

Deep Space Maneuver II 9/2028 ECA - 220 d $\Delta V = 0.04$ km/s

Approach & Initial Characterization 12/2028 ECA - 116 d $\Delta V = 0.94$ km/s

Earth Closest Approach (ECA)

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

> Image Effects of Earth Flyby **Characterize Interior Structure (Radar)** Characterize Mass, Shape, Spin

Demonstrate Rapid Response Platform



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

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

For Planning and Discussion Purposes Only *Distributed Radar Observations of Interior Distributions Rashied Amini and Lorraine Fesq. Jet Propulsion Laboratory, California Institute of Technology

4/13/2029

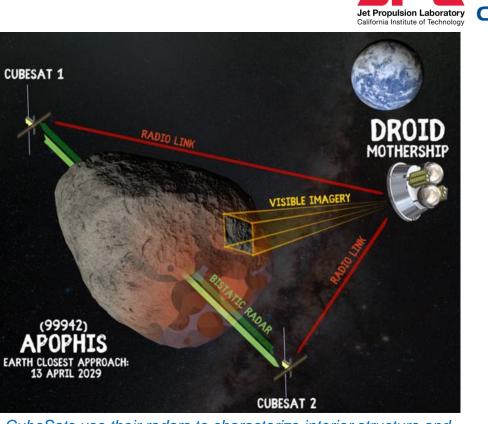
DROID

2004 GU9 Flyby 5/2028 ECA - 326 d V = 8.6 km/s

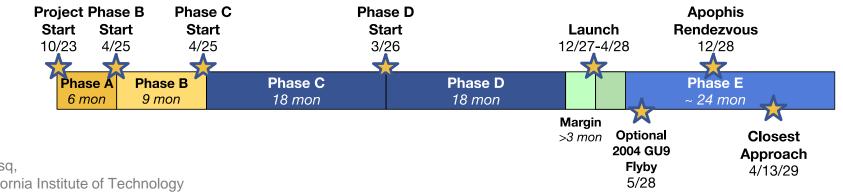
Deep Space Maneuver I

DROID: The Mission to Apophis 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

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