Quasars are some of the brightest objects in our Universe and are believed to play an important role in galaxy formation and growth of the largest black holes. While variability has long been recognized as a characteristic feature of quasars, astronomers have only recently identified extreme quasar variability; dramatic changes in either the brightness or spectral characteristics of sources. In particular, a new class of ``changing-look quasars" have recently been identified where the strong UV continuum and broad hydrogen emission lines associated with "unobscured" quasars either appear or disappear on timescales of several years. The physical processes, responsible for such changes are still debated, but fundamental changes in the quasar, such as the black hole accretion rate appear more likely than changes in obscuration, at least for quasars showing extreme mid-infrared variability. Here we report on three epochs of spectroscopy of SDSS~J110057.70-005304.5, an extreme mid-infrared variable quasar at $z = 0.378$ whose UV continuum and broad hydrogen emission lines have dramatically faded over the past 20 years. Uniquely, an archival spectrum of this quasar from 2010 shows an intermediate phase of the transition, when the flux below rest-frame ~ 3400~\AA\ has collapsed, suggestive of dramatic changes in the innermost regions of the accretion disk. This provides not only important clues to the physics of changing-look quasars, but also a prediction that the Hβ flux will increase in the next few years.