Life on Mars? The answer may come from Leicester

Britain's major role in exploring the Red Planet will also benefit those on Earth.

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Interplanetary travel may not be the first thing that springs to mind when you think of Leicester.

But the East Midlands city is home to a group of scientists and engineers trying to answer the question: is there life on Mars?

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Of course, cynics may pose their own question: why are they bothering?

Those same people might shake their head at the fact Britain is spending €165m (£146m) to take part in the joint NASA and European mission to the Red Planet. And they may wonder about the sanity of Lord Drayson, the science minister, who says he very much hopes that in 100 years we will be living there (Mars, not Leicester).

But there are very good reasons why earthlings should sit up and take notice of the work being done by this group of British scientists as they prepare for the 2018 mission to Mars.

The Leicester-based group is part of a team of British scientists working with the European Space Agency (ESA) on the ExoMars rover, one of two vehicles that will be sent to Mars in 2018, one European and the other belonging to NASA. The European rover is being built by Astrium, part of European defence and aerospace giant EADS, in Stevenage.

Before that, an orbiter will be sent to Mars in 2016, carrying a craft that the European team will attempt to land on the planet. If that first successful European landing goes to plan, the rover will follow in 2018.

The European rover will drill below the surface of the planet, taking samples of rock, testing them for signs of life and beaming back the results.

Space exploration requires kit that is small, light, can operate for years without a service, uses very little power and can survive being fired out of a rocket at incredibly high speeds and landing intact; qualities that are also useful on

Earth.

Technology developed for NASA's Apollo space missions in the 1960s and 70s produced, among many other things, medical CAT scanners, modern trainers, kidney dialysis machines and flame-proof clothing.

"In an ideal world you would build parts with zero mass, zero weight and that use zero power," said Professor Mark Sims of Leicester University, who is leading the team building the the life-marker chip, known as the "pregnancy test", which will be testing samples on Mars for very low levels of chemicals that indicate life is present or might have been at some time.

The terrestrial spin-off of this equipment is a portable testing kit that fits in the palm of your hand but has the equivalent capability of an entire laboratory. For countries in the developing world without labs, or even to speed up the process of blood and drug tests in developed nations, such a product has "real human benefit," said Andrew Bowyer, managing director of Leicester-based Magna Parva, which is working on the ExoMars rover along with Leicester University.

The company has received a £500,000 grant from the regional development agency, and also plans to approach Bill Gates's charitable foundation, to come up with an affordable version. The Mars life-marker chip costs in the region of £100,000, but the company is working towards a version costing a couple of pounds.

Another spin-off from the rover is a metal-shaping process that could save the food and drinks industry up to £100m a year in packaging costs.

The rover's drill for digging below the surface of Mars is ultra-sonic – and such devices up until now have required manual tuning. That would clearly be impossible on Mars, so Magna Parva have designed and patented an automatic tuning system for the drill.

The ultra-sonic system can also be used to shape thinner sheets of aluminium into cans or any required shape. Using just a fraction less aluminium creates a huge saving for companies, and also has environmental benefits because the metal is one of the most energy-intensive to produce.

"Even if you don't see the point of the mission, the space industry is one of the few areas where people are left to invent and experiment all the time," said Mr Bowyer. "Space is 80pc of our business, and it's the most fun part, no doubt about it. But its all high-risk and very rarely pays for itself, so we always have to be looking for spin-out applications."