# iLAuNCH

# Australian Radioisotope Heater Unit

## THE PROBLEM

Radioisotope Heater Units (RHUs) are devices that use the decay of plutonium-238 (238Pu) to keep the spacecraft and critical components warm throughout long lunar cycles. The production of 238Pu based RHU's is complex, long and cost prohibitive. Additionally, the unintentional release in case of a malfunction of 238Pu would present considerable environmental and health concerns.

Australia wishes to develop sovereign space capability and lacks the capacity to manufacture RHU units.

## THE SOLUTION

This project aims to utilise Thallium-204 (204Ti) as an alternate 238Pu candidate. The implications of which would be; favourable supply chain access for 204Ti, sovereign capability and a reduced radiological risk should unintentional release occur.

The project consists of two parallel activities:

- Development of a nuclear enrichment process for 204Ti that scales.
- Develop a heat flow switching capability to control thermal states.

## RESEARCH CAPABILITY

**UniSA - Future Industries Institute (FII)**

Materials, fabrication and analysis techniques include: Microfluidic separation, micromachining and fluidic device fabrication, chemical and elemental spectroscopy, 3D printing, materials for thermal and electrochemical energy.

Industrial and manufacturing experience specialising in translating R&D from the laboratory through scale-up into production ready products and processes.

## PROJECT PARTNERS

University of South Australia

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**CONTACT DETAILS - PROJECT LEAD**

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