

Developing a Superconducting Electromagnetic Thruster for Use in Space

What is Electric Propulsion (EP)?

- Electric Propulsion (EP) thrusters create exhaust traveling much faster than that from traditional chemical rockets, maximising thrust for a given mass of fuel.

Electric Propulsion Applications

- EP thrusters are extremely efficient, but they don't generate much instantaneous thrust; they can not get a rocket off the ground. EP thrusters are used for spacecraft manoeuvring and station-keeping, or to slowly accelerate over a long period of time.

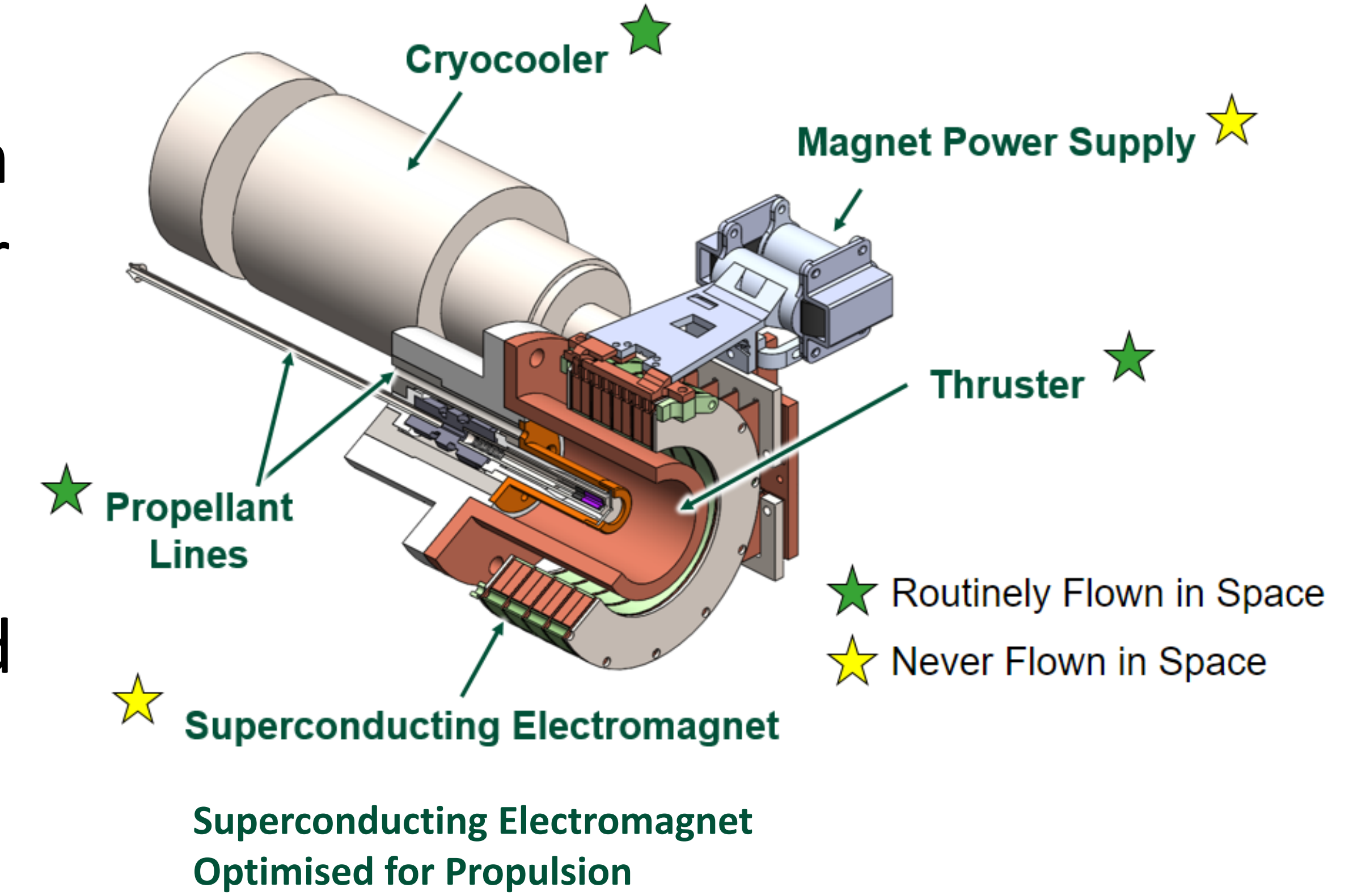


What are "High Temperature" Superconductors?

- "High Temperature" Superconductors (HTS) are materials with zero electric resistance at about -200°C , enabling high magnetic fields to be generated with very low power electromagnets.

Integrating EP and HTS components into a novel design

- The Paihau-Robinson team are experts in design & construction of HTS magnets and their power supplies. By integrating an HTS magnet with an EP thruster, high thruster efficiencies are achieved within spacecraft-sized power budgets.

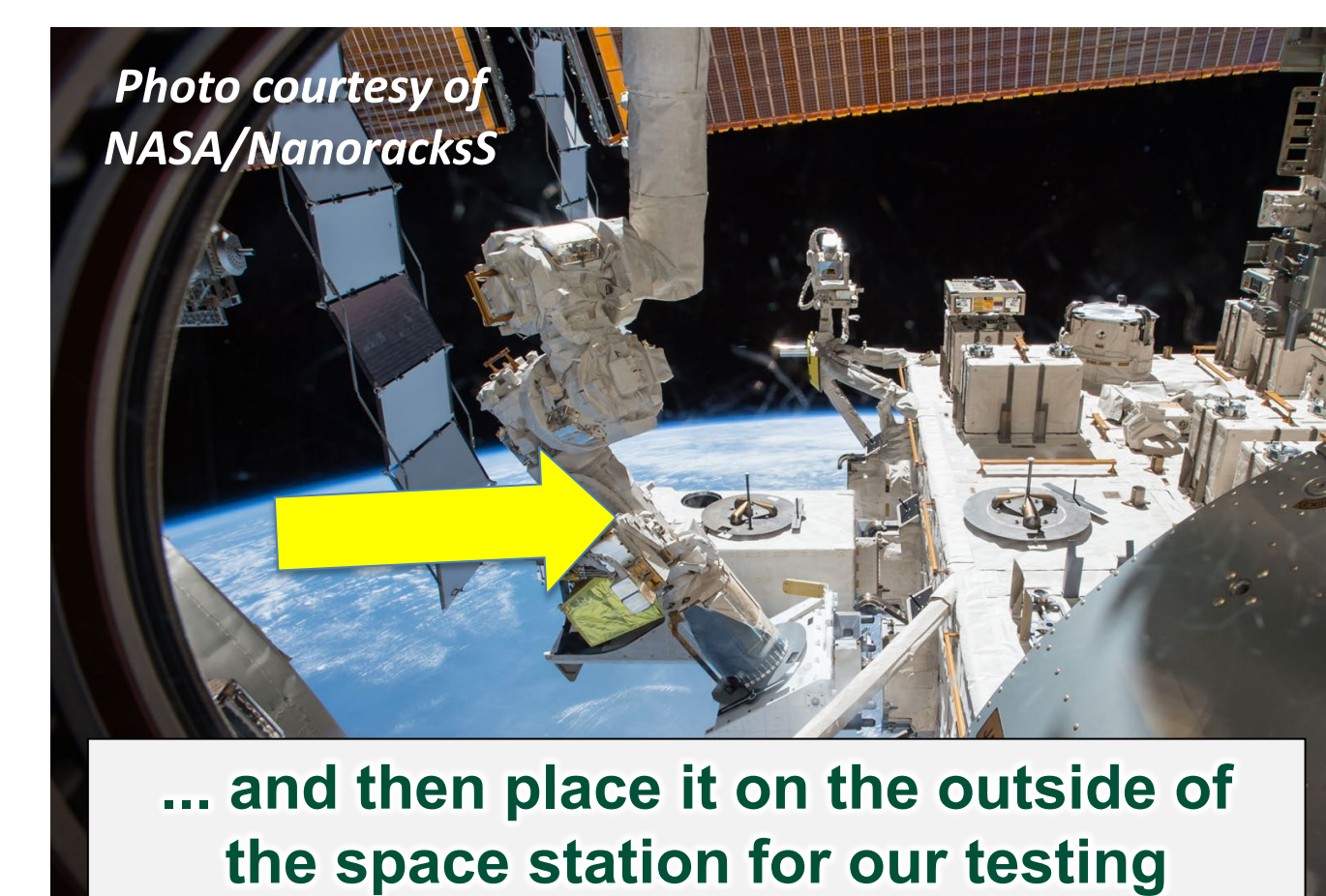


Parallel Efforts Validate EP/HTS Technology for Use in Space

- Kōkako** – an EP thruster integrated with a superconducting magnet – is being tested and its performance characterised in a chamber simulating the vacuum of space.



- Hēki** is currently in development and will be sent to the International Space Station in 2024/25 to demonstrate compatibility of the novel magnet and power supply with the space environment.



Hēki Hardware

