Supernova remnant catalog in the PHANGS survey

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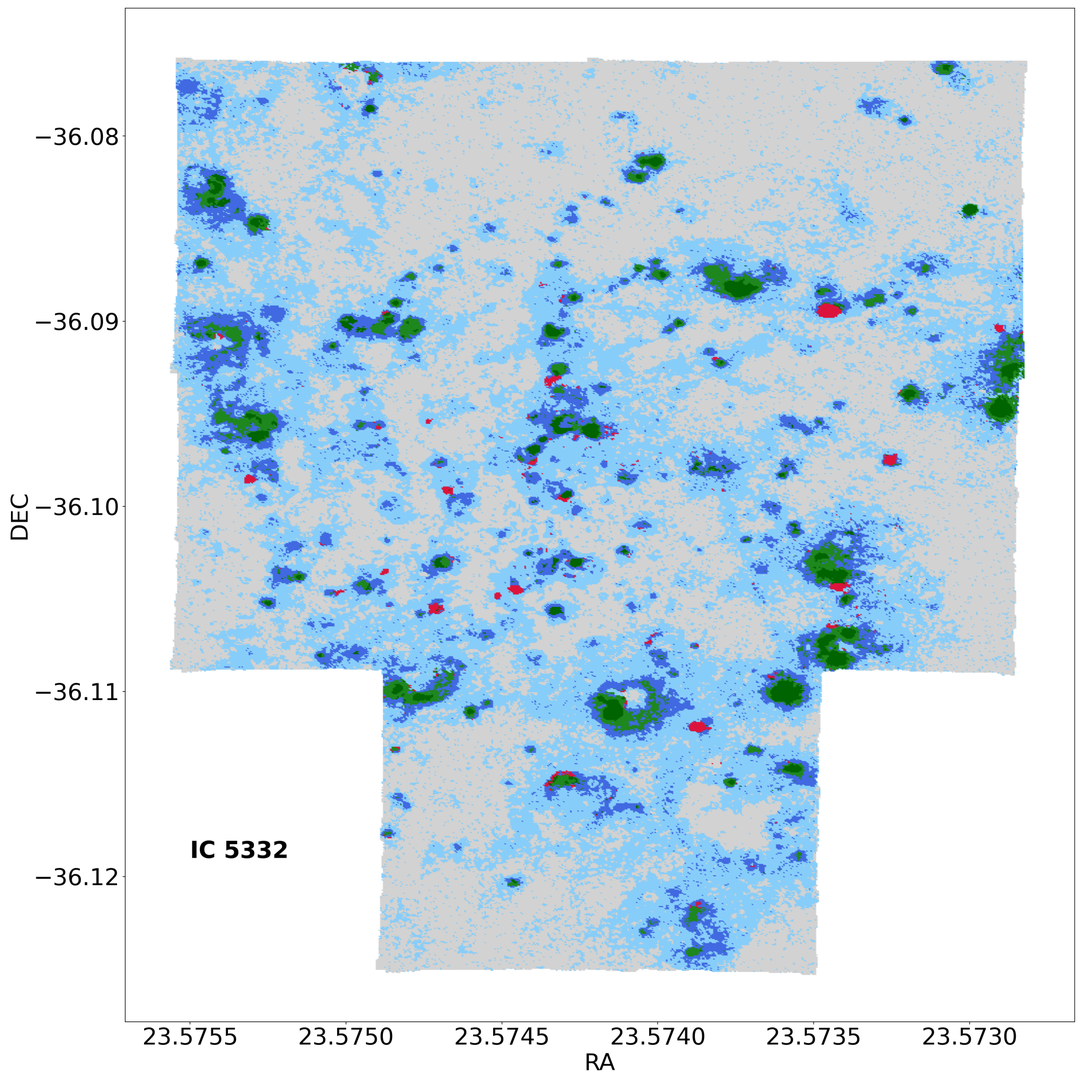
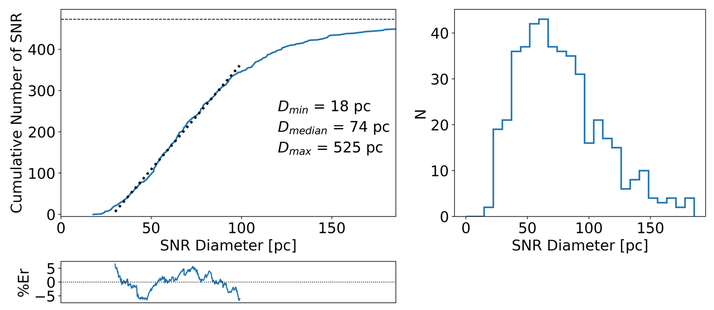
We have developed an unsupervised machine learning classification algorithm that is able to find the different structures of the ISM using only the spectral information in a spaxel-by-spaxel approach.



We have found 483 SNR along the PHANGS galaxy survey of 19 face-on star-forming spirals.

We have analyzed the size distribution of the SNR and compared it to the theoretical prediction for evolved pressure driven radiative shocks, taking into account the interplay between the remnant and the surrounding local density environment.

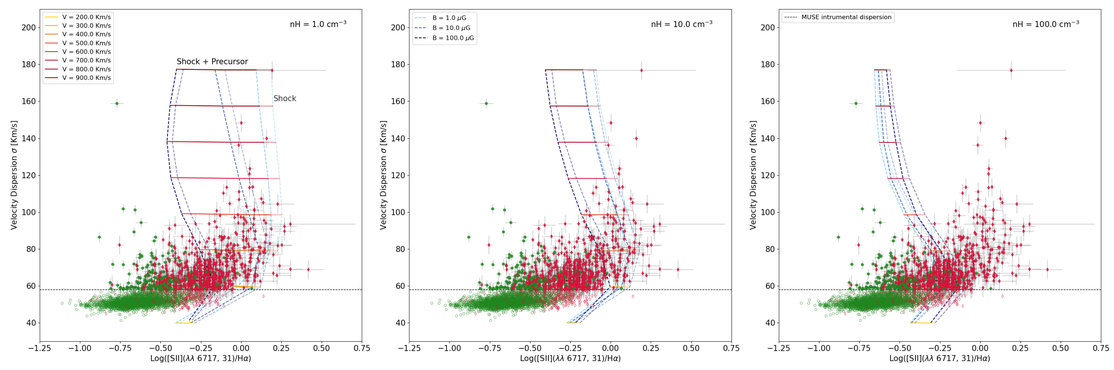


$$\frac{dN}{dR} \propto R^0$$

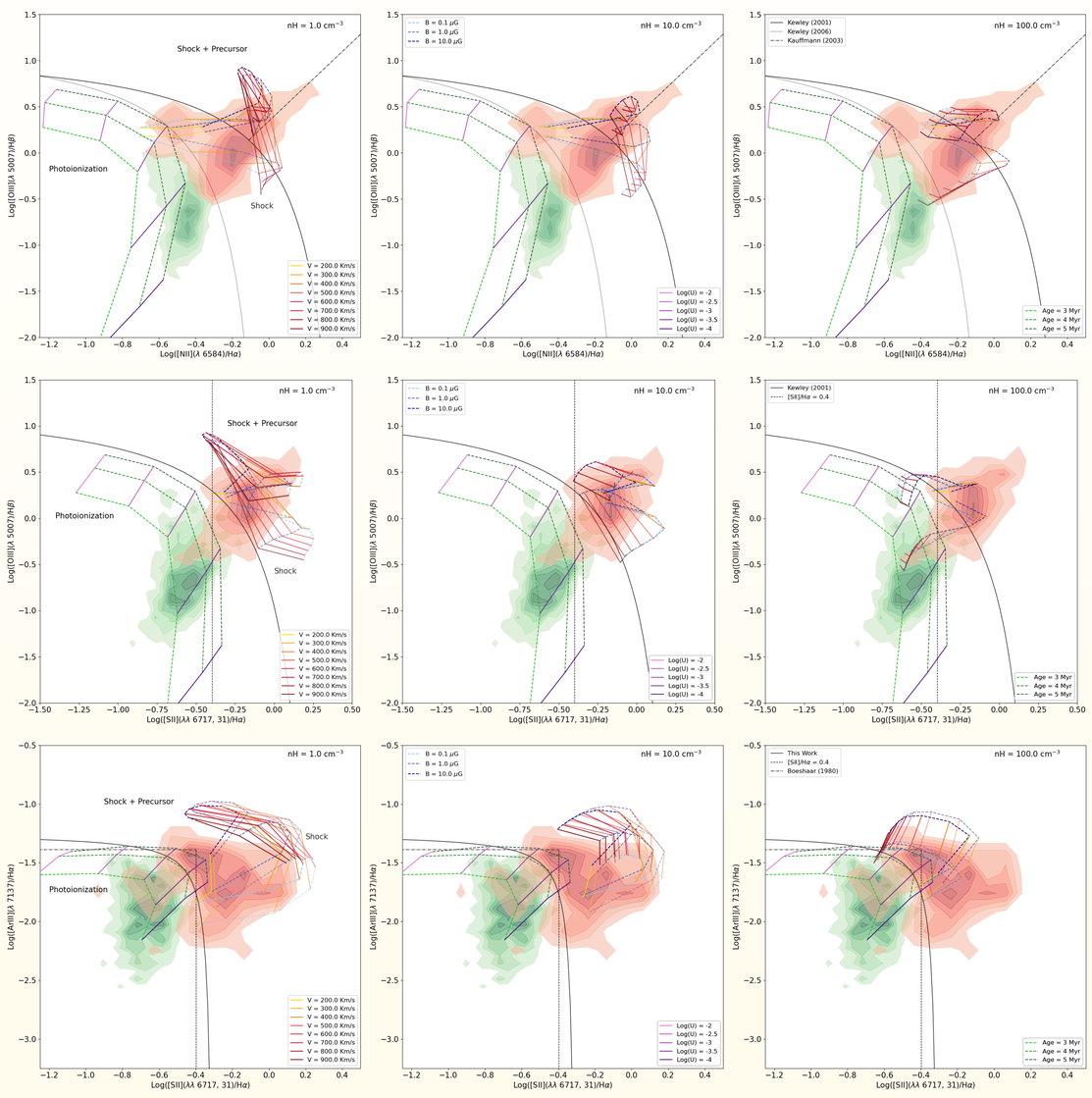
$$R_0 \simeq 14.0\,[pc]$$

$$R_{max} \simeq 51.3\,[pc]$$

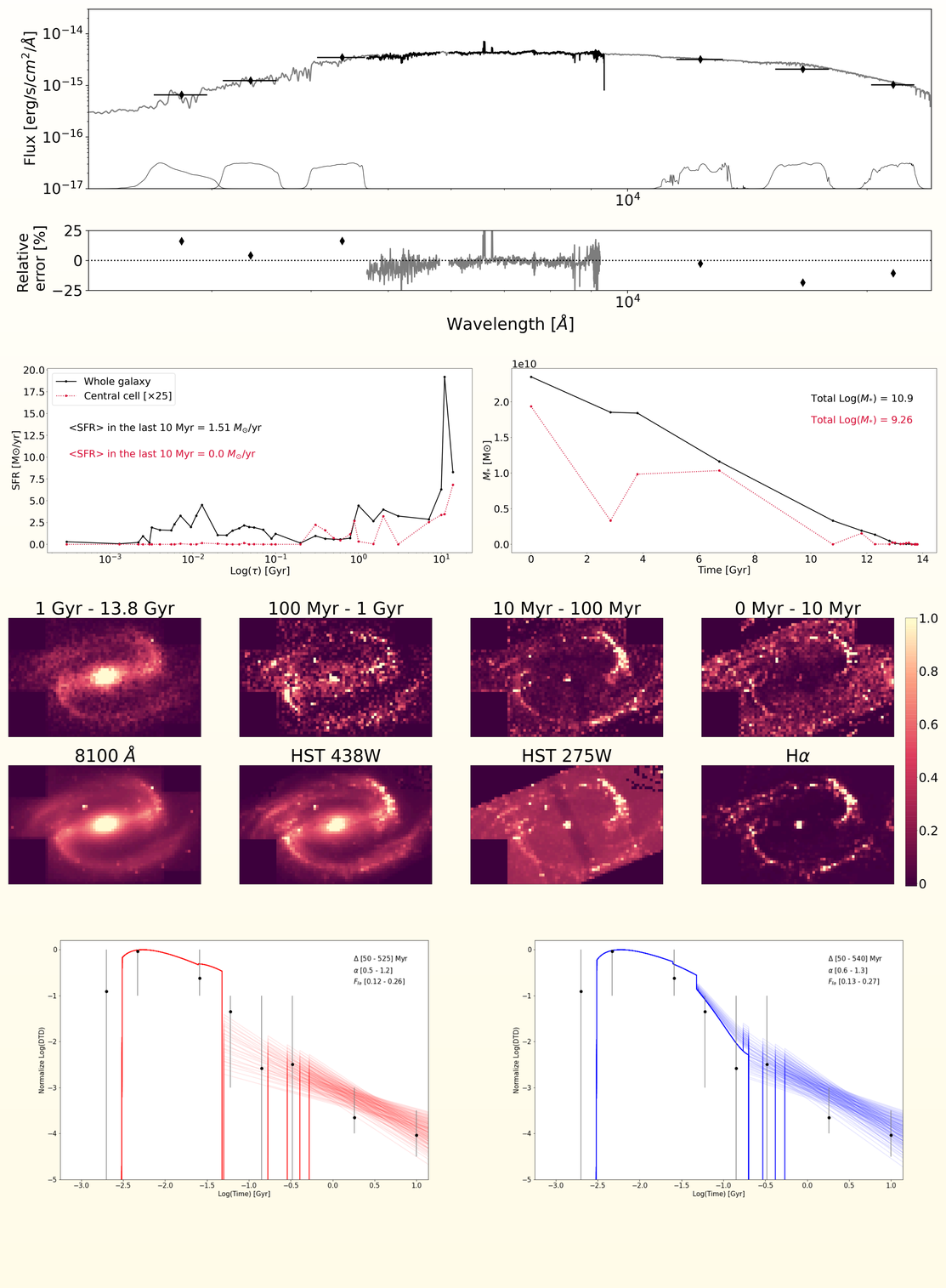
We have measured the kinematic properties of our SNR sample, and even taking into account the MUSE spectral resolution limitations, we can ensure that they are compatible with fast radiative shocks.



We have used the emission lines within the MUSE spectral range to explore different diagnostic diagrams, searching for new demarcation lines to discriminate HII regions from SNR, comparing these populations with state of the art theoretical models for radiative shocks (MAPPINGS) and star formation photoionized nebulae (CLOUDY).



Finally, using the stellar population synthesis technique we are able to derive the star formation history of the sample galaxies with a 400 pc resolution. Being able to set some constraints on the delay time distribution of SNR.



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