

# Princeton wins NASA Competition to Develop Plasma Rocket

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[NASA](#) has selected engineers at Princeton University to develop an advanced [rocket](#) thruster that could send people or robots to other planets with far less propellant than conventional engines.

Source: Princeton University

The National Aeronautics and Space Administration awarded a three-year, \$4.4 million contract to a team led by Edgar Choueiri, associate professor of mechanical and aerospace engineering, to develop **an advanced type of rocket called a plasma thruster**. The contract is part of a broad effort by NASA to develop "a new class of ambitious robotic and human exploration missions not possible with existing propulsion technologies," according to Ray Taylor, acting deputy director of NASA's Project Prometheus.

Plasma thrusters are unlike conventional rockets because they do not burn fuel. Instead, they produce superheated, electrically charged particles, called plasma, and use electromagnetic forces to propel the plasma particles from the thruster at a very high speed. Plasma thrusters need relatively little propellant because the particles can be made to move much faster than the combustion exhaust from conventional rockets. In Choueiri's system, the particles will be lithium ions.

Plasma propulsion systems have been used in recent space flights, but still do not operate at the very high power levels (hundreds of kilowatts) required for interplanetary flight, said Choueiri. His project, called "Alfa2: Advanced Lithium-fed Applied-field Lorentz Force Accelerator," could result in a rocket design capable of sending heavy cargo and humans to the moon, Mars or beyond.

Choueiri will lead a group that also includes scientists at three NASA facilities -- the Glenn Research Center, Jet Propulsion Laboratory and Marshall Space Flight Center -- in addition to the University of Michigan and the Worcester (Mass.) Polytechnic Institute.

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