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How to assemble extremely massive black holes in a very short quasar life-time

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The existence of extremely massive black holes at very high redshift is a true challenge to the commonly accepted black hole formation and evolution models. The quasars found at z>4 host extremely massive black holes, up to the case of a quasar found at z>6 with 11 billion solar masses. These objects are particularly problematic: there is not enough time to accrete such large masses in a standard scenario, and their disc emission seems consistent with sub-critical accretion. The presence of a jet could speed up the accretion process enough to build up 10^9Msun black holes before z~6 from a reasonable black hole seed. Studying the population of jetted quasars is hence necessary. The peculiar orientation of blazars (that have jets directed along our line of sight) makes them the most effective tracers of the whole population of jetted quasars. Do relativistic jets really have a role in the early formation of extremely massive black holes? Or a different accretion paradigm is required to justify the observed high-redshift population? We will explore the options, trying to draw conclusions about one of the most urgent questions on quasar physics: how could the first, most massive black holes form so fast in the early Universe?

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