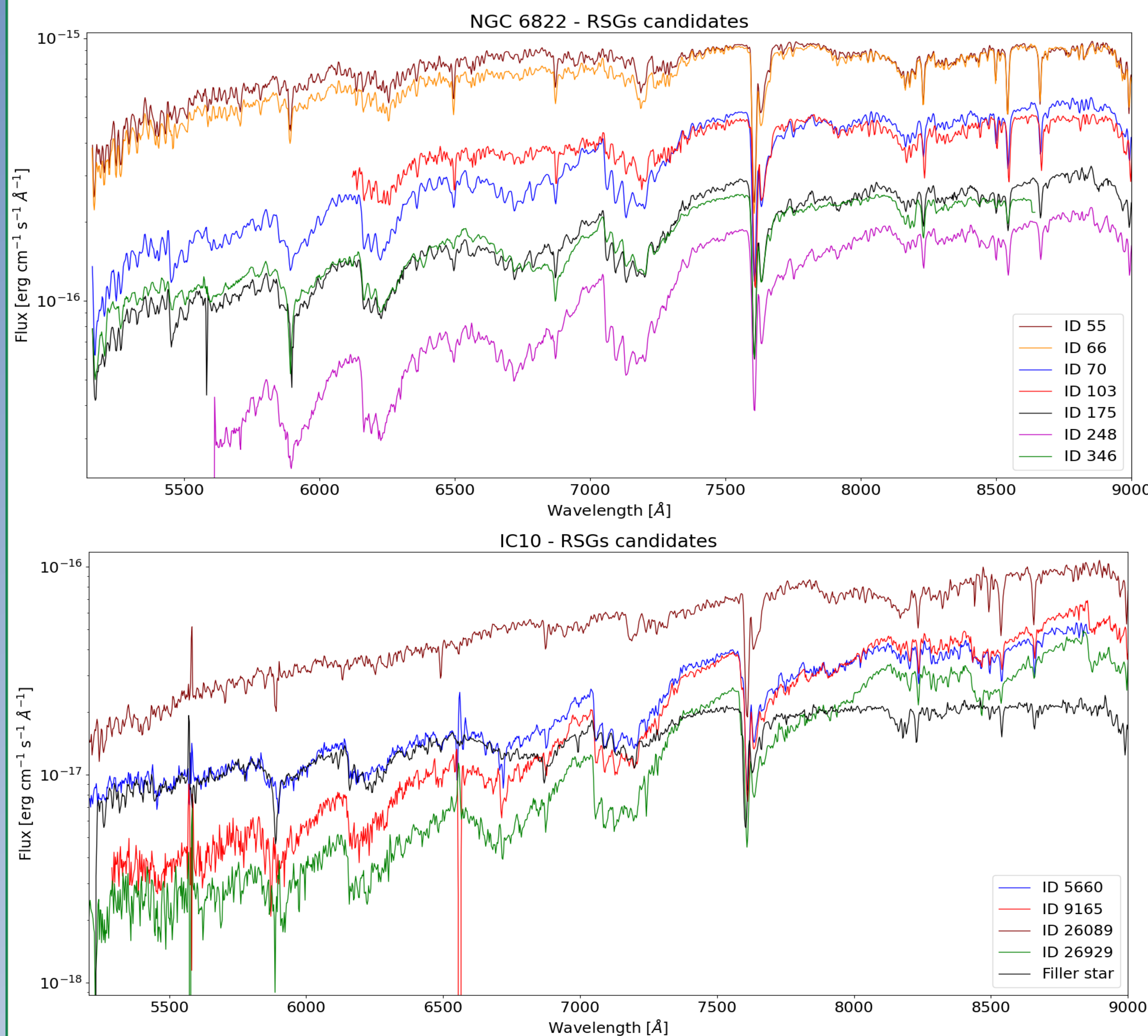
Table 2: General properties of the galaxies observed

## RESULTS

The observations took place in August 2020 with OSIRIS (GTC) using the grism 1000R in the multi-slit mode. We observed NGC 6822 and IC10 with two and one pointing respectively with a total of 90 minutes (1350s x 4 exposures) per field. After a first spectral classification we found the main result of 8 RSG candidates in NGC 6822 and 6 in IC10 (figure 1), including some other objects such as OB stars, C stars or a YSG candidate (figure 2). For 22 of our targets, the S/N was too low to obtain a classification, so we only noted whether the slope was red or yellow. Some targets weren't detected in the optical despite their brightness in the IR, suggesting a high obscuration due to their dusty environment.

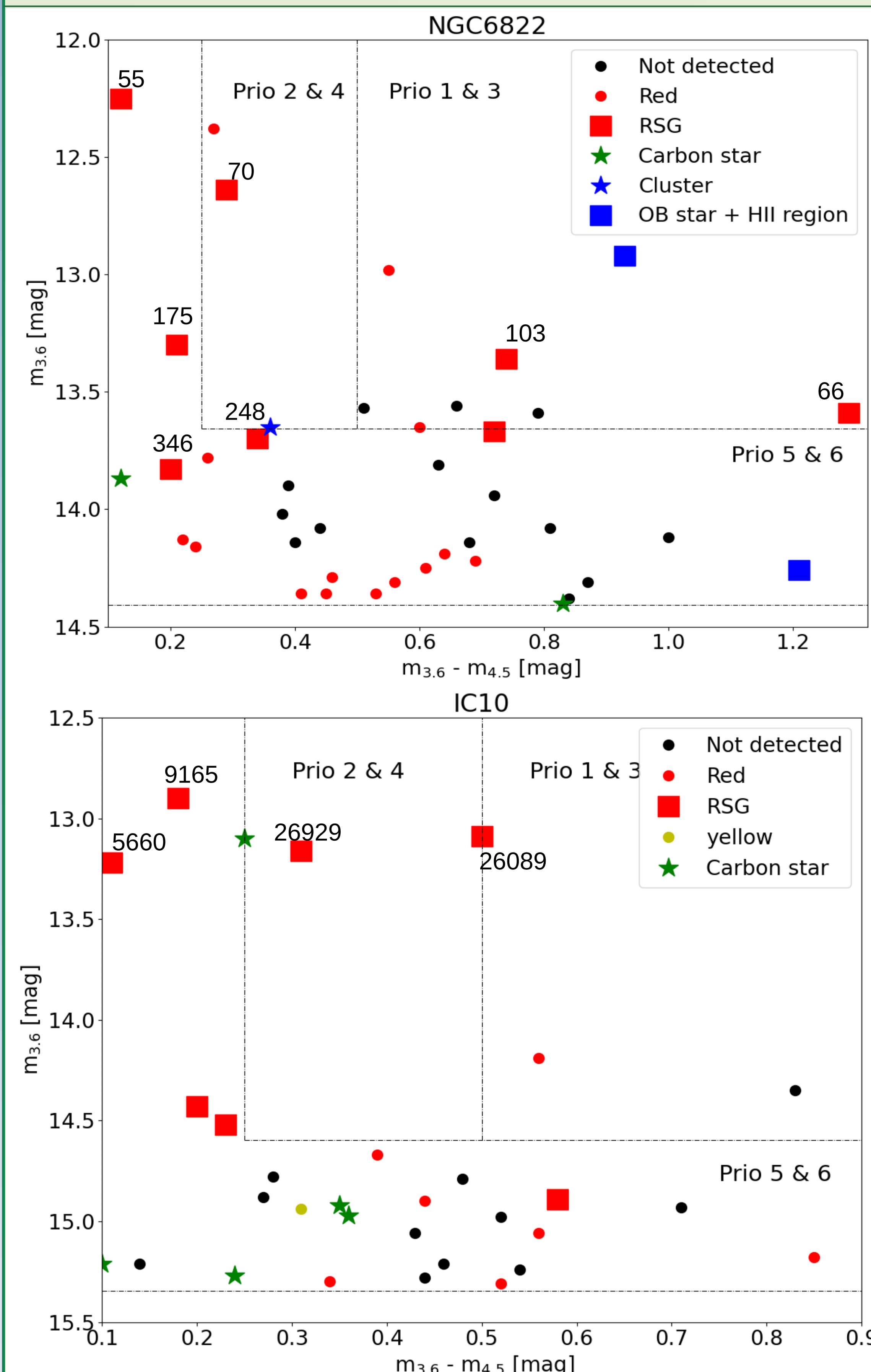
## RSG candidates

Figure 1: Spectra of the brightest RSG candidates. Up: NGC 6822. Bottom: IC 10



## CMD

Figure 2: CMD with the first spectral classification of the targets. Up: NGC 6822. Bottom: IC 10



## Coming soon in ASSESS project

- Observations for the northern survey carrying out now (4 galaxies more).
- Ending of the southern survey (8 galaxies) with FORS2 (VLT).
- Testing machine learning predictions on massive stars (Maravelias et al. 2022) [5]
- Follow-up observations of the most interesting targets from both surveys.
- MARCS modeling for cool stars and CMFGEN modeling for the hot ones.

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