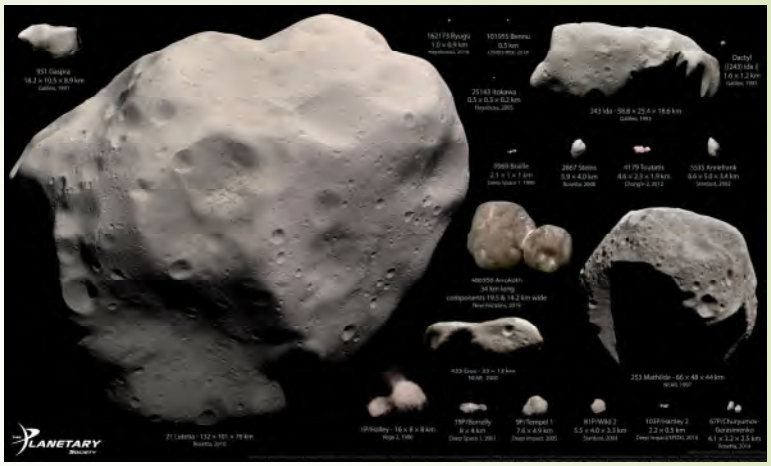
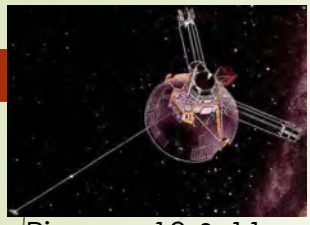


Zonnestelsel exploratie

Josiane



Pioneer 10 & 11

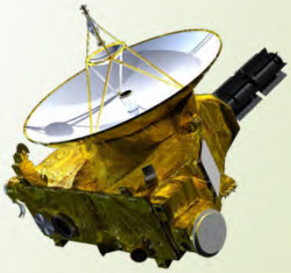
Ulysses

Cassini

Huygens probe

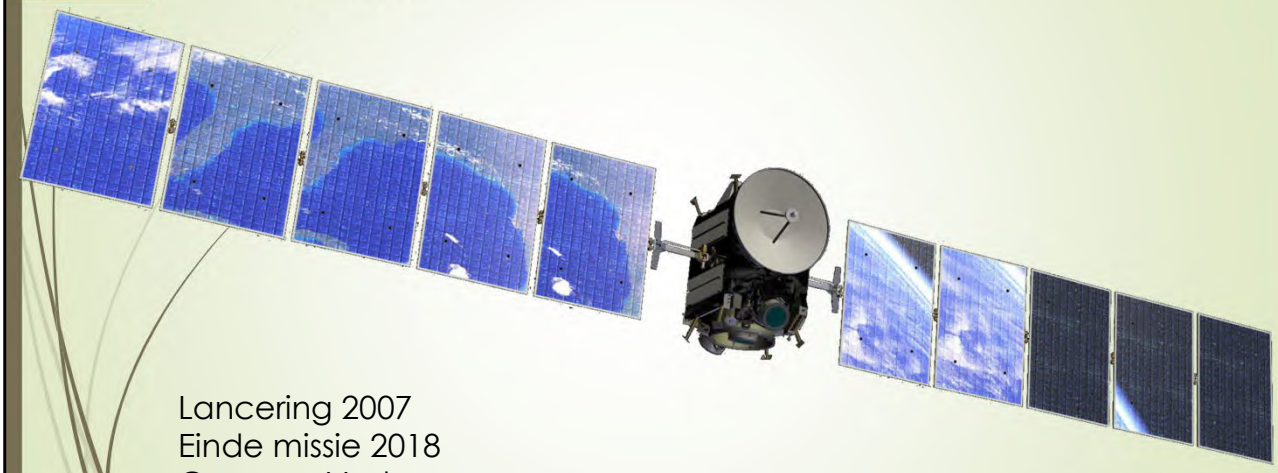
Galileo

Voyager 1 & 2



New Horizons

Dawn



Lancering 2007
Einde missie 2018
Ceres en Vesta

4 Vesta

Dimensies:
573 x 557 x 446 km

Temperatuur: -198° / -23° C

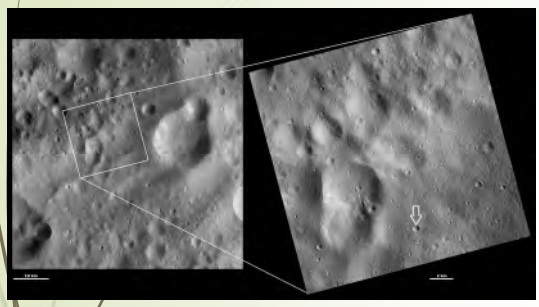
Afstand: 353 miljoen km

Omloop:
3,6 jaar aan 19,34 km/sec

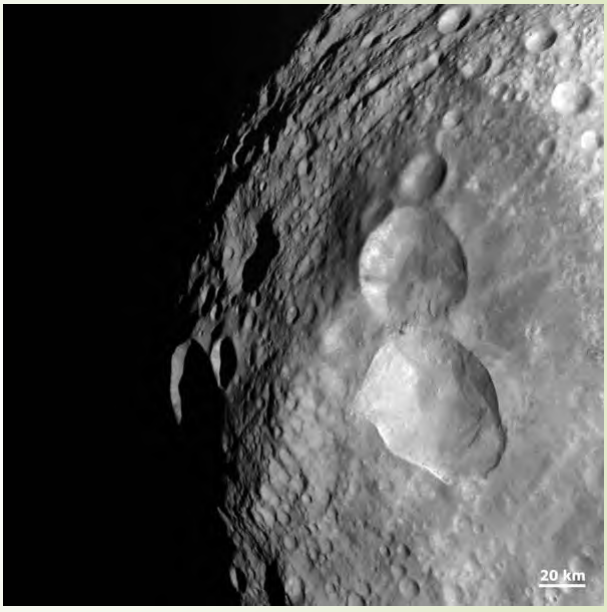
Vesta

Dawn at Vesta in 2011

Vesta



Claudia krater



Snowman

1 Ceres

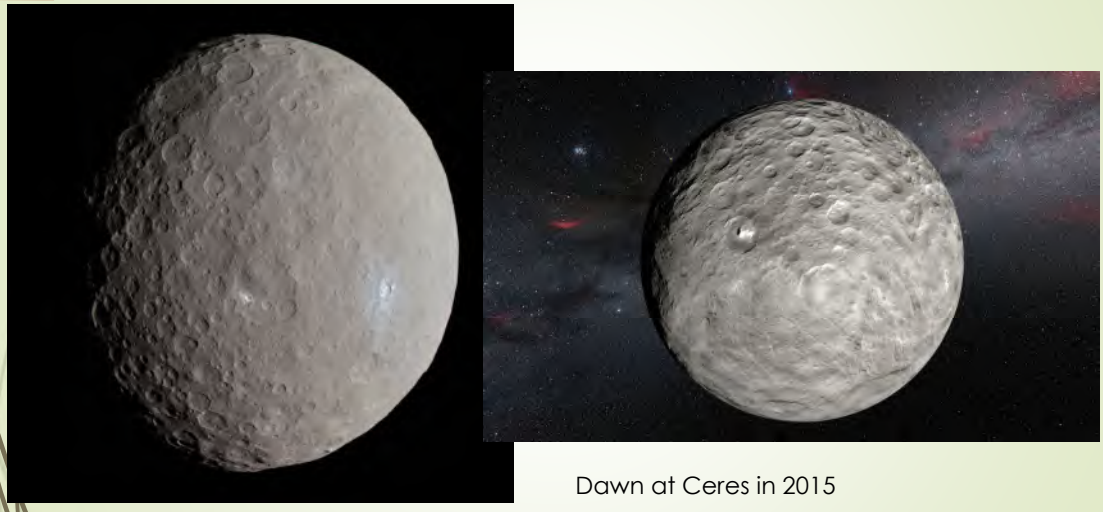
Dimensies: 966 km

Temperatuur: -143° / -73° C

Afstand: 414 miljoen km

Omloop:
4,6 jaar aan 17,9 km/sec

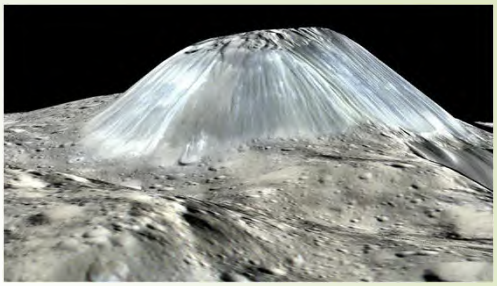
Ceres



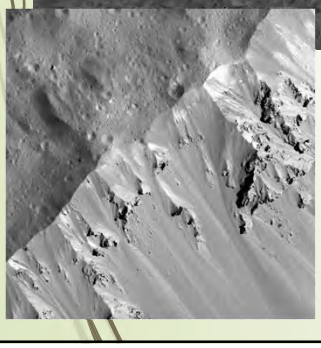
Dawn at Ceres in 2015

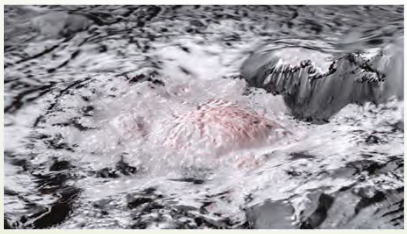
Ceres

Occator krater, Cerealia facula (li), Vinalia faculae (re)

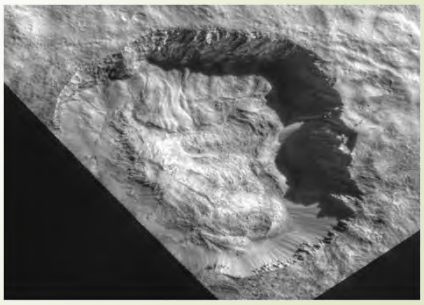


Ahuna mons, 5 km hoog





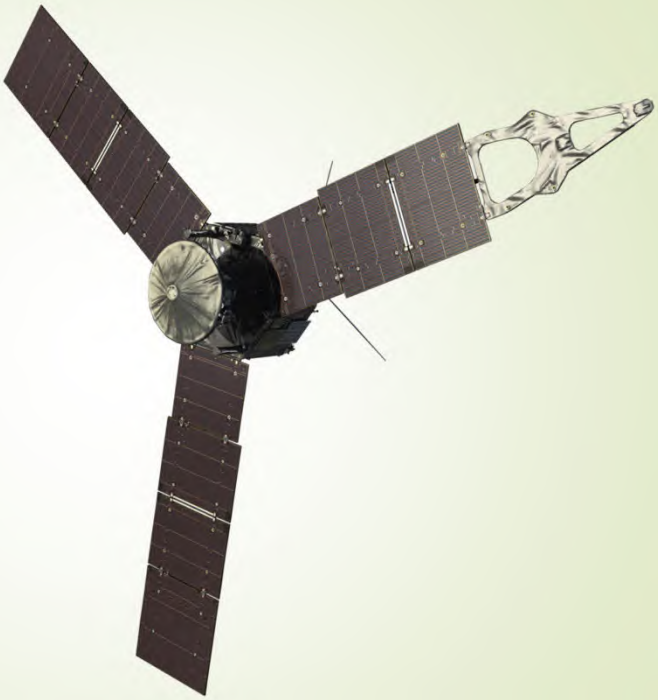
Cerealia facula



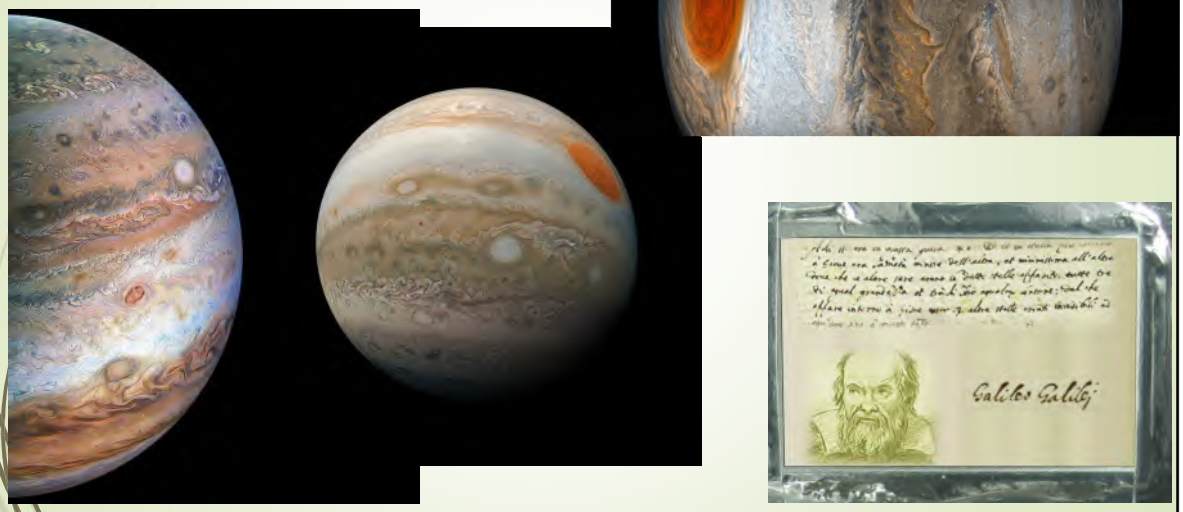
Kratervloer Juling

Juno

Lancering 2011
Einde missie …
Jupiter-systeem



Jupiter



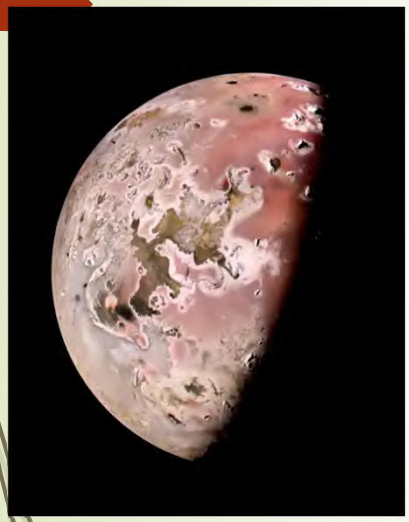
Ganymedes

Juni 2021

Europa

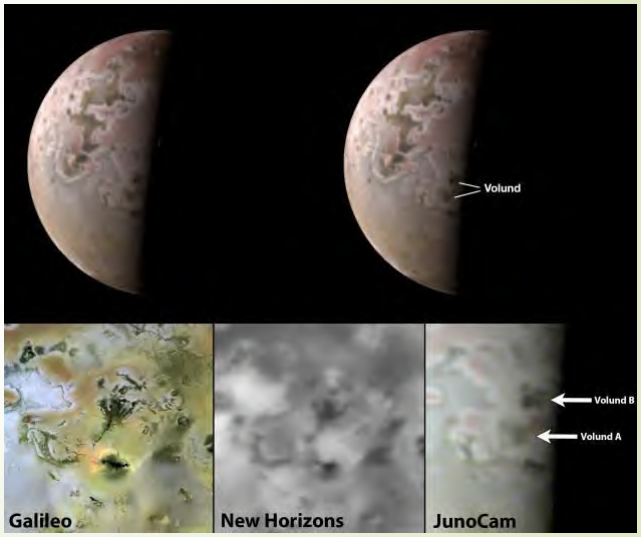
September 2022

Io



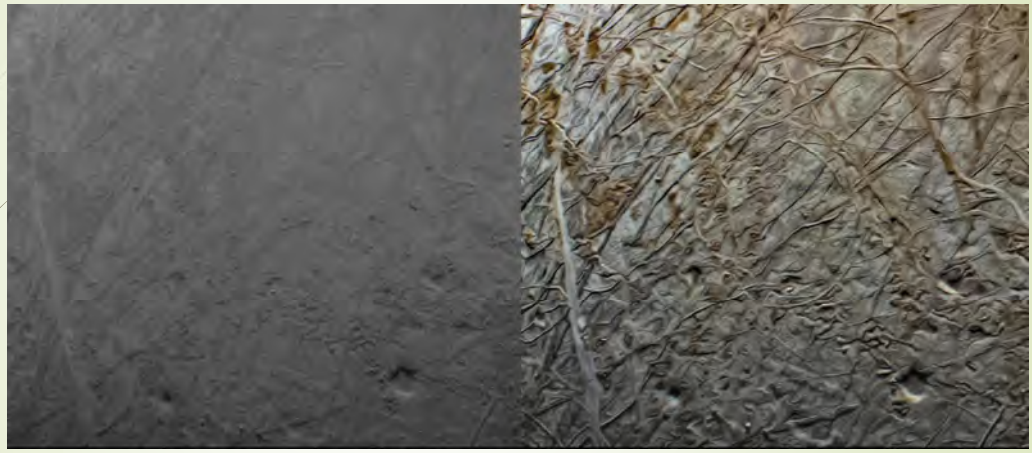
16 oktober 2023

2023 + 2024



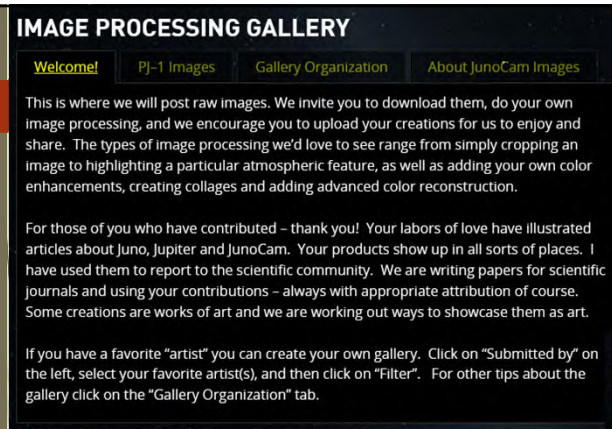
1996 2007 2023

Juno, doe je mee?



https://www.missionjuno.swri.edu/junocam/processing

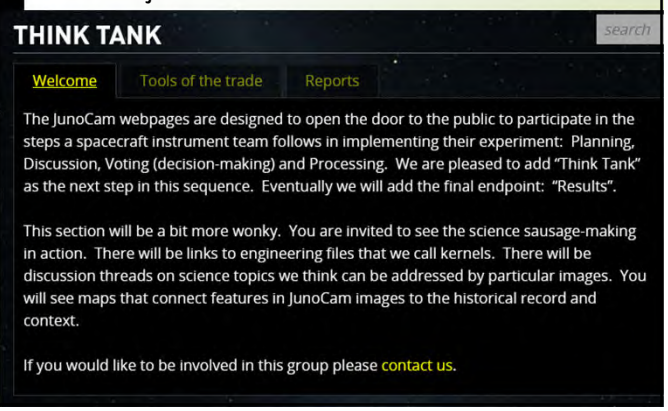
https://www.missionjuno.swri.edu/junocam/think-tank



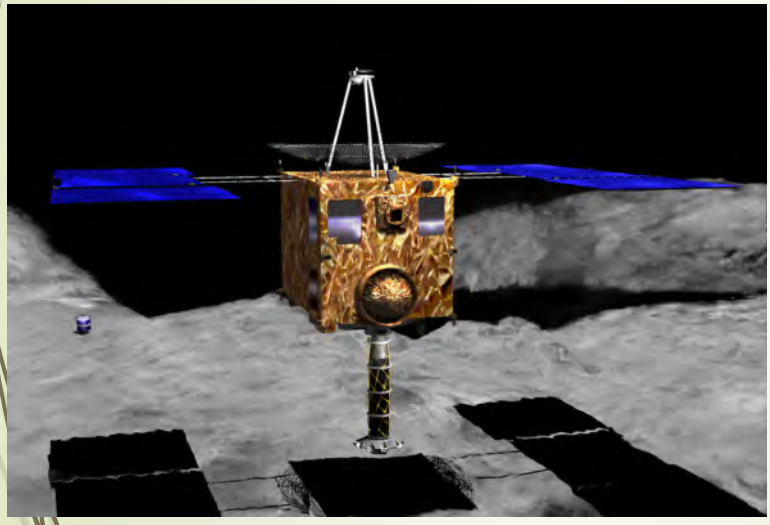
https://www.missionjuno.swri.edu/junocam/processing

Je kunt zelf meedoen

https://www.missionjuno.swri.edu/junocam/think-tank

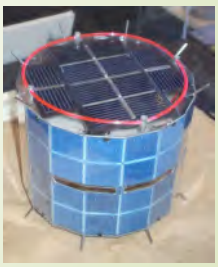


Hayabusa1



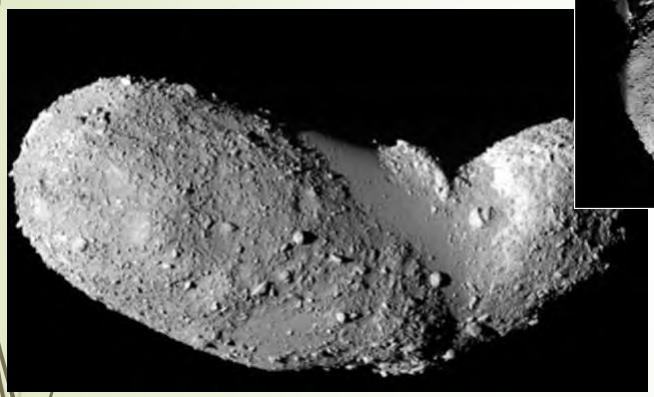
Lancering 2003
Landing 2005
25143 Itokawa
+ Sample return 2010

Last contact nov 2005



Minerva

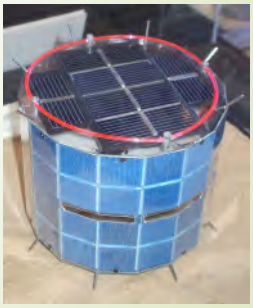
25143 Itokawa



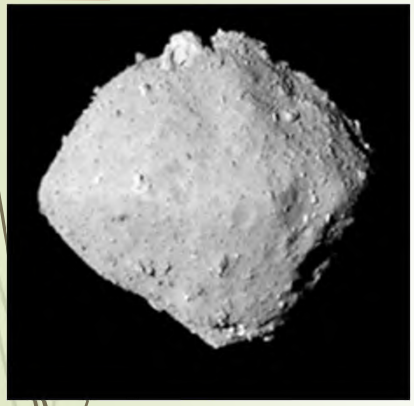
630 x 250 km
Water in deeltjes
(olivijn, pyroxeen, albiet)

Hayabusa2

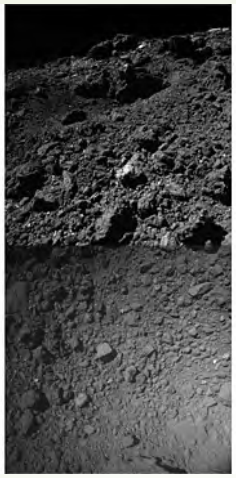
Lancering 2014
Landing 2019
162173 Ryugu
+ Sample return 2020



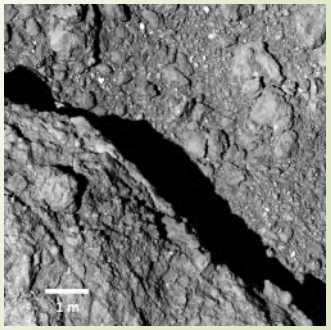
162173 Ryugu



Juni 2018 – nov 2019
1004 x 876 m
Jong opp (9 mjn j)
Weinig stof
77 kraters



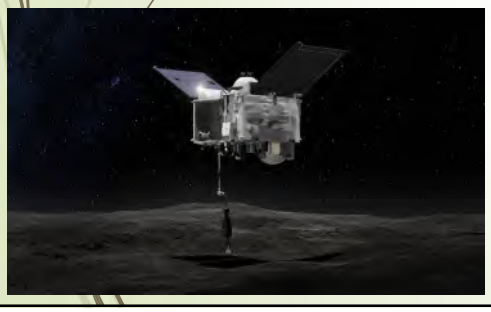
Impactor: 2 kg koper (april 2019)



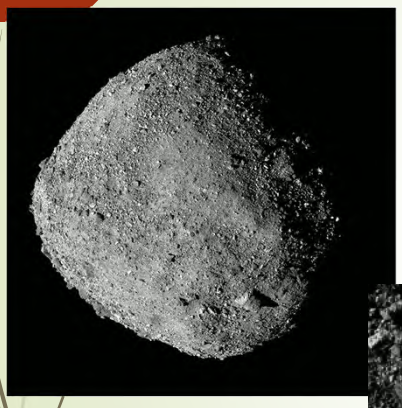
Osiris-Rex

Lancering 2016
101955 Bennu
+ Sample return sept 2023

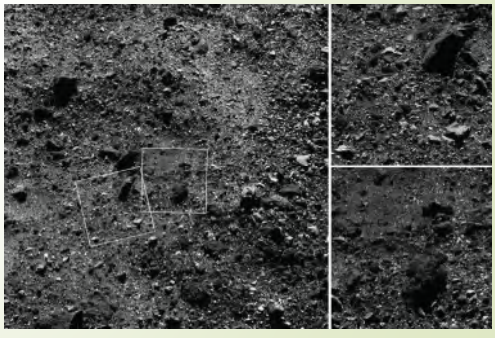
-> Osiris-Apex



101955 Bennu



490 m
Sample return
koolstof

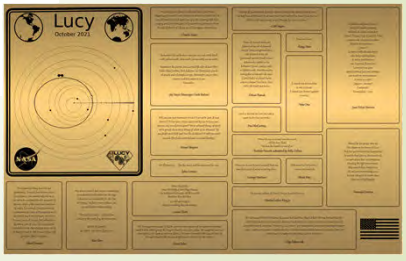


Osiris-Apex (Apophis Explorer)

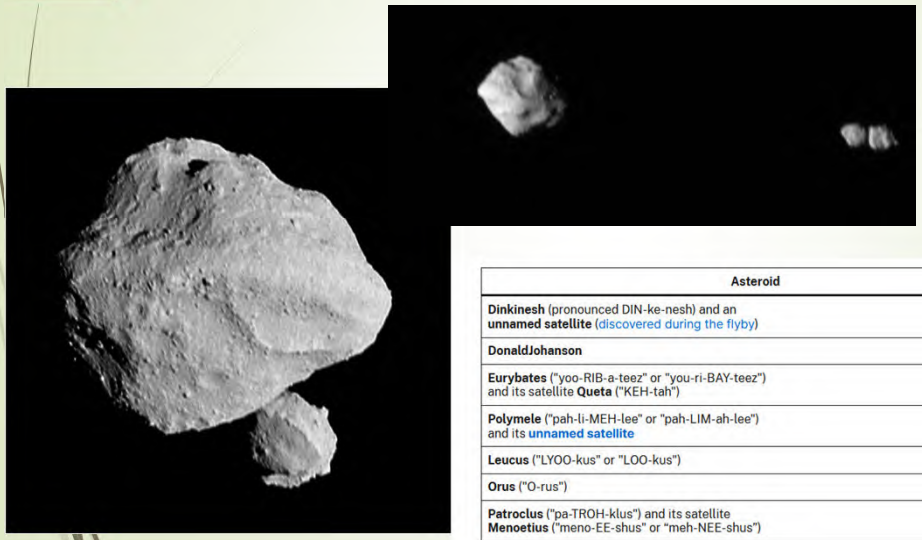
Vertrek sept 2023
99942 Apophis
(18 mnd)
Aankomst 2029

Lucy

Lancering 2021
Planetoiden +
Trojans van Jupiter
…



152830 Dinkinesh !!



790 m
Maantje dubbel !

Asteroid	Flyby Date
Dinkinesh (pronounced DIN-ke-nesh) and an **unnamed satellite** (discovered during the flyby)	Nov. 1, 2023
DonaldJohanson	April 20, 2025
Eurybates ("yoo-RIB-a-teez" or "you-ri-BAY-teez") and its satellite **Queta** ("KEH-tah")	Aug. 12, 2027
Polymele ("pah-li-MEH-lee" or "pah-LIM-ah-lee") and its **unnamed satellite**	Sept. 15, 2027
Leucus ("LYOO-kus" or "LOO-kus")	April 18, 2028
Orus ("O-rus")	Nov. 11, 2028
Patroclus ("pa-TROH-klus") and its satellite **Menoetius** ("meno-EE-shus" or "meh-NEE-shus")	March 3, 2033

DART
Double Asteroid Redirection Test

Lancering 2021
Didymos & Dimorphos
Dimorphos impactor
  26 sept 2022
  6 km/sec

Didymos & Dimorphos

Didymos 780 m
Dimorphos 170 m

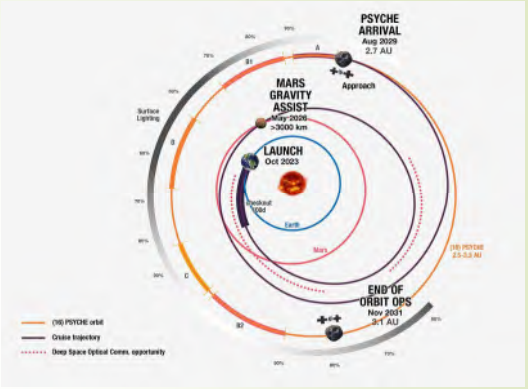
HERA

Lancering okt 2024
Dimorphos

Resultaat Dimorphos impact?

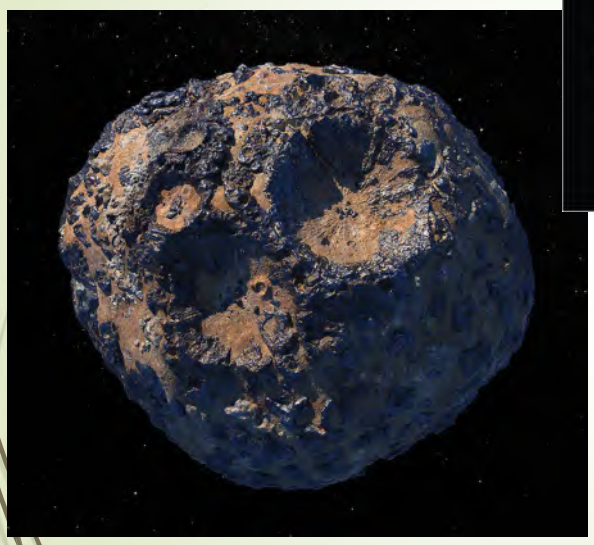
6 mnd

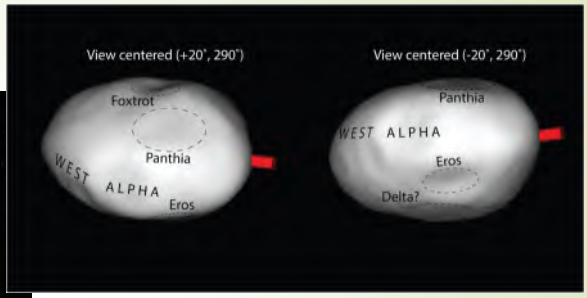
Psyche



Lancering okt 2023
16 Psyche
Aankomst 2029

16 Psyche





VLT
Dimensies 277 x 238 x 168 km
Afstand 400 miljoen km
Omloop 4,19 jaar

JUICE
Jupiter Icy Moons Orbiter

Lancering april 2023
Europa, Ganymedes, Callisto, (223 Rosa (2029))

Aankomst
- Jupiter 2031
- Europa 2032
- Callisto 2033
- Ganymedes dec 2034

Europa, Callisto, Ganymedes

Europa
1560 km

Callisto
2410 km

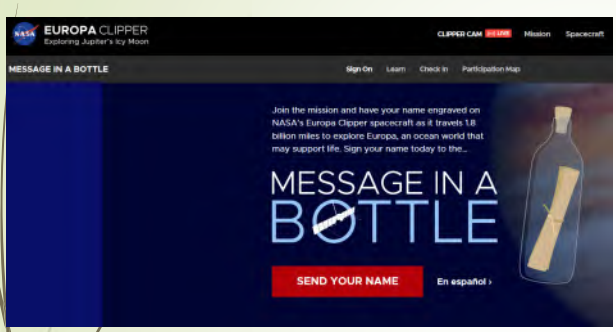
Ganymedes
2634 km

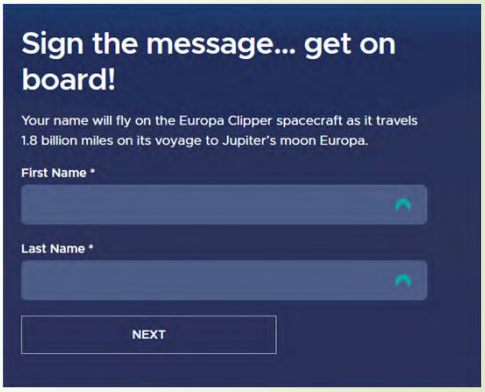
Europa Clipper

Lancering okt 2024
Europa multiple flyby
Aankomst 2030

Europa Clipper

Message in a bottle





https://europa.nasa.gov/message-in-a-bottle/sign-on/

jaxa

Destiny

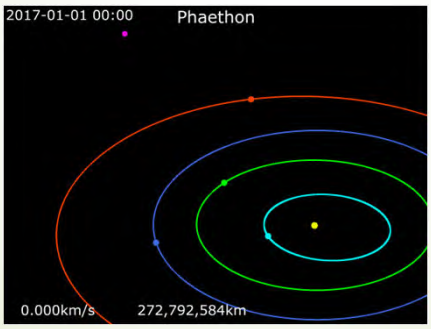
Lancering 2025
3200 Phaethon
Aankomst 2029
Flyby

3200 Phaethon (1983 TB)

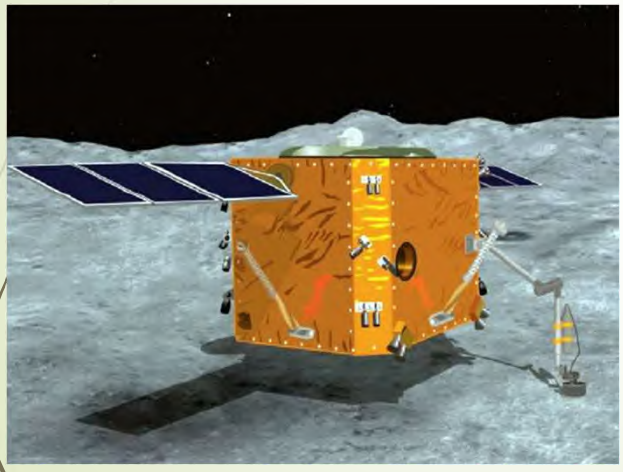
Dimensies 6 x 4 km
Omloop 523,6 d
Afstand 190 miljoen km

Mogelijk gevaarlijke asteroide!

Parent body van Geminiden meteoren



Tianwen-2 (ZhengHe)

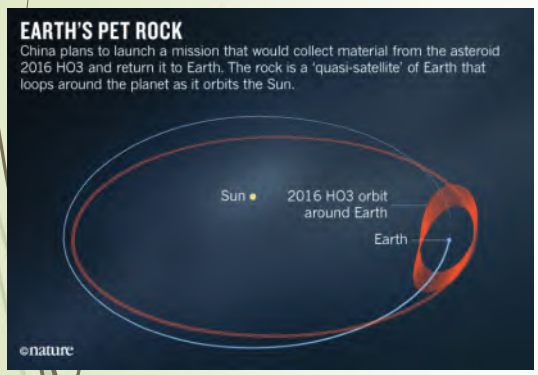


Lancering mei 2025

469219 Kamo'oalewa
Aankomst 2029
Orbiter + sample mass

311P/Panstarrs
Aankomst 2034
Orbiter (min 1 jaar)

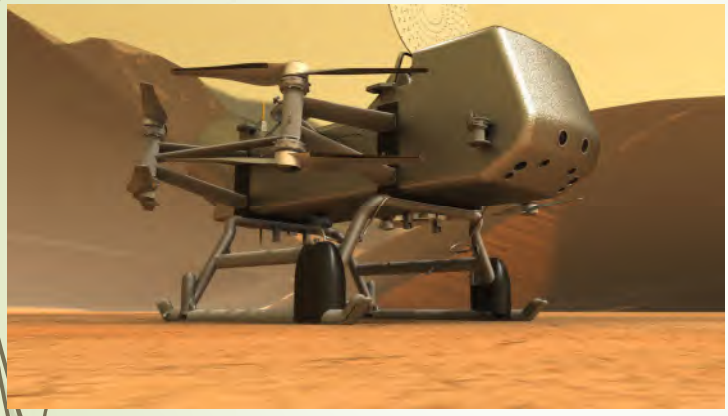
469219 Kamo'oalewa (2016 HO3)
311P/Panstarrs (P/2013 P5)



40 x 100 m

480 m

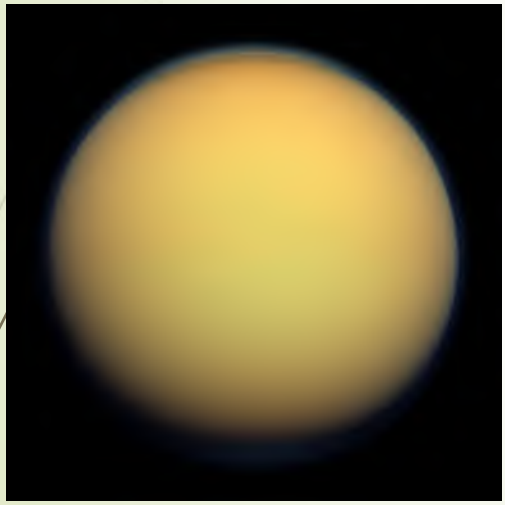
DragonFly



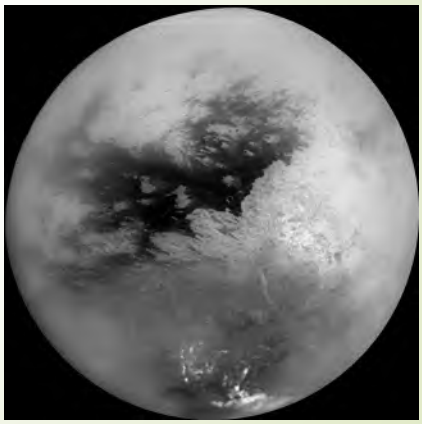
Lancering juni 2027
Titan
Landing 2034
Rotorcraft op Titan
(drone)

DragonFly is de vierde missie in Nasa's New Frontiers programma

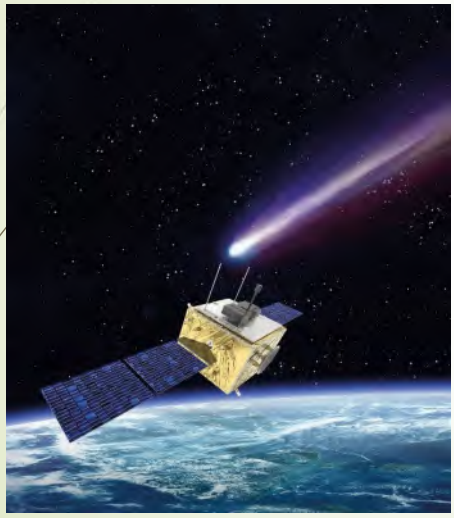
Titan



Dimensie 5150 km
DragonFly zal landen in Shangri-La



Comet Interceptor

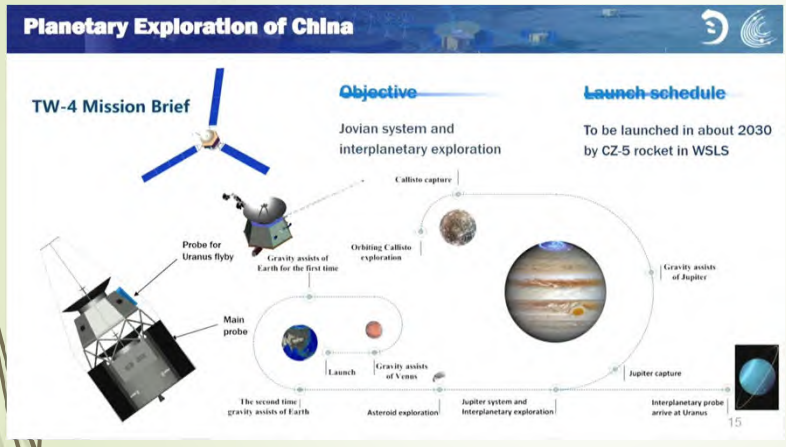


Lancering 2029
Lang periodieke komeet

Zal parkeren bij het Aarde-Zon L2 Lagrange punt

en tot 3 jaar wachten op een lang periodieke komeet

Tianwen-4



Lancering okt 2029
Flyby Venus apr 2030
Flyby Aarde feb 2031
Flyby Aarde mei 2033
Jupiter orbiter aug 2035
Tot 2038
Callisto orbiter 2038
Flyby Uranus 2046

MMX
Mars Moons Exploration

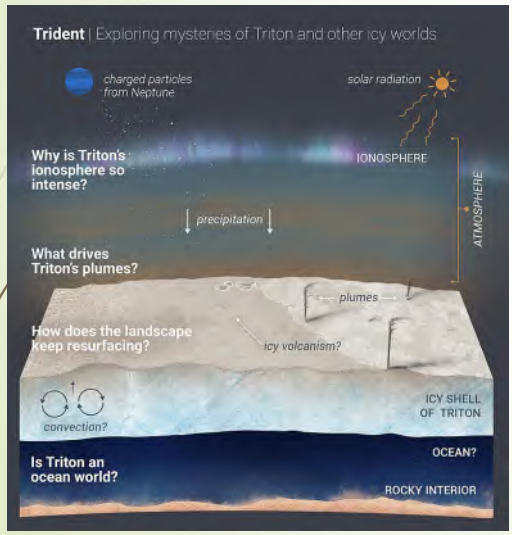
Lancering sept 2024
Phobos sample return
Deimos flyby
Landing Phobos 2025
Tot 2028

Phobos & Deimos

26 x 23 x 18 km

16 x 12 x 10 km

Trident



Lancering okt 2025
Triton

Aarde flyby okt 2026
Venus flyby mrt 2027
Aarde flyby feb 2028
Aarde flyby feb 2031
Jupiter & Io flyby juni 2032
Flyby Neptunus & Triton Juni 2038

Triton

Dimensies 2710 km
Retrograde baan

The Ocean Worlds Exploration Programma OWEP

1)	Europa clipper	Europa	2024
2)	Dragonfly	Titan	2027
3)	Europa lander	Europa	2027
4)	Trident	Triton	2025

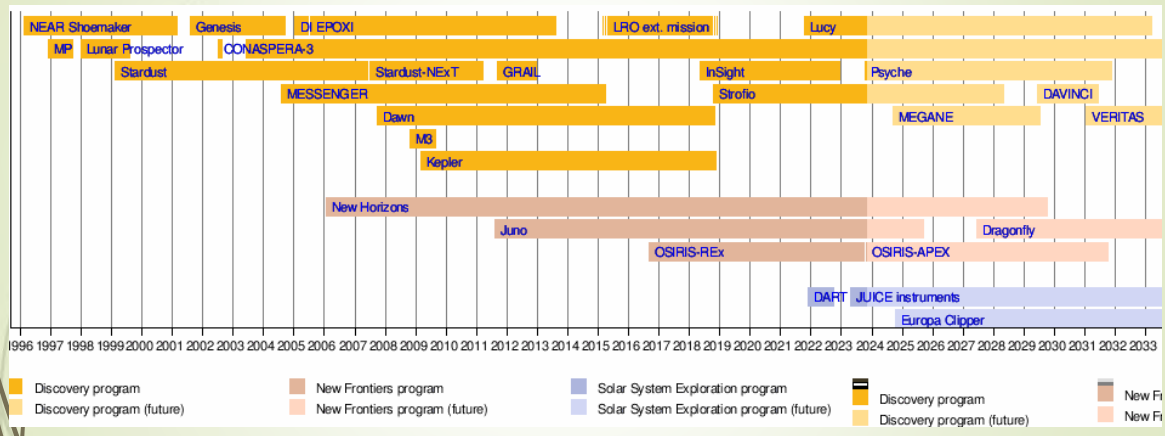
New frontiers programma

1)	New Horizons	Pluto, Arrokoth	2006-…
2)	Juno	Jupiter + manen	2011-…
3)	Osiris-Rex	101955 Bennu	2016-2023
	Osiris-Apex	99942 Apophis	2023-…
4)	Dragonfly	Titan drone	2027

Discovery programma missies

1)	Near Shoemaker	433 Eros, 253 Mathilde	1996-2001
2)	Mars Pathfinder	Mars (Sojourner rover)	1996-1998
3)	Lunar Prospector	Maan	1998-1999
4)	Stardust	81P/Wild, 5535 Annefrank, Tempel 1	1999-2011
5)	Genesis	Zonnewind deeltjes verzamelen	2001-2004
6)	Contour	Encke, Schwassmann-Wachmann-3	2002-mislukt
7)	Messenger	Mercurius, Venus	2004-2015
8)	Deep Impact	Tempel 1, 103P/Hartley	2005-2013
9)	Dawn	4 Vesta, 1 Ceres	2007-2018
10)	Kepler	Exoplaneten	2009-2018
11)	Grail	Maan (Selena)	2011-2012
12)	InSight	Mars (lander)	2018-2022
13)	Lucy	Jupiter trojanen	2021-…
14)	Psyche	16 Psyche	2023-…
15)	Davinci	Venus (atmosfeer afdaling)	2029
16)	Veritas	Venus (orbiter, topogr. + spectr.)	2031

Missies



Wordt vervolgd…