

### Offered Title: The New Space Race

Seems like everyone wants to be a space cowboy, heading off to the Moon or an asteroid, comet, or even Mars! The rhetoric and projections are flying at close to escape velocity. The reality is more mundane. It takes a lot, a LOT of research and development to mitigate the danger and difficulty outside our little security blanket atmosphere. So, while politicians or billionaires boast of future space conquests their scientists and engineers are working hard not to input an incorrect value into vector equations. Yin-Yang.

Where are we all going in this race? Space Race 1 was simple. Two opponents, the US and Soviet Union. Just get to the Moon first! The sequel is less defined, not so much a dire power play, at least not yet. President Trump has tasked NASA with going back to the Moon first, while Space X's Elon Musk likes Mars. Others have been coy but that doesn't mean they have been sitting on their hands.

China has been quietly working on space faring technology for decades and is well positioned to see through a program aimed at Mars. They have placed people in orbit and sent a rover and mapping satellite to the Moon. A heavy lift booster is in the works.

Japan, while a technology leader, is feeling the pressure to up their game. They currently have the only non-Russian/non-US service module (H-II Transfer Vehicle) for the ISS. Their Hayabusa 2 mission is on track to rendezvous with, collect and return samples from asteroid Ryugu. Plans for human exploration of the Moon or Mars?

The European Union has perhaps the widest ranging financial support and plans to jump into the fray, but not until its next long-term budget in 2021. It looks like Europe might try a partnership (China?). They have a lot of un-manned space travel experience but aren't in a hurry.

South + North Korea?

India might be the sleeper. It has a lot of experience with launching commercial satellites and has sent an orbiter to Mars. Lack of budget is its biggest hinderance.

Russia has committed to building a super lift rocket and going to Mars by 2030. At this point they continue to taxi astronauts to and from ISS.

The USA is in a frenetic phase with numerous players vying for prominence. NASA is going back to the Moon but has no specific time frame or budget. They are developing a next generation booster (Space Launch System) along with a new capsule/habitat (Orion) for long term space travel. Space X has made great strides in reusable boosters, has a heavy booster and is developing an even bigger heavy booster. The others (orbital ATK, Virgin Galactic, Blue Origin, Sierra Nevada, XCOR, Boeing, ULA) are in various stages.

Oh yeah, then there's the "Space Force".

### What's in the Sky?

Mercury is near the western horizon in early July. Scan with binoculars just after sunset.