"Made in space" coming soon to a product near you

Chris Wickham, Reuters

(Reuters) - The European Space Agency is hatching plans for a branding campaign aimed at making people more aware of the benefits of spending their hard-earned taxes on the International Space Station (ISS).

The list of products and technologies that have their roots in space research is long, from memory foam to the in-ear thermometer, but in a world struggling to pay the bill from the financial crisis the billions of dollars spent on space exploration are increasingly hard to justify.

The branding plan is an indication that space scientists are concerned about cuts to space agency budgets, and worried that their contribution to economic growth is not fully recognized.

"It frustrates people because we know we have a valuable asset," International Space Station Director at NASA Mark Uhran told Reuters at a conference in Berlin of scientists from the 14 nations backing the project.

The European Space Agency estimates the bill for the space station will come to about 100 billion euros ($131.53 billion), including running costs for the next 10 years. The European share of 8 billion euros, it says, equates to 1 euro a day from every European, or less than the price of a cup of coffee.

"If we stop investing we will harm our economies," said Julie Robinson, ISS Programme Scientist at NASA. Robinson points out that the construction of the station was only fully completed last year but since then there has been a surge in the amount of scientific work being done on board.

Research on the space station cuts across disciplines, from biotechnology to materials science, all in a series of laboratories stuffed with equipment, now covering an area equivalent to a football field and orbiting the earth at more than 17,000 miles an hour.

It is run by the United States, by far the dominant player, Russia, Canada, Japan and 10 of the 17 European Space Agency nations Belgium, Denmark, France [1], Germany, Italy, the Netherlands, Norway, Spain, Sweden and Switzerland.

What it offers science is a stable environment in microgravity, essentially weightlessness, that can only be replicated in short bursts on earth through the parabolic flight of aircraft used for spaceflight training and research.

COLD HARD CASH

Research in microgravity has led to advances in metallurgy, particularly the production of metallic foams - blocks of metal that contain bubbles - that are strong, light and provide a cushioning effect on impact. Foams are unstable, and therefore harder to study in gravity, said Professor John Banhart from the Technical University of Berlin. The car industry is excited and lightweight crane lifting arms are already using the technology.

Turbine blades made from an alloy called titanium aluminide could lead to a 50 percent reduction in the weight of a typical jet engine, which would reduce fuel consumption and emissions from air travel. This was another spin-off from research in weightless conditions.

"Without the research on the ISS this type of turbine blade would never have been made," said Jean-Jacques Dordain, Director General of the European Space Station.

Station-linked research into "cold plasma", a version of the ionized gas that exists at thousands of degrees and is used to sterilize surgical tools, has found it can kill bacteria in a form closer to room temperature, and therefore not harmful to human tissue. Germany's Max Plank Institute for Extraterrestrial Physics is a leader in the field.

Such a breakthrough could become vital to medical science in the struggle to fight superbugs that are increasingly resistant to antibiotics.

"We may be looking at a total game change on how we control bacteria," NASA's Uhran said.

The behavior of bubbles in microgravity has also caught the attention of Nestle, the world's biggest packaged food company. Nestle research scientist Cecile Gehin-Delval told the conference that the Swiss group is carrying out expensive research on the station to enhance the taste and shelf life of a range of its products from chocolate mousse to coffee.

WINNING HEARTS AND MINDS

There are huge challenges in building more public support for space research and convincing politicians and industry that the benefits are worth the expense.

Uhran notes that the timescale of a typical research project is three to five years, which doesn't easily mesh with corporate priorities like reaching sales or profit targets for the next quarter, or even the next year.

But scientists are adamant that the economic dividend is unquestionable.

"One of the issues is that people don't really understand the process by which knowledge is turned into the things around us," Mike Cruise, a British scientist from the University of Birmingham who also works for the European Space Agency, told Reuters.

Cruise cites satellite navigation, digital cameras and even the tiny laser that runs a humble DVD player as innovations with roots in space research.

"If we are going to get the most out of the space station, we need to move concepts into action as quickly as possible," he said, adding that it can take decades to go from idea to market.

Cruise said it was impossible to predict how long some ideas could lie dormant and that although governments had a duty to balance their budgets every year, more research inevitably resulted in a greater number of advanced products.

It's a hard argument to sell to a finance [2] minister or a chief executive, but Cruise says the alternative would be much more alarming.

"If you think knowledge is expensive, just try ignorance for a while." ($1 = 0.7603 euros)

(Edited by Paul Casciato)

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