

# NSS North Houston Space Society

## Space News

July 11, 2020



Greg Stanley



# NASA Mars 2020 Perseverance rover delayed

- Delayed until at least July 30 due to liquid O<sub>2</sub> level sensing problems
- Launch windows: planets align best every 26 months
- If delayed past summer, will have to wait until Autumn, 2022

- Ancient life search
  - Sample return (2031)
  - Weather, monitoring
  - Test O<sub>2</sub> generation
  - Helicopter on Mars!

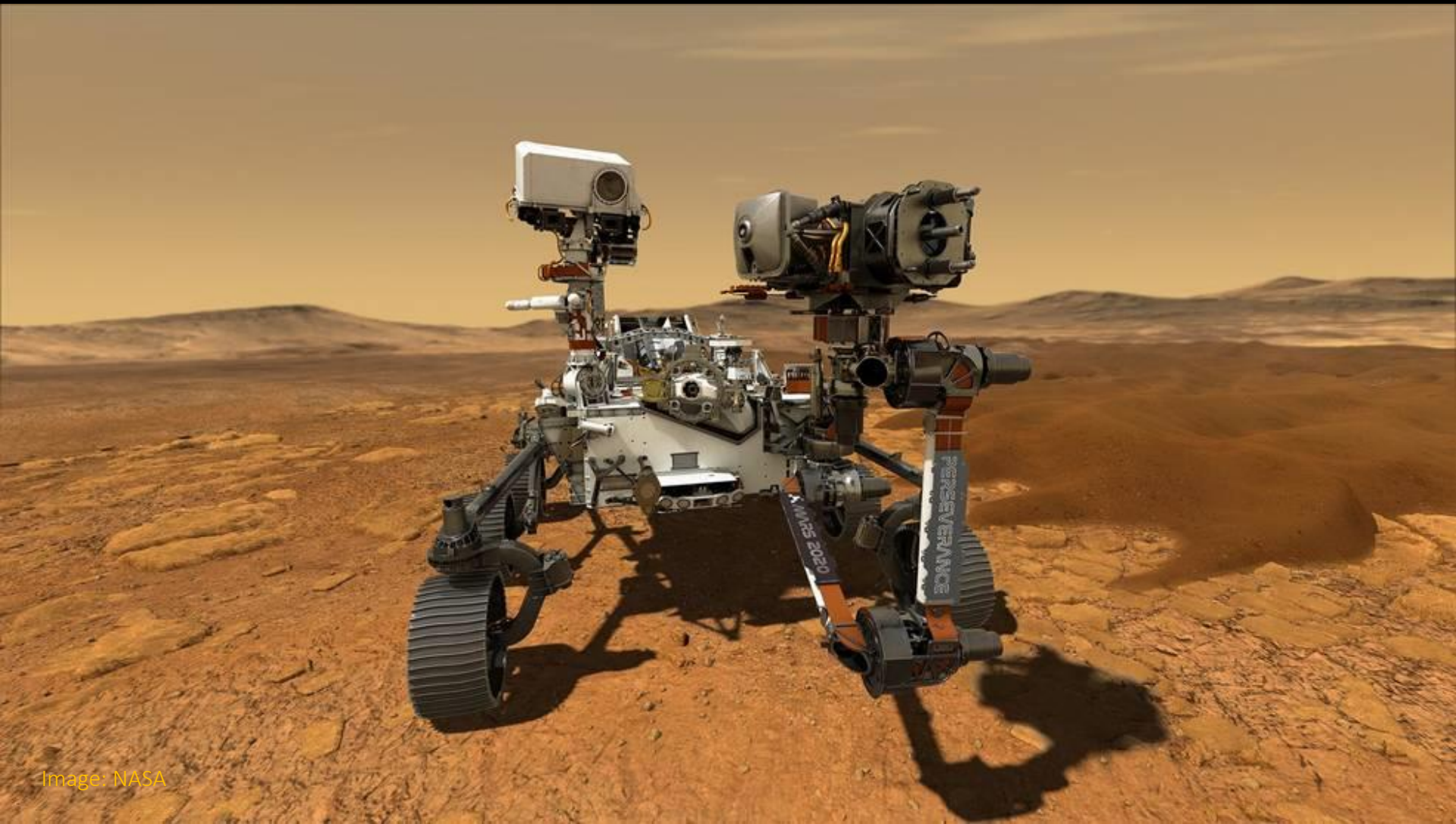
Rover before encapsulation  
in Atlas V fairing

# Perseverance Mars rover

Landing after a 314 million mile trip, Feb 18, 2021

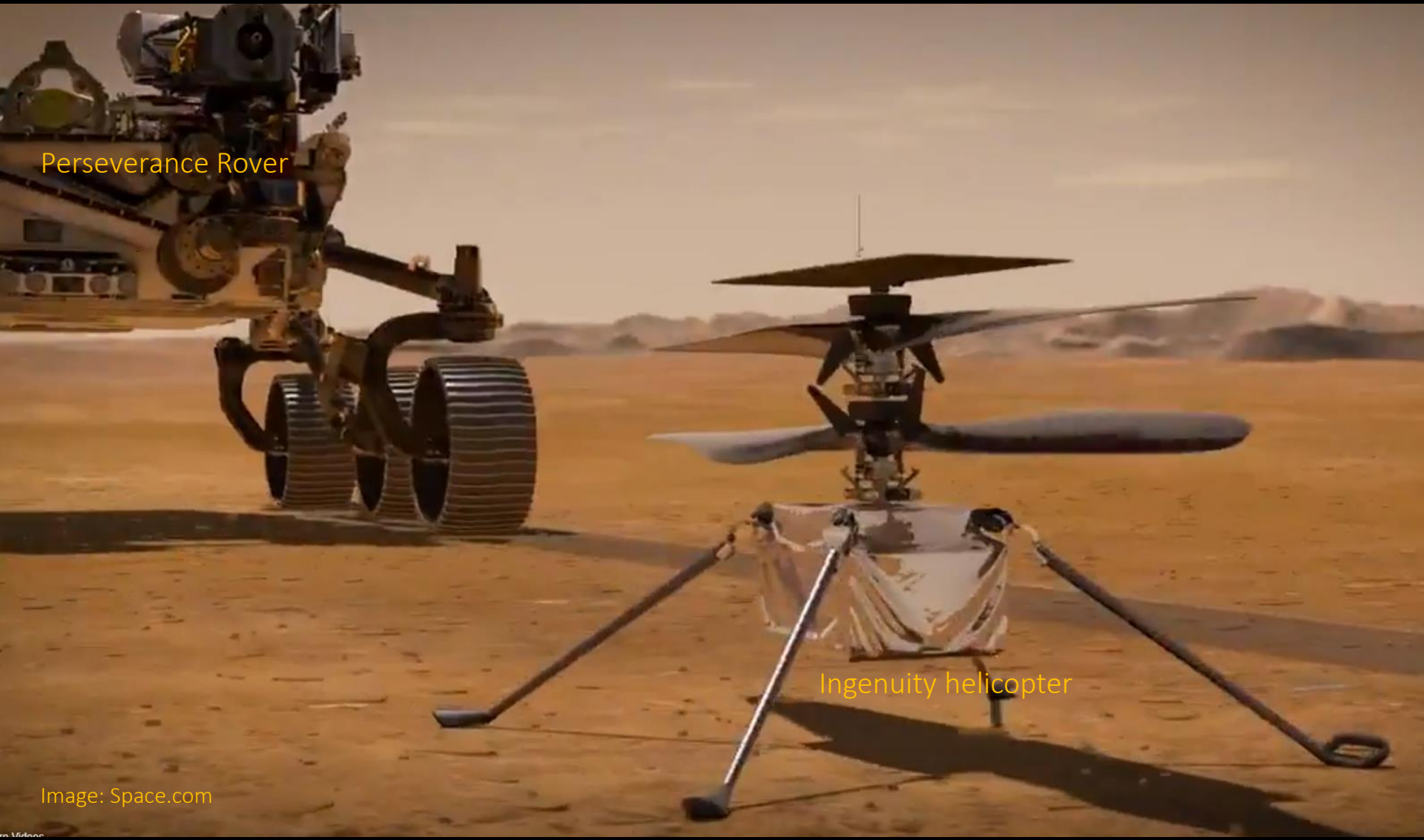


# Perseverance Mars rover



# Helicopter on Mars: Ingenuity

4 lbs, 30 day design life, solar cell powered



Perseverance Rover

Ingenuity helicopter

# Another SpaceX Starlink launch



- 9<sup>th</sup> launch of Starlink satellites for internet service (58 this time)
- Also included 3 SkySat Earth-imaging satellites (first ride share, but there will be more)
- Sign up for beta testing announcements at the Starlink web site



12,000+ satellites goal  
Currently: 540

# Space business news

- Bankrupt OneWeb being recapitalized with \$1 billion from British government and Indian telecom company Bharti Global
  - Pending approval from U.S. bankruptcy court
  - Had already launched 74 of planned 650 satellites for internet service
  - Higher altitude than Starlink (1200 km.)
  - Now filed FCC proposal for 48,000 !! more satellites
  - Adding GPS-like capabilities
  - Astronomers even more concerned than with Starlink- visible all night in summer
- Amazon Web Services established a space-focused business unit
  - Had already been offering ground station services for satellite operators  
*Going beyond just “cloud” services!*

# Spaceship Neptune: To the stratosphere in a balloon

- 8 Passengers and pilot climb to 100,000 feet in a hydrogen-filled balloon, for \$125,000 (half of Virgin Galactic flight cost)
  - Launch from Kennedy Space Center, no space suits required, testing next year
  - 6 hour round trip (plus returning from splashdown in Atlantic or Gulf)
- Not really “space” (generally accepted as 62 miles), but you will see the curvature of the earth, huge view, black sky, 2 hrs. at peak altitude

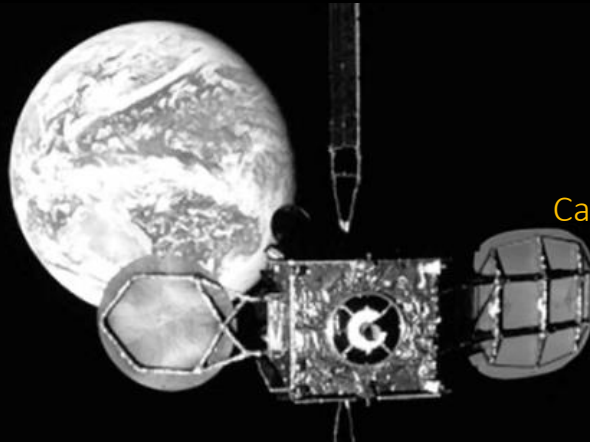
- By Space Perspective, started by Taber MacCallum & Jane Poynter (Biosphere 2, Paragon Space Development, World View)
- Includes a bar and airline-style toilet
- Poynter: “It will have the best view of any loo in the world”



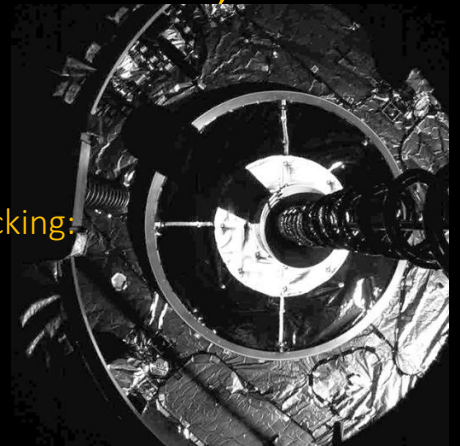
# Zombie satellites return from the graveyard\*

- Geosynchronous satellites should climb up >300 km up to a graveyard orbit at the end of their 15 year design life, to avoid collisions
  - IADC guideline (Inter-Agency Space Debris Coordination Committee)
  - Satellites usually still function – they're just running out of maneuvering fuel
  - 283 are in the graveyard
  - Of 915 objects within 200 km of GEO, 365 are defunct – didn't follow guidelines
- Solution from NASA/Northrop Grumman: MEV (Mission Extension Vehicle)
  - Captures the satellite and maneuvers it back to GEO
- MEV-1 captured Intelsat satellite IS-901 in April, moved back into service
  - Will hold for 5 years, then move it back to the graveyard, move to a new customer
- MEV-2 will launch this summer, reaching another Intelsat satellite in Jan, 2021

80 meters from docking:



Capturing during final docking:



*Northrup Grumman: "The era of the space garbage truck is coming"*

# Other space news

- SpaceX launched 3<sup>rd</sup> of next-generation GPS satellites for U.S. Space Force, previously delayed due to COVID-19
- NASA announces “Lunar Loo Challenge”
  - \$35,000 prize for best lunar lander toilet design, closes Aug 17
  - Work in moon gravity and in orbit
  - *(See TheVerge.com, or Google it)*



*Space settlement takes more than rocket science!*



# Unimportant space news

- NASA-developed perfume “Eau de Space” may now be marketed
  - Developed 10 years ago, used for training
  - Only experienced when re-entering spacecraft after a spacewalk
  - Smells like gunpowder or burned cookies
  - Over \$300,000 raised via Kickstarter



- Birthday party for founder of Firefly Aerospace (Austin), Max Polyakov
  - A technical discussion arose about the optimal way to light 43 candles on the birthday cake ...



# Unimportant space news, continued

- Firefly Aerospace finds a new use for their rocket engine



# Unimportant space news, continued

Rocket science & engineering isn't the solution for everything ...

Define "optimum" carefully when dealing with scientists and engineers ...






How many launches since the last meeting?



*Yes, this includes failed launches*

# Launches Since Last Meeting (June 6, 2020)

-  ~~July 11 – Falcon 9 – MAYBE – 10<sup>th</sup> batch (57) Starlink satellites, 2 BlackSky earth-imaging satellites \*~~
-  July 10– KZ-11 (new Chinese rocket)– FAIL \*  
*(could send 3300 pounds to LEO or 220 pounds to Medium Earth Orbit)*
-  July 9 – Long March 3D – APSTAR-6D communications satellite to GEO
-  July 4 – Electron (Rocket Lab, NZ) – (7 CubeSats) FAIL (second stage) \*
-  June 30 – Falcon 9– 3<sup>rd</sup> of new generation GPS satellites \*
-  June 22 – Long March 3B – Nav satellite (GEO - geostationary orbit) \*
-  June 17 – Long March 2D – Earth observation satellite, others
-  June 13 – Falcon 9 – 9<sup>th</sup> batch, (58) Starlink satellites, also 3 SkySat earth-imaging satellites \*
-  June 13 – Electron (Rocket Lab, NZ) – US spy satellite, CubeSats for Boston University, NASA, Australia \*
-  June 10 – Long March 2C – ocean observation satellite

\* Launches previously delayed, many due to COVID-19

# Featured Speaker: Yumna Majeed

- Student of Medical Lab Technology at Allama Iqbal Medical College
- Aspiring astronaut
- Promoting astronomy and space technology in Pakistan since 2016
- Founded “Exploration”, a space education based social enterprise in Pakistan

*“As a school kid I was told space has no scope in Pakistan. So I decided to create it.”*



TOPIC:

**EXPLORATION**  
SHADES OF COSMOS