



BIG SCIENCE AND NOMATEN INNOVATION DAYS

14.04.2026

KRZYSZTOF KALLAS



BUSINESS
INCUBATION
CENTRE

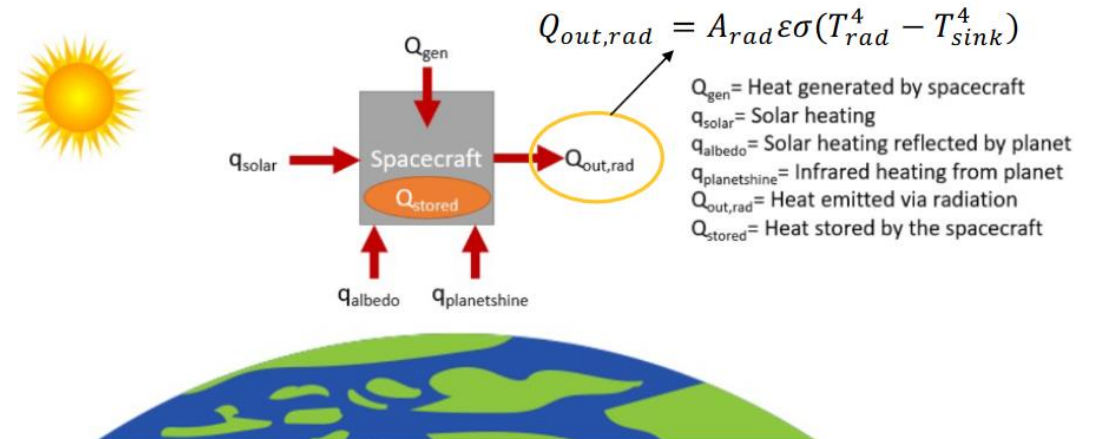
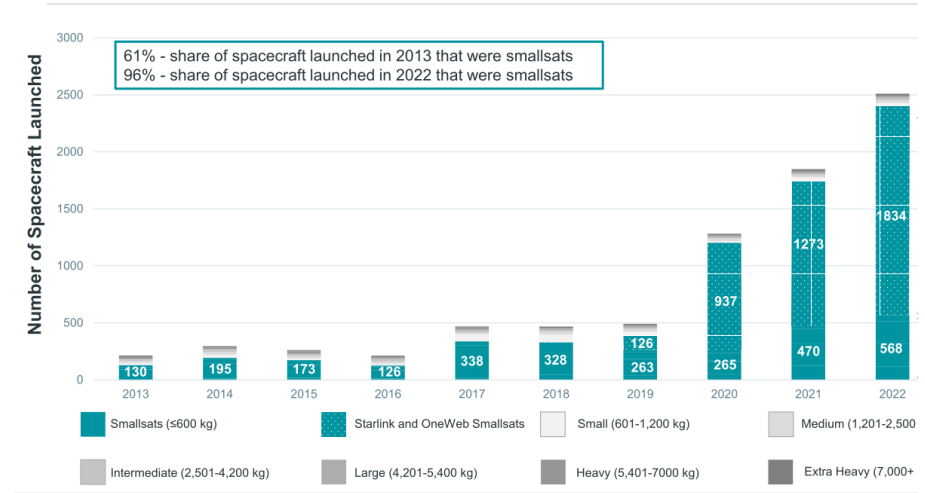
Poland

DEPLOYABLE RADIATOR – IDEA ORIGIN



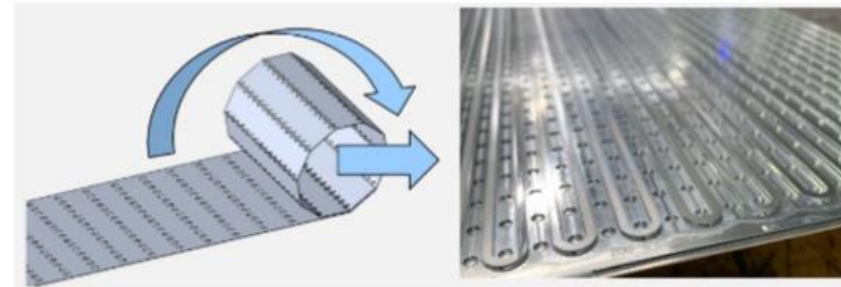
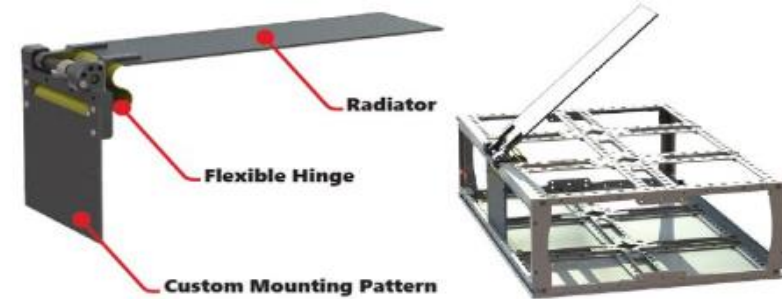
- Two of the trends in the development of the space sector:
 - increasing market share of smaller satellites
 - edge computing
- This means an increasing amount of heat produced, the dissipation of which is already a bottleneck
- Smallsats have bigger issues with thermal control
 - Low thermal mass
 - Small external surface
 - Low volume, high density of heat-generating components
 - Limited power generation for thermal control
- Radiation is the only mechanism of rejecting heat
- When internal heat generation increases, the only way to achieve heat balance is to increase radiation

Spacecraft Launched 2013 – 2022, by Mass Class



STATE OF THE ART

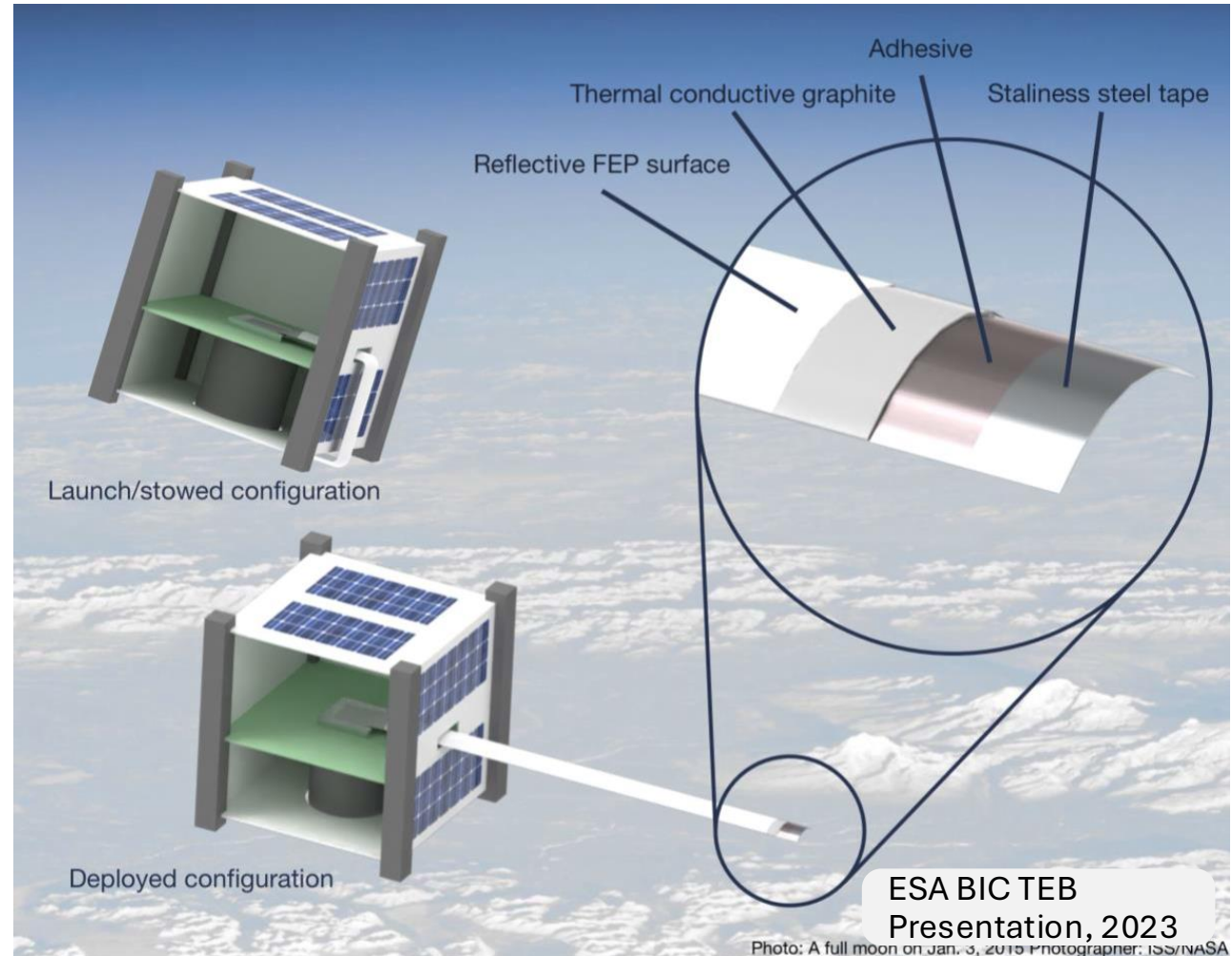
- Deployable radiators on smallsats are challenging due to volumetric constraints
- There is development in the technology of deployable radiators for smaller spacecrafts, but they are at lower TRL (to ~6). All of them are outside of Europe.
- Current solutions are mostly rigid panel radiators. Further development is focused on flexible links transferring heat from cooled component to radiator panel. For this purpose, graphite materials or heat pipe of special design are used.
- Some solutions use rollable, inflatable aluminum heat pipes. It is thermally highly efficient, but more complicated and expensive in terms of manufacturing and testing, less reliable and more prone to micrometeoroids & space debris.



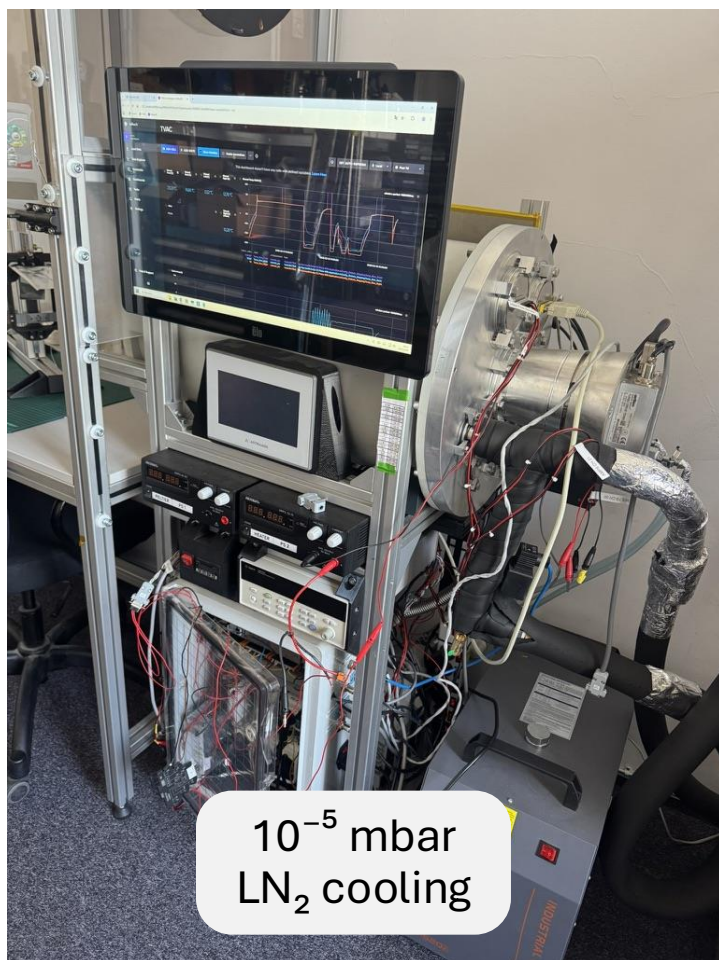
OUR IDEA



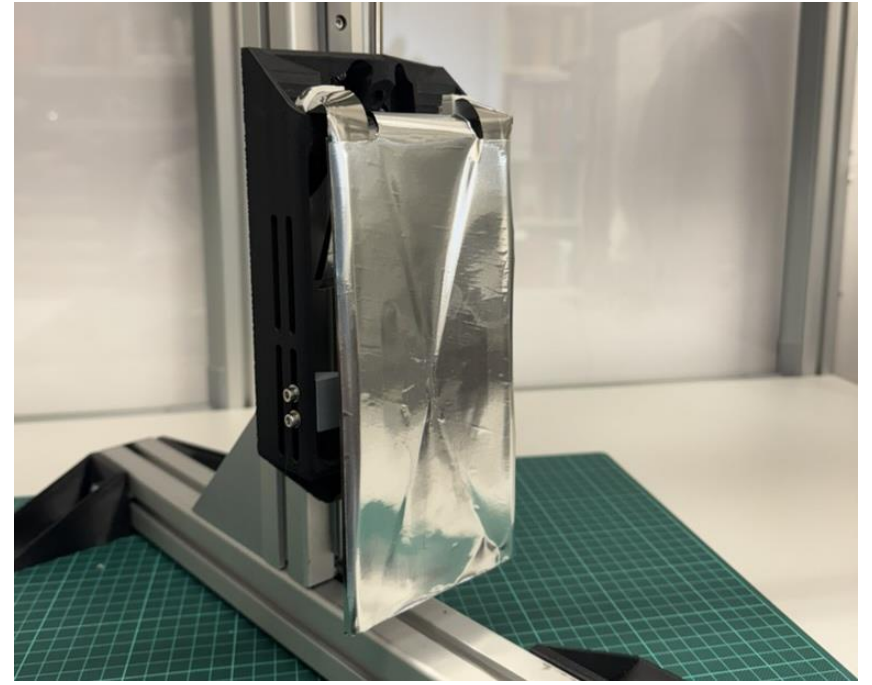
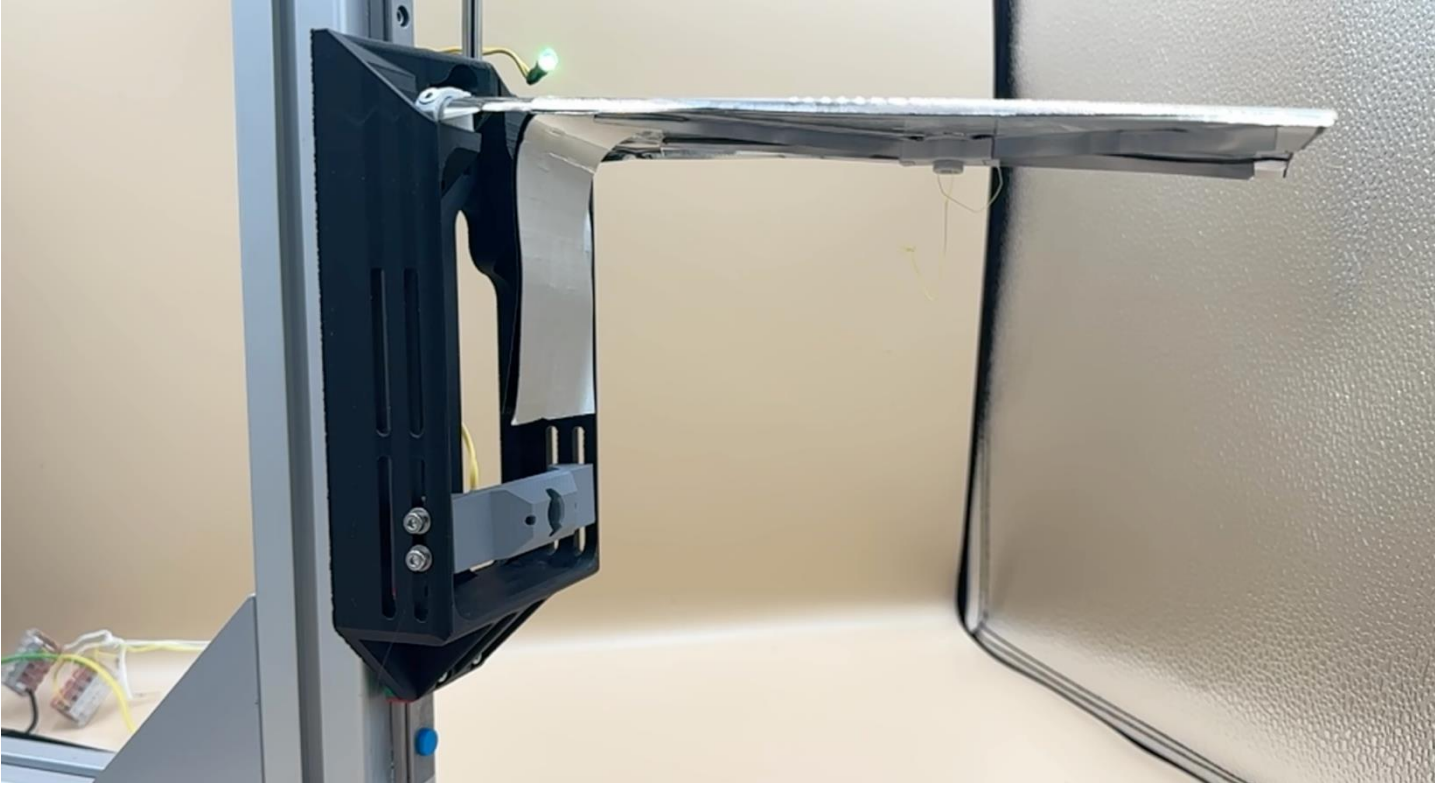
- Small satellites struggle with thermal control — radiation is the only way to reject heat
- Deployable radiator: more surface area, no motors, minimal mass
- Tape-spring composite: light, simple, self-deploying
- Target: TRL 7–8 within incubation



BUILDING THE FOUNDATION



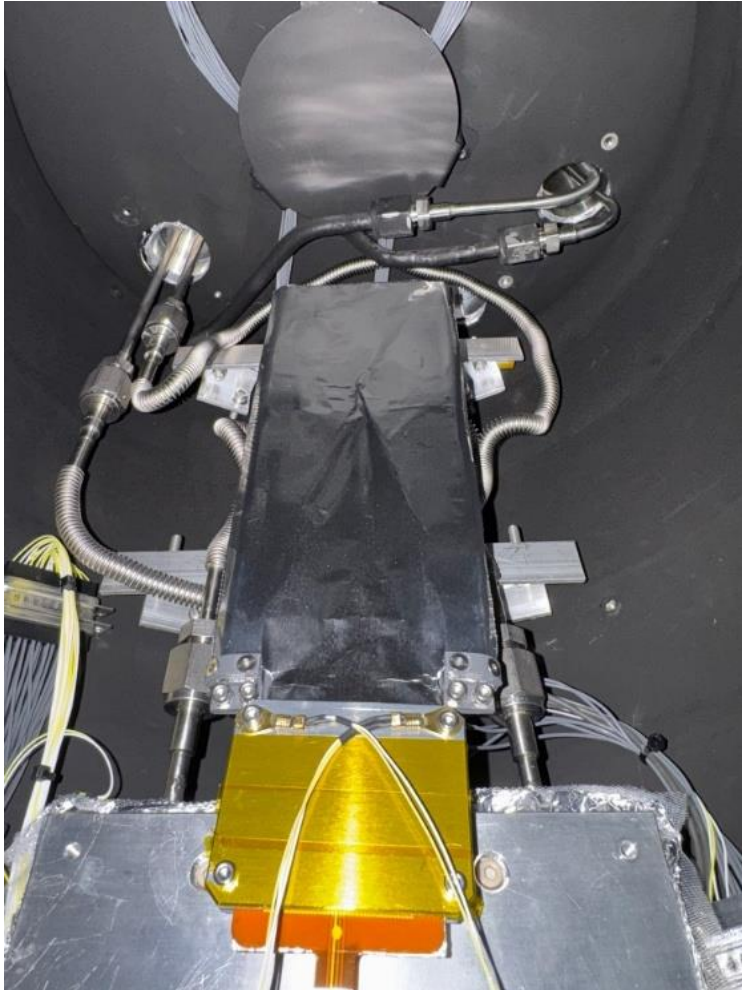
WHAT WE BUILT - THE RADIATOR



aerial density
~2 kg/m²
vs NASA target <6kg/ m²

heat rejected
8.7 W
@ 101°C source temp.

VERIFICATION & TESTING



PATH FORWARD



In Orbit Demonstration





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THANK YOU!