

# Bounds on ultralight bosons from the Event Horizon Telescope observation of Sgr A\*

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Recently, the Event Horizon Telescope (EHT) has observed the first image of the supermassive black hole (Sgr A\*) at the center of our own Milky Way galaxy. EHT observations also give some information about the spin of Sgr A\*. They found that the dimensionless spin parameters ( $a^*$ ) 0.5 and 0.94 have passed all their tests. These observations can be used to study the Ultra light Bosonic (ULB) particles using Superradiance (SR), which is a process of a rotating BH losing its angular momentum and energy due to the existence of massive bosonic particles surrounding it. As a result of losing its angular momentum, the BH is spun down. Assuming that the BH spin has not been depleted via SR, we derive bounds on the masses of ULBs. If the scalar ULBs have self-interaction, self-interaction can prohibit the growth of the ULB clouds around the BHs. We use this property to constrain the axion decay constant. We constrain new regions in the parameter space of ultralight axion decay constant for a certain spin of Sgr A\*.

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