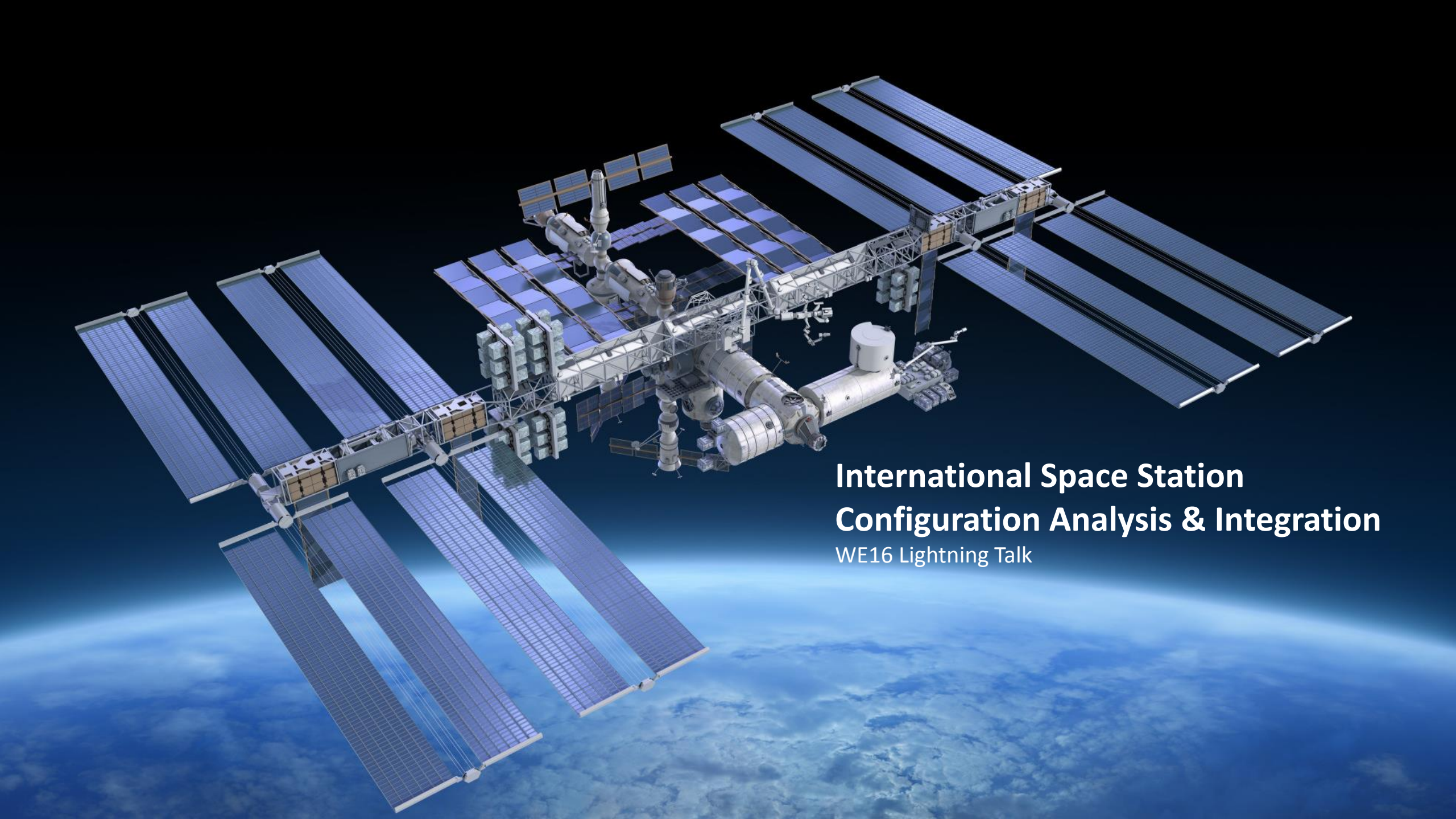


International Space Station Configuration Analysis & Integration

WE16 Lightning Talk

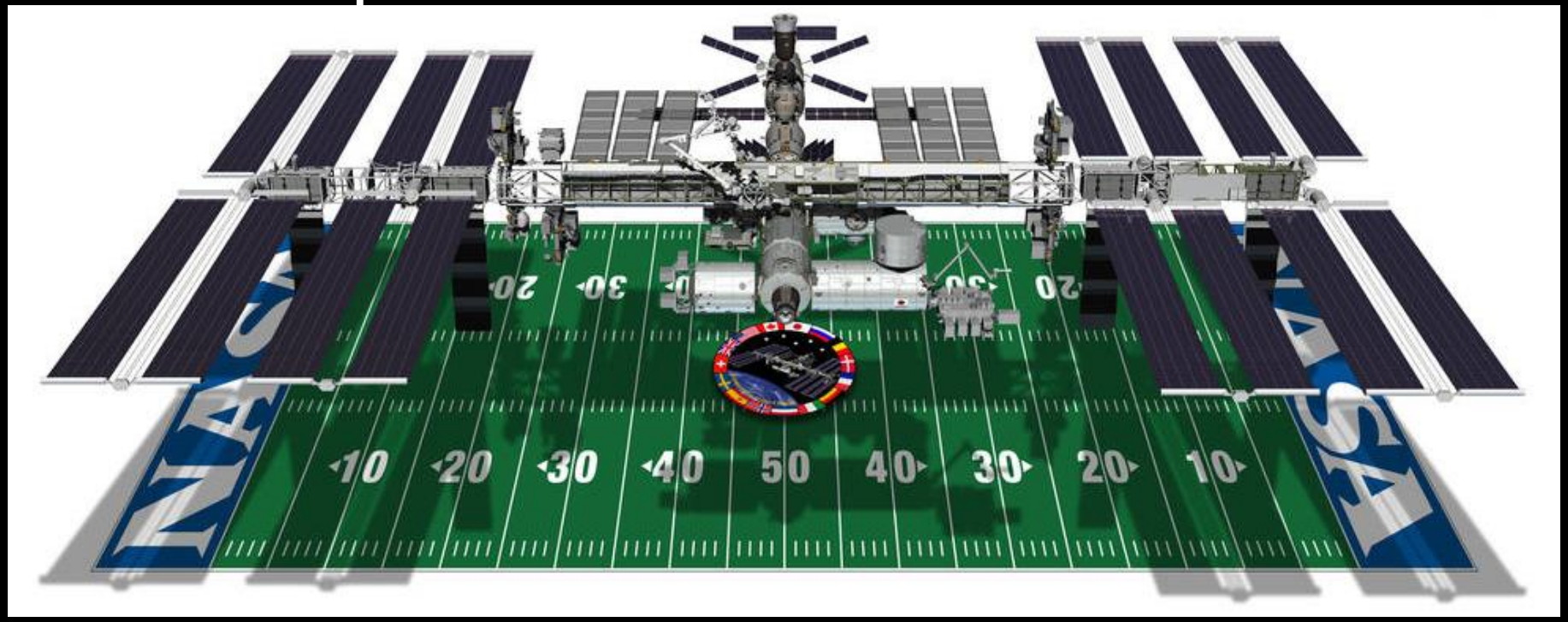
Rebekah Anchondo
Lead Engineer, Booz Allen Hamilton

B.S. in Aerospace Engineering, University of Texas at Austin
M.S. in Systems Engineering, University of Houston at Clear Lake

Booz | Allen | Hamilton

- Modeling, Analysis, Visualization, Robotics, and Integration Center (MAVRIC) Team
- NASA's International Space Station (ISS) Program Office
- ISS Internal Volume Configuration Lead

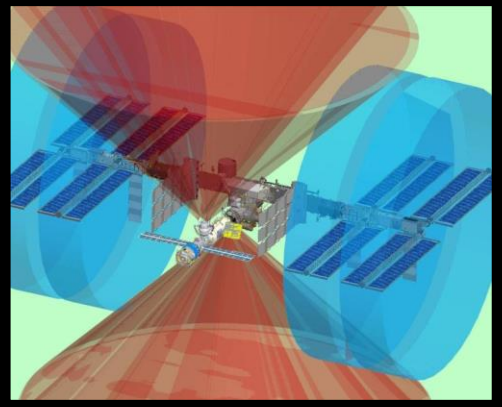
With the first ISS element launched in 1998 and assembly completion in 2011, ISS can support a permanent 6 person astronaut crew, and is used to test technologies needed for tomorrow's exploration.



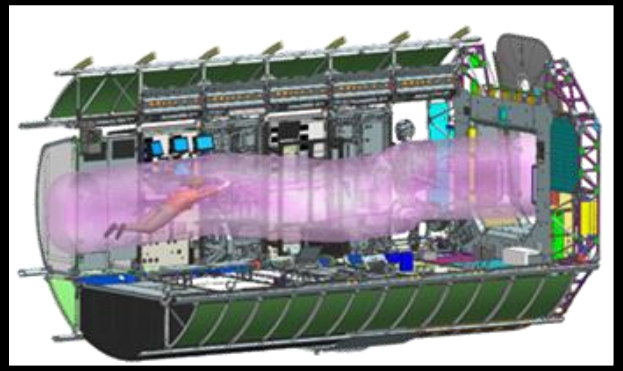
Mass	~920,000 lbs
Habitable Volume	13,693 ft^3
Max Speed (orbits Earth every 1.5 hours)	17,150 mph
Orbital Height	268 miles

NASA ROSCOSMOS JAXA esa CSA ASC

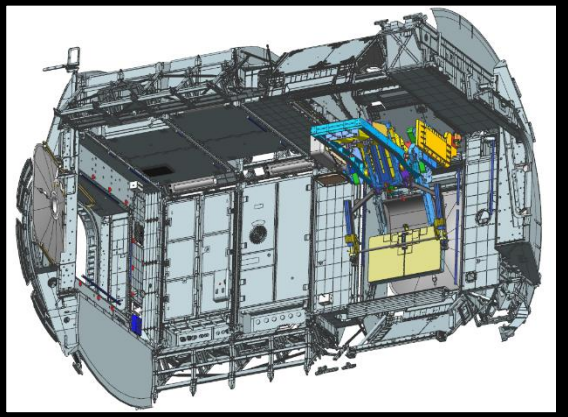
What Booz Allen Does:



External Configuration



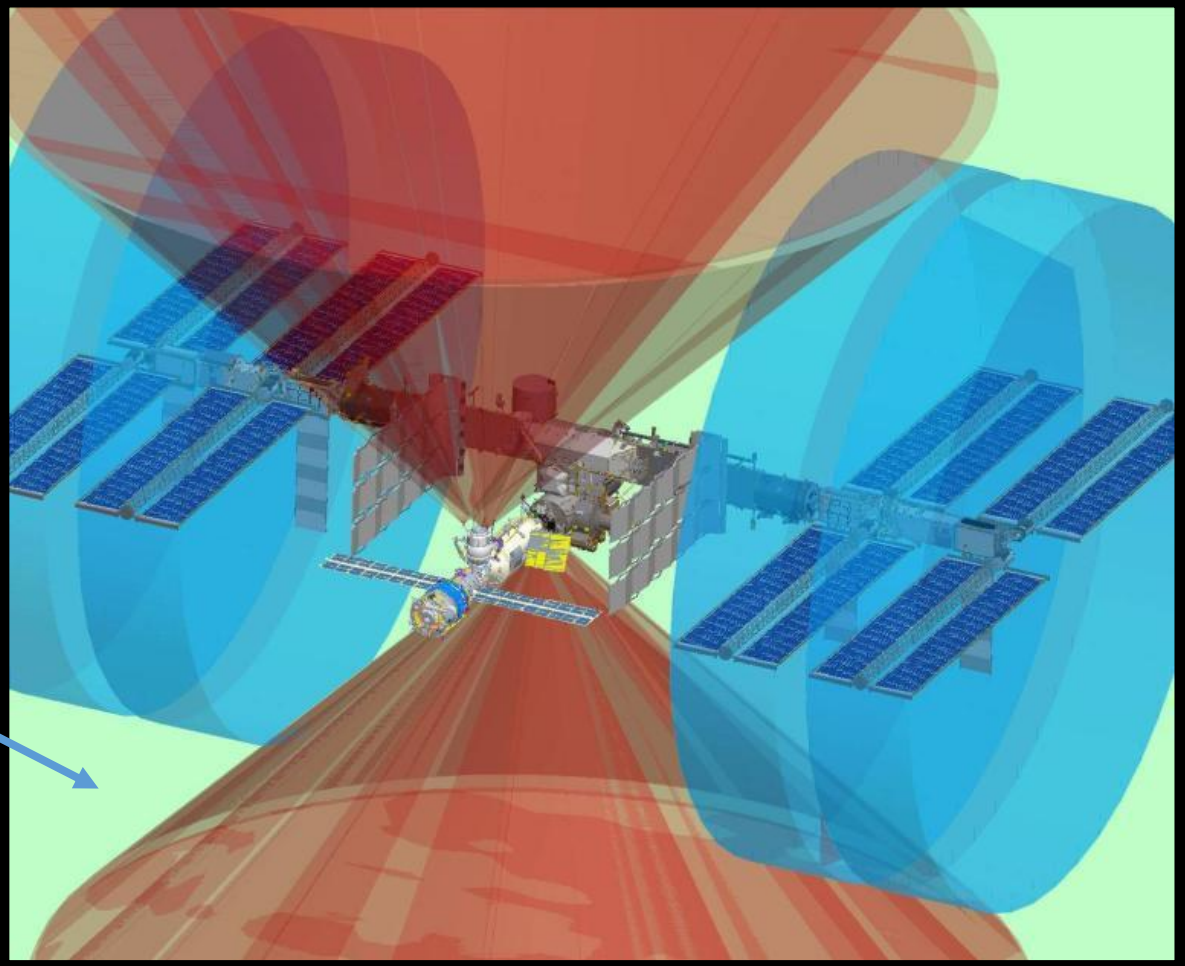
Internal Configuration



Trade Studies

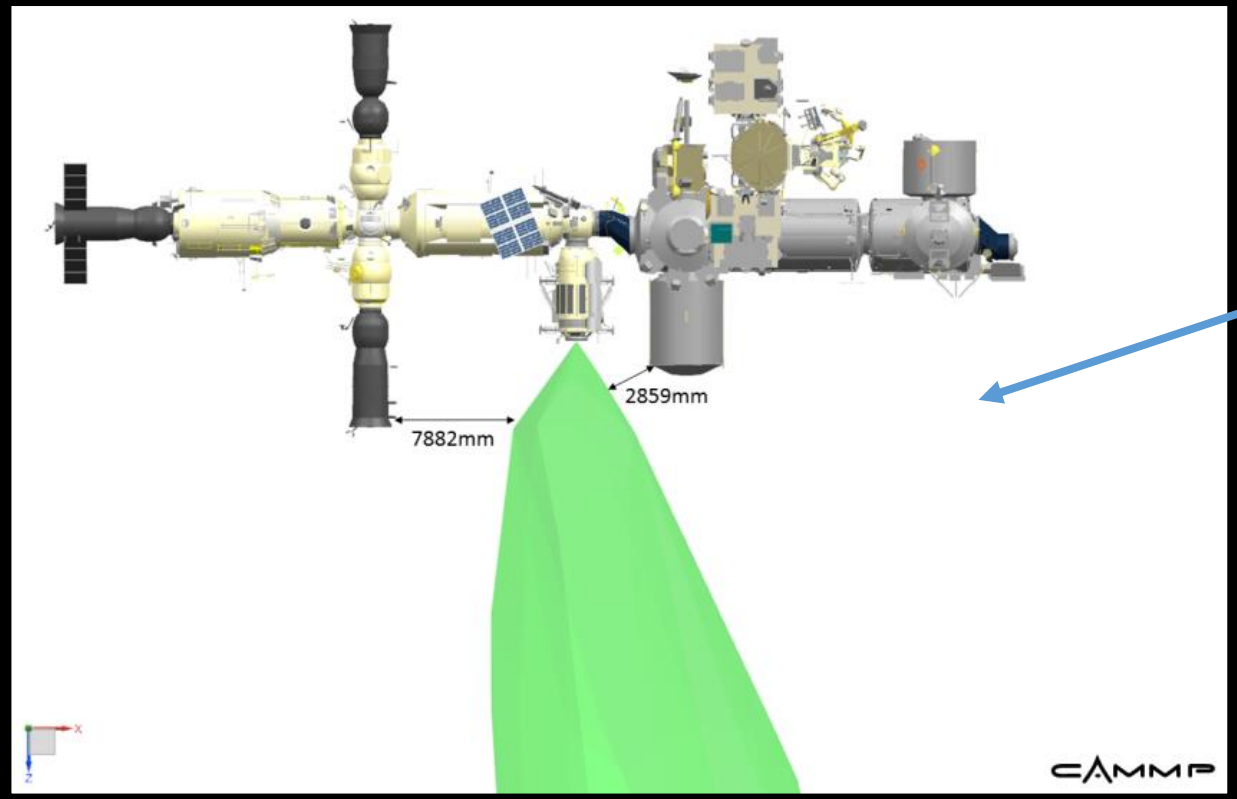
Booz Allen tracks and analyzes past, present, and future external configurations to perform static, dynamic, and kinematic analysis and to calculate aerodynamic and mass properties.

Clearance Envelopes, Keep Out Zones, Field of View, and Motion Envelopes



Performing clearance analysis with DC1 and FGB Kurs with Solar Array Static Envelopes

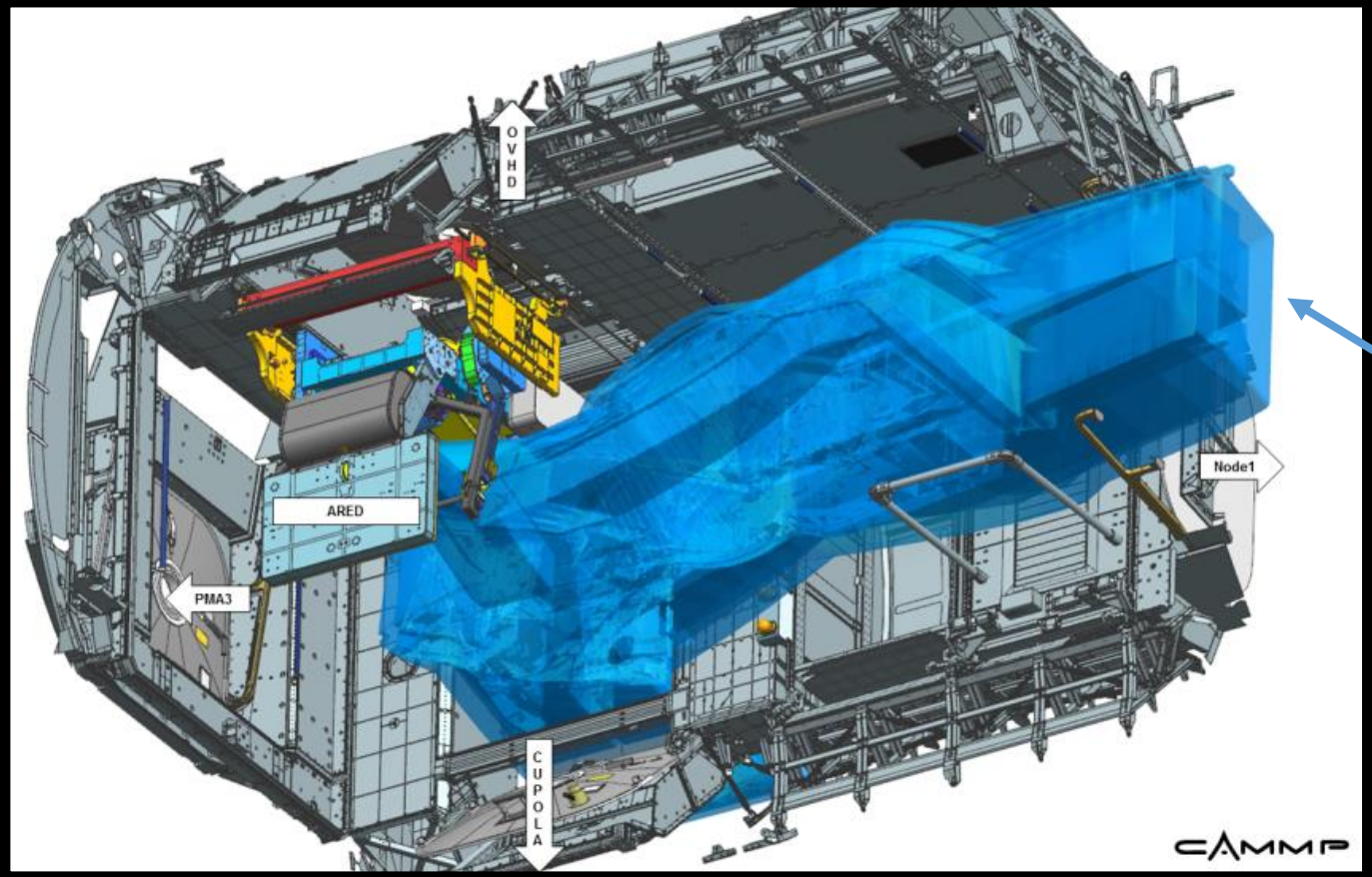
Booz Allen tracks and analyzes past, present, and future external configurations to perform static, dynamic, and kinematic analysis and to calculate aerodynamic and mass properties.



MRM1 Departure Corridor

Visiting vehicle approach, capture, separation, and departure corridor envelope creation and clearance analysis

Booz Allen assesses internal configurations of ISS against safety and habitability volumetric requirements such as visibility, lighting, translation paths, and environmental control.



Rack Translation though Node 3

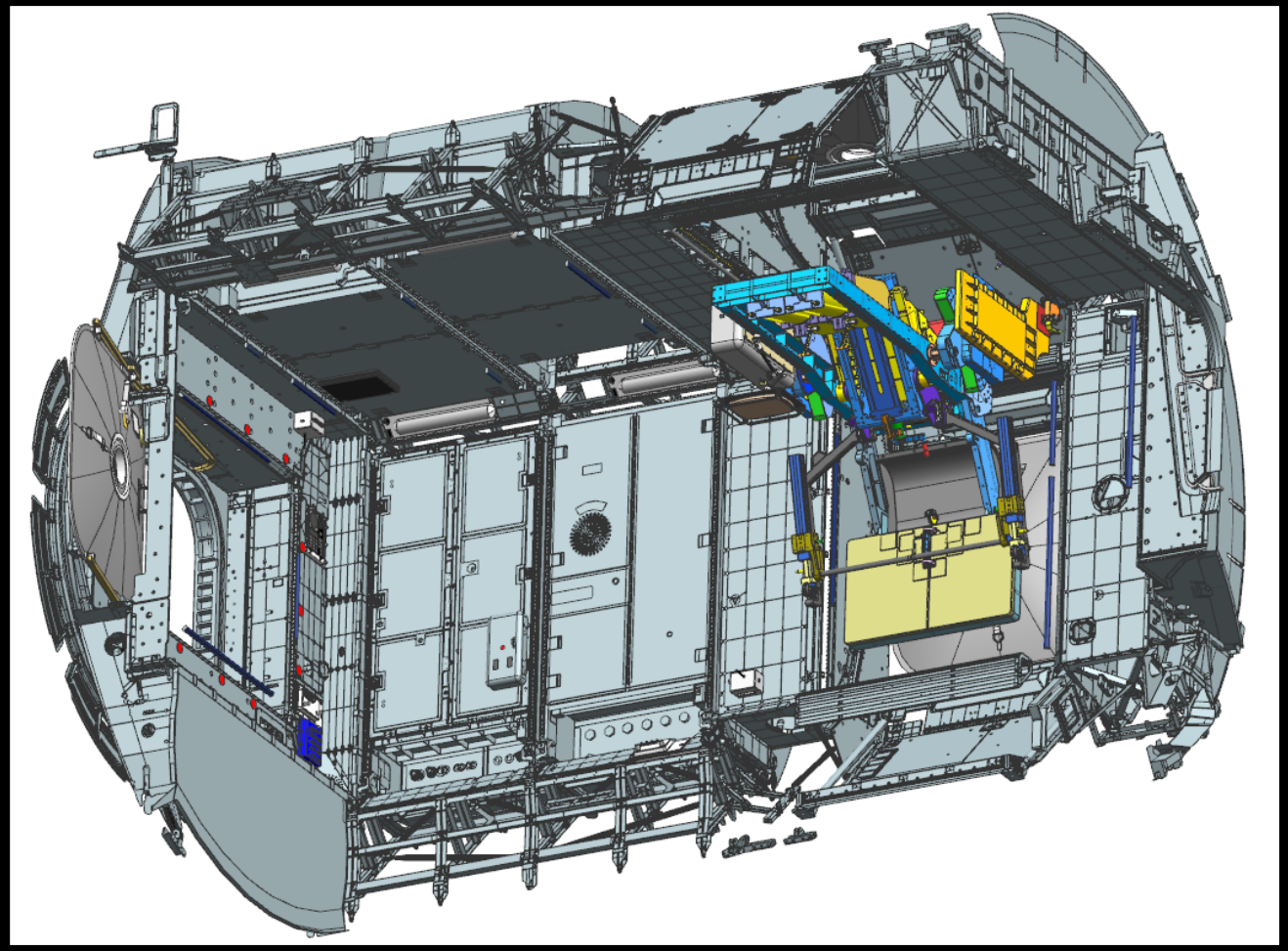
Translation path calculation and optimization for astronauts and large hardware through ISS

Booz Allen performs multidisciplinary trade studies of ISS configurations by working with stakeholders to make sure their needs are correctly matched against evaluation criteria.

Trade Studies Include:
- Docking and Berthing Port Study
- Rack Topology Study
- Sleep Station Location Study

Stakeholders Include:
- Astronauts
- Hardware Owners
- Program Management
- Operation teams

Evaluation Criteria:
- Safety
- Cost
- Habitability
- Design Feasibility
- Operational Impacts
- Science Impacts



Advanced Resistive Exercise Devise Location Study within Node 3

We do it all with…

Thank you!