Could we ever travel to another star?

KS2 KS3 Ages 9-14 ⏰ 3 min read

The nearest star to our sun is Proxima Centauri, about 4.2 light-years away. That sounds manageable until you translate it: 40 trillion kilometres. Our fastest spacecraft, the Voyager 1 probe, travels at roughly 60,000 km/h. At that speed, it would take about 70,000 years to get there. We need a better plan.

The problem with distance

Space is almost incomprehensibly empty and large. The distances between stars are measured in light-years — the distance light travels in a year — and light is the fastest thing in the universe. Even travelling at a significant fraction of light speed would take years or decades to reach the nearest stars. For more distant ones, centuries or millennia.

Imagine the sun is a football on a pitch in London. On that scale, the nearest star would be another football sitting in Paris. The entire solar system — all the planets, the asteroid belt, everything — would be about the size of the centre circle. The distances between stars make the distances between planets look like stepping stones.

Idea 1: Generation ships

One proposal accepts the timescale problem: build a ship large enough to house hundreds of people, who live and die on board across multiple generations during the journey. The great-great-great-grandchildren of the original crew would eventually arrive. This would be an extraordinary feat of engineering, sociology, and self-contained life support — essentially building a travelling colony.

Idea 2: Laser-propelled light sails

The **Breakthrough Starshot** project, backed by Stephen Hawking before his death, proposed firing a powerful laser at a tiny spacecraft with a reflective sail. The light pressure could accelerate it to 20% of the speed of light — fast enough to reach Proxima Centauri in about 20 years. The catch: the spacecraft would be roughly the size of a postage stamp. Getting useful data back would be the challenge.

Idea 3: Suspended animation

Science fiction loves this one — putting the crew in a kind of deep sleep so they don't age (or get bored) during a long journey. There's no technology to do this yet, but research into inducing hibernation-like states in humans is genuinely underway, driven partly by medical applications like preserving patients during surgery.

Will it ever happen?

Not in the next century, almost certainly. But given that humans went from the first powered flight to landing on the moon in 66 years, projecting technological limits over thousands of years seems unwise. The real barriers — energy, materials, biology — are enormous. But they're physics problems, not magic. And physicists have a good record.