

# NSS North Houston Space Society

## Space News

June 6, 2020



Greg Stanley



# Historic launch to ISS on a SpaceX Falcon 9/Crew Dragon

First crew launch to the ISS (space station) from the U.S. since 2011

Crew of 2 American astronauts:  
Robert Behnken & Douglas Hurley

12 minutes to initial orbit

19 hours total launch to dock

Fully automated docking

1<sup>st</sup> stage landed on ship, returned

Crew Dragon will eventually return with crew, splashing down in Atlantic

First astronauts launched in a commercially-made spacecraft

Costs per seat:

Boeing (future): \$90 million

Russia: \$86 million

SpaceX: \$55 million

Musk:

“The trampoline works”

Astronaut Chris Cassidy:

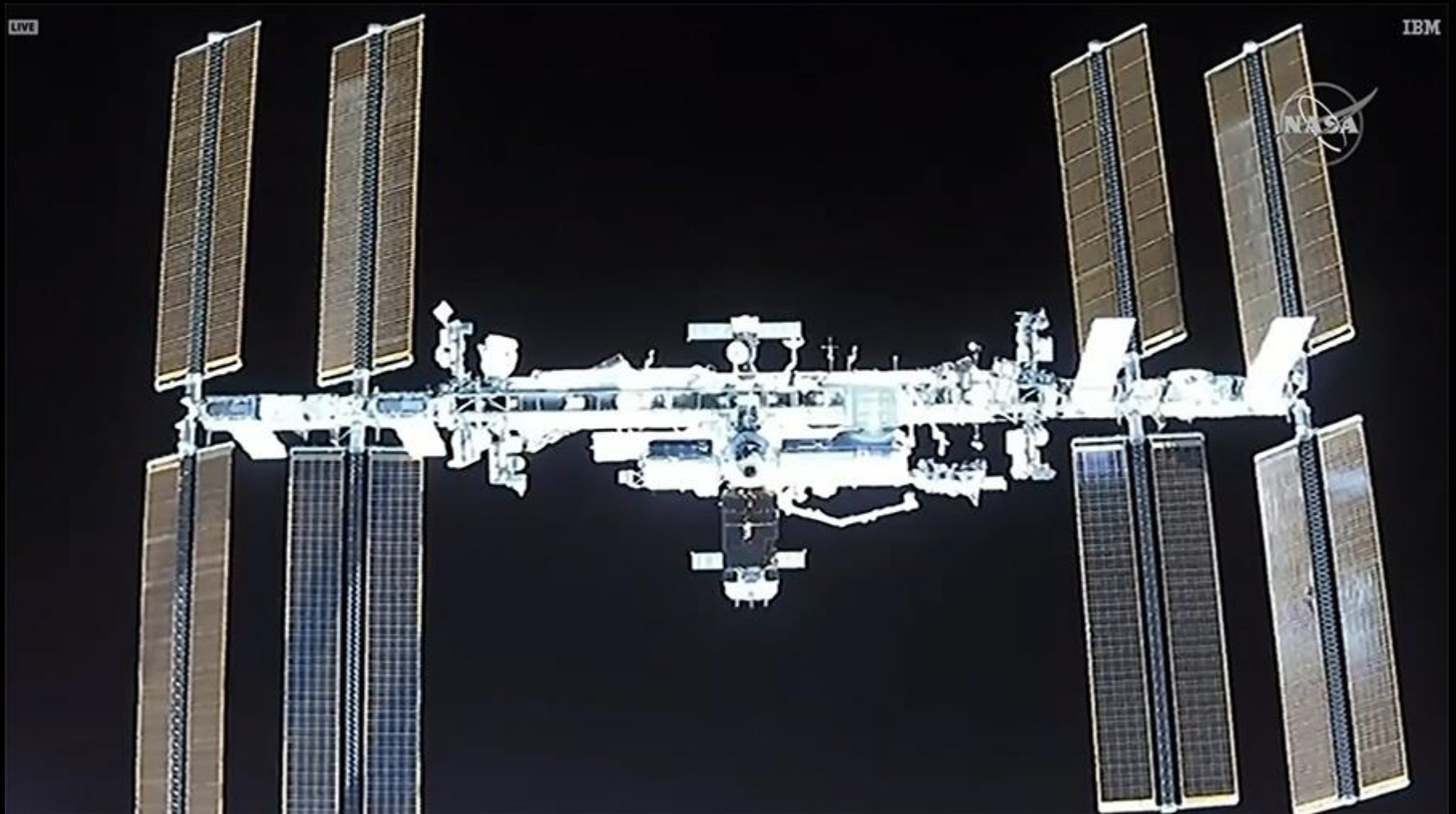
“New car smell”

Credit: SpaceX



# View of ISS from Dragon capsule at 150 meters

- (This is actual, but there is a docking simulator at the SpaceX site)



# Another SpaceX Starlink launch



- 8<sup>th</sup> launch of 60 Starlink satellites for internet service, now totaling 482
- Serious re-usability: first stage now flown 5 times, returned (total recovered: 50)
- Testing new sunshade to address astronomers' concerns about brightness



12,000+ satellites goal

# SpaceX Starship SN4 prototype explodes May 29 in Boca Chica, TX

- Full sized (400 feet) prototype, not the 60 foot “Starhopper”
- Explosion 2 minutes after successful static-fire test
- No injuries with this “RUD” = “Rapid Unscheduled Disassembly”
- Some external estimates suggest prototypes cost \$10 million
- Next step in a few weeks would have been a 500 foot “hop”
- 4<sup>th</sup> Starship prototype destroyed in testing in 6 months
- Problem may have been due to propellant quick disconnect system



Credit: Getty Images



Credit: YouTube Space Padre Island

# A stadium-sized asteroid near miss on June 5

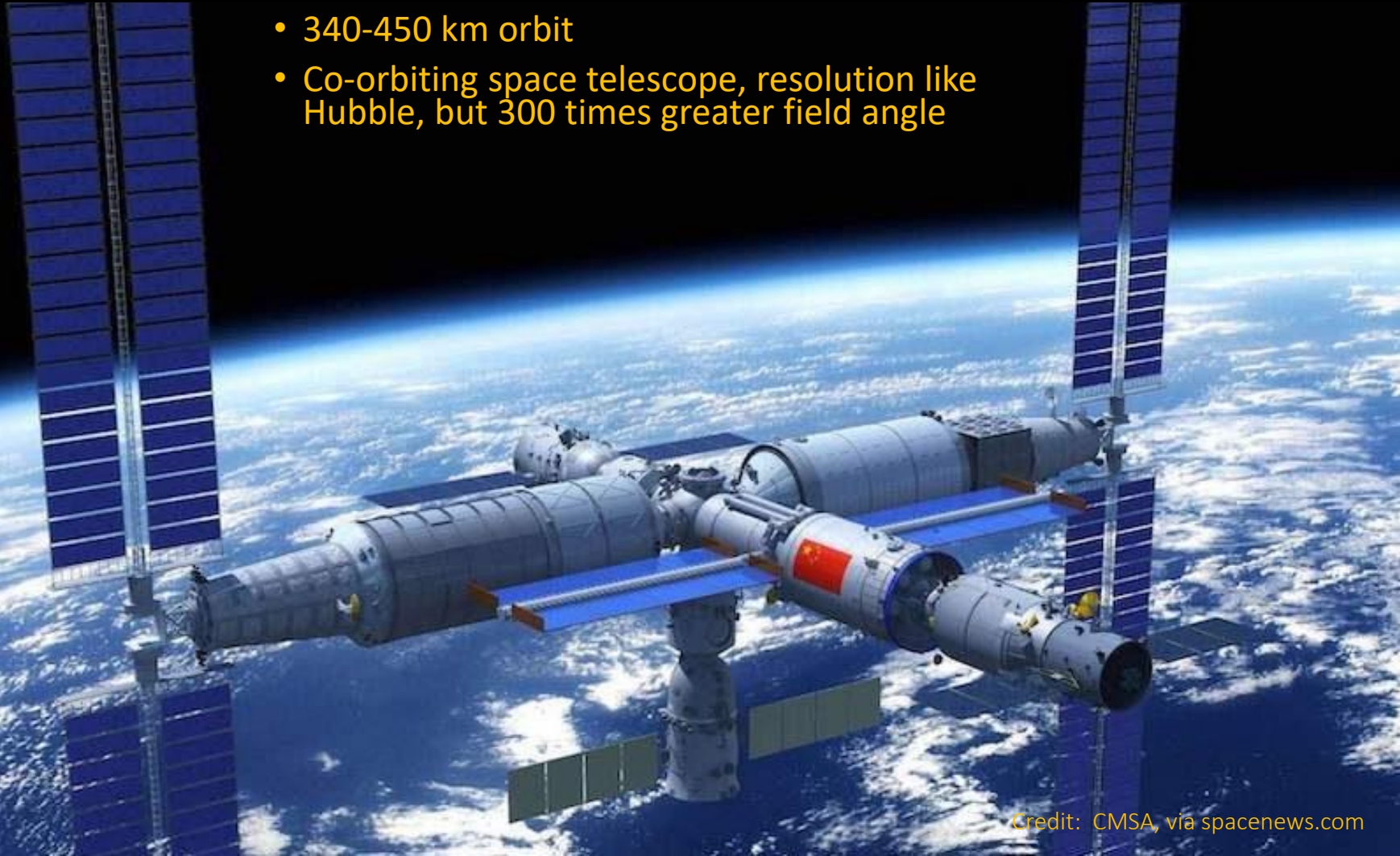
- Diameter 820 – 1870 feet (12x larger than one hitting Russia in 2013)
- Closest distance: 13.25 x distance of Earth to the Moon
- Hard to spot: dimmer than Pluto



*(A public service reminder that space defense will be needed, someday)*

# China intensifying space station development

- Announced 11 missions to build it in 2 years, starting next year
  - Holds 3 astronauts, but expandable
  - 66 metric tons
  - 340-450 km orbit
  - Co-orbiting space telescope, resolution like Hubble, but 300 times greater field angle



# Other space news











- Doug Loverro resigns from NASA after 6 months as chief of human spaceflight
  - Cited some “mistake” he made in procurement for HLS (Human Landing System, part of Artemis program to go back to the moon)
  - No one is commenting, but timing follows an audit
  - Unclear what this means for NASA or Artemis program
- Another object bigger than Pluto found orbiting our sun, 3x farther than Pluto from our sun
- Rocket Lab resuming launches in New Zealand in June, after COVID-19 delays

How many launches since the last meeting?



*Yes, this includes failed launches*

# Launches Since Last Meeting (May 2, 2020)

-  June 3 – Falcon 9 – SpaceX 8<sup>th</sup> batch of 60 Starlink communications satellites
-  May 31 – Long March 2D – Gaofen Earth observation satellite and a microsatellite for ship & aircraft tracking
-  May 30 – Falcon 9 – Crew Dragon, 2 astronauts to space station
-  May 29 – Long March 11 – unknown experimental satellites
-  May 25 – LauncherOne (Virgin) – orbital test flight – FAILED
-  May 22 – Soyuz – Military satellite
-  May 20 – H-2B – Delivering cargo to space station
-  May 17 – Atlas 5 – Orbital Test Vehicle (spaceplane)
-  May 11 – Kuaizhou 1A – communications satellite
-  May 5 – Long March 5B – test flight for crew capsule (unpiloted)

# Featured Speaker: Charles Phillips

- CEO, Spaceflight Research LLC (Houston)
- Space station, space shuttle work at SAIC, Barrios Technology, Lockheed Martin
- Flight controller, Johnson Space Center
- Orbital analyst for USAF, tracking satellites at NORAD (Cheyenne Mountain, also Alaska)



TOPIC: How you can track satellites (and why)