



OSIRIS-REx
ASTEROID SAMPLE RETURN MISSION

Space Mission Planning Advisory Group

OSIRIS-REx Update

March 25, 2021



OSIRIS-REx Status



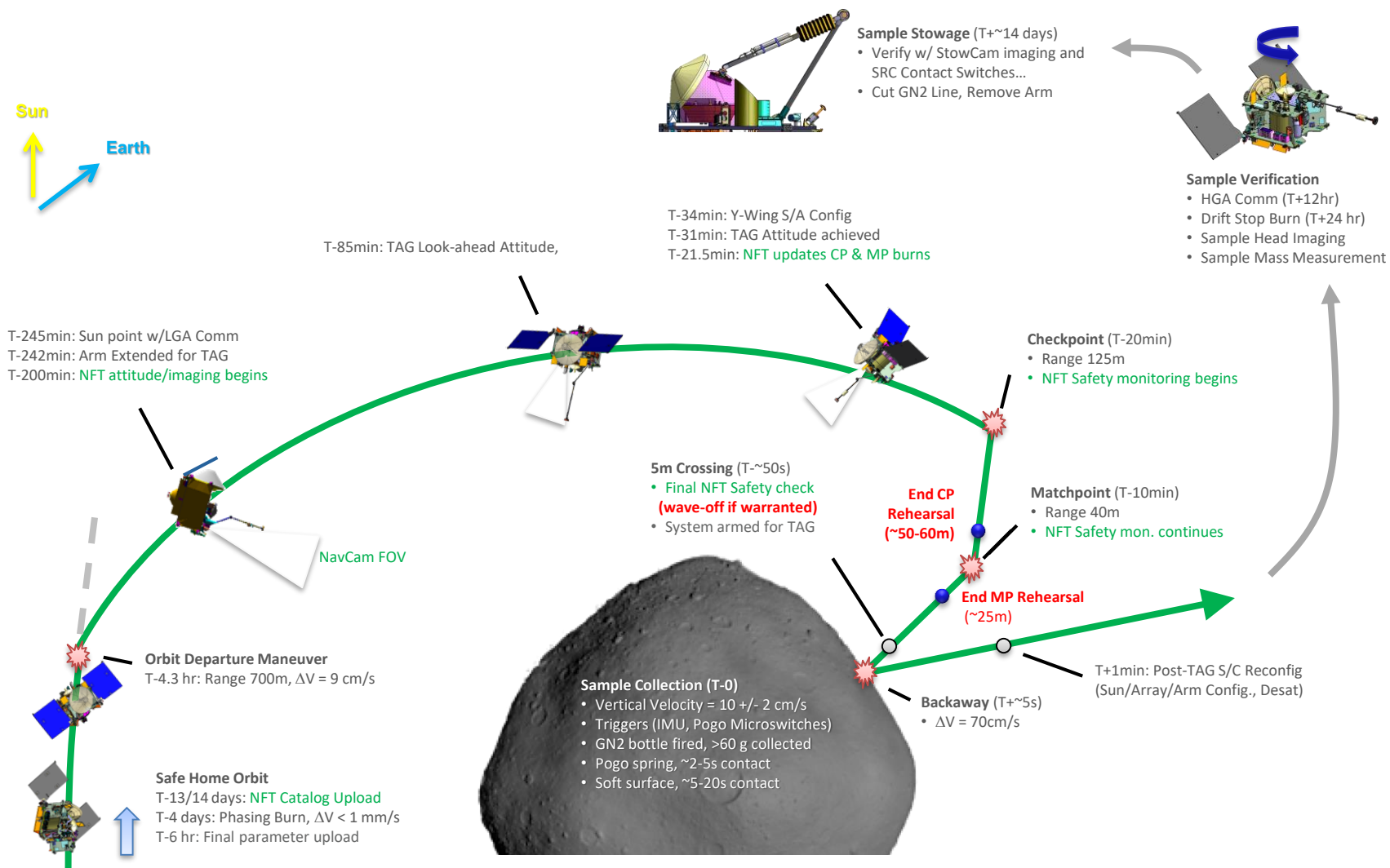
Activities in 2020:

- Completion of the low altitude reconnaissance flyovers of the primary and backup sample sites; Apr. 14, 2020
- Completion of the Checkpoint and Matchpoint TAG rehearsals, bringing the spacecraft to within 25m of the asteroid surface; Aug. 11, 2020
- Touch-and-Go (TAG) sampling maneuver executed on Oct. 20, 2020
 - Substantial sample mass collected; 100's of grams
 - Evidence of excess sample escaping from sample head
- Expedited sample stow executed on Oct. 27, 2020
- Trade study for optimizing Bennu departure date completed.

Upcoming Activities:

- Post-TAG observation campaign underway
 - Near range (4 Km) flyover planned for Apr. 7, 2021
 - Primary objective; observation of the disturbed Nightingale sample site for pre/post TAG comparison
- Asteroid Departure Maneuver (ADM) - Bennu departure date; May 10, 2021
- Extended mission scenarios for after sample capsule return in Sept. 2023 are being investigated

TAG Campaign Overview





OSIRIS-REx

Accomplishments & Status

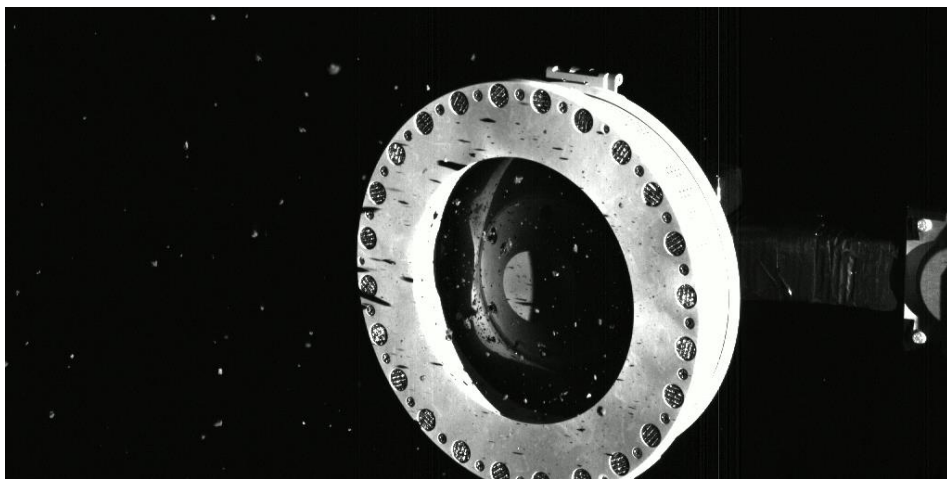


TAG was Successful!!

- TAG was executed flawlessly
- Team and spacecraft preformed perfectly
- Sample head penetrated ~4.5 cm before GN₂ was fired
- TAGSAM collected well over required 60 grams of sample
- So much sample was collected, TAGSAM began shedding particles – leading to early Stow decision
- Team bumped up Stow operations to conserve sample
- Stow went quickly and was executed as expected
- OREx's sample is safely contained and team is preparing for the return to Earth

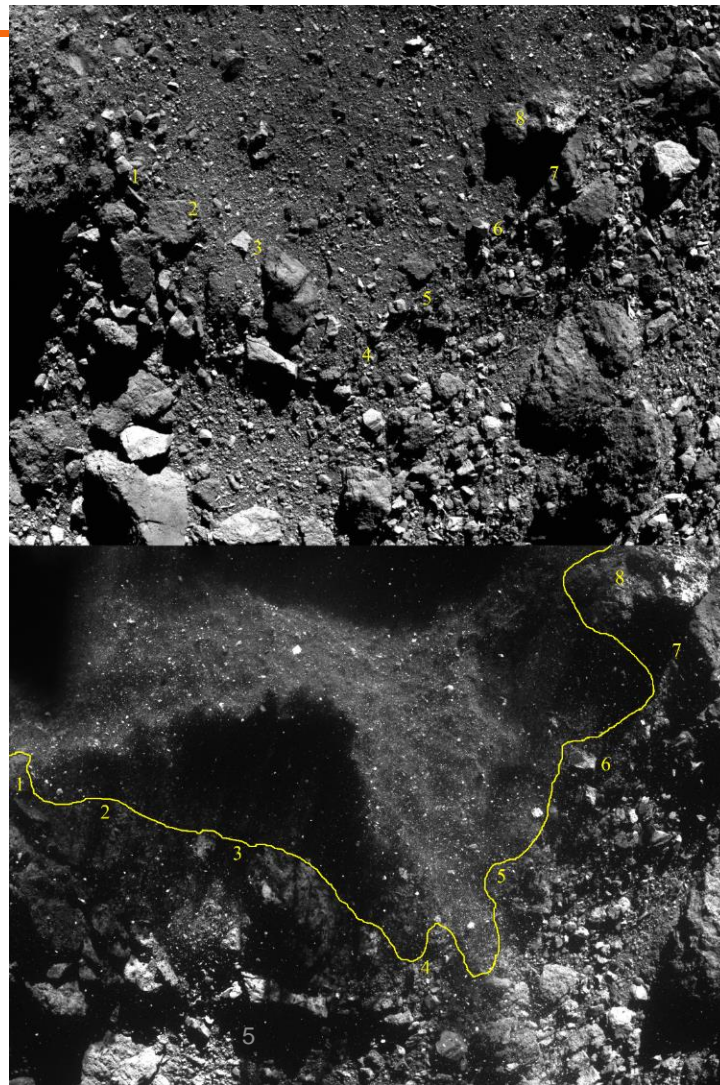


- Particles escaping from TAGSAM sample head



TAG Backaway Image Analysis

- Comparison of landmarks between pre-TAG images and post-TAG images shows that a considerable amount of underlying, undisturbed surface can be seen in the post-TAG images.
 - 8 obvious landmarks common in both images are labeled.
 - Entire area below and to the right of the yellow line is undisturbed surface.

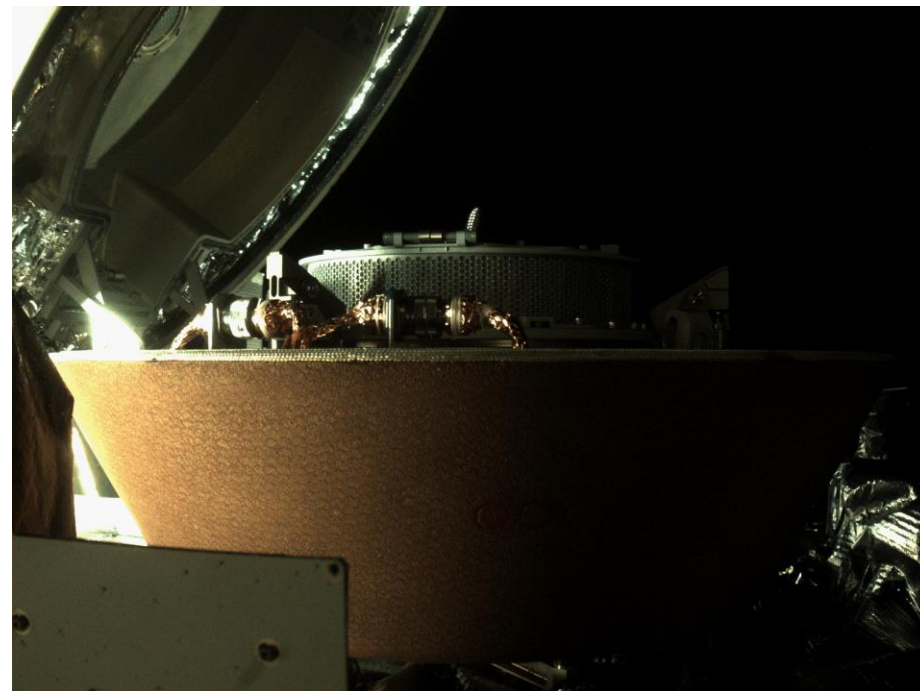




Sample Stow



- TAGSAM sample head insertion into Sample Capsule



- Sample Capsule door closure



OSIRIS-REx Post-TAG Activity Timeline

