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Unveiling the nuclear activity in the least dense regions of the nearby Universe

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Unveiling the mechanisms that trigger active galactic nuclei (AGN) is a badly understood problem, that is crucial for our understanding of the galaxy formation and evolution. While interactions and galaxy mergers are associated with the triggering of powerful AGN, less luminous AGN would be driven by secular processes (Treister et. al., 2012). Over the last few years, several observational studies performed at optical wavelengths have tried to identify AGN triggering mechanisms in the local Universe. Despite these efforts, the main drivers for AGN triggering in isolated galaxies still remain unclear.

In this contribution, firstly, I will present the on-going CAVITY survey, an international collaboration with more than 40 members from different countries (Spain, Netherlands, Canada, France, Germany, and the United States). It will perform the first statistical study of galaxies in voids, the least dense areas of the Universe. Compared with the large number of works studying active galaxies in clusters and groups of galaxies, the number of studies characterising AGN in void regions is scarce to date. The void galaxies might have gone through a different dark halo mass assembly than galaxies in denser environments, suggesting an influence of the void large-scale environment on the black-hole growth. In fact, recently, void galaxies have been found to have different SFH than galaxies in denser environments (Domínguez-Gómez, J., et. al. accepted in Nature). Secondly, I will present our careful sample selection reducing possible bias in the selection and our preliminary results studying the nuclear activity in void regions overcoming previous limitations.

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