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**Title:** Fast rotating massive boson stars from strongly self-interacting scalar fields: stellar structure and multipole moments

**Abstract:** Massive boson stars are among the most promising candidates which could act as mimickers of ordinary astrophysical compact objects. They represent a theoretically motivated alternative to the black hole paradigm, which can be tested with current and future observations. In this talk we present a detailed analysis of a class of fast rotating boson stars with a quartic self-interaction coupling, focused to outline the main stellar features that affect the gravitational wave emission from binaries, and can be useful to disentangle them from astrophysical black holes. Our results strengthen and extend previous numerical works, showing that the non-trivial multipolar structure induced by the rotational flattening, differs, even for the most compact configurations, from the one of a Kerr black hole in a wide range of the boson star's spin. We also discuss the presence of ergoregions for specific stellar configurations, as well as the viability of universal relations between boson star observables.