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Press release

Rosetta: primary and back-up landing sites selected for Philae

With the much-awaited touchdown of Rosetta's small Philae lander now only two months away, scientists and engineers from ESA, CNES, DLR and other institutes got together this weekend at CNES's Toulouse Space Centre to select a primary and back-up landing site from the list of five candidate sites.

Some 70 scientists and engineers gathered this weekend at CNES's Science Operations and Navigation Centre (SONC) in Toulouse to choose the two most promising landing sites from the list of five candidates downselected in August for the 100-kilogramme Philae lander aboard the Rosetta spacecraft that is currently in orbit around comet Churyumov-Gerasimenko. Each of the five sites was reviewed to determine their pros and cons, both in terms of intrinsic science value and the ability to land Philae safely.

The first key selection criterion was that the landing area must be as safe as possible, avoiding rough terrain and many potentially dangerous rocks. Secondly, it must ensure enough sunlight—which depends on the length of the day at each site—to recharge the lander's batteries and provide good visibility between Philae and Rosetta to support communications for a long period. Finally, the site chosen must offer the best possible conditions for science observations.

The lander will fly a passive descent to the comet's surface. The SONC has calculated a large number of trajectories and possible landing sites inside an ellipse of several hundred metres, taking into account all uncertainties.

Combined with science data from the orbiter—high-resolution imagery from the OSIRIS camera but also the first details of the comet's surface composition from VIRTIS, levels of outgassing measured by ROSINA and surface temperature by MIRO—these trajectory calculations were factored into the choice of the primary and back-up landing sites.

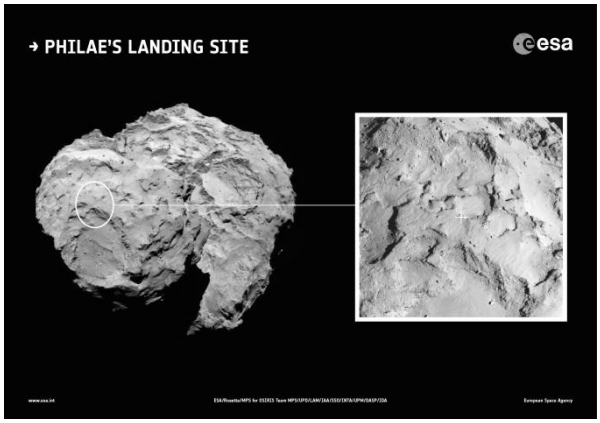
The site chosen is Site J, on the 'head' of the comet. This site offers the best trade-off between the length of Philae's descent, a safe landing, sunlight and science value. After close analysis, it was the only site matching all the criteria, although not 100% in every case. Most of the slopes in the landing area are less than 30 degrees, thus minimizing the risk of Philae tipping over on landing. Site J also has relatively few rocks and sufficient solar illumination to be able to recharge Philae's secondary battery and pursue science operations once its primary battery has been drained.

A first estimation of Philae's descent trajectory to Site J shows that it should take seven hours, short enough for it to be able to perform the full sequence of science operations once on the comet's surface.

If Site J has to be abandoned when the final choice is made in mid-October, due notably to the fact that the comet's changing activity is hard to predict, the back-up Site C would then become the first choice. Located on the comet's main 'body', this site has acceptable characteristics—unlike the three other downselected sites—although sounding inside the comet's nucleus with the CONSERT radar instrument will prove more difficult there.

For Francis Rocard, in charge of the Rosetta programme at CNES, "the choice of this site is the result of a complex process involving more than 100 people that took only a few weeks. Despite the tough challenge of finding an ideal site to meet all of our criteria on this comet with its particularly rough terrain, it is remarkable that we have achieved such a good consensus."

Philae's landing sequence for Site J can now be programmed more precisely. The landing is planned for before mid-November, before the comet starts to get more active as it approaches the Sun.



Located on the comet's 'head', Site J has been selected as the primary landing site for Philae.

Located on the comet's 'body', Site C will be the back-up site.

More information at: www.cnes.fr/rosetta-blog

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