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High-pressure phases of alumina MATTHEW LYLE, Univ of Cambridge, CHRIS PICKARD, University College London, RICHARD NEEDS, Univ of Cambridge — Alumina (Al2O3) has been widely used as a pressure standard in static diamond anvil cell experiments and is a major chemical component of the Earth. So a detailed knowledge of its high-pressure stability is of great importance in both materials science and deep Earth science. A phase transition is known to occur at roughly 80-100 GPa between corundum and the Rh2O3 (II) structure. A second phase transition to the CaIrO3 structure occurs at even higher pressures. Here we present a computational structure search to reveal three additional structures which are competitive at these pressures but hitherto unknown to be stable in high-pressure alumina.

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