FORMATION OF 67P

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The Rosetta and Philae mission to Comet 67P/Churyumov–Gerasimenko provided the largest and most diverse data set on a comet nucleus ever collected during the history of mankind. Still, we have not yet managed to reach a consensus on how we think the comet formed.

Partially, this is because of a current lack of testable hypotheses. By this I mean the following: there is certainly not a shortage of scenarios we can think of in terms of formation, processing, and combinations thereof, but these scenarios are not necessarily associated with realistic, quantifiable, and unique predictions that can be checked against actual observations. I will discuss the problems we are facing and what modeling efforts that are needed in order to improve this situation.

The analysis of Rosetta/Philae data has already revealed many important properties of 67P that are relevant to the problem of its formation. I will summarize those, but also discuss what crucial information that may still lurk in the Rosetta data archives and the focused efforts that may be needed to actually harvest this information. Still, at some point, the information about comet formation that we can obtained from Rosetta will be exhausted. I will therefore discuss what we, perhaps, could have done differently, and what experiments we need to propose for future missions to fill the gaps.