



***Dream Chaser
Orbital Transportation Vehicle
and UNOOSA Mission***

John Roth

VP Strategy & Business Development

Sierra Nevada Corporation

29 August 2017

Dream Chaser Spacecraft

- Only runway-landing crew-capable Space Vehicle actively in development
- Crewed or uncrewed transportation to and from Low Earth Orbit (LEO)
- Non-toxic propulsion for launch abort, orbital translations, attitude control, deorbit
- < 1.5g re-entry profile and >1000 mile cross-range capability
- Designed to launch on a variety of launch vehicles
- Able to Land at Commercial Airports or Spaceports with Proper Licensing



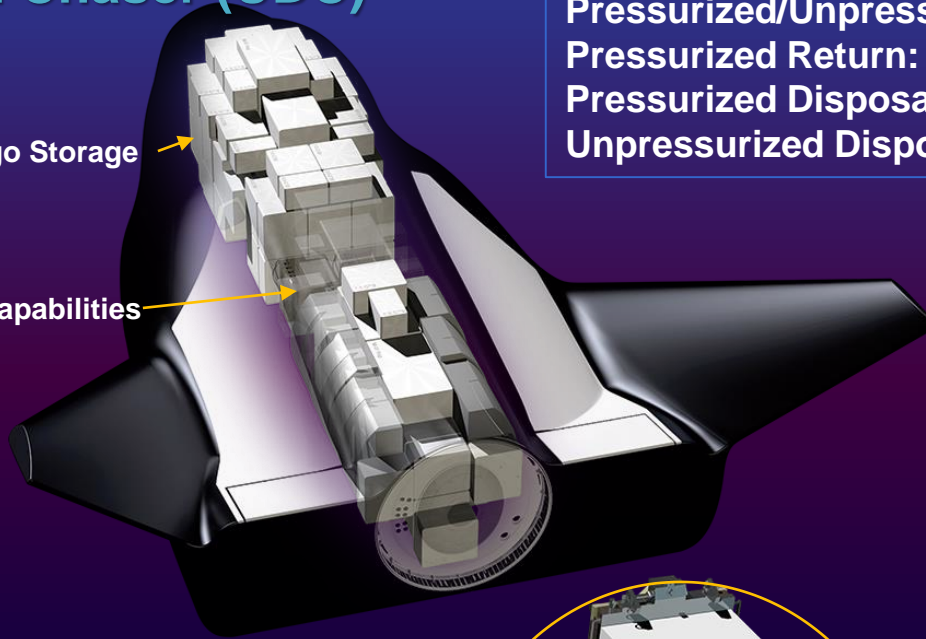
Dream Chaser Cargo Variant

Uncrewed Dream Chaser (UDC)

Pressurized Cargo

Pressurized Cargo Storage

Powered Payload Capabilities



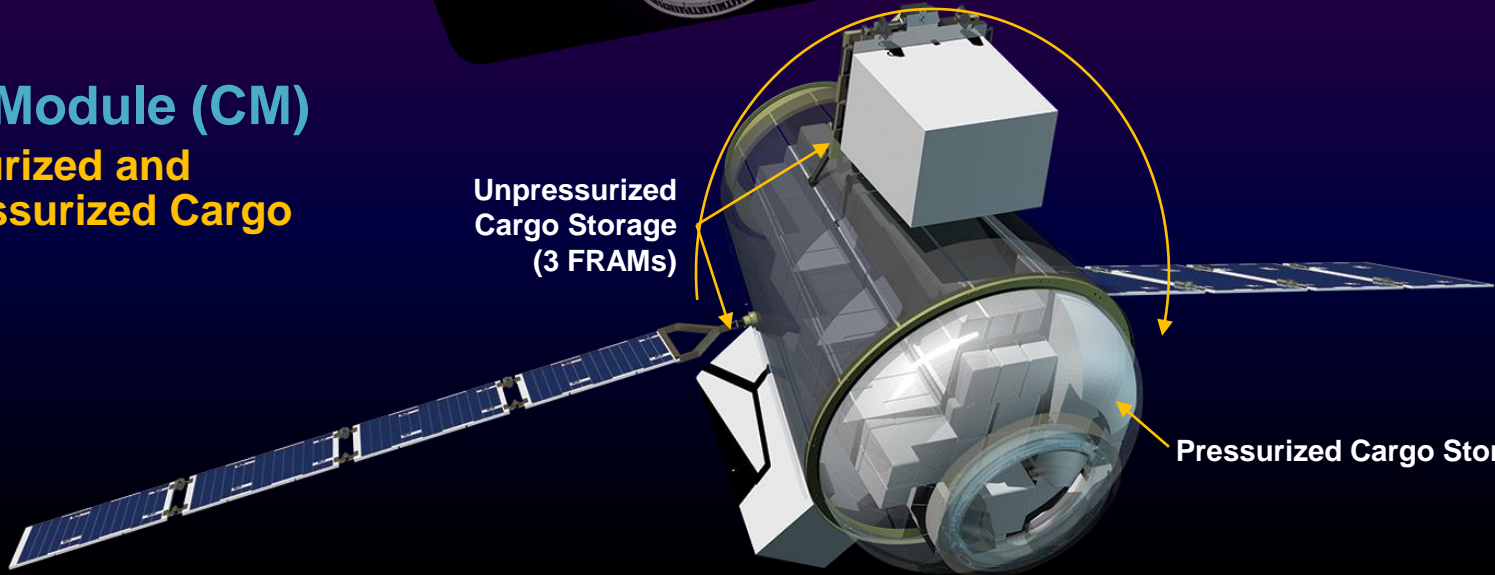
Pressurized/Unpressurized Upmass:	5,500 kg
Pressurized Return:	1,750 kg
Pressurized Disposal:	3,250 kg
Unpressurized Disposal:	1,500 kg

Cargo Module (CM)

Pressurized and Unpressurized Cargo

Unpressurized Cargo Storage (3 FRAMs)

Pressurized Cargo Storage



Dream Chaser Performs ISS Resupply

- NASA Contract Awarded 2016
- Minimum 6 Missions 2019-2024

Cargo Delivery

Mission Flexibility: 10+ day on-orbit loiter for pre-docking checks and phasing

Mission Capability: Propulsion used for ISS dock/undock, deorbit, entry and ISS reboost

Disposal

Rapid Cargo Access

Launch



A True Space Utility Vehicle (SUV)

Broad Appeal, Value, and Sustainability

- **NASA contract provides a good business base, but Dream Chaser designed to support a broad set of Missions beyond ISS Servicing**
 - Short and long duration standalone science missions
 - Exploration support missions
 - Servicing of future commercial space stations
 - Satellite deployment / servicing / retrieval
 - Earth observation missions
 - Orbital test bed for new technologies and hypersonic flight
- **Capability to land on standard 3,000m runways expands opportunities for commercial missions**



UNOOSA Human Space Technology Initiative (HSTI)

Three Activity Pillars

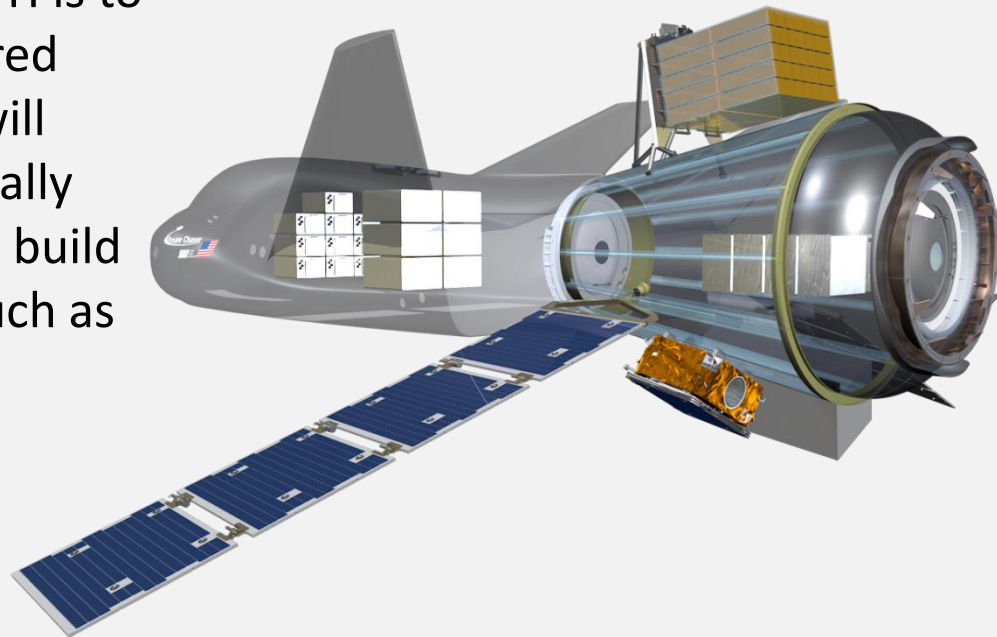
- **Promote international cooperation** in human space flight and activities related to space exploration;
- **Conduct outreach activities** to promote increased awareness among Member States of the benefits of utilizing human space technology and its applications;
- **Support capacity-building efforts world-wide** in microgravity science education and research.



United Nations Dream Chaser Mission

Most Ambitious Program under HSTI is to fly the first United Nations sponsored multi-country space mission that will provide member countries, especially developing countries, the ability to build and fly payloads for applications such as microgravity science, remote earth sensing, and space hardware qualification

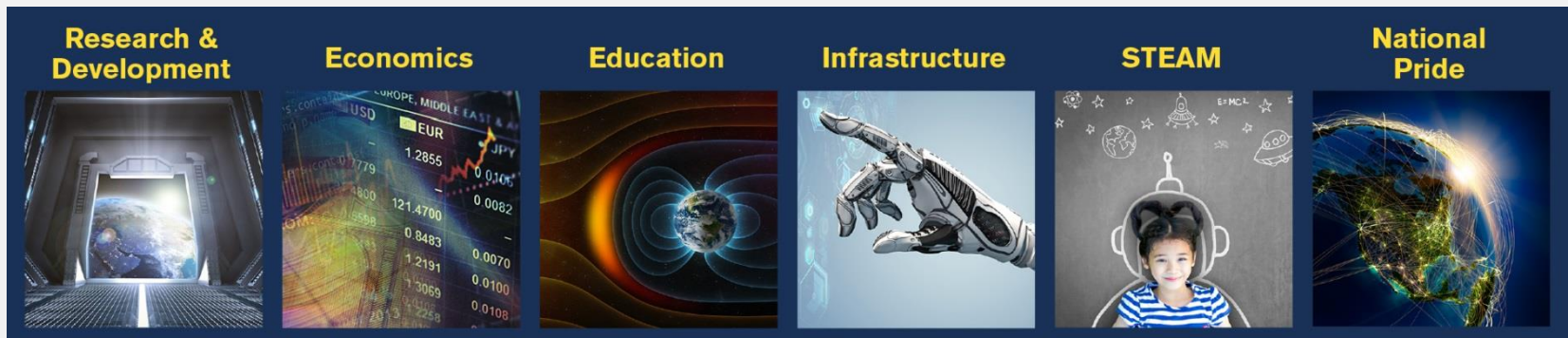
MOU executed between the United Nations and SNC in June 2016 to utilize SNC's Dream Chaser space vehicle as the host to up to 35 country's payloads



Benefits for Participating Countries

Office for Outer Space Affairs

- **Research & Development:** of new space-related knowledge-based industries to support space science understanding and development of experiments in diverse economic sectors.
- **Economic:** growth in high technology fields.
- **Education:** formation of academic centers of excellence to study various aspects of space: space sciences, environmental sciences, atmospheric physics, etc.
- **Infrastructure:** creation of the supporting infrastructure for development of experiments, robotics for manipulating experiments and providing ground operations for (their) space missions.
- **STEAM:** inspire participation in the space program, encouraging education and work in science, technology, engineering, arts and mathematics (STEAM).
- **Pride:** of supporting international cooperation and global promotion of peaceful uses of outer space.



Conceptual UN Dream Chaser Mission



Preliminary Mission Timeline

Office for Outer Space Affairs

- Sep 2017: Issue Call for Interest to UN Member Countries
- Nov 2017: CFI responses due
- Dec 2017: Briefing to interested countries
- Mar 2018: Release of Announcement of Opportunity (AO)
- Sep 2018: AO responses due
- Dec 2018: Payload selections
- Late 2021/Early 2022
 - Launch to low-Earth orbit
 - Stay on orbit for 14-21 days
 - Perform runway landing in a selected country

