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## Robot balloons could explore Mars

Remote-controlled balloons carrying armies of mini-robots could be filling Mars' skies if a project by Californian scientists takes off.

Nasa-funded researchers are developing the StratoSail, a balloon with a wing, that can be accurately steered through Mars' winds for months.

Like weather balloons, the StratoSail could carry cameras and gadgets to spot potential areas for human missions.

The hi-tech devices could also launch robotic probes to monitor the surface.

"The ability of long-duration guided planetary balloons to alter their flight path in the atmosphere, to deploy surface probes, and to carry out detailed reconnaissance make them a very powerful tool for future Mars exploration," said Dr Alexey Pankine, project scientist at the Global Aerospace Corporation.

### Steady she goes

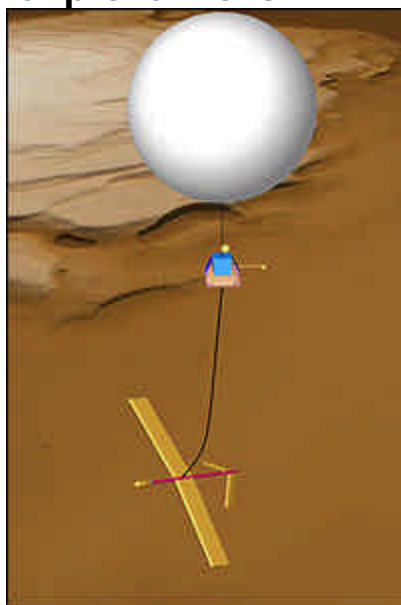
The balloons, or Directed Aerial Robot Explorers (Dares), could act like "motherships", exploring the planet's atmosphere for months.

When required, they could launch swarms of baby robot probes and mini-laboratories to carry out experiments.

Balloons have long been used as observation platforms on Earth because they are relatively low-cost, require little power consumption, and are versatile.

Some have even gone where no balloons have ventured before. In 1985, two balloons were sent out to monitor the atmosphere of Venus.

But researchers realised there was a problem with stabilising



The balloons would research areas of interest for human missions

## Exploring Mars

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and controlling the aerial rovers in different atmospheres, particularly those with strong wind currents.

The robotic StratoSail overcomes this problem by having a lightweight, stabilising wing suspended several miles below it.

The wind force that is generated, because of the distance between the balloon and the wing, propels the whole device at speeds of one metre per second, explains Dr Pankine.

Using this kind of "sail" technique means the device is not weighed down by other heavy and power-hungry propulsion equipment, like small engines.

The research, backed by the Nasa Institute for Advanced Concepts, is still in its first phase.

Dr Pankine and his team presented their research into the balloons at the Space Technology and Applications International Forum in US city of Albuquerque on Tuesday.

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