Champollion Comet Lander

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A comet lander is being designed by NASA and CNES. The lander, named Champollion after the translator of the Rosetta Stone, will fly piggy-back style aboard the ESA Rosetta spacecraft, which will be launched in 2003 and rendezvous with comet P/Wirtanen in 2011. Following reconnaissance and gravity field mapping by the main Rosetta orbiter spacecraft, Champollion will be released and fall passively onto the surface of the comet from an altitude of a few kilometers. Depending on the size of the comet, the impact speed will be in range 1 to 4 m/s. During descent, the attitude of the lander will be maintained by a flywheel. Most of the kinetic energy will be absorbed by landing pads of crushable material, such as aluminum honeycomb. The small rebound will be negated by solid propellant hold-down thrusters which will fire for a few seconds at impact. Rocket-propelled spikes will anchor the lander to the surface and will react out sample acquisition forces. Samples taken from up to 1 meter deep will be transferred to science instruments for analysis. The results will be relayed back to the earth by the Rosetta spacecraft, which will continue its prime mission of remote sensing. Except for science instrument detectors, no radioactive materials will be flown. Thermal control is by electric resistance heaters. The current baseline lander design has no solar arrays. Powered solely by primary batteries, Champollion will complete its mission within 84 hours of landing.