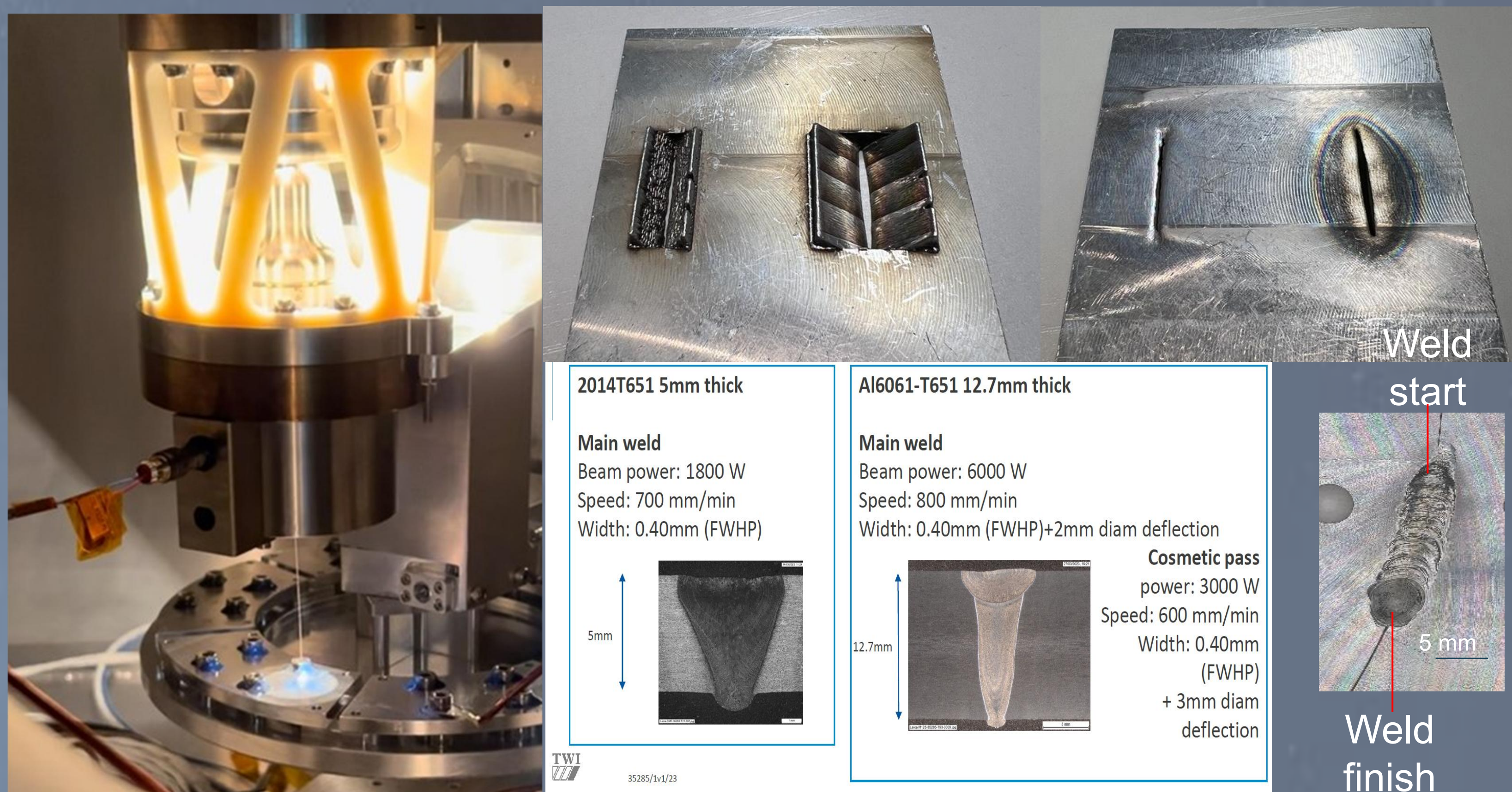
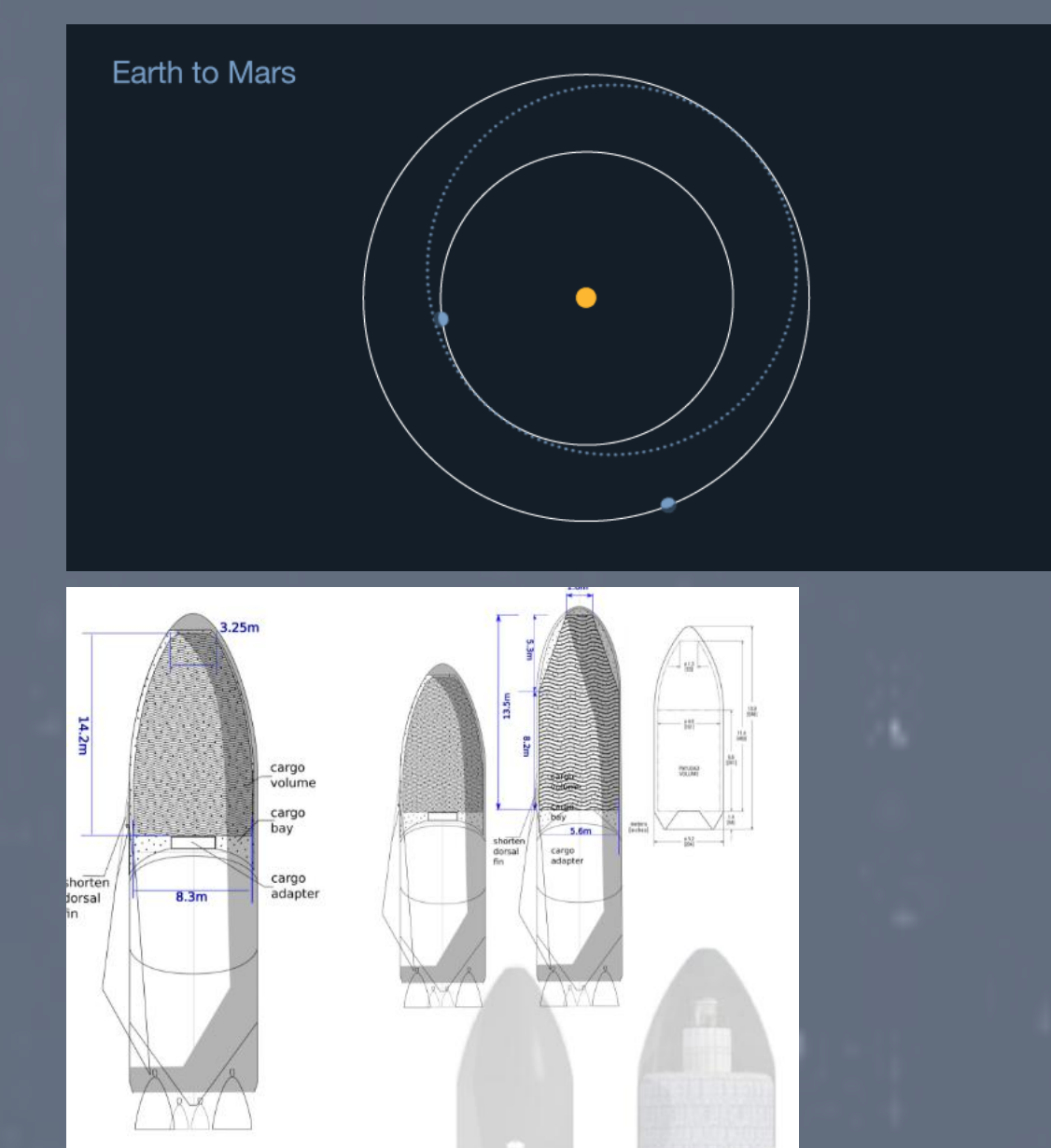


Electron Beam Based Cutting/Welding Inspection



Ship Design and Mass Analysis



- Delta-V:
- 3.9 km/sec for a Mars Mission
  - 4.98 m/sec for Jupiter reference mission

- Launch Loads and Envelope:
- No Dynamic Pressure
  - Envelop per SpaceX Starship
  - Loads per Falcon 9 Users Guide

Mass Estimation Via Industry Sizing Equations

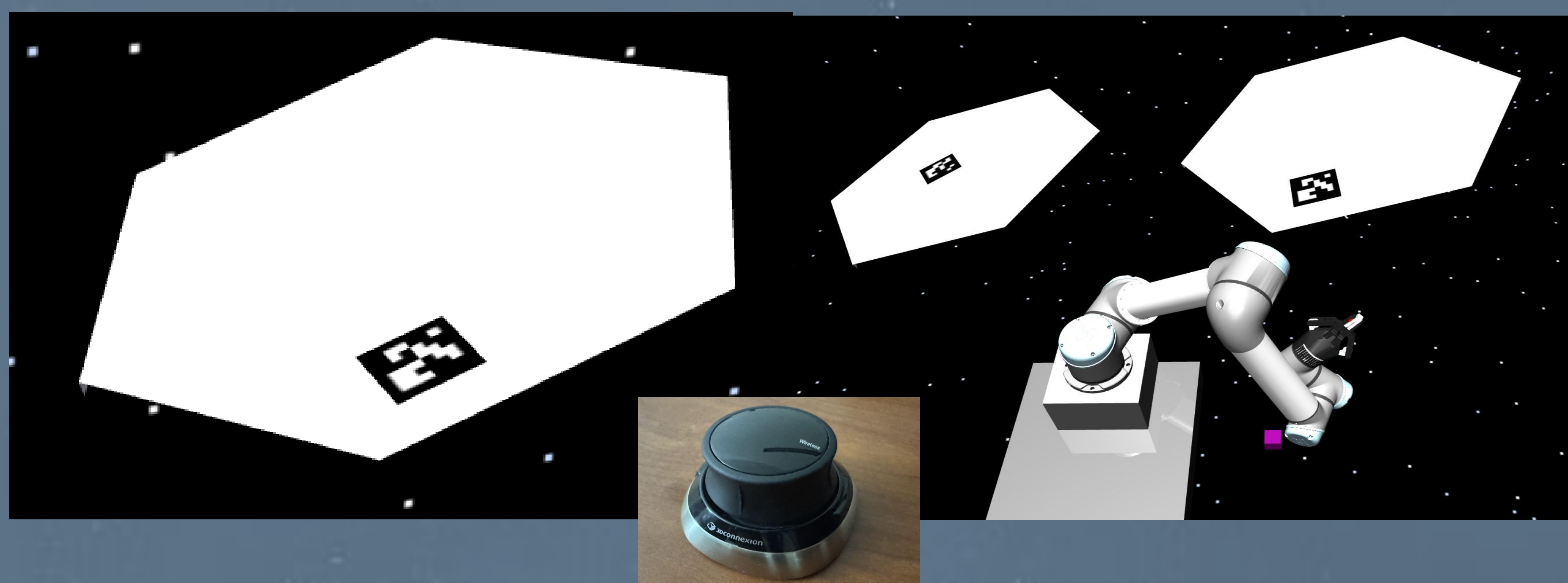
- Open Work:
- Final Ship CAD/Design Mass Verification

Assembly Cost Model

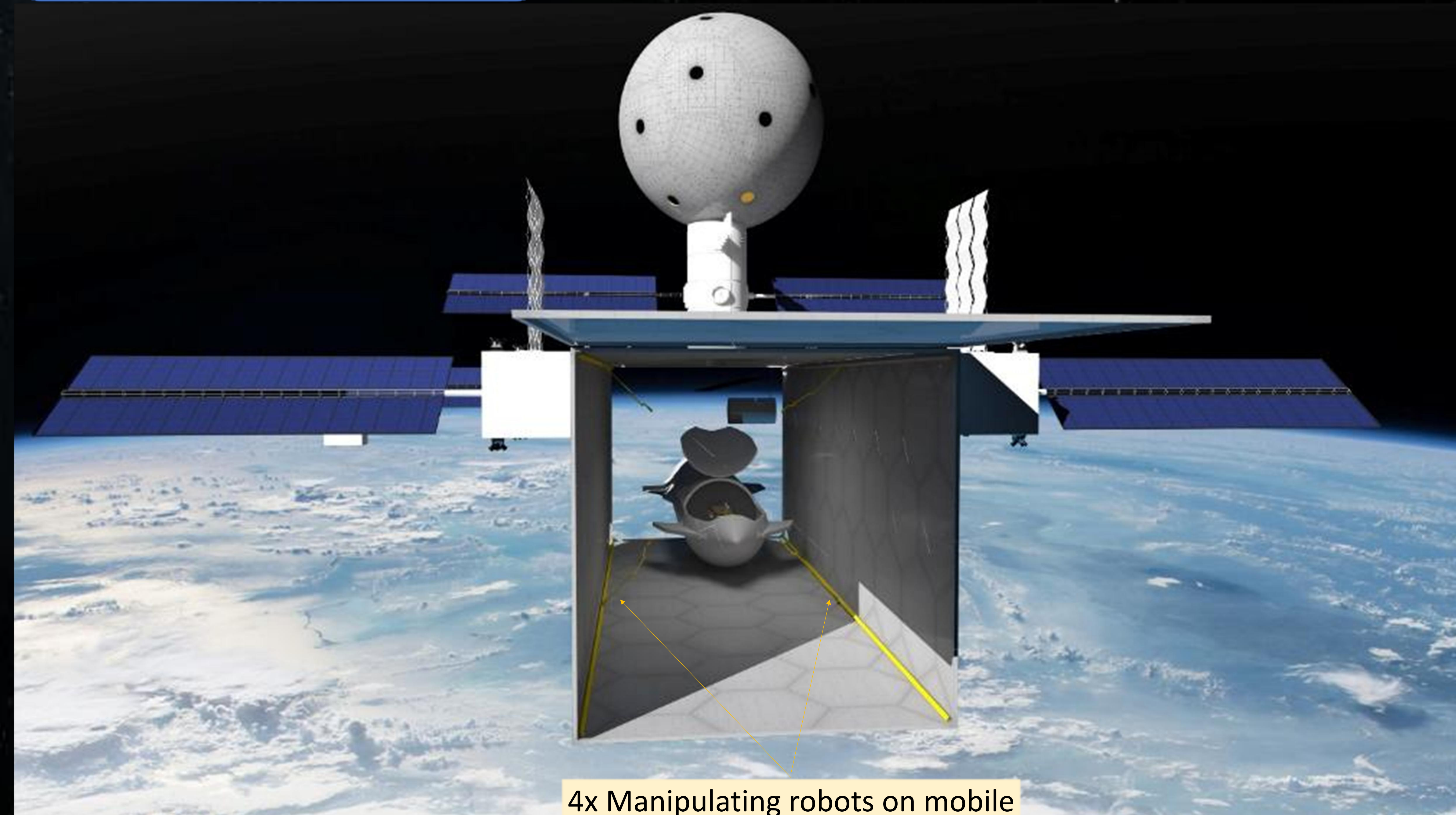
- Input from Weld Rates
- Input from ASU Assembly Rates
- Input from ship design and mass analysis

Output: Mass/Cost/Assembly Times

Robotics Optimization Study



- Computer simulated plate manipulation environment
- AI/ML augmented user commands
- Final Product(In-Work): Assembly Rate



4x Manipulating robots on mobile crane rails

Near-Term

Far-Term

