DESTINY+ Mission Overview

★ Joint mission of technology demonstration & science observation.
★ Engineering mission led by JAXA and science mission led by ChibaTech.
★ International collaboration with JAXA and DLR.

Engineering Goals

- Expand the range of applications for electric propulsion
- Acquire advanced flyby exploration technologies

Science Goals

Science Goals	*Science objectives*
• Characterize cosmic dust delivered to the Earth	- Determine mass, speed, arrival direction, chemical composition of IDPs 1 au to constrain their origin: asteroidal or cometary.
	- Determine chemical composition of interstellar dust around 1 au.
	- Determine chemical composition of dust from Phaethon.
• Understand geology of asteroid Phaethon, Geminids parent	- Constrain dust ejection mechanism from active asteroid.
	- Understand global surface material distribution.

Science Instruments

Phaethon imaging

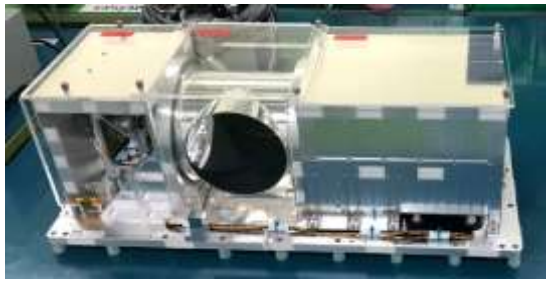
★Developed by PERC, Chiba Inst of Technology

- 3D shape
- Surface geology <10 m/pix
- VIS-NIR spectral variation <100 m/pix

Telescopic CAmera for Phaethon (TCAP)

with a tracking mirror

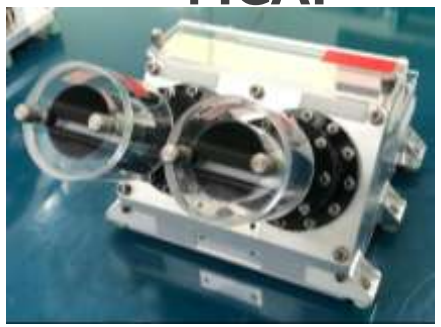
TCAP



Multiband CAmera for Phaethon (MCAP)

with compound eyes and four bands (425/550/700/850 nm)

MCAP



Dust analyses

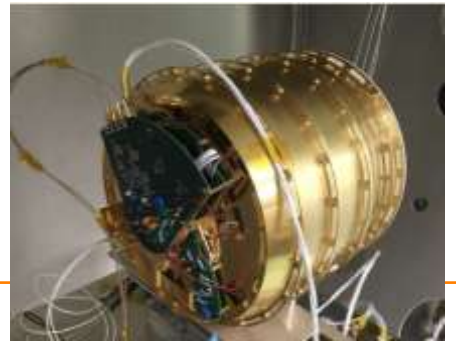
★Developed by Univ. of Stuttgart

- Physical & Chemical properties of IDPs and interstellar dust
- Physical & chemical properties of nearby Phaethon & dust trails

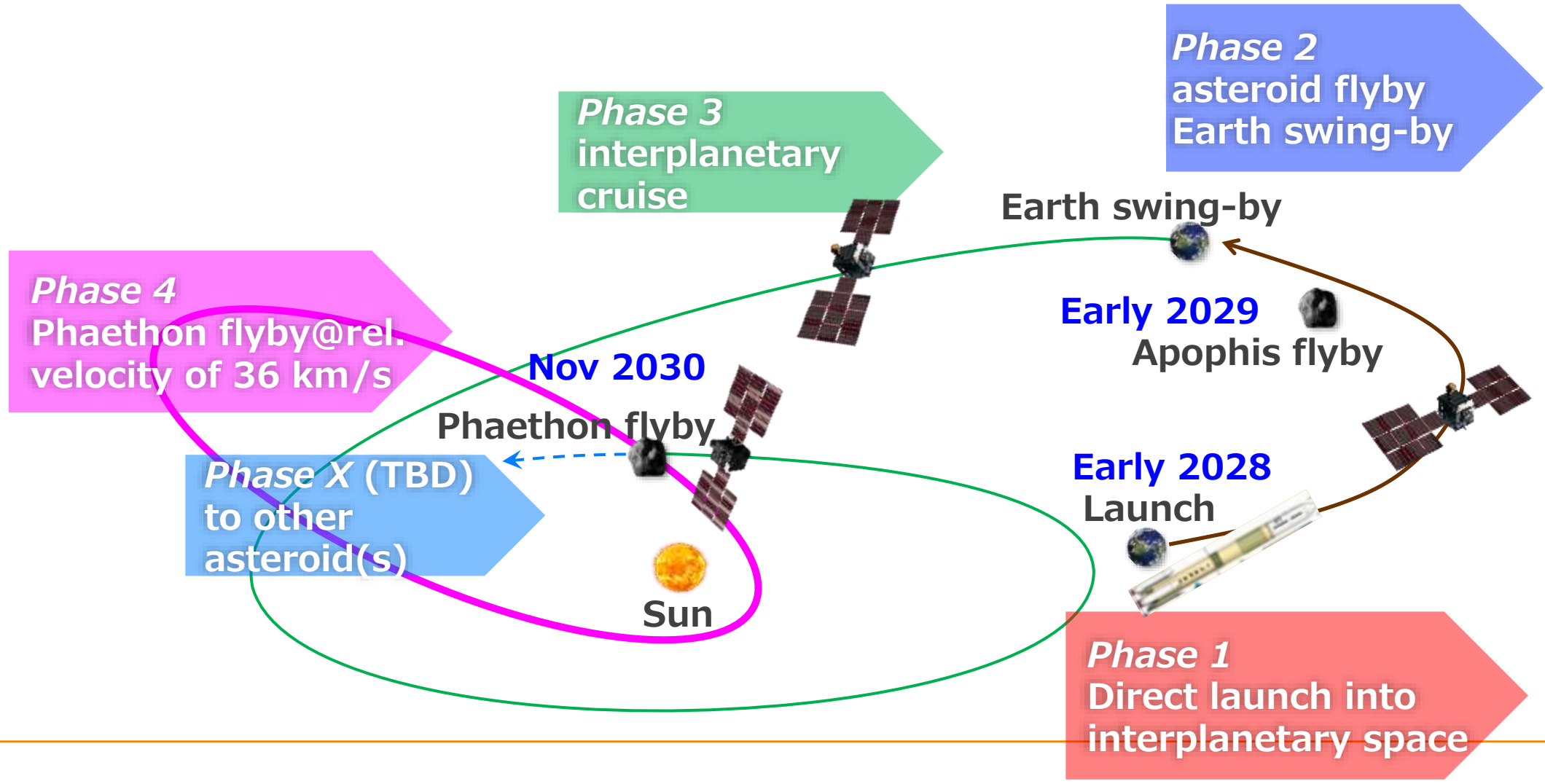
DESTINY⁺ Dust Analyzer (DDA)

Integrated impact-ionization trajectory sensor with TOF mass

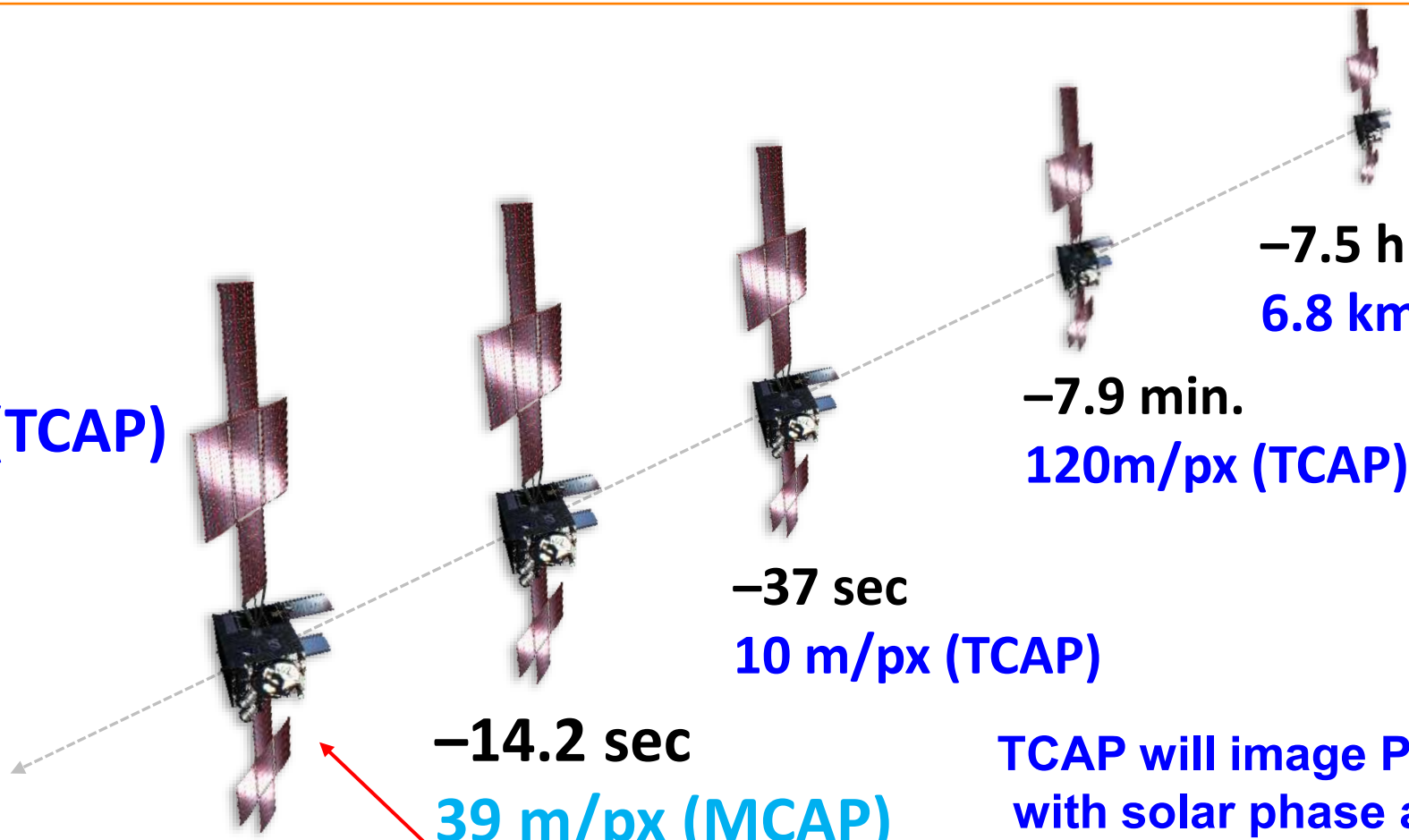
DDA



Mission Profile updated



Phaethon Flyby imaging sequence



0 s
3.5 m/px (TCAP)

–14.2 sec
39 m/px (MCAP)

–37 sec
10 m/px (TCAP)

–7.9 min.
120m/px (TCAP)

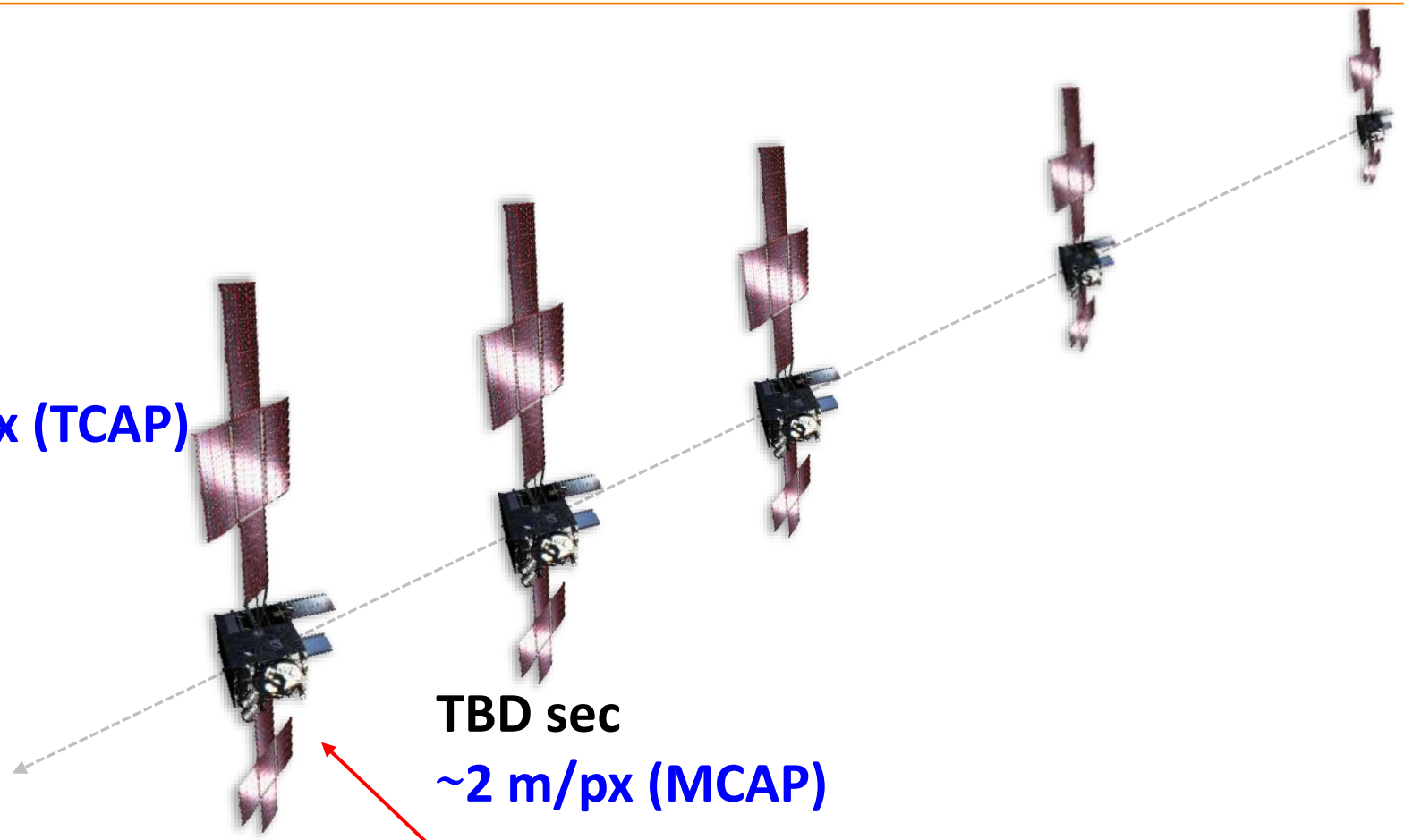
–7.5 hr
6.8 km/px (TCAP)

TCAP will image Phaethon surface with solar phase angles of 0-90°

Closest distance : 500±50 km
Flyby speed : ~36 km/sec

Phaethon (Dia. 5-6 km)

Apophis Flyby imaging sequence



0 s

~0.2 m/px (TCAP)

TBD sec

~2 m/px (MCAP)

Closest distance : 27 km (TBD)

Flyby speed : 1.5 km/sec

Apophis (Dia. ~340m)