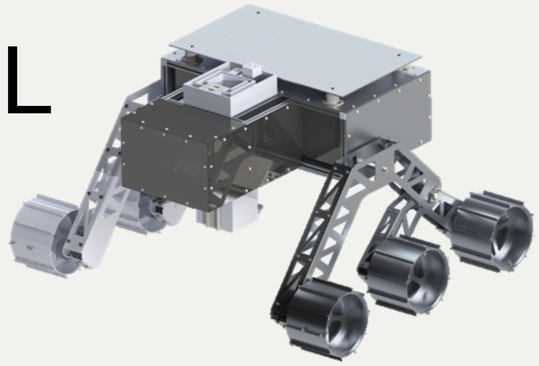
Imperial College London

MARS ROVER - STRUCTURAL FRAME AND INTEGRITY



Objective: construct a modular, robust and lightweight structural frame for the Mars rover.

GROUP 3B - MECHANICAL ENGINEERING DEPARTMENT

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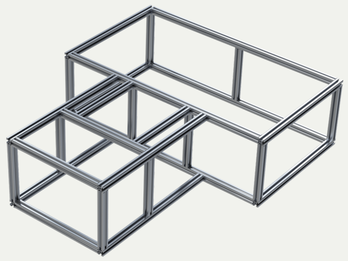
DESIGN

Aluminium profile extrusions

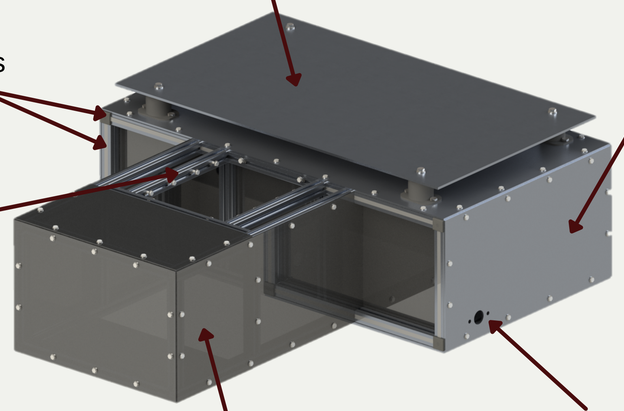


Solar panel model, suspended by 4 rubber anti-vibration mounts

Aluminium Composite Material (ACM) panels for strength and support

End caps and cover profiles for ingress protection

Integration with Experimental subassembly by means of t-nuts and screws



Integration with Propulsion subassembly through face and foot mounted bearing housings

Polycarbonate panels for protection and enclosure

- ☑ **Inexpensive**
- ☑ **Modular**
- ☑ **Easy to (dis)assemble**
- ☑ **Lightweight**
- ☑ **High strength**

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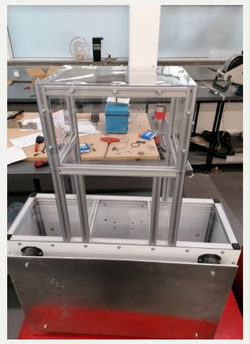
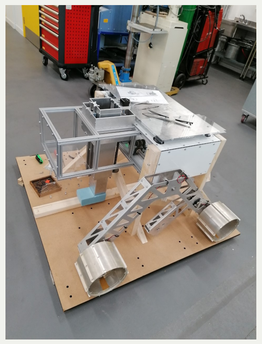
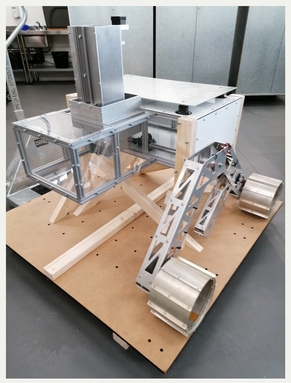
MANUFACTURE AND ASSEMBLY





- Manufactured in 4 external workshops
- Assembled in IDEAS Space at Imperial College London



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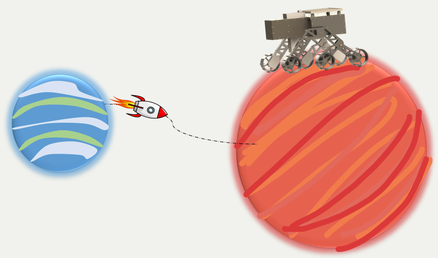
TEST

1) **Weight:** 11.95 kg
2) **Dimensions:** 840 x 715 x 280 mm
3) **Impact Hammer Test:** 11 resonances observed in 0-100 Hz range
4) **HADES Test:** future test to determine survivability against Ariane 5 launching conditions

Redesign:

- Corner brackets added to frame
- Stiffened extrusion profile structure



ANNE CASTILLE BUISSON, PETER HANNA, CANDELA MARTÍN GALLEGO, RIZWAN QURESHI, CARMEN VALERA