

## Innovation in Ptolemy

Space & Planetary Exploration pushes the boundaries of science and technology; for instance, if you are to build an instrument to analyse the composition of another planet then you need to make it small, light, robust (capable of surviving large shock and vibration loads, extremes of temperature and radiation), use little power and energy yet provide lab-quality data that allows the science questions to be answered. The Ptolemy instrument on the Rosetta mission that landed on a comet in November 2014 after a 10 year, 4-billion-mile journey was led by a UK team from The Open University. By sniffing the dust released on the first bounce the team were able to show that the building blocks of life, that we are all made from, are on a comet. Ptolemy required a large multi-disciplinary team of scientists and engineers to shrink something that is the size of a family car down into a shoebox. Having such a multidisciplinary team has allowed researchers from The Open University to apply collective know-how to solving problems here on Earth, from developing an award winning air monitoring system to be used on all future UK submarines, to mimicking dogs in sniffing cancer, detecting bed bugs in hotels through to helping the Scotch Whisky Research Institute detect fake and adulterated whisky to protect the brands of companies in the biggest export sector in the UK. One of the latest projects is a medical diagnostic device to detect the bacteria that cause stomach cancer, one of the biggest killers in India. It is amazing to think that the same analysis methods used to detect signs of life on comets and Mars are now being used to potentially save millions of lives here on Earth.