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Supermassive Black Holes ABRAHAM LOEB, Harvard University

Recent data indicates that almost all galaxies possess a supermassive black hole at their center. When gas accretes onto the black hole it heats-up and shines, resulting in the appearance of a bright quasar. The earliest quasars are found to exist only a billion years after the big-bang. I will describe recent observations of both the nearest and the most distant supermassive black holes in the universe. The formation and evolution of the black hole population can be described in the context of popular models for galaxy formation. I will describe the key questions that drive current research on supermassive black holes and present theoretical work on the radiative and hydrodynamic effects that quasars have on their cosmic habitat. Within the coming decade it would be possible to test general relativity by monitoring over time, and possibly even imaging, the polarized emission from hot spots around the black hole in the center of our Galaxy (SgrA^{*}).