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Surrey satellite firm to design NASA lunar mission

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NASA has asked Surrey University spin-out firm Surrey Satellite Technology Ltd (SSTL) to develop a low cost lunar orbiter for a joint US-UK mission called Magnolia. The project will see the firm develop the primary mission design for NASA.

As part of a multi-million pound package the firm will also train engineers from Mississippi State University (MSU) and NASA Stennis Space Centre in the fundamentals of small satellite technology, SSTL's area of expertise.

The mission, if approved, is likely to explore the Moon's south pole, where there are good indications that a build up of water ice exists there, possibly from cometary impacts.

SSTL systems analyst Andy Phipps told us he was very confident the project would result in a mission, explaining that this is only the first phase: "The UK government announced recently that it is planning to collaborate with the US on space exploration. We're hoping that this project will merge into a joint NASA, UK government funded mission."

Phase one will culminate in a preliminary mission design, and SSTL says it will draw on its 27 years of experience in designing satellite technology to make it work.

"There are some differences designing for a lunar orbiter, but there are also plenty of commonalities. We'll start with a heritage baseline, something we know works, and tweak it to suit the lunar environment," says Phipps.

This means changes to the propulsion system (the Moon is further away than low earth orbit), changes to the avionics, a serious upgrade for the communications package, and a redesign to take into account the much more extreme thermal environment. Interestingly, the radiation a lunar probe will be exposed to is very similar to that of a low earth orbit satellite.

"Low earth orbit is a pretty benign place. The temperature really only varies between minus and plus ten degrees. But the moon is very cold, especially around the poles, where we are interested in going," Phipps notes.

SSTL's involvement stops at mission design, though. The scientific instruments the lunar satellite is likely to carry with it will be designed elsewhere.

Although all its existing kit is whizzing around our own planet, the company has a good track record in working further afield, conceptually, at least: it completed a lunar exploration design study for the UK's now disbanded Particle Physics and Astronomy Research Council, back in 2006, and was involved in developing the comet chaser mission, Rosetta.

It also carried out a feasibility study for ESA about the prospect of a trip to Venus, and has worked on plans for missions to the asteroid belt, and for a sample-return mission to Mars. ®

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