

FOLLOWING SUPERMASSIVE BLACK HOLES OVER COSMIC TIME

HAGAI NETZER

School of Physics and Astronomy, Tel Aviv University

Abstract. The first black holes were seeded in pre-born galaxies in the early Universe, at redshift 10 or even higher. Their growth, in parallel to star formation and the growth of their host galaxies is, perhaps, the leading factor that determines the size and mass of the most massive galaxies of today. The mass of the largest black holes of today exceed 10 billion solar mass but, surprisingly, such supermassive black holes are observed also in galaxies whose age is less than a billion years indicating super-fast growth which is not yet fully understood. Active black holes are the lamp-posts of the Universe. Every 50-100 million years they light up for a short period of time, enabling a glimpse of their parent galaxies and their environment. I will present the black hole history of the Universe using recent observations. To each black hole I will assign a measured mass – one of the greatest achievements of modern astronomy – and present evidence that black hole activity is related to mergers of galaxies, and to the clearing of star-forming gas. Such processes shape galaxy evolution and morphology and lead to what astronomers call “red and dead” galaxies.