

# Through hardship to the stars

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"Humanity's adventurous, stubborn, mad and glorious aspiration to reach the stars" is the subject of *Physics World's* lead feature in January.

Sidney Perkowitz, Candler Professor of Physics Emeritus at Emory University, Atlanta, US, reports from the 100 Year Starship Study (100YSS) conference and discusses the challenges that [interstellar travel](#) presents.

With current propulsion technology only able to move spacecraft at 0.005% of the [speed of light](#), a one-way trip to the [star system](#) nearest our Sun, Alpha Centauri, would take 80,000 years to travel the four light-years to our nearest stellar neighbours.

Delegates at 100YSS – from ex-astronauts to engineers, artists, students and science-fiction writers – looked at the range of issues facing scientists who would like to make the "mad and glorious [aspiration](#)" a reality.

Starting with the development of a rocket engine that can reach high velocity, humans are not short of initiative, but, as Perkowitz describes, even with engines based on photon-powered sails or nuclear fusion, we are still a long way from reaching the speed of light.

Some theoretical models present tantalizing options, such as Miguel Alcibierre's idea to contract space–time in front of a spaceship and expand space–time behind it to create a bubble that would propel the [spacecraft](#) at any speed without violating special relativity.

Picking on this example, Perkowitz explains that the maths is impeccable but that the model requires negative mass, which, to the best of our knowledge, doesn't exist.

Accepting that interstellar travel will, at very best, take decades, some are now considering using suspended animation, or even carrying the DNA and other resources necessary to recreate humans on an unmanned ship.

As Perkowitz writes, "With the exploration of the solar system by the US space agency NASA and others well under way, and with the discovery of hundreds of exoplanets orbiting distant stars, it may be time to contemplate the next great jump outwards."

Provided by Institute of Physics

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