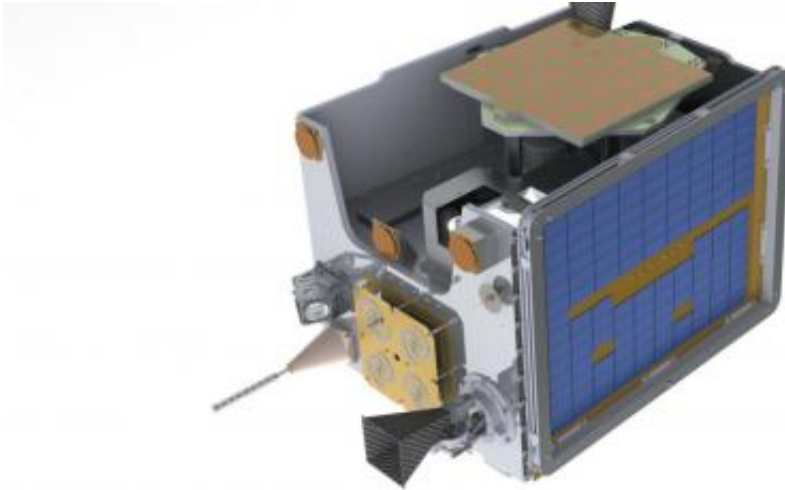


British asteroid mapper sent into orbit

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UK technology that can create thermal maps of asteroids, giving us vital information about how their trajectories might change, is about to undergo trials in space.

The Compact Modular Sounder instrument, built by researchers at Oxford University and the Science and Technology Facilities Council RAL Space facility, was launched on 8 July 2014, at around 17:00 BST, as part of the spacecraft TechDemoSat-1. The spacecraft was blasted into Earth orbit aboard a Soyuz-2 rocket taking off from a launch site in Kazakhstan.

The size of a shoebox and weighing just 4.5kg, Compact Modular Sounder (CMS) is designed to do the job of a much bigger, heavier instrument at a fraction of the cost. The eventual aim of the scientists behind the project is to send CMS into deep space to use its infrared technology to create thermal maps of the surface of a Near Earth Asteroid.

'Imagine that an asteroid is detected on a possible collision course with Earth, with enough time that we have options to deal with it. One of the most important things we need to know is how its orbit might change with time: will it hit us or just fly by? If it looks like it could hit us what could we do about it?' said Dr Neil Bowles of Oxford University's Department of Physics, a member of the Oxford team that built CMS.

'One option is to send a spacecraft to investigate, and an accurate temperature map of the asteroid's surface is likely to be very useful. Temperature maps can tell us about the rockiness of its surface, so where is a good place to land a robotic spacecraft, and how heating from the Sun and cooling to space can 'push' the asteroid around changing its orbit,' said Dr Bowles. 'In Oxford we have studied, built and tested a number of thermal mapping instruments for missions to asteroids but have not had the opportunity to test them in space, until now.'

TechDemoSat-1 is a small (about 1 metre cubed) spacecraft built by Surrey Satellite Technology Ltd and supported by the South East England Development Agency and the Technology Strategy board. The mission provides a test-bed for UK industry and academia.

'If you are sending equipment on missions lasting many years into the harsh environment of space it is essential that they are tested thoroughly before launch. However, nothing beats actually testing an instrument in space, and this is where TechDemoSat-1 comes in, it's a vital way for us to test our technology and so reduce the risk of anything going wrong in

future missions,' said Dr Bowles. 'And since we are up there in Earth orbit we will take the opportunity to map the surface temperature of the surface of the Earth, including the oceans, the temperature structure of the atmosphere, and look to compare this data with that from other Earth-observing instruments.'

Dr Bowles said: 'Once CMS has been tested on TechDemoSat-1, we hope to work with our colleagues at RAL Space to propose the [instrument](#) to international [space](#) agencies such as NASA and ESA, as well as the rapidly expanding commercial satellite sector. Both ESA and NASA are studying ways to reduce risk from asteroid impacts and maybe a version of CMS will have a role to play.'

Provided by Oxford University

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