

The Global Launch Vehicle Armada for Human Spaceflight (May 2018)

With the pledge of NASA to launch astronauts from “US soil” in 2018 again after the decommissioning of the shuttle program (STS, July 21, 2011 final landing of Atlantis) – it might be worthwhile to take a snapshot of the currently available global capabilities with respect to agency- and commercial “man-rated” launch vehicles.

The summary is followed by a personal analysis of the current schedule of the “Beyond Earth Orbit” program schedule by the author.

Here is a summary extracted from Wikipedia [1] and private sources.

Launch Vehicle	Thrust	Schedule	Capsule	Country
SLS	70 t to LEO	2010 – ongoing Development 2019 EM-1 no crew 2023 EM-2 Crew of 4	Orion Crew of 7 “Beyond LEO Program” Deep space Gateway	USA/NASA
Atlas-V (HLV)	18 t - (29.4) t to LEO	2018 first crewed flight to ISS	CST-100 Starliner Crew of 7	USA ULA
Delta IV H	23 t to LEO		CST-100 Starliner Crew of 7	USA ULA
Falcon 9 v1.0-1.2	10.4-22.8 t to LEO reusable	2018/early 2019 first crewed flight to ISS	“Crew”- Dragon Crew of 7	USA SpaceX
Falcon Heavy	63.8 t to LEO reusable	2018 first successful test flight No crew	“Crew”- Dragon Crew of 7 Interplanetary flights	USA SpaceX
BFR Big Falcon (F...ing) Rocket	150 t to LEO Reusable	Planned for 2024	BFR Spaceship Crew of 100 (final destination Mars)	USA SpaceX
Soyuz-FG	7.8 t to LEO	Since 2016 active	Soyuz MS Crew of 3	Russia
Chang Zheng 2F Long March 2F	8.4 t to LEO	Since 2003 active	Shenzhou Crew of 3	China

The 2018 time frame to launch astronauts from “US soil” might have a 50:50% chance.

My personal prediction is, that the “beyond low earth orbit”- program sequence will be to first build the [Deep Space Gateway](#) in cislunar space (SLS & Orion) in cooperation with Russia and the other ISS participants (Europe, Japan, Canada etc.), by 2028/2029 (30:70% chance to meet this target date), then send crews first to the Moon, later to Mars.

The first crewed Mars flight might well be beyond 2050 i.e., in the time frame 2060-2080, however exploiting the Moon (permanent human presence, Moon village...etc.) I think, will be a reality from 2050 onwards.

However, this sequence will only be possible using a well coordinated international cooperation of all the aforementioned space nations, including China

If I have missed something or you have a different opinion – please let me know (JoachimKehr@aol.com).

References

[1] https://en.wikipedia.org/wiki/List_of_human_spaceflight_programs

[2] https://en.wikipedia.org/wiki/Comparison_of_manned_space_vehicles