

Moon probe heads for crash landing

The European Space Agency's *SMART-1* lunar orbiter will crash into the Moon's surface as its mission ends on Sunday. Driving the probe since it entered orbit in September 2003 is a revolutionary ion thruster – an engine which expels a beam of charged atoms to push the spacecraft forwards

SMART-1: Tested new-generation solar panels and carried seven scientific instruments weighing just 19kg

Probe has been searching for signs of water-ice – key to any future lunar colony. X-ray telescope and infrared spectrometer have been mapping Moon's elements and minerals

Hall-effect thruster

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1. Propellant: *Xenon* gas injected into discharge chamber

Magnets Discharge chamber

4. Electrostatic grid: Perforated metal plate with negative charge of up to 1,280 volts. Electrostatic force accelerates plasma beam

Plasma travelling at 100,000km/h

2. Cathode: Negatively-charged *electrons* trapped by magnetic field in discharge chamber

3. Impact: Electrons collide with xenon atoms. Xenon's outer electrons are knocked away, resulting in atoms with positive charge – *ionized gas* or *plasma*

5. Neutralizer: Emits electrons into ion exhaust to prevent craft from acquiring electric charge