



# Cygnus Support for International Space Station Utilization

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**Bob Richards  
Vice President  
Orbital ATK**



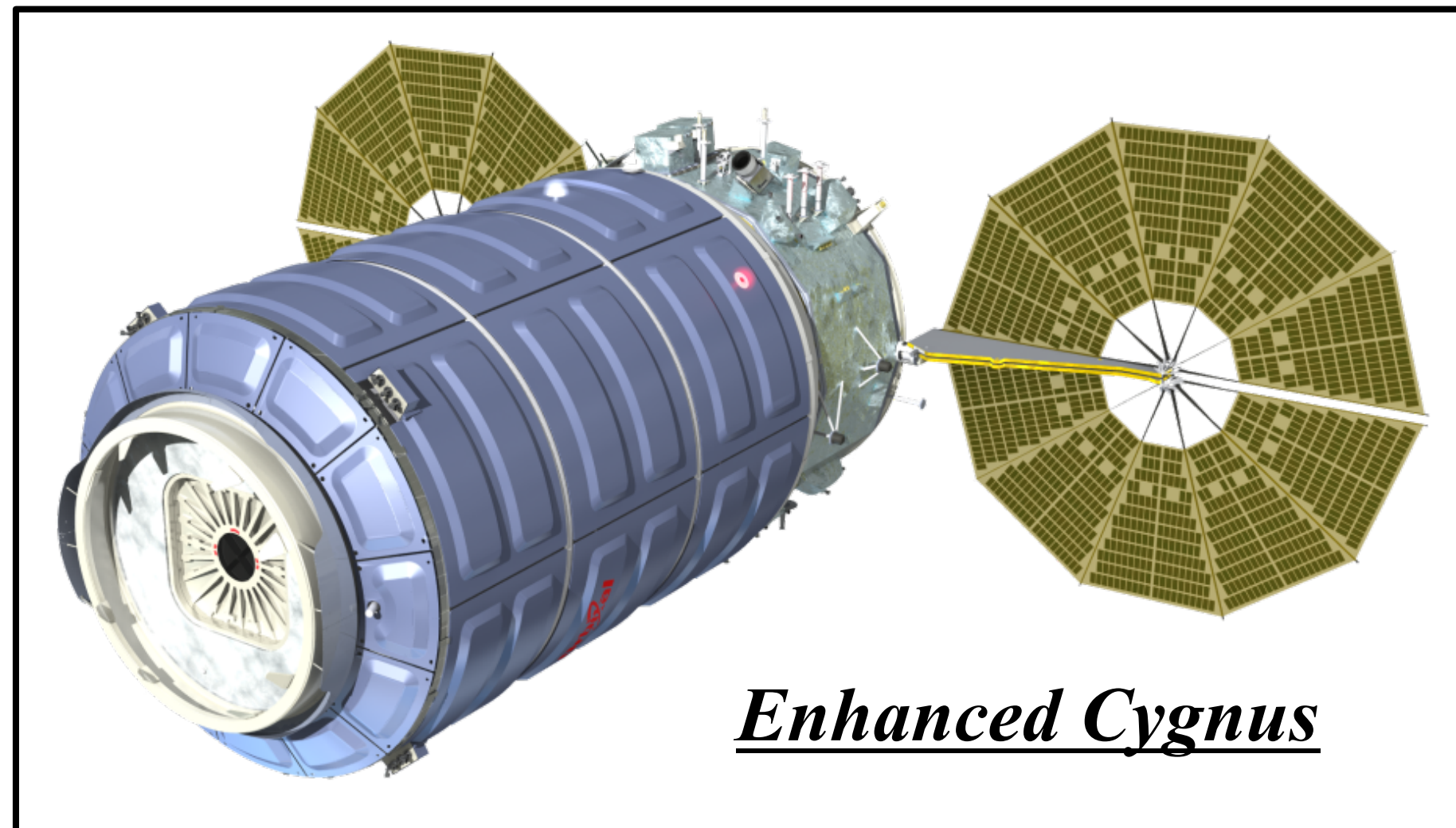
- **Cygnus Provides Regular Cargo Resupply to the ISS Program**
  - Orb-1 Mission: Completed 2/19/2014
  - Orb-2 Mission: Completed 8/17/2014
  - OA-4 Mission: Completed 12/3/2015
  - 6 additional CRS Flights 2016 to 2018



# Cygnus Spacecraft Overview



**The Cygnus Vehicle Is A Human-rated Spacecraft Currently Providing Cargo Services For NASA's International Space Station Program**



- **Cygnus is designed to maximize pressurized volume to meet NASA's Cargo and Payload delivery needs**
- **Cygnus also removes disposal items after cargo is unloaded**

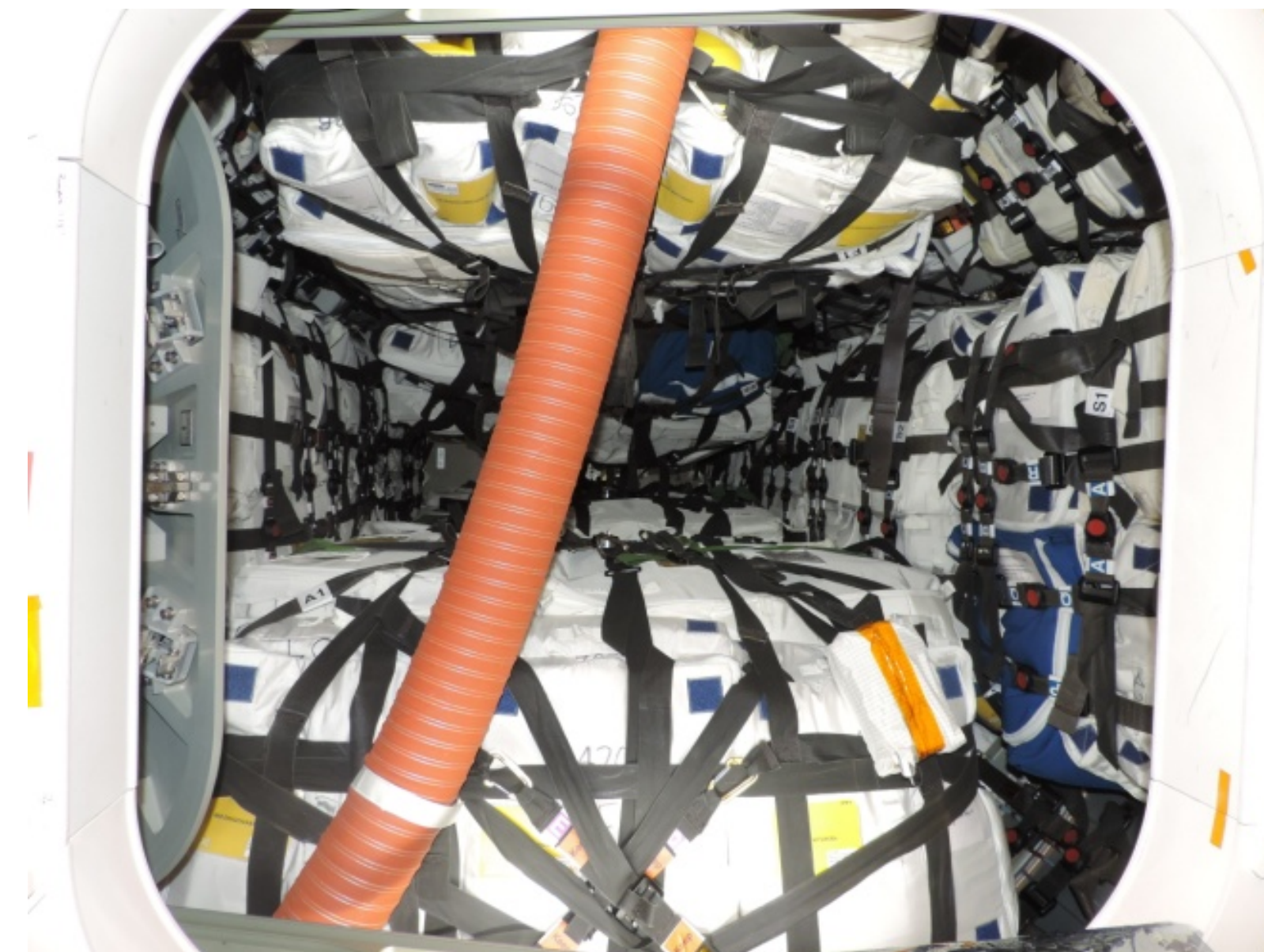
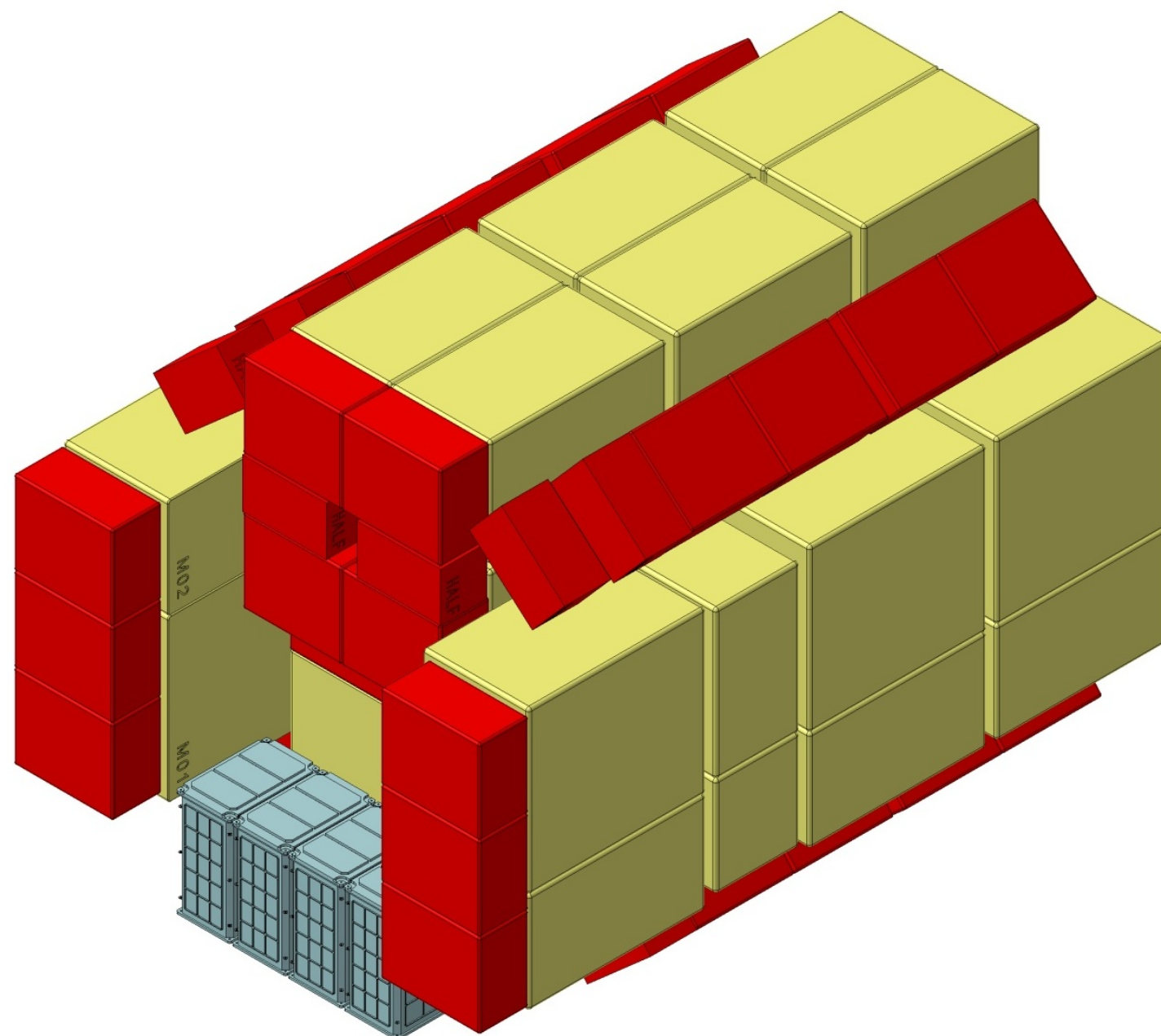
## **The Cygnus Consists of Two Primary Elements**

- **Pressurized Cargo Module (PCM) – TAS-I**
  - Heritage: Multi-Purpose Logistics Module (ISS); ATV
  - Payload Mass: 3,200-3,500 kg
  - Pressurized Volume: 27 m<sup>3</sup>
  - Berthing at ISS: Common Berthing Mechanism
- **Service Module (SM) – Orbital ATK**
  - Heritage: Orbital ATK GEO and LEO missions
  - Power Generation: 2 Fixed Wing Solar Arrays
  - Power Output: 3.5 kW (sun-pointed)
  - Compatible with various launch vehicles

# Cygnus Cargo Capability



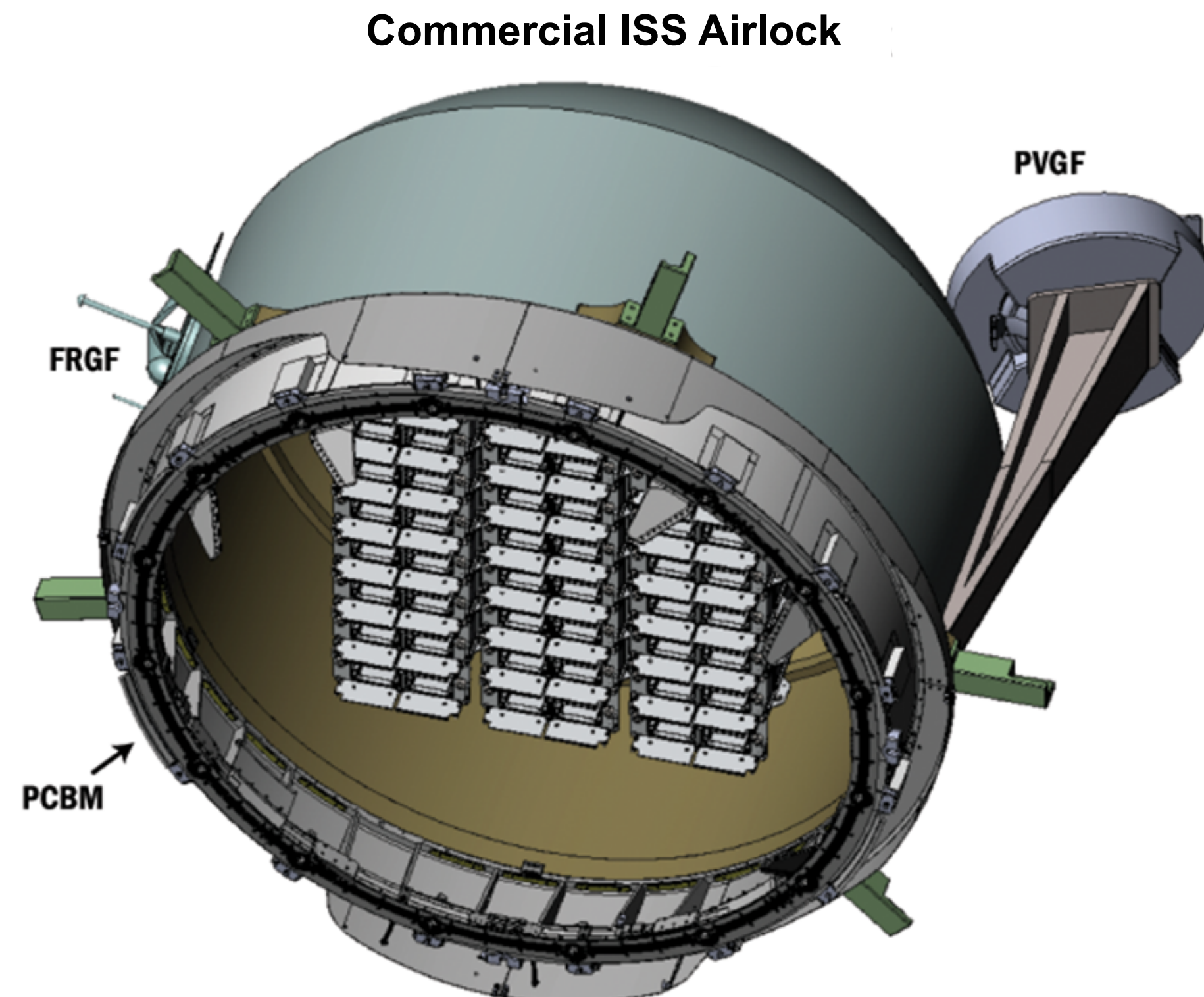
- The Cygnus spacecraft can accommodate a large amount of pressurized cargo
  - Cargo can consist of both NASA and commercial payloads
- Cygnus cargo upmass will include payloads for the commercial airlock



# Payload Airlock Collaboration



- Orbital ATK, Thales Alenia Space, and NanoRacks are collaborating on the development and operation of a commercial airlock service on the ISS
- Cygnus spacecraft will supply the commercial airlock with pressurized payload delivery to ISS



# Example Airlock Payloads



# Conclusion

- **Cygnus is a proven platform supporting human spaceflight operations and related scientific research**
- **Available for commercial services including delivery of payloads for a new commercial airlock**

