

Small satellites offer astronomers 'PC' access to the Universe

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Small satellites are now ready to open up new avenues in astronomy, according to a presentation on Friday 7th April at the RAS National Astronomy Meeting in Leicester. Rapid advances in the capabilities of satellites smaller than a domestic washing-machine mean that they now have the pointing stability and accurate positioning needed to carry astronomical instruments, such as ultraviolet telescopes.

Stuart Eves of Surrey Satellite Technology Ltd (SSTL) said, “We see small satellites as the ‘PCs of astronomy’. Like personal computers, the capabilities of our satellites have moved forward very rapidly over the past decade. Whilst there will always be a role for the big ‘mainframe computer’ satellites, which can carry the huge mirrors and complex pointing equipment needed for some astronomical experiments, small satellites can be developed very quickly and the costs are relatively modest. This means that astronomical experiments can be designed, launched and be delivering results in under two years.”

SSTL has already carried out studies for the European Space Agency for a Mars sample return mission and a Venus entry probe but the company is now keen to work with the astronomical community on probing the depths of the Universe.

“Our satellites can now provide high-precision pointing using an automatic star camera system to determine the orientation of the platform, large amounts of on-board data storage and high data downlink rates to return the observations from the sensors as quickly as possible,”

said Eves. “We are also now able to operate several satellites orbiting in formation and could develop small satellite constellations for experiments that need rapid responses, e.g. studying gamma-ray bursts, or three-dimensional investigations of an area of space, e.g. monitoring the solar wind.”

Don Pollacco of Queen’s University Belfast said, “Small satellites are useful in that they can be dedicated to just one or two instruments. This means that tried and tested instruments can be launched into space to study a specific problem relatively cheaply. It makes sense that the UK’s technical expertise in small satellites should be combined with the expertise of the British astronomical community.”

The relatively low costs involved mean that small satellites can be funded by a single country. Canada’s MOST satellite, which was launched in 1993 and has carried out high-precision photometry of stars, has paved the way for a much larger contribution to astronomy from small-scale missions.

Source: Royal Astronomical Society

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