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Boson Star Lensing at the Center of the Galaxy AMITAI BIN-NUN, Yeshiva University — Observations of the Sgr A* region in the galactic center have implied a large amount of matter in a small volume, leading to the assumption of a black hole at Sgr A*. However, dynamical observations cannot rule out the presence of a boson star, a compact object made up of scalar particles, as both objects are far more compact than current observational resolutions. While a boson star in the galactic center is disfavored for a number of theoretical considerations, we outline the first test that can directly observe a boson star. We accomplish this by studying strong gravitational lensing by boson stars, taking advantage of the fact that boson stars have an extended mass distribution that gives rise to a radial caustic curve and are transparent to electromagnetic radiation. We calculate the brightness of images formed by stars crossing these radial caustics and show that a boson star can give rise to much brighter images than a black hole with a similar mass.

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