

# Spacecraft propulsion

An RS-68 rocket engine during a test at a NASA facility

**Spacecraft propulsion** is the method that a [spacecraft](#) uses to control its movement through [outer space](#). A spacecraft with no means of propelling itself is typically considered derelict.

The problem of propelling a spacecraft has, predictably, existed since spacecraft themselves. Most spacecraft are propelled by [rocket engines](#), which combust an explosive liquid fuel with liquid oxidizer (oxygen in a liquid state) to generate hot gas which expands and propels the spacecraft forward.

## Methods

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Many methods of spacecraft propulsion have been developed and practiced. Most work by accelerating a propellant to a very high speed and ejecting it from the spacecraft through a nozzle.

### Chemical rocket

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A chemical rocket works by mixing an explosive propellant with [liquid oxygen](#) and burning it under [pressure](#). This releases a great amount of heat. It results in a rapidly expanding gas. This gas is then funneled out of the rocket's [nozzle](#) (usually a bell shape) and off into space.

### Ion thruster

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An [ion thruster](#) works by using [static electricity](#) or [magnetism](#) to accelerate [ions](#) ([atoms](#) with an [electric charge](#)) to very high speeds, and out of the thruster's nozzle. Ion thrusters make very little thrust but are very efficient.

### Nuclear thermal rocket

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A [nuclear thermal rocket](#) heats a propellant with heat from a [nuclear reactor](#) before expelling it through a nozzle. Nuclear thermal rockets are currently experimental, but will have decent [thrust](#) and high efficiency once put into practice.

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