Running on Sunlight

Solar cells are made of a special material that can convert sunlight to electrical energy. Atoms absorb energy from the sunlight and release it as an electric current. However, once a spacecraft travels far away from the Sun—as far as the outer planets—the amount of solar energy reaching it is very small. The sunlight can be helpful only if solar cells on the vehicle can collect enough of it. One solution is to reflect sunlight. Scientists are developing solar sails that will act like enormous mirrors. The pressure of reflected sunlight on the sails can be used to move a large ship through space—even far from the Sun.

Beaming Energy from Earth

Another possible way to power a spacecraft involves no matter at all but a beam of energy sent from Earth. This idea is called beamed energy propulsion. A beam delivers energy to solar sails on the spacecraft. The energy can be in the form of microwaves—the same form of energy used to heat food in an oven or to deliver calls on a cell phone. Or it can be in the form of laser light, a very concentrated beam of visible light. This method has already been used successfully to power very small vehicles, 10 centimeters (4 in.) long.

Combined Technologies

Some recent space flights have combined common and experimental technologies. For example, the Cassini space probe has two regular rocket engines for propulsion. Other energy comes from three generators powered by radioactive decay. This combination of engines allowed Cassini to be one of the largest and most complicated spacecraft ever launched. It has sent back important data about the planet Saturn.