

## Finding the First Quasars with E-ELT and Euclid (Daniel Whalen)

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Although more than 160 quasars have now been discovered at  $z > 6$ , little is known of their origins or early evolution for certain because observations to date have been limited to  $z = 7.5$ . This picture will soon change with the advent of the E-ELT and TMT, whose high sensitivities could allow them to detect these rare black holes at much earlier times. I will present synthetic NIR AB magnitudes at  $z = 6 - 20$  for every stage of primordial quasar evolution: the birth of a supermassive Pop III star (SMS), its collapse to a direct-collapse black hole (DCBH), and its subsequent growth in cold accretion flows to  $\sim 10^9$  solar masses by  $z \sim 7$ . We find that THE E-ELT could detect a SMS and DCBH out to  $z \sim 15$  and capture these quasars at later stages of evolution down to  $z \sim 7$ . In particular, there is an excellent opportunity for synergies in which quasar candidates could be identified by wide-field surveys by Euclid or WFIRST and followed up in spectroscopic detail by E-ELT.

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**Track Classification:** Synergies