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Cometary dust in-situ observations - Next steps after Rosetta

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The ESA mission ROSETTA remotely and in-situ observed the nucleus and the dusty coma of comet 67P/Churyumov–Gerasimenko from 2014 to 2016 during the journey of the comet through the inner solar system. The instrument COSIMA collected cometary dust particles by exposing metal targets in the inner coma, from 10 to hundreds of kilometers off the cometary nucleus. The targets are imaged with an optical microscope and a selection of the collected particles are analyzed by secondary ion mass spectrometry (SIMS). The dust particles are a sample of matter of the early solar system but also weathered and processed during the lifetime of the comet. We will discuss the observed dust particle characteristics in view of the dust morphology, optical, electrical and mechanical properties as well as the dust particle composition in view of future missions to comets, including sample return.