Observational evidence for understanding the growth of supermassive black holes

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Supermassive black holes are found in the centres of all massive galaxies, but how they are formed and evolve are still largely unknown. They may be formed from seed black holes of ∼100-100000 $M_\odot$ and then undergo mergers and accretion to reach the high masses that we observe today, however, the formation mechanism and thus the mass of the seeds are still unconstrained, as are the rate of accretion and the role of mergers. The *Laser Interferometer Space Antenna* (LISA) will detect gravitational waves emitted by both merging massive black holes and tidal disruption events, and these observations will provide information about the masses and the redshifts of the black holes. The next generation X-ray observatory, *Athena*, is expected to be launched at a similar time to *LISA* and it will provide complementary information such as accretion rates and details about the environment in which these events occur. Here I will present electromagnetic signatures of tidal disruption events and massive black hole mergers and discuss future synergies of *LISA* and *Athena* to better understand these types of events and thus better understand the growth of supermassive black holes.