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ONERA
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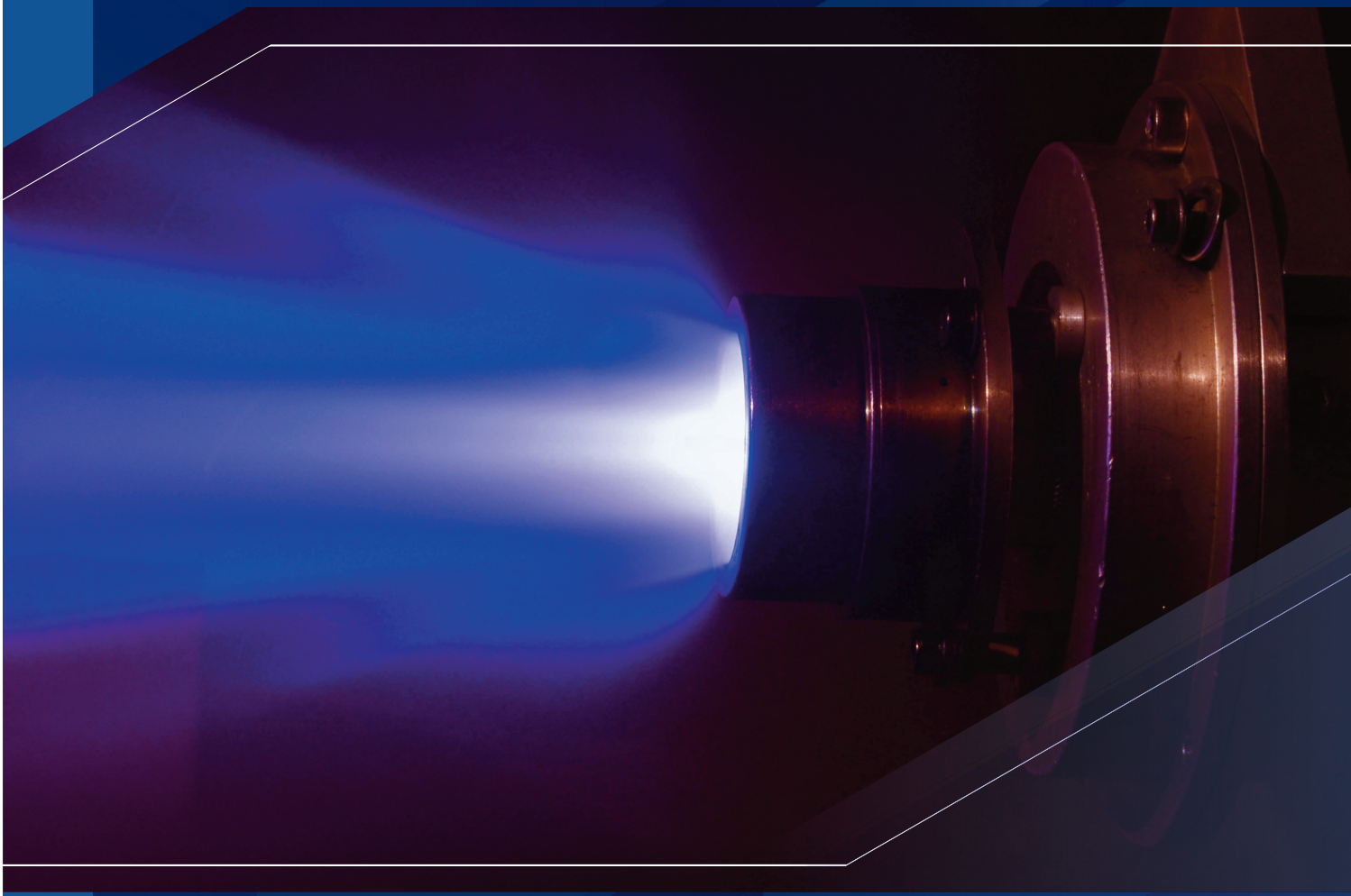
SPACE - NEWSPACE

ELECTRICAL PROPULSION: ECRA TECHNOLOGY



ONERA is developing the ECRA (Electron Cyclotron Resonance Accelerator) technology, whose performance is distinguished by its advantages in terms of reliability and cost, and because it does not require a neutraliser (cathode).

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CURRENT DEVELOPMENTS

Developed in particular in the framework of the European MINOTOR project (2017-2020), this technology has demonstrated an increase in maturity (TRL 4) thanks to a new configuration patented by ONERA. The ECRA thruster, which is operational with Xenon, is currently being adapted for iodine, an element that is much less expensive than Xenon, but highly oxidising, an aspect to which the ECRA engine, which has no cathode, is well suited.

First ignition of the ECRA iodine thruster.

ASSETS

In 2021, ONERA has invested in a new space simulation test facility, the ERIS chamber (€1.70 million), which meets a national interest in new electric satellite propulsion applications. Its dimensions (5 m long and 2.3 m in diameter) are suited to the study of thrusters in the 1-2 kW range, to support the development of ECRA thrusters. Acceptance tests for the installation will take place from 2021 onwards in a laboratory bay that has been specially fitted out and consolidated because of its unusual mass and dimensions. Thanks to the thrust balances and plasma measurement equipment in the ERIS chamber, and its high pumping speed (~100,000 l/s with Xenon and Krypton, ~200,000 l/s with air), the performance of electric thrusters can be studied and measured with great precision.

MAIN PARTNERS

CNES is providing financial support for the study of iodine on the ECRA thruster as part of a Joint Interest Programme set up with ONERA.

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