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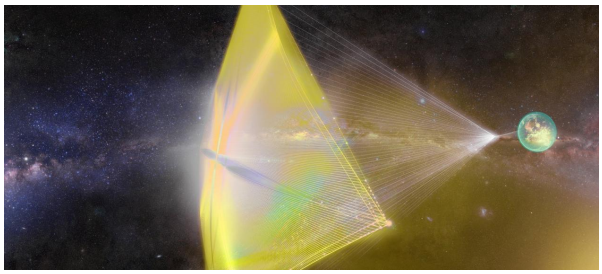

TechTalk

Trip to Alpha Centauri ©

by John McCarthy

Hi and a very warm welcome once again to TechTalk. There hasn't been much mainstream media interest in this, but a couple of weeks ago an event occurred that could prove to be a seminal moment in the history of humanity. I'm referring to the 'Breakthrough Starshot' project, where world-renowned theoretical physicist Stephen Hawking joined forces with Russian billionaire Yuri Milner and Facebook's Mark Zuckerberg to begin financing and preparing the exploration far outside the solar system and launch the first inter-stellar mission from Earth. $100 million will be invested in research to create prototype spacecraft capable of reaching our nearest star in just 20 years of travel. This amount will go to establish the feasibility of the project and not to fund a full mission, which will undoubtedly be a decades-long multibillion dollar venture on the scale of the world's biggest scientific experiments, and indeed beyond.

Forget about starships along the lines of the USS Enterprise, because the spacecraft in question would be small enough to fit in the palm of your hand, and weigh in at just a few grams. The idea is to leave all the fuel behind, save weight, and rely on "sails" - I use the word in inverted commas – that resemble a silicon wafer 10 centimetres across. These would be boosted into space by a conventional rocket, and then released individually, subsequently using lightsails of reflective material which will be propelled by energy from a powerful array of Earth-based lasers, enabling thousands of these tiny spacecraft to fly at approximately one-fifth of the speed of light. The objective is to travel to the Alpha Centauri star system, which is a mere 25 trillion miles away.

Those of you who were fans of the highly successful series *Cosmos* televised back in 1980 may recall that the idea for a spacecraft to be equipped with a special sail to use solar wind for propulsion, was described by the visionary astrophysicist Carl Sagan. He believed that these sails could accelerate spacecraft far beyond the speeds of traditional fuels and thereby make interplanetary – and eventually interstellar – travel a reality.

The major downside of the 'Breakthrough Starshot' project is that the technical challenges and economic costs are so high that such a project probably won't be feasible for a considerable period of time. Moreover, the technology required to

guarantee success still doesn't exist. But recent advances in electronic miniaturisation, laser technology and dramatic improvements in nanotechnology have made such a mission at least realistic to consider.

Then, of course, there are economical and ethical considerations. In a world where literally billions are still eking a miserable existence if not dying in squalor, can we really afford to invest in what could prove to be an interstellar white elephant?

When asked why humankind should aspire to reach another star system a fortnight ago, this is what Stephen Hawking answered: "Firstly, because there are no greater heights to aspire to than the stars. Secondly, it is unwise to keep all our eggs in one fragile basket. If we are to survive as a species, we must ultimately spread to the stars."

Echoing the well-known "Space, the final frontier…" – James Tiberius Kirk - which finishes with perhaps the most famous split infinitive in the history of the English language. Since time immemorial, we've dreamt of release from our gravitational shackles. Icarus, the Montgolfier and Wright Brothers, Sputnik, the Apollo space programme, robots on Mars, and Voyager…"I've slipped the surly bonds of earth… (and) trod the high untrespassed sanctity of space." - John MacGee.