Outburst and Splitting of Interstellar Comet 2I/Borisov

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We present Hubble Space Telescope observations of a photometric outburst and splitting event in interstellar comet 2I/Borisov. The outburst, first reported with the comet outbound at 2.8 AU (Drahus et al.~2020), was caused by the expulsion of solid particles having a combined cross-section about 100 sq. km and a mass in 0.1 mm sized particles $2 \times 10^7$ kg. The latter corresponds to $1 \times 10^{-4}$ of the mass of the nucleus, taken as a sphere of radius 500 m. A transient double nucleus was observed on UT 2020 March 30 (about three weeks after the outburst), having a cross-section 0.6 sq. km and corresponding dust mass $1 \times 10^5$ kg. The secondary was absent in images taken on and before March 28, and in images taken on and after April 03. The unexpectedly delayed appearance and rapid disappearance of the secondary are consistent with an origin through rotational bursting of one or more large (meter-sized) boulders under the action of outgassing torques, following their ejection from the main nucleus. Overall, our observations reveal that the outburst and splitting of the nucleus are minor events involving a negligible fraction of the total mass: 2I/Borisov will survive its passage through the planetary region largely unscathed.