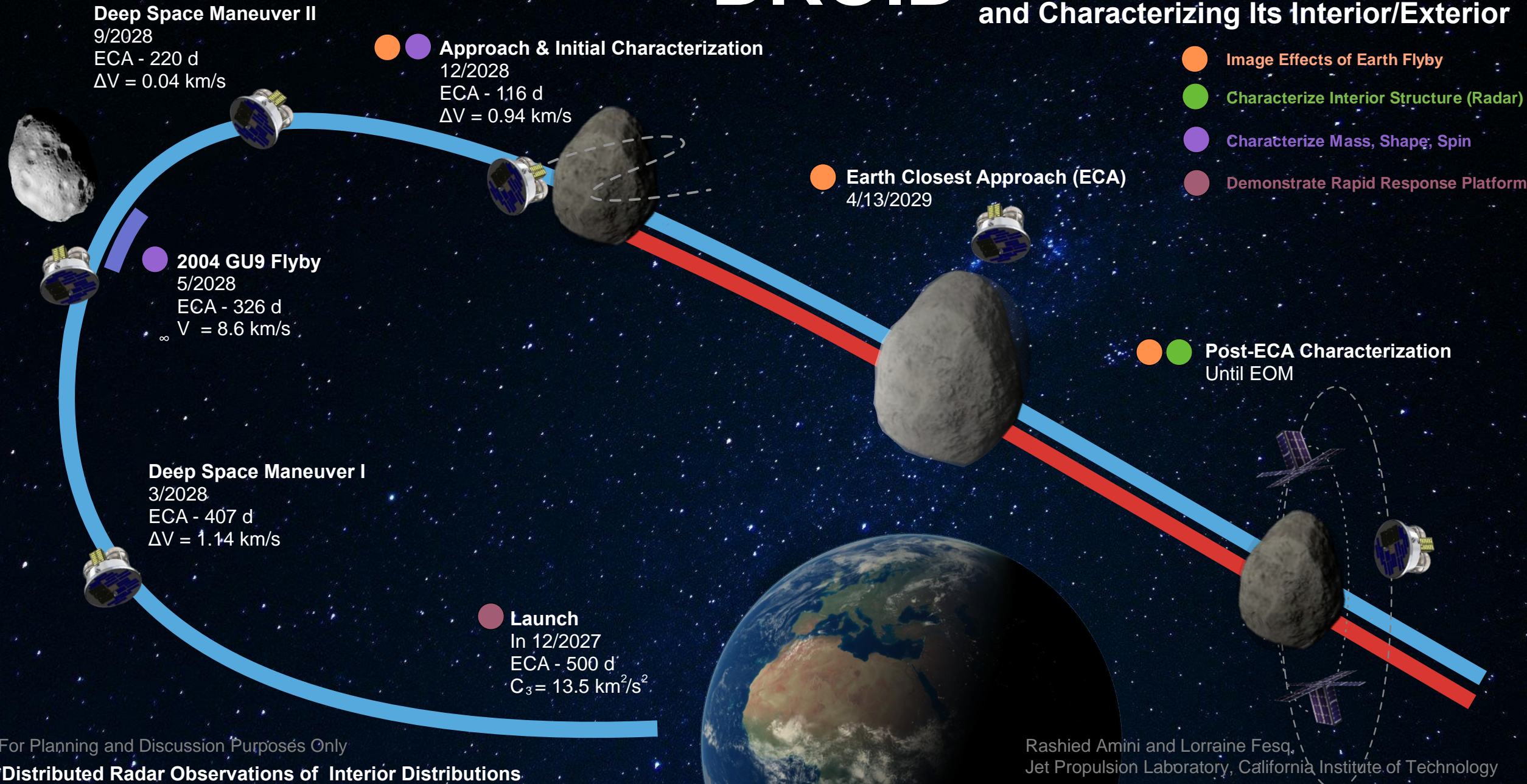


DROID* * Shepherding Apophis Through Close Approach, Imaging Surface Changes, and Characterizing Its Interior/Exterior



Deep Space Maneuver II

9/2028
ECA - 220 d
 $\Delta V = 0.04 \text{ km/s}$

● ● **Approach & Initial Characterization**
12/2028
ECA - 116 d
 $\Delta V = 0.94 \text{ km/s}$

- Image Effects of Earth Flyby
- Characterize Interior Structure (Radar)
- Characterize Mass, Shape, Spin
- Demonstrate Rapid Response Platform

● **2004 GU9 Flyby**
5/2028
ECA - 326 d
 $V_{\infty} = 8.6 \text{ km/s}$

● **Earth Closest Approach (ECA)**
4/13/2029

● ● **Post-ECA Characterization**
Until EOM

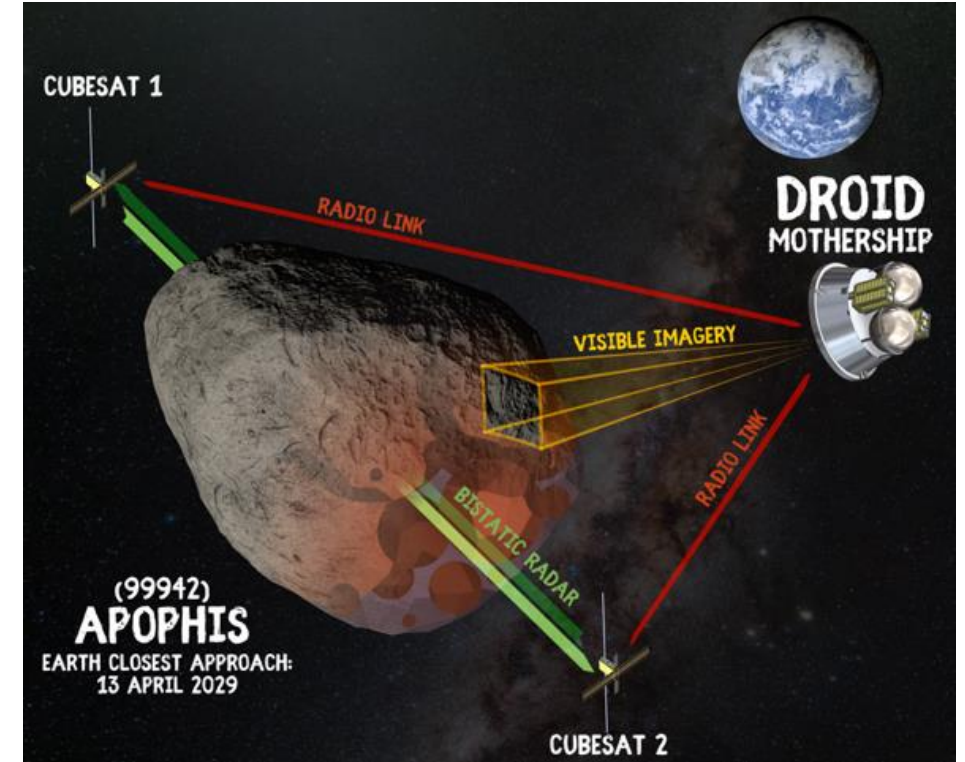
Deep Space Maneuver I

3/2028
ECA - 407 d
 $\Delta V = 1.14 \text{ km/s}$

● **Launch**
In 12/2027
ECA - 500 d
 $C_3 = 13.5 \text{ km}^2/\text{s}^2$

DROID is an International Collaboration

- **CNES:** *CubeSats, Wide Angle Cameras, Inter-Satellite Links*
- **Rocket Lab:** *Mothership, Launch Vehicle*
- **University of Grenoble, Luxembourg:** *Monostatic/Bistatic Radar*
- **JPL:** *Management, Narrow Angle Camera*



CubeSats use their radars to characterize interior structure and dielectric distribution as the Mothership develops a <5 cm/px map.

Preliminary Schedule

