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On the search and characterization of black holes in low-mass compact galaxies

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With sizes typically below 2 kpc but stellar masses spanning the entire mass range (10^5 - $10^{11} M_{sun}$), the realm of compact galaxies is populated by different families: ultra-compact dwarfs (UCDs), compact ellipticals (cEs) and compact massive galaxies. Although scarce and rare, we need to understand the nature of these tiny galaxies: *what are the mechanisms that created them over such a wide mass range? Do they follow the same channels of formation and, therefore, do they follow the same scaling relations?*

In the last years major progress towards better understanding the stellar content and properties of UCDs and cEs has been made. However, one key property remains elusive due to the current instrumentation's limitations: the presence of an intermediate-mass or supermassive black hole at their centers. In this talk I will present a recent search for active black hole (AGN) activity in the largest compilation of low-mass compact galaxies to date. I will show that when we include these objects in the local scaling relations of galaxies and black hole mass, some long-standing issues like the possible existence of a flattening at the low-mass are better understood. I will also show how with MAVIS we will be able to populate that 'terra incognita' regime, opening a new era for the characterization of intermediate-mass black holes.

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