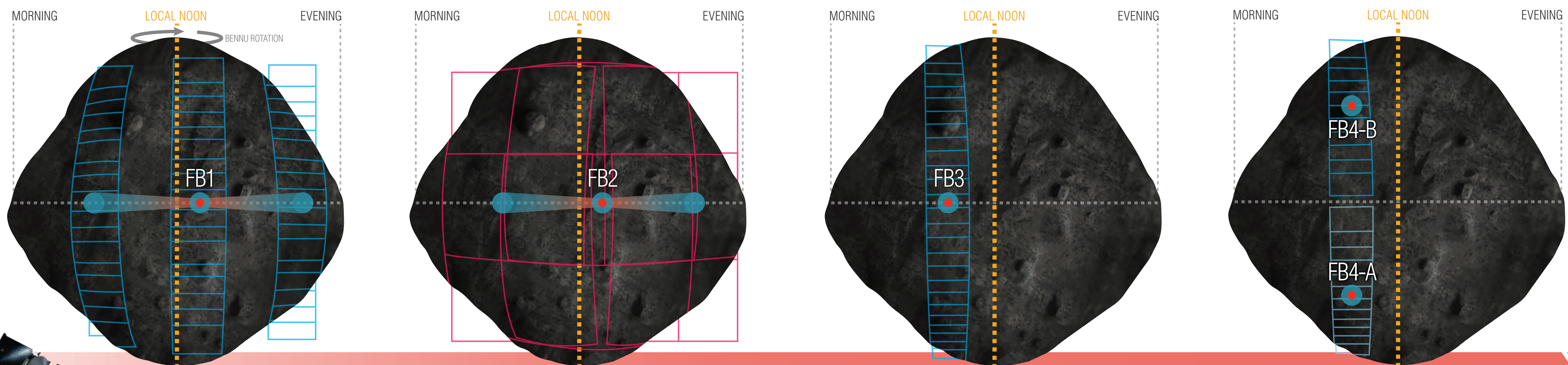




# DETAILED SURVEY: BASEBALL DIAMOND

## SCIENCE PHASE PLAN • MARCH–APRIL 2019

The primary goal of Detailed Survey: Baseball Diamond Phase is the Global Imaging Campaign. During this phase, MapCam and PolyCam data will be acquired to produce Global Panchromatic Image Mosaics, Global Color Maps, 8cm NFT Features and a Global 35cm shape model for stereophotoclinometry.



Dates subject to change

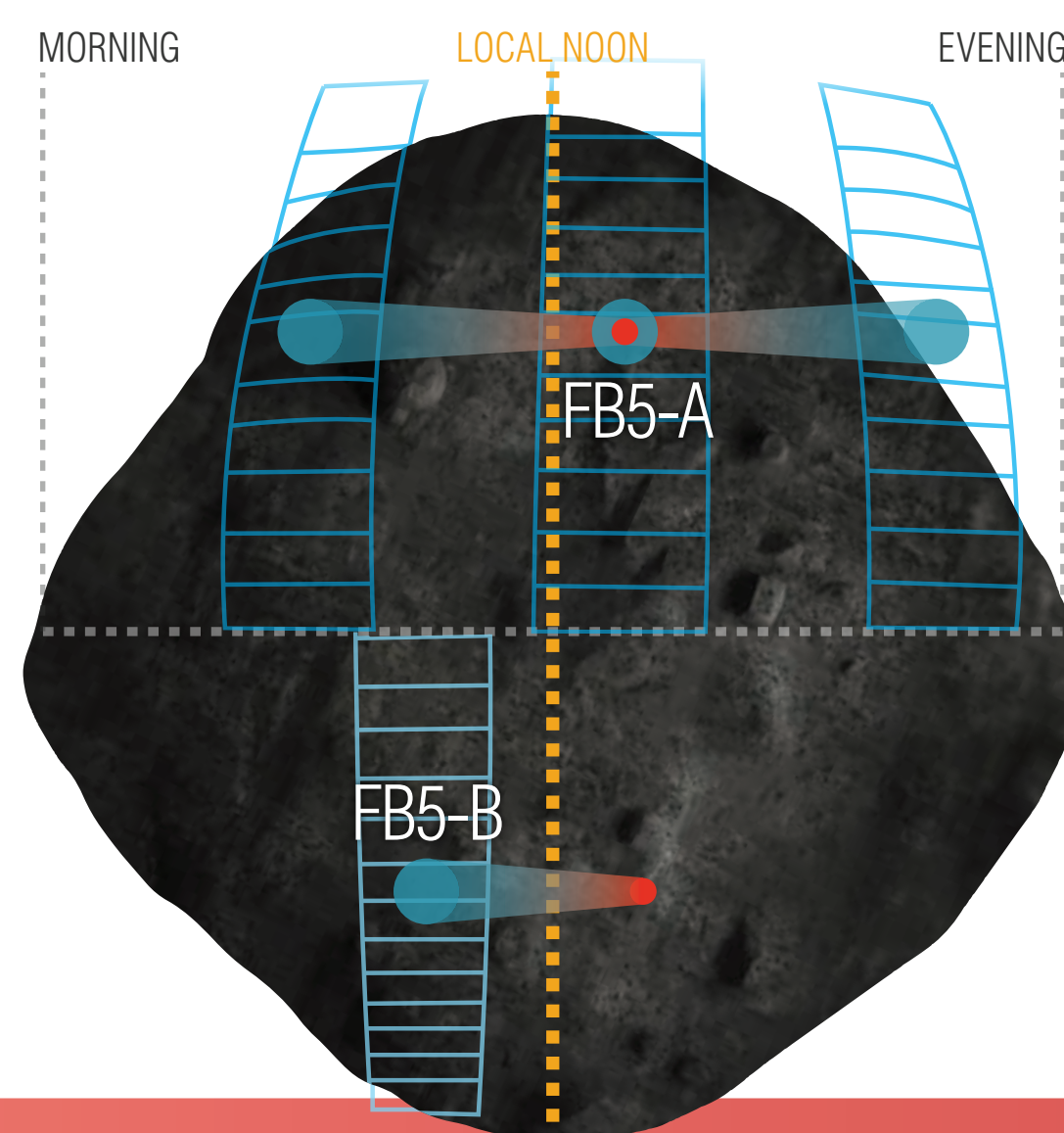
**March 7**  
**FlyBy 1**  
Latitude: 0°  
Spacecraft Station: 12:30pm LST  
Pointing: Nadir, off-nadir east/west (±30°)  
Instruments: PolyCam, OTES (ridealong)  
Bennu Range: 5 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Rectangular Raster Scan  
8cm NFT Strategy, 35cm Shape Model

**March 14**  
**FlyBy 2**  
Latitude: 0°  
Spacecraft Station: 12:30pm LST  
Pointing: Nadir, off-nadir east/west (±30°)  
Instruments: MapCam, OTES (ridealong)  
Bennu Range: 3.8 km  
Scan Range from Obs. Point: ±35° North/South  
Scan Type: Point and Stare  
MapCam Global Color Strategy,  
35cm Shape Model

**March 21**  
**FlyBy 3**  
Latitude: 0°  
Spacecraft Station: 10am LST  
Pointing: Nadir  
Instruments: PolyCam, OTES (ridealong)  
Bennu Range: 3.7 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Linear Scan  
PolyCam Global Panchromatic Strategy,  
8cm NFT Strategy

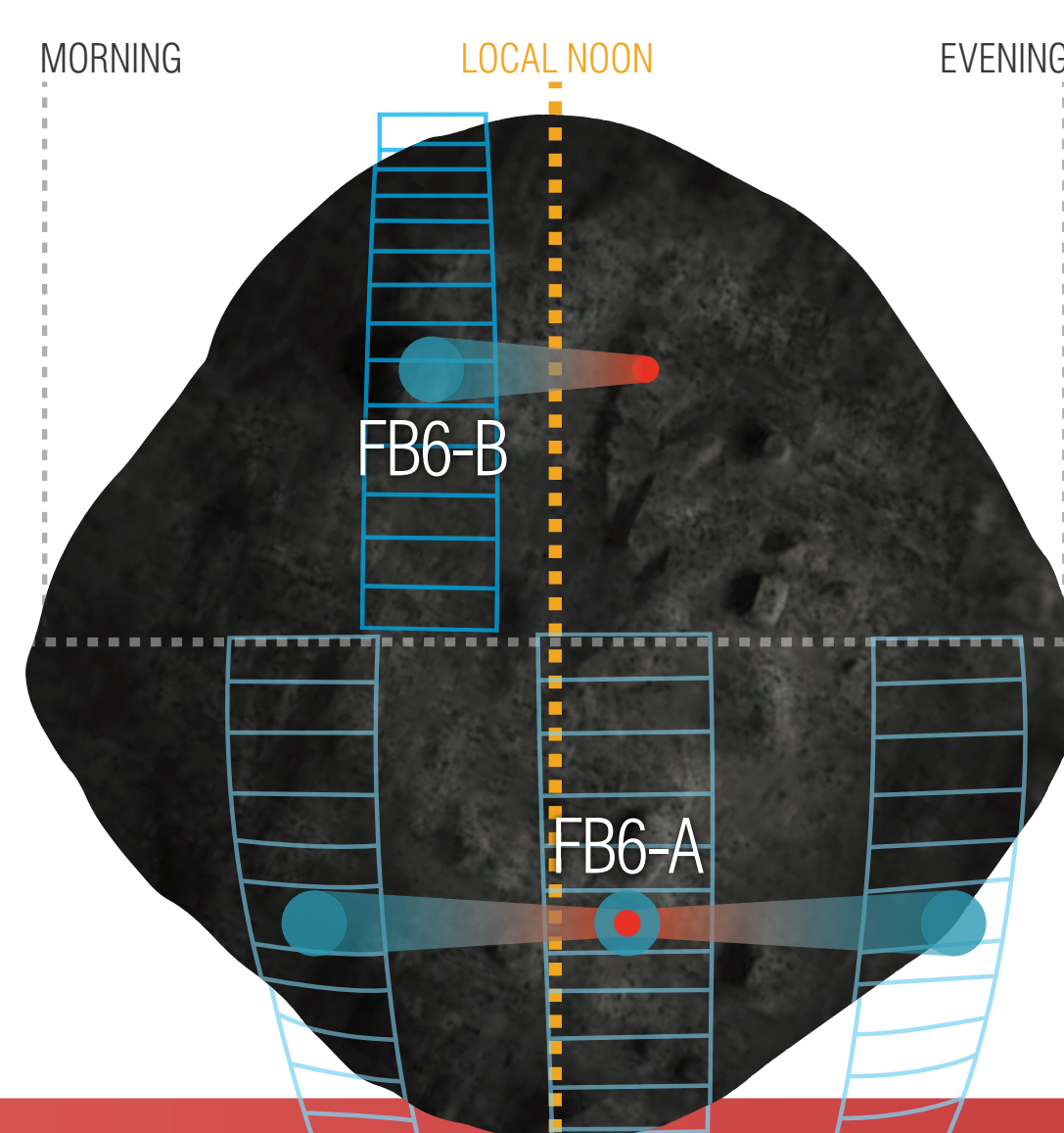
**March 28**  
**FlyBy 4-A**  
Latitude: 40°  
Spacecraft Station: 10am LST  
Pointing: Nadir  
Instruments: PolyCam, OLA, OTES (ridealong)  
Bennu Range: 3.7 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Linear Scan  
PolyCam Global Panchromatic Strategy, 8cm NFT Strategy

**March 29**  
**FlyBy 4-B**  
Latitude: -40°  
Spacecraft Station: 10am LST  
Pointing: Nadir  
Instruments: PolyCam, OLA, OTES (ridealong)  
Bennu Range: 3.7 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Linear Scan  
PolyCam Global Panchromatic Strategy, 8cm NFT Strategy



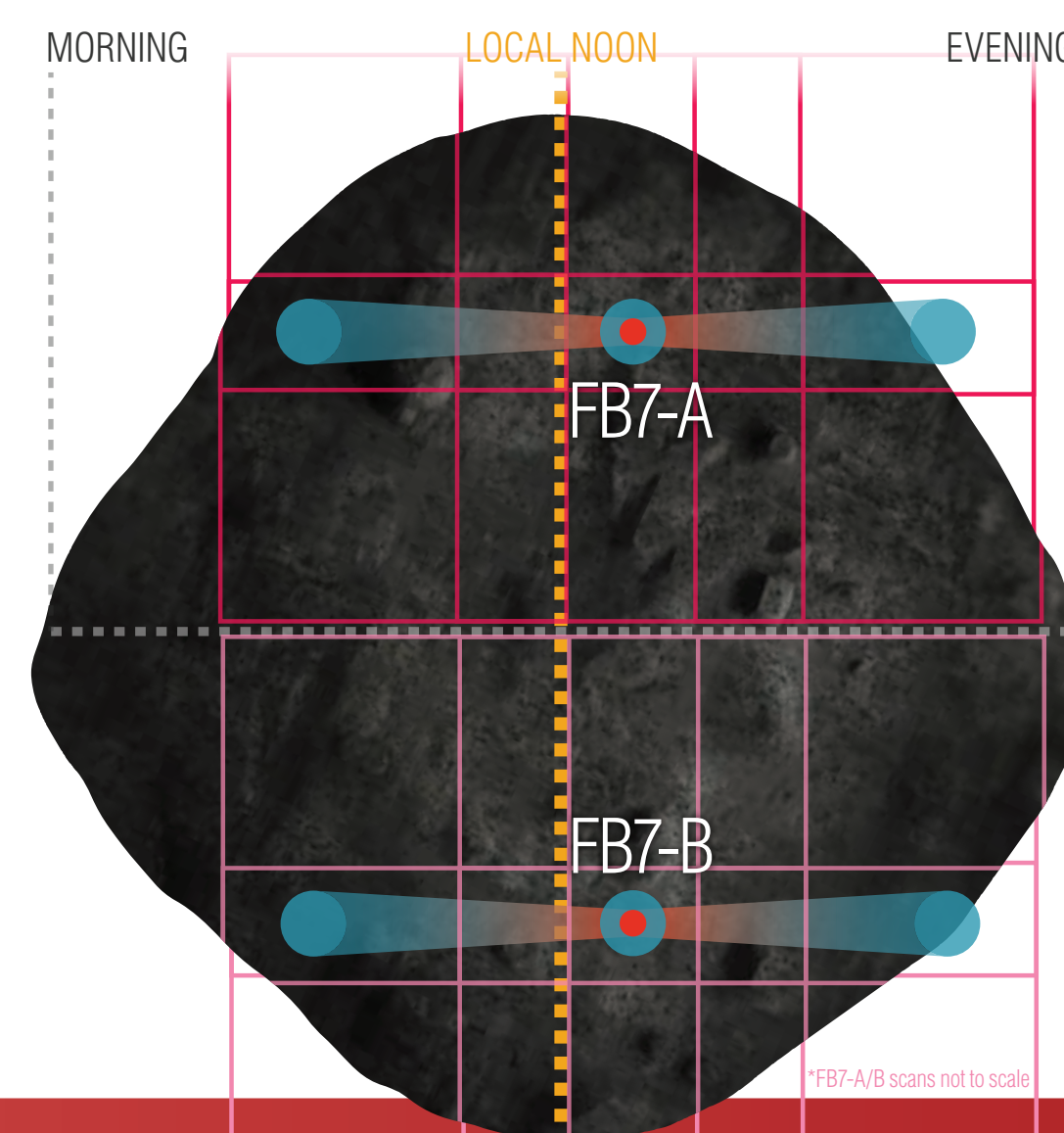
**April 4**  
**FlyBy 5-A**  
Latitude: 40°  
Spacecraft Station: 12:30pm LST  
Pointing: Nadir, off-nadir east/west (±30°)  
Instruments: PolyCam, OLA, OTES (ridealong)  
Bennu Range: 5 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Rectangular Raster Scan  
8cm NFT Strategy, 35cm Shape Model

**April 5**  
**FlyBy 5-B**  
Latitude: -33°  
Spacecraft Station: 12:30pm LST pointing to 10:30am LST  
Pointing: Off-nadir west (-22.5°)  
Instruments: PolyCam, OLA, OTES (ridealong)  
Bennu Range: 3.06 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Sun Line Scan  
PolyCam Global Panchromatic Strategy,  
8cm NFT Strategy



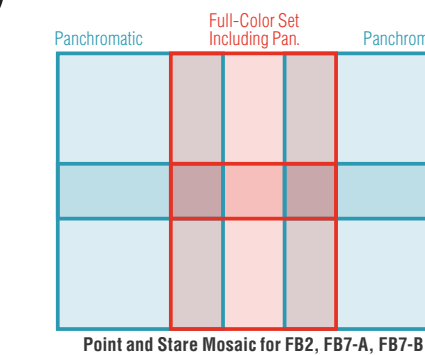
**April 11**  
**FlyBy 6-A**  
Latitude: -40°  
Spacecraft Station: 12:30pm LST  
Pointing: Nadir, off-nadir east/west (±30°)  
Instruments: PolyCam, OLA, OTES (ridealong)  
Bennu Range: 5 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Rectangular Raster Scan  
8cm NFT Strategy, 35cm Shape Model

**April 12**  
**FlyBy 6-B**  
Latitude: 33°  
Spacecraft Station: 12:30pm LST pointing to 10:30am LST  
Pointing: Off-nadir west (-22.5°)  
Instruments: PolyCam, OLA, OTES (ridealong)  
Bennu Range: 3.06 km  
Scan Range from Obs. Point: ±45° North/South  
Scan Type: Sun Line Scan  
PolyCam Global Panchromatic Strategy,  
8cm NFT Strategy



**April 18**  
**FlyBy 7-A**  
Latitude: 40°  
Spacecraft Station: 12:30pm LST  
Pointing: Nadir, off-nadir east/west (±30°)  
Instruments: MapCam, OLA, OTES (ridealong)  
Bennu Range: 3.8 km  
Scan Range from Obs. Point: ±35° North/South  
Scan Type: Point and Stare  
MapCam Global Color Strategy,  
35cm Shape Model

**April 19**  
**FlyBy 7-B**  
Latitude: -40°  
Spacecraft Station: 12:30pm LST  
Pointing: Nadir, off-nadir east/west (±30°)  
Instruments: MapCam, OLA, OTES (ridealong)  
Bennu Range: 3.8 km  
Scan Range from Obs. Point: ±35° North/South  
Scan Type: Point and Stare  
MapCam Global Color Strategy,  
35cm Shape Model



**POLYCAM GLOBAL PANCHROMATIC STRATEGY**  
Employs imaging angles that highlight the topography of the asteroid's surface and define the shape of features such as boulders and craters.

- Includes two 3.7 km flybys with three imaging stations at the 10am location at the 40°, 0°, and -40° latitudes
- Includes two additional 3.06 km flybys with two imaging stations at the 12:30pm location pointing to the 10:30am location (to provide stereo compliments) at the 33° and -33° latitudes
- FB3, FB4-A, FB4-B, FB5-B, FB6-B

**8CM NATURAL FEATURE TRACKING STRATEGY**  
Employs OCAMS data to create high-resolution digital elevation maps of natural features on the asteroid's surface for use in spacecraft navigation.

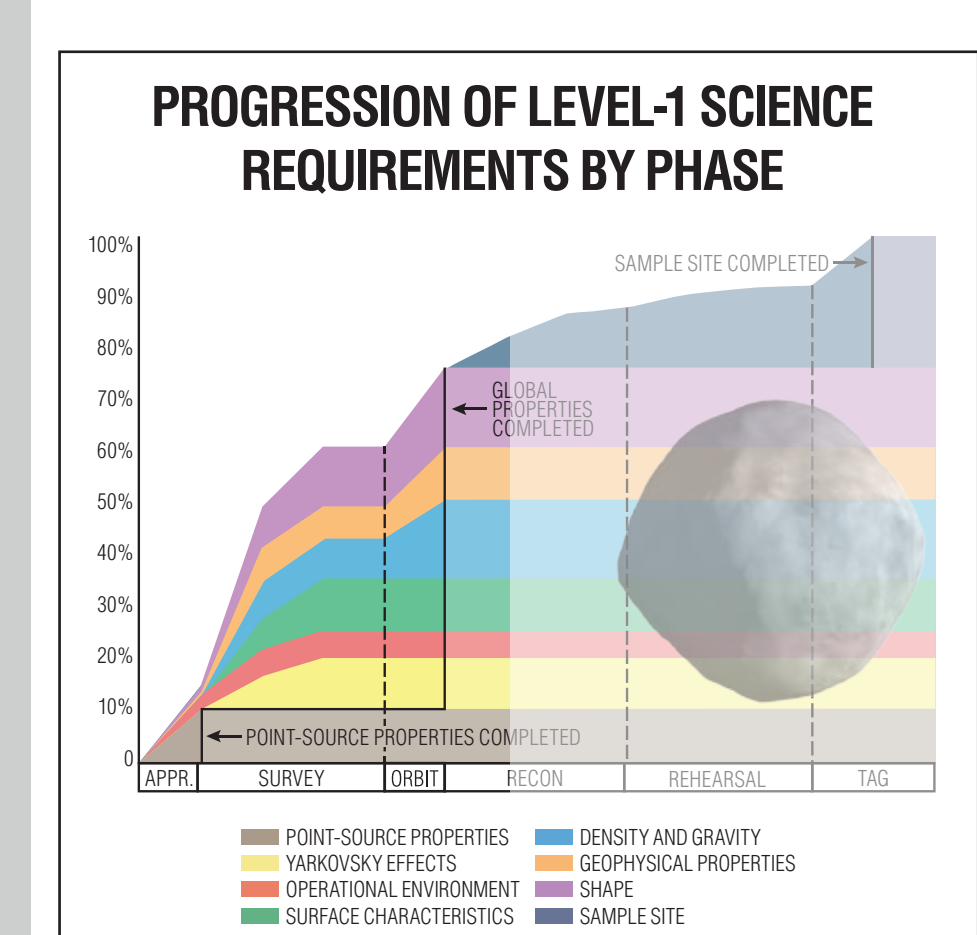
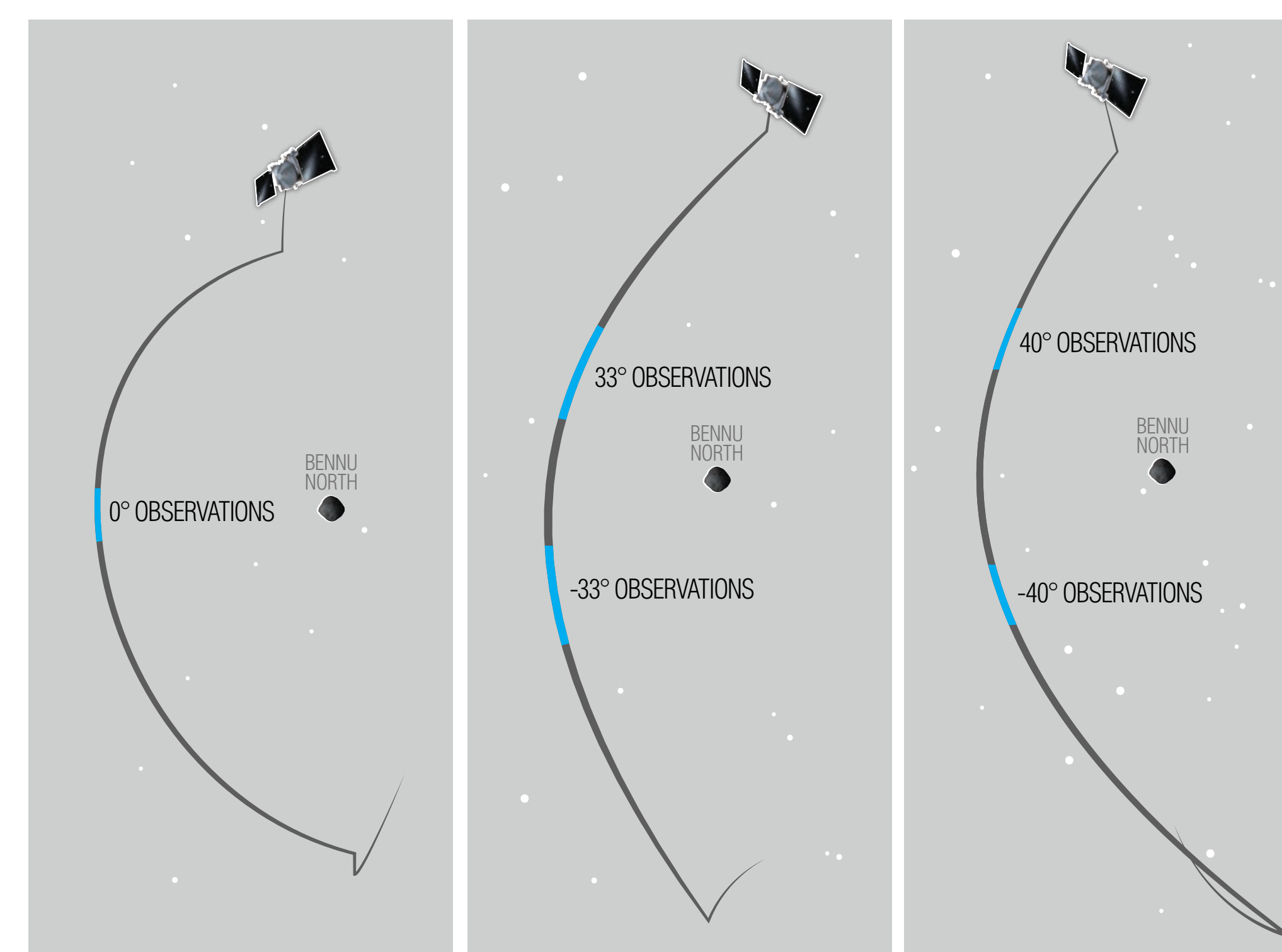
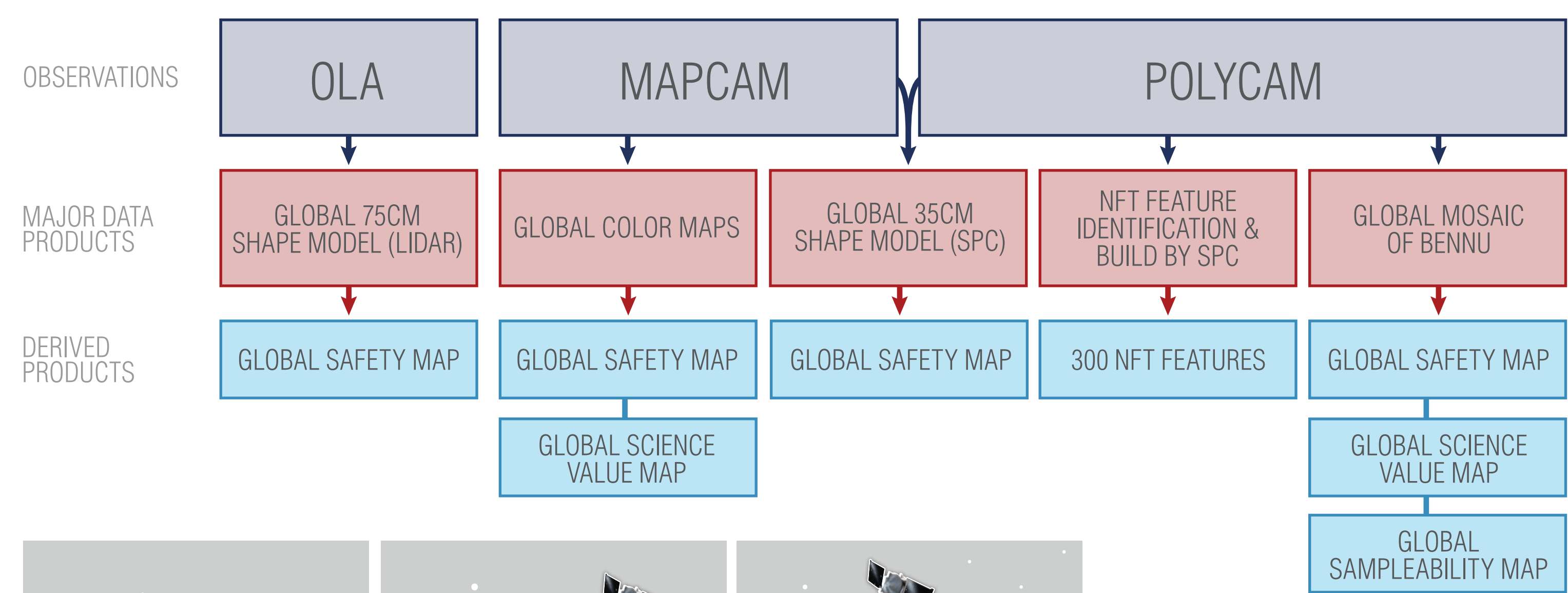
- Consists of three 5 km flybys, two 3.7 km flybys, and two 3.06 km flybys with imaging stations at the 40°, 33°, 0°, -33°, and -40° latitudes
- Imaging occurs at the 10am, 12:30pm, and 12:30pm pointing to 10:30am location
- FB1, FB3, FB4-A, FB4-B, FB5-A, FB5-B, FB6-A, FB6-B

**MAPCAM GLOBAL COLOR STRATEGY**  
Employs each of MapCam's five filters to obtain a global, color data set of the asteroid's surface.

- Consists of two 3.8 km flybys with three imaging stations at the 40°, 0°, and -40° latitudes
- Imaging occurs at the 12:30pm location in order to acquire low-emission angle observations over a full asteroid rotation period
- FB2, FB7-A, FB7-B

**35CM SHAPE MODEL**  
Employs OCAMS data to create a global 35cm shape model, digital elevation maps and slope maps of the asteroid for use in producing high-level science data products and navigation.

- Consists of three 5 km flybys, three 3.8 km flybys, and one 3.7 km flyby, with imaging stations at 40°, 0°, and -40° latitude
- Imaging occurs at the 12:30pm and 10am location
- FB1, FB2, FB5-A, FB6-A, FB7-A, FB7-B



● GROUND IMAGING LOCATION ● SPACECRAFT POSITION ● OFF-NADIR IMAGING LOCATION OBSERVATION WINDOW = 1 BENNU ROTATION

DERIVED FROM APPROACH SPPV9c  
LAST UPDATED: 07-03-2018