Human Spaceflight 2015



Human Spaceflight Initiatives Government and Private

NASA

Russia – China

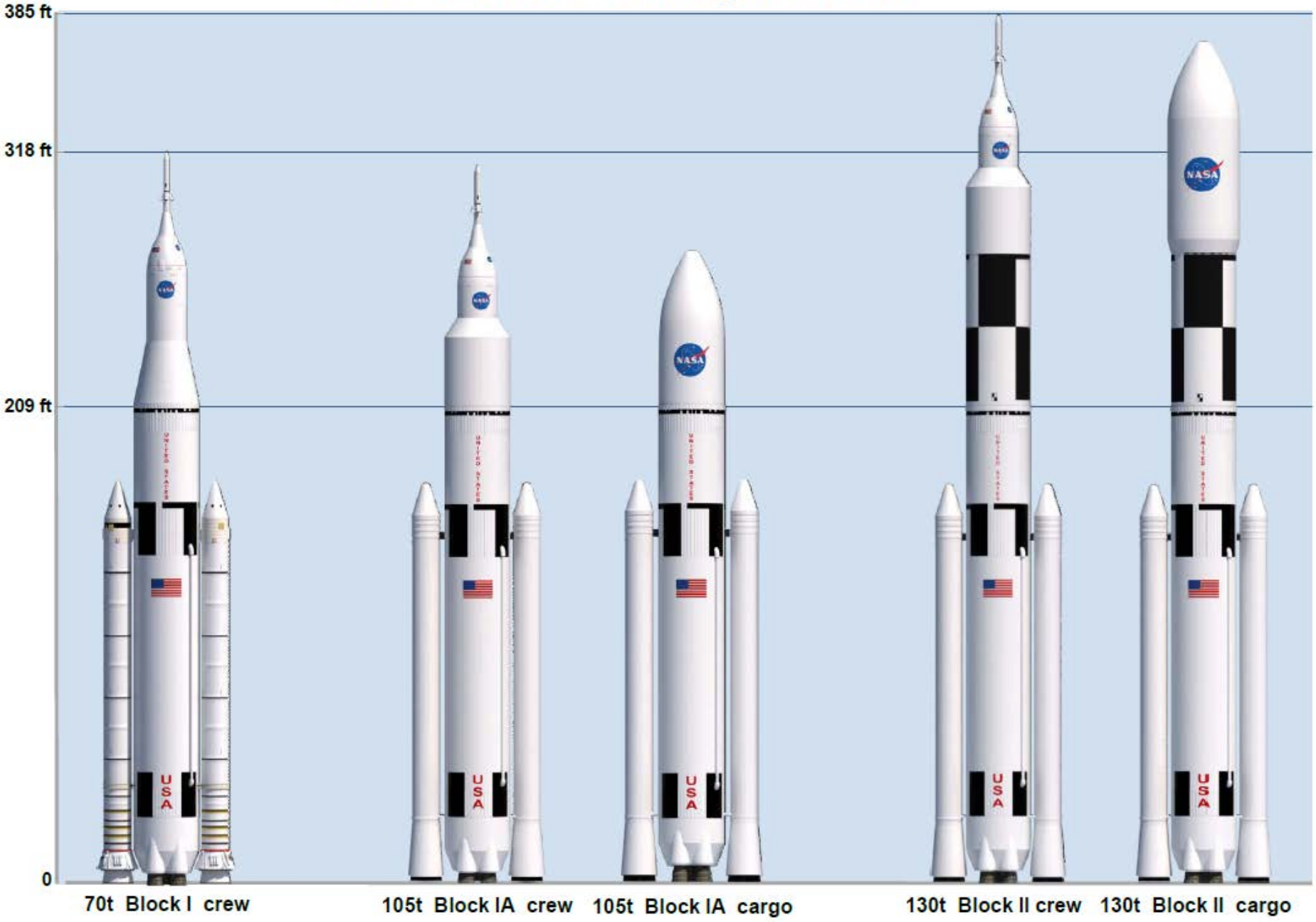
SpaceX

Orbital Sciences

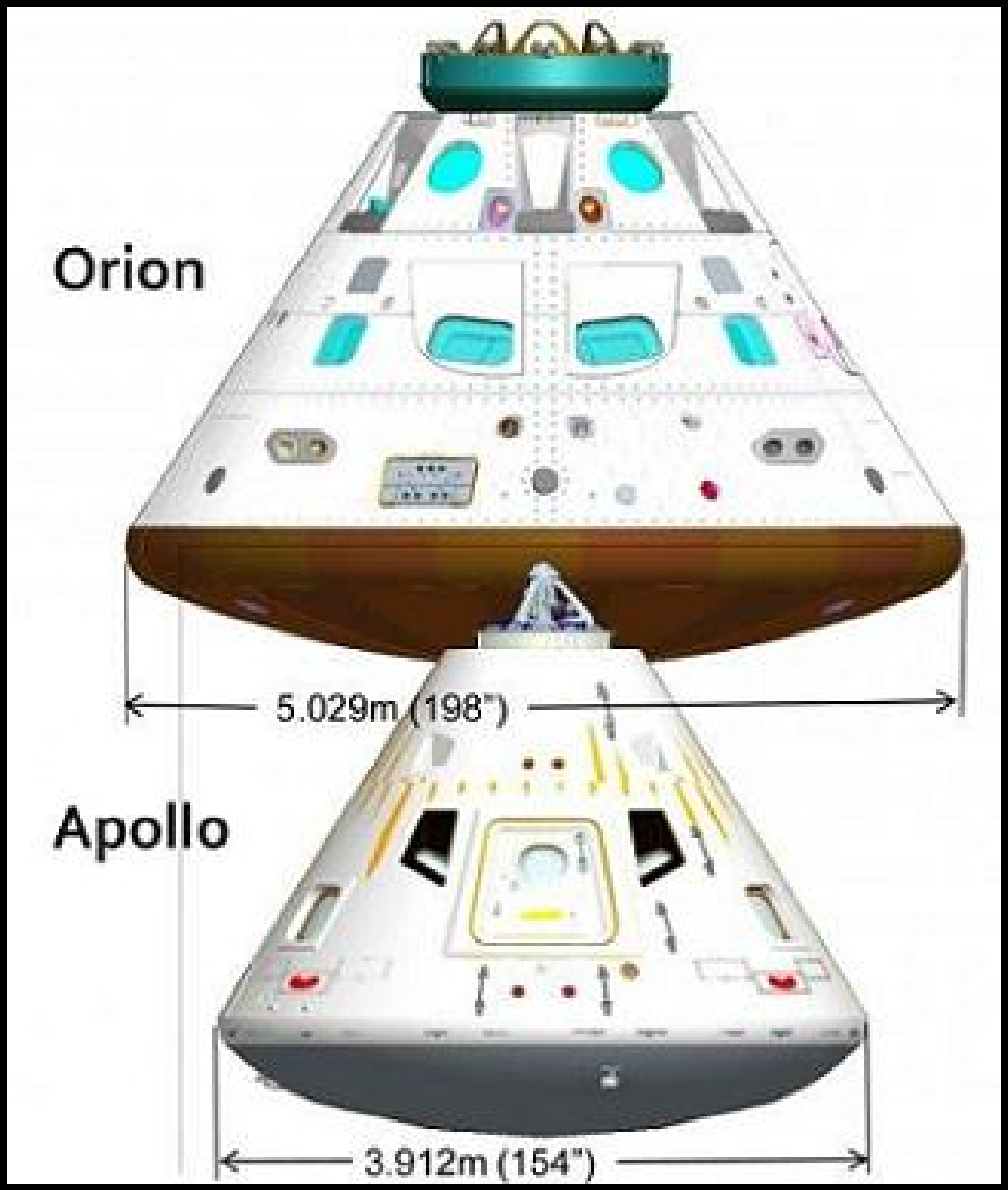
Boeing

Mars One – Inspiration Mars

SLS Vehicle Configurations




ORION


Orion
5.029m (198")
Apollo
3.912m (154")


Mike Keefe The Denver Post 4-17-10
AT LEAST WE STILL HAVE THE CAPSULE.
ORION
NASA BUDGET

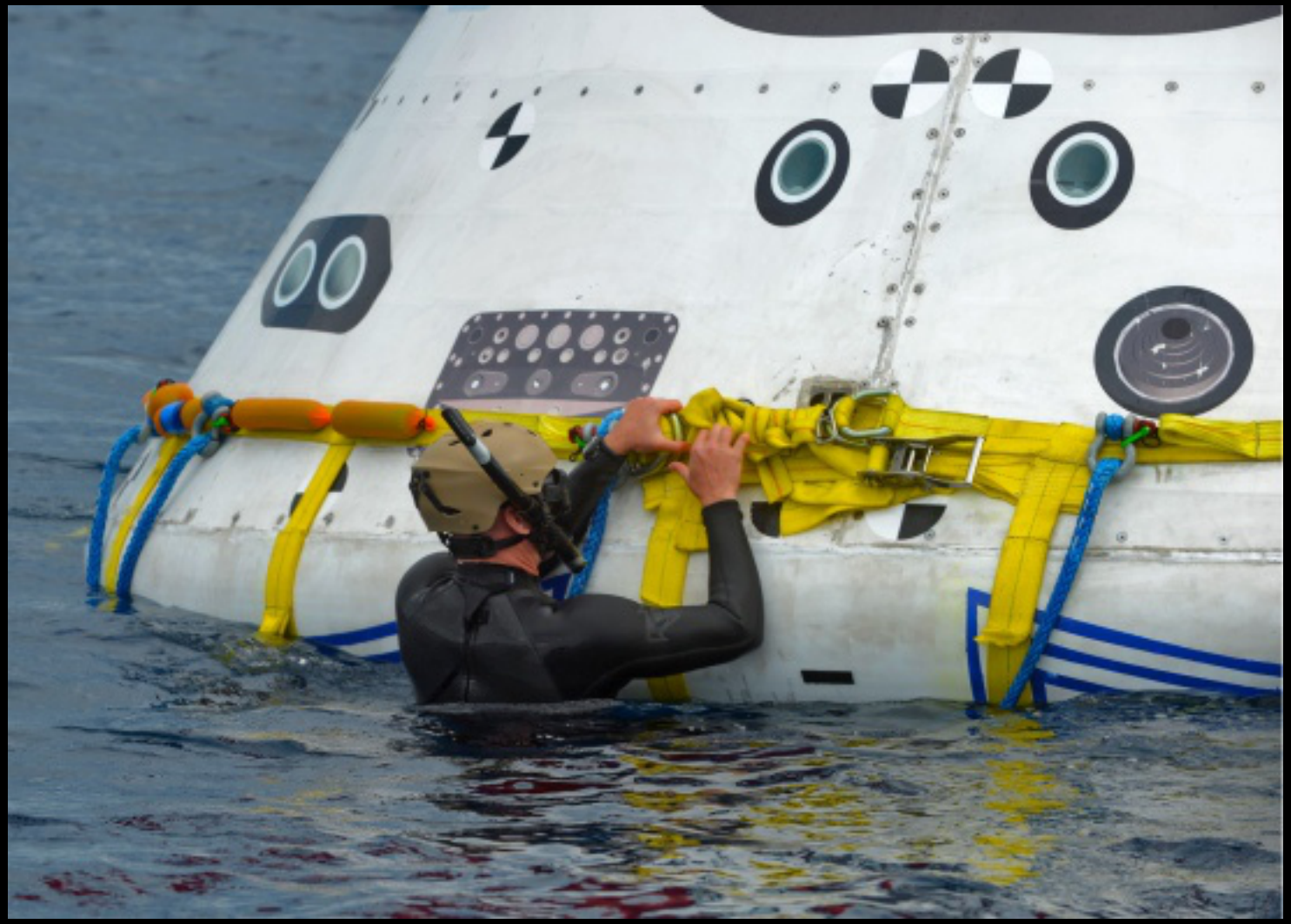

First Orion Test Flight
December 5, 2014



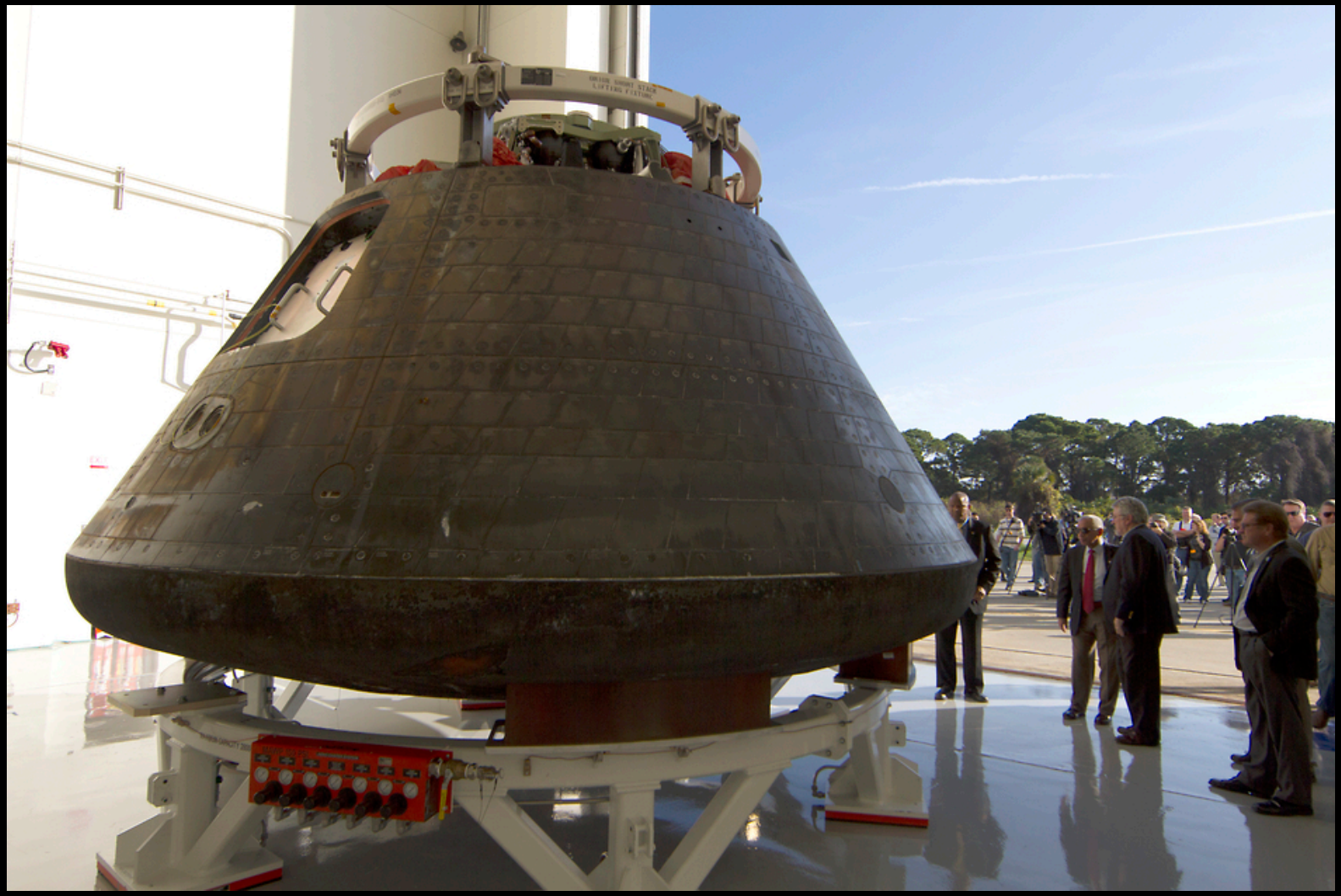

9



After Splashdown SE San Diego



After 1st Mission Dec 2014



Orion Suggested Missions

Asteroid Capture

Mars Flyby

Mars Landing Mission



SpaceX

OVERVIEW

TOTAL LAUNCH PAYLOAD MASS ↑

6,000 kg 13,228 lbs

TOTAL LAUNCH PAYLOAD VOLUME ↑

25 m^3 883 ft^3



TOTAL RETURN PAYLOAD MASS ↓

3,000 kg 6,614 lbs

TOTAL RETURN PAYLOAD VOLUME ↓

11 m^3 388 ft^3

PRESSURIZED SECTION

The pressurized section of the spacecraft, also referred to as the capsule, is designed to carry both cargo and humans into space. Towards the base of the capsule but outside the pressurized structure are the Draco thrusters, Dragon's guidance navigation and control (GNC) bay and Dragon's advanced heat shield.



SPACECRAFT PAYLOAD VOLUME

11 m^3 388 ft^3

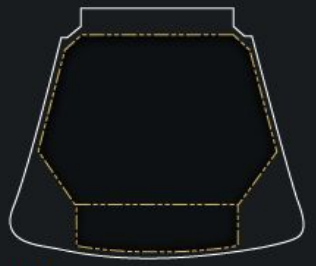


FIG. 1

Schematic of the available space for payload in the pressurized section.

SpaceX Launch Sat Jan 10, 2015
Sixth Resupply Mission

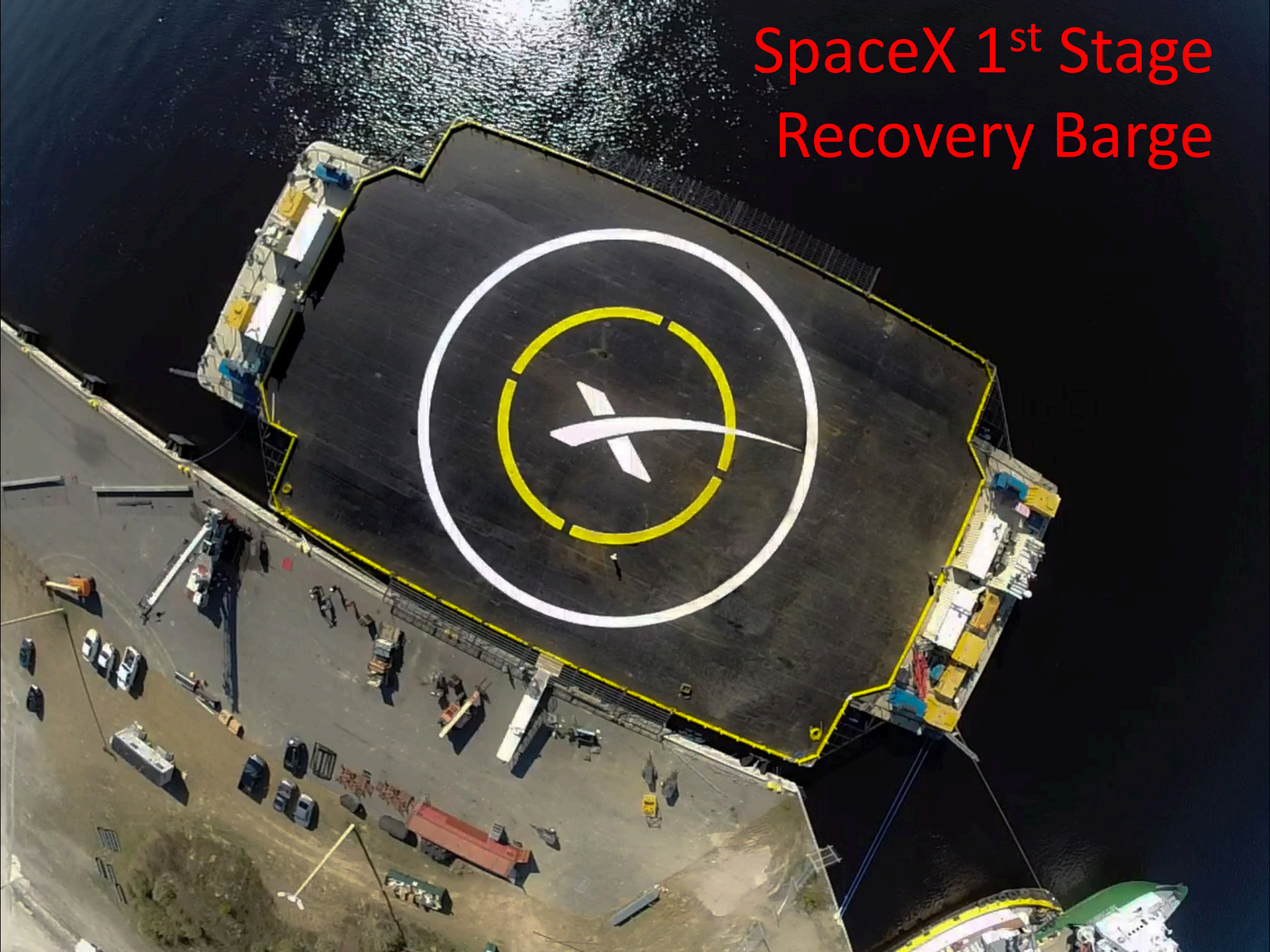


SpaceX Docking Mon Jan 12, 2015



1St Stage Landing Tests




SpaceX 1st Stage
Recovery Barge


SpaceX 1st Stage
Recovery Barge
After…

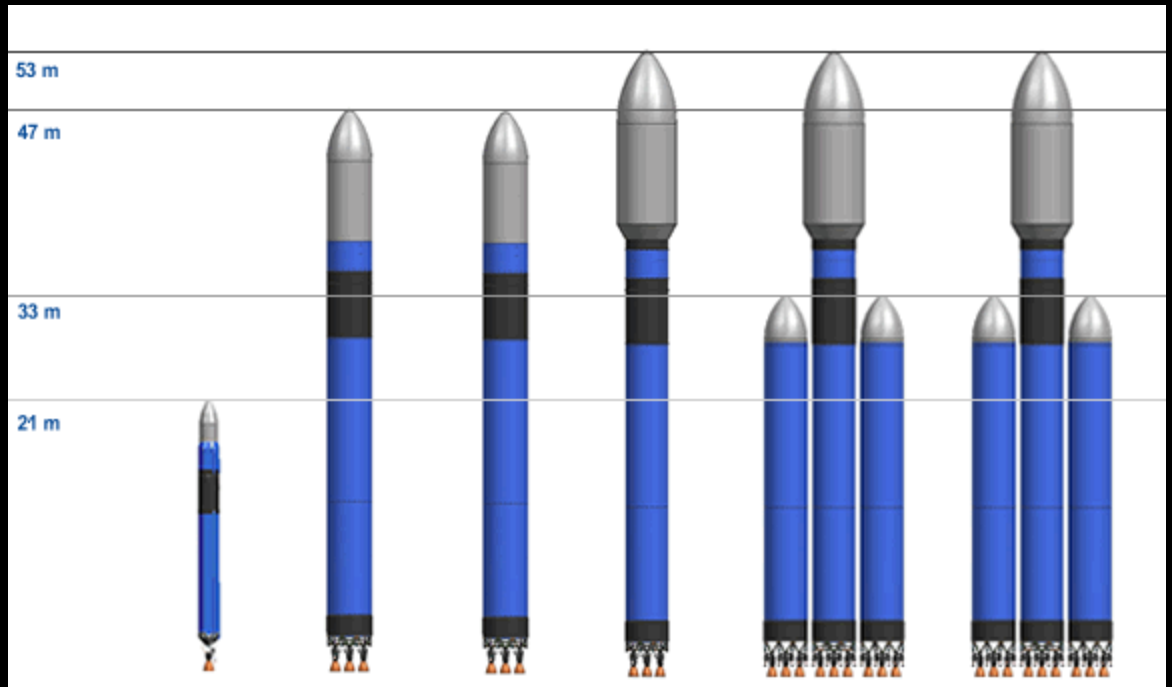
Elon Musk – SpaceX CEO



Falcon – Merlin Engines



SpaceX Rocket Family



	Falcon 1	Falcon 5	Falcon 9	Falcon 9	Falcon 9 - S5	Falcon 9 - S9
LEO	570 kg	4,100 kg	9,300 kg	8,700 kg	16,500 kg	24,750 kg
GTO	--	1,050 kg	3,400 kg	3,100 kg	6,400 kg	9,650 kg
Fairing diameter	1.5 m	3.6 m	3.6 m	5.2 m	5.2 m	5.2 m
Price in millions *	$6.7	$18	$27	$35	$51	$78

* Prices are all inclusive of launch range, third party insurance and standard payload integration costs.

Dragon Crew Module



SpaceX To Mars





Orbital Sciences Corp Resupply Attempt – Oct 28, 2014
The 3rd Orbital Sci Resupply Mission



Boeing Crew Capsule



Boeing and SpaceX

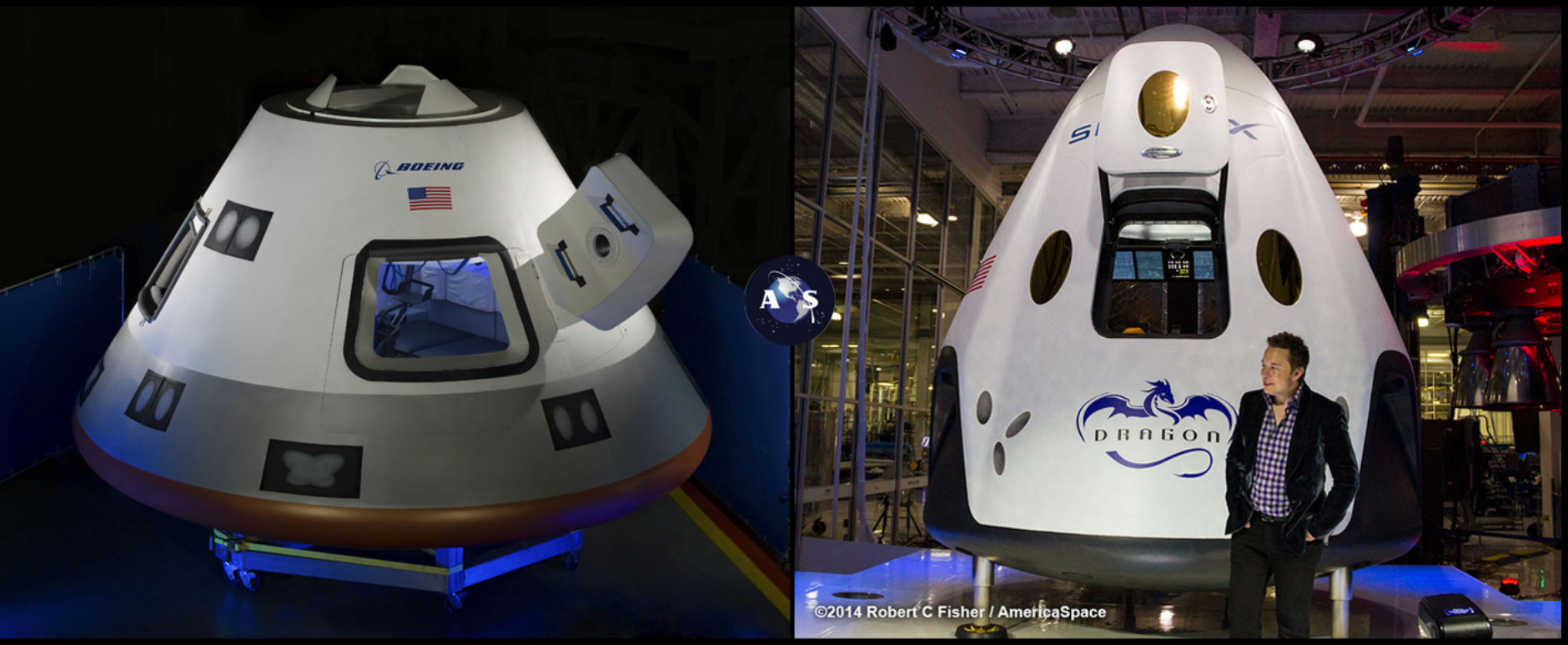


Photo Credit: Boeing / Robert Fisher / AmericaSpace

Boeing Award: $4.2 B

SpaceX Award:2.6 B

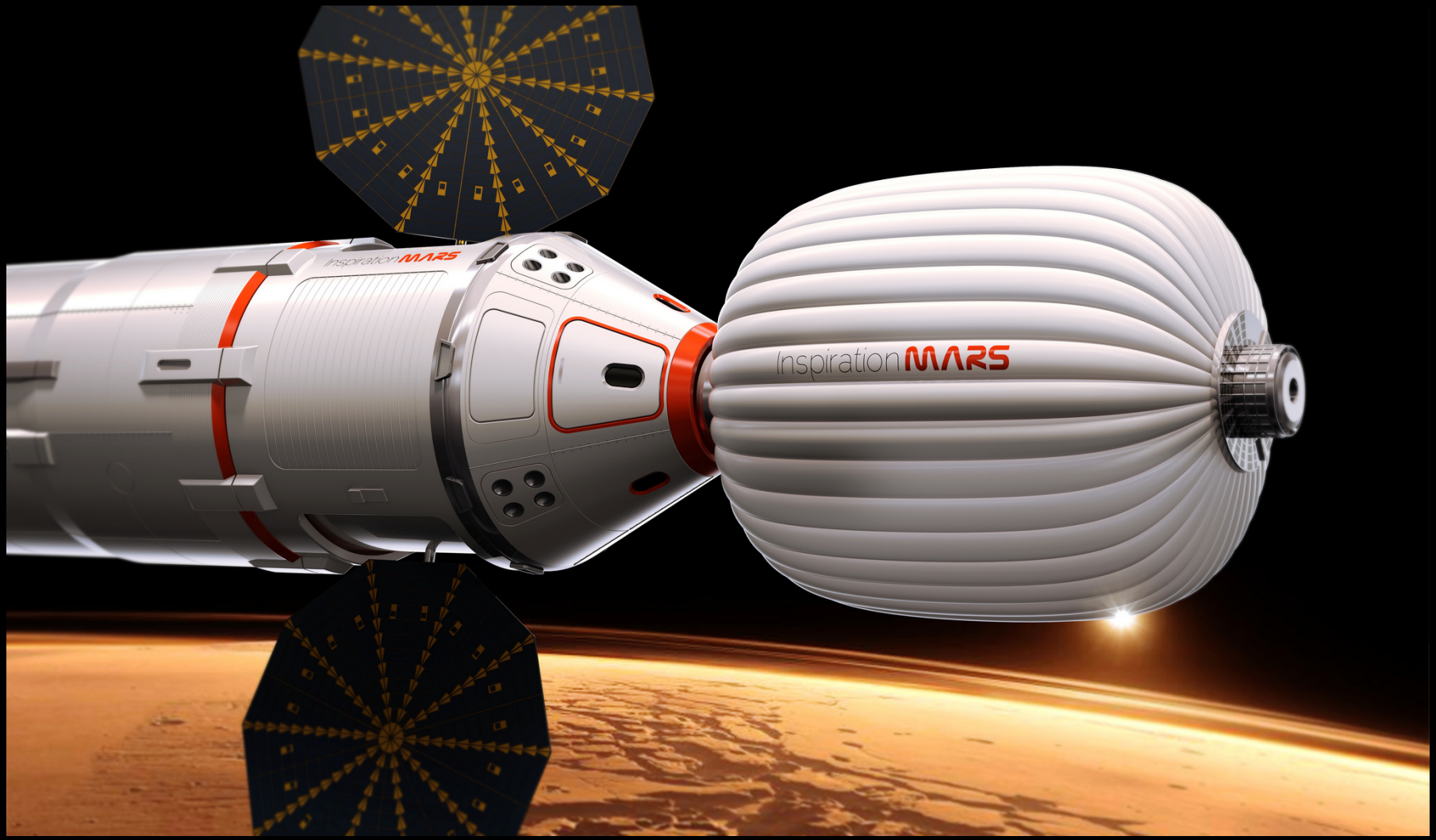
First Crew Launch to ISS by 2017

Mars One – 1 Way Trip



2,782 Paid Applicants

Inspiration Mars
Married Couple – Mars Flyby 2018



Questions?

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