# Propulsion systems for space

Patent insight report

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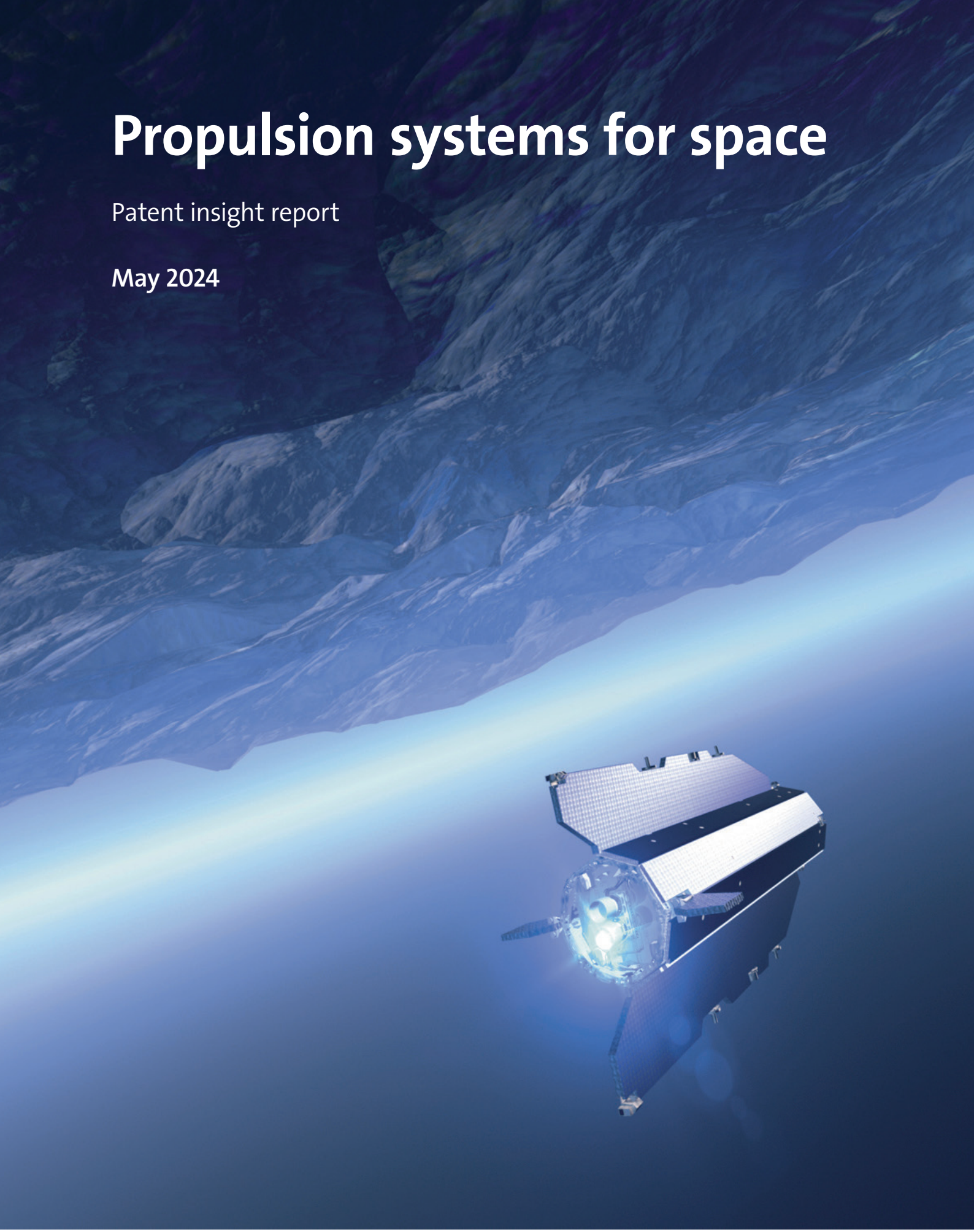

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## Executive Summary

Propulsion is a key element in all space activities because it provides the fundamental function of producing thrust to move launchers, satellites, and other assets from Earth to space or within space.

Space propulsion encompasses different principles, most prominently chemical and electric propulsion concepts as well as alternative and emerging concepts accompanied by a variety of propellants and even "fuel-less" concepts, such as solar sails.

The significance of propulsion capabilities stems from their transversal **enabling role for a spectrum of applications**, including access to space; collision avoidance; on-orbit servicing, assembly, manufacturing and space exploration.

For this study a total number of 4559 patent families filed at 52 patent authorities have been identified with applicants registered in 43 countries and inventors residing in 53 countries. The data set comprises 1178 international patent families (IPF) in four distinct technology principles, namely chemical propulsion, electrical propulsion, "alternative" propulsion and propellants.

Figure E1

National filings vs International Patent Family (IPF) by country