

## Teams line up for N-Prize challenge

"Gentlemen, we don't have any money, so we are going to have to think." So said the physicist Ernest Rutherford, and this phrase seems to have become the motto of what is probably the world's smallest - and certainly one of the oddest - space programmes.

The N-Prize, launched in April 2008 by Cambridge scientist Dr Paul Dear, has recently registered its twelfth team and is looking forward to an interesting 2009. The challenge posed by the N-Prize is difficult enough: to launch and track a nanosatellite (hence the 'N', though an alternative interpretation is 'Negligible resources') weighing between 9.99 and 19.99 grams through at least nine complete Earth orbits.

As if that weren't tricky enough, there's a catch. The whole thing has to be done on a budget of less than £999.99 - roughly the price of a modest second-hand car.

"Surely it's impossible?" asks the N-Prize website ([www.n-prize.com](http://www.n-prize.com)), and then goes on to provide its own answer: "Very nearly".

Nevertheless, at least 12 groups around the world - including three from the UK - are either smart or dumb enough to think it can be done. Two prizes are on offer, each of £9,999.99 - "a nano-Prize for a nano-challenge," says Dear.

The first, jokingly called the 'SSO' or 'Single-Spend to Orbit' is for a non-reusable launch system built and operated entirely within the budget - everything that leaves the ground has to cost under a thousand pounds.

The second, the 'RV' or 'Reusable Vehicle' prize, allows an unlimited budget, as long as enough of the launch hardware is recovered to keep the per launch cost below the thousand pound ceiling.

Despite his light-hearted tone, Dear says that he is deadly serious about the N-Prize, and expects to lose one or both of the prize money pots by the close of the competition in September 2011.

"It's such a crazy idea that it's bound to work," he says. "We're talking about sending a matchbox the distance from London to Birmingham, then giving it a shove sideways. Yes, the distance is vertical, and the sideways shove has to be on the order of ten thousand miles per hour..."

His proposed budget at first seems hopelessly unrealistic but a little back-of-the-envelope calculation shows that it's tantalisingly close to being feasible.

A number of teams (including Cambridge University Spaceflight) are proposing to use 'rockoons' - rockets launched from balloons

at altitudes high enough that air resistance doesn't penalise small craft too much.

Others (Such as Nebula Aerospace and Microlaunchers) have opted for ground-launched rockets of a variety of designs, both reusable and expendable. Still others have more outlandish proposals or have not disclosed their plans. In all cases, though, their calculations show that the goal is just within reach, given enough ingenuity, luck and, in a phrase taken from the N-Prize rules, 'imaginative use of string and chewing gum'.

"Already, discussions surrounding the N-Prize have suggested a number of ingenious low-cost solutions to high-cost problems," said Dear. "Cheap sun-following navigation systems; tracking and imaging systems cobbled from consumer electronic equipment - there's a wealth of creativity out there waiting to be tapped once budgets are pared to the bone."

Does he see anything of practical use coming out of the N-Prize? "Absolutely. Let's be clear - the N-Prize was launched for fun and as a challenge to would-be boffins, nothing more. But I'd be amazed if the technology developed along the way doesn't have wider applications," he said. "Already, a few of the teams have their eye on commercial possibilities, and are using the N-Prize as a stepping-stone."

Time will tell. But it promises to be interesting, even if nobody succeeds: a clause in the rules allows a consolation prize to be awarded to the entrant who fails 'in the most original, interesting or spectacular way'.

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## Maiden flight of Soyuz from Kourou

Arianespace plans from six to eight missions by Ariane 5s in 2009 including launches of Herschel-Plank and Terrestar 1 and the maiden flight from Kourou of a Soyuz booster which should open the way for eight missions by Soyuz boosters in 2010. The European Space Agency's Vega booster will also make it maiden flight from Kourou at the end of the year.

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Russia will launch 39 rockets from Baikonur and Plesetsk in 2009, with a higher rate of flights to the International Space Station, four manned Soyuz TMA crew transfers and five Progress tankers, including one carrying an attached small research module to the Russian segment.

## ISS tourist flights to be curtailed

Russia is unlikely to be sending tourists to the International Space Station (ISS) after this year because of plans to double the size of the Station's crew, the chief of Russia's space agency has stated.

Roscosmos director Anatoly Perminov said that the last commercial flights would be made in March 2009 by Charles Simonyi (his second trip) and by a Kazakh national in the autumn of 2009, the latter replacing a previously announced Russian tourist.

The Russian's have flown six private spaceflight participants since 2001, each paying at least US \$20 million for flights aboard Russian-built Soyuz craft brokered by US-based Space Adventures.

"The crew of the Space Station will be expanded this year to six members. Therefore there won't be any possibility for making tourist flights to the Station after 2009," Perminov said.

Russian Soyuz and Progress craft have been a crucial part of the \$100 billion Station's upkeep and expansion - particularly in the wake of the 2003 Columbia disaster, which saw the entire US Space Shuttle fleet grounded.

NASA will again be reliant on the Russians after 2010 when the US Shuttle programme ends permanently, leaving astronauts to hitch rides on Russian spacecraft until around 2015.

The most recent private citizen to fly aboard a Soyuz craft, computer game designer Richard Garriott, paid a reported US \$35 million for his seat.

Last year, as Roscosmos indicated that the days for space tourism aboard Russian craft might be numbered, Space Adventures announced it would seek to charter an entire spaceflight. The Russian agency would still run the mission, but Space Adventures would pay for the trip and buy its own Soyuz spacecraft.

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## Vietnamese satellite to map resources

Vietnam's \$100 million VNREDSat 1 will be launched in 2012 to map the country's resources and its environment as well as monitoring natural disasters. While Vietnam's Vinasat 1 communications satellite, launched in April 2008, was built by Lockheed Martin, VNREDSat will be built in France.