Central peak complex of Bhabha crater (70 km diameter) rising from the shadows of dawn. View is seen from east-to-the west, north is to the right, visible portion of central peak complex is about 14 km wide.

Bhabha crater is located on the Moon’s farside, deep within the South Pole–Aitken (SPA) basin. At 80 km in diameter, Bhabha is approximately the same size as Tycho crater, though it lacks Tycho’s spectacular rays and crisp features because it is substantially older. But Bhabha has other aspects going for it that make the crater important in its own way. Its location within SPA means that the impact event exposed material that originally resided deep within the Moon, but was excavated and melted by the giant SPA impact event. Reflectance spectroscopy has shown that the central peaks of Bhabha contain pyroxenes that are rich in magnesium but poor in calcium, typical of many craters within SPA. This material may represent the melt sheet of SPA. However the walls of Bhabha have pyroxenes that are rich in calcium, more typical of volcanic material. A mound just to the southeast of Bhabha (termed “mafic mound”) also shares this composition, and has been proposed to be a volcanic feature that formed from extruded SPA melt, or melting of the underlying mantle.

A site like Bhabha crater would make an excellent spot to explore the unusual geologic history of the SPA basin and how the surface and subsurface evolved after the formation of that basin. Samples obtained from this area would allow us to test theories about the timing of the formation of the basin, learn whether there was a large spike in impact events around 3.9 billion years ago, better understand the composition of the Moon's interior, and learn about non-mare volcanism.