

A Nuclear-Powered Spaceship!

At last, reason has found a way past the objections of the Environmental religion.

An ambitious and controversial mission to explore the other planets of the solar system using nuclear-powered spacecraft has come a step closer after Nasa gave a giant aerospace company the go-ahead to develop revolutionary new engines.

The aim is to build an interplanetary space probe powerful enough to fly vast distances and still to have enough power to collect scientific information and send it back to Earth.

Hurray!

Sat, 06/14/2003 - 02:48 | [digg](#) | [del.icio.us](#) | [permalink](#)

FLASH: Several Physical Laws Yet To Be Repealed By Congress!

Nuclear power could indeed be used to provide the **energy** a spacecraft's propulsion requires, but there's another gotcha that the power of the atom cannot address, and which is perhaps the strongest reason for which chemical rockets have dominated space travel so far: conservation of momentum, a.k.a. Newton's Third Law. Until we learn how to finesse that law -- and I doubt we will -- a self-propelled spacecraft will need to eject reaction mass behind it to accelerate. A nuclear reactor doesn't naturally meet that need, whereas a chemical rocket propellant does.

This one is going to take some really hard thought.

Curmudgeon Emeritus, Palace Of Reason

by [fporretto](#) on Sat, 06/14/2003 - 11:16 | [reply](#)

Reaction mass isn't a 'gotcha'

I think there are straightforward ways of solving this problem. (At least, straightforward from the physics point of view.) Basically, to economise on reaction *mass* you have to use more reaction

velocity. The exhaust of chemical rockets travels at a few hundred metres per second relative to the rocket. For ion rockets it could in principle go up to a reasonable fraction of the speed of light. So I guess the new engine will be an ion rocket powered by a nuclear reactor.

by [David Deutsch](#) on Sat, 06/14/2003 - 13:51 | [reply](#)

Deep Space One

Nasa's **Deep space one** probe tested electrically driven Ion Propulsion. This system could provide much of the transit thrust, but would probably still need to be augmented with a chemical system.

The reactor proposal is exciting because it will provide the scientists with a great deal more power to drive a more complex and detailed set of experiments than could be performed with a solar powered craft.

by [mailleta](#) on Sat, 06/14/2003 - 13:51 | [reply](#)

New type of rocket

This new type of rocket could do the biz!

<http://dma.ing.uniroma1.it/users/bruno/Petro.prn.pdf>

It combines aspects of chemical rockets and ion drives.

Chemical rockets are limited because

- (a) there's only so much chemical energy in the fuel, and
- (b) if the exhaust gets too hot the nozzle starts to melt, which limits thermodynamic efficiency

OTOH ion drives are efficient but the thrust has hitherto been poor.

The new plasma rocket would use microwaves to heat the propellant to a scorching plasma, with a nozzle shaped out of a magnetic field.

It's not been tested yet but the plasma confinement bit should be helped by all that expensive fusion research that's been done in the past 50 years.

It probably needs bags of electricity to run, so great news about getting a fission reactor past the ecopuritans :-D

by [Tom Robinson](#) on Sat, 06/14/2003 - 17:59 | [reply](#)

