

# Zonnestelsel exploratie

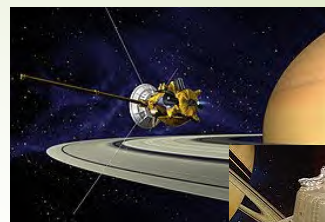
Josiane



Pioneer 10 & 11



Ulysses



Cassini



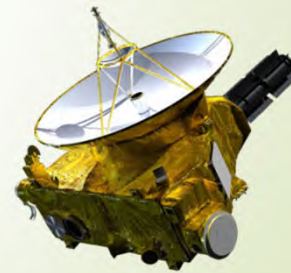
Huygens probe



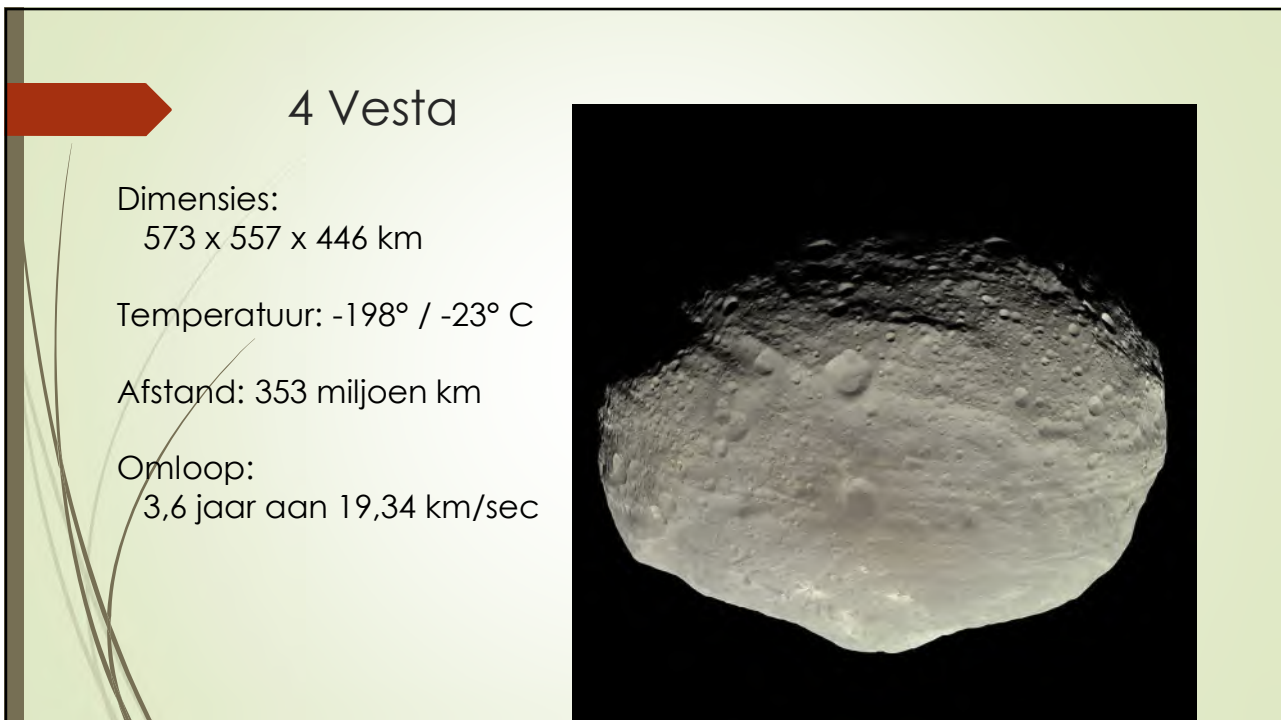
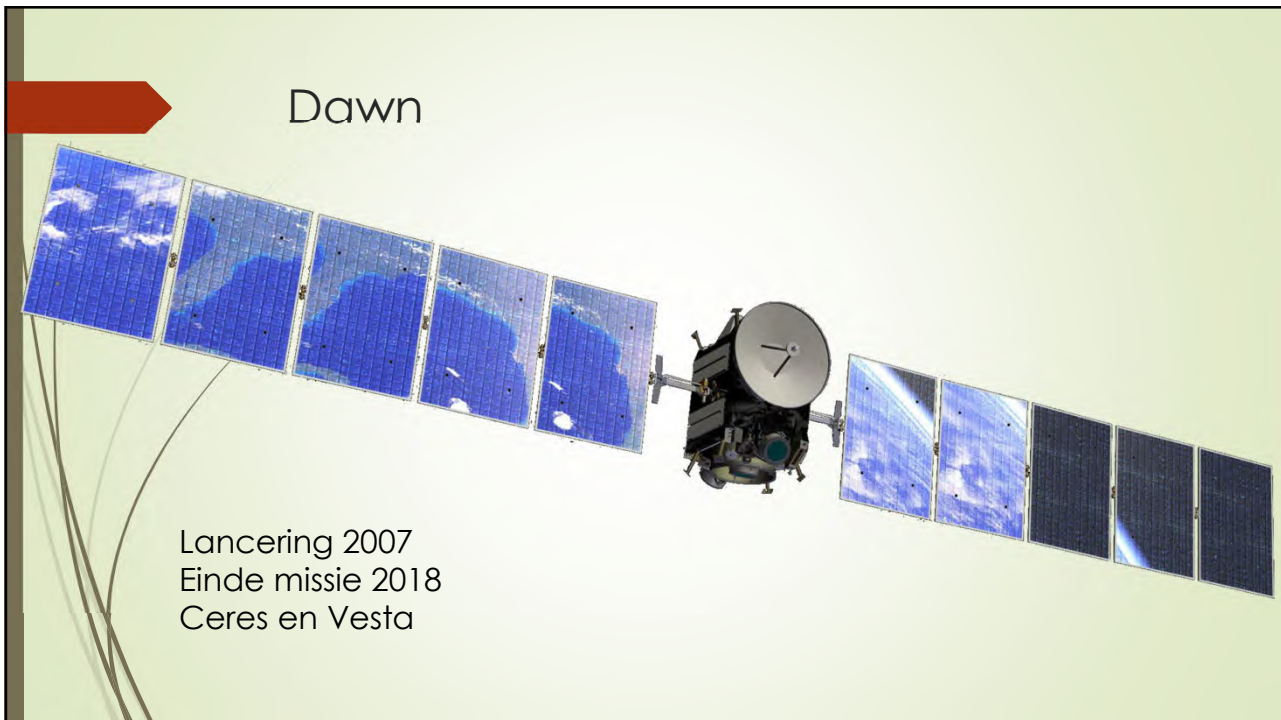
Galileo

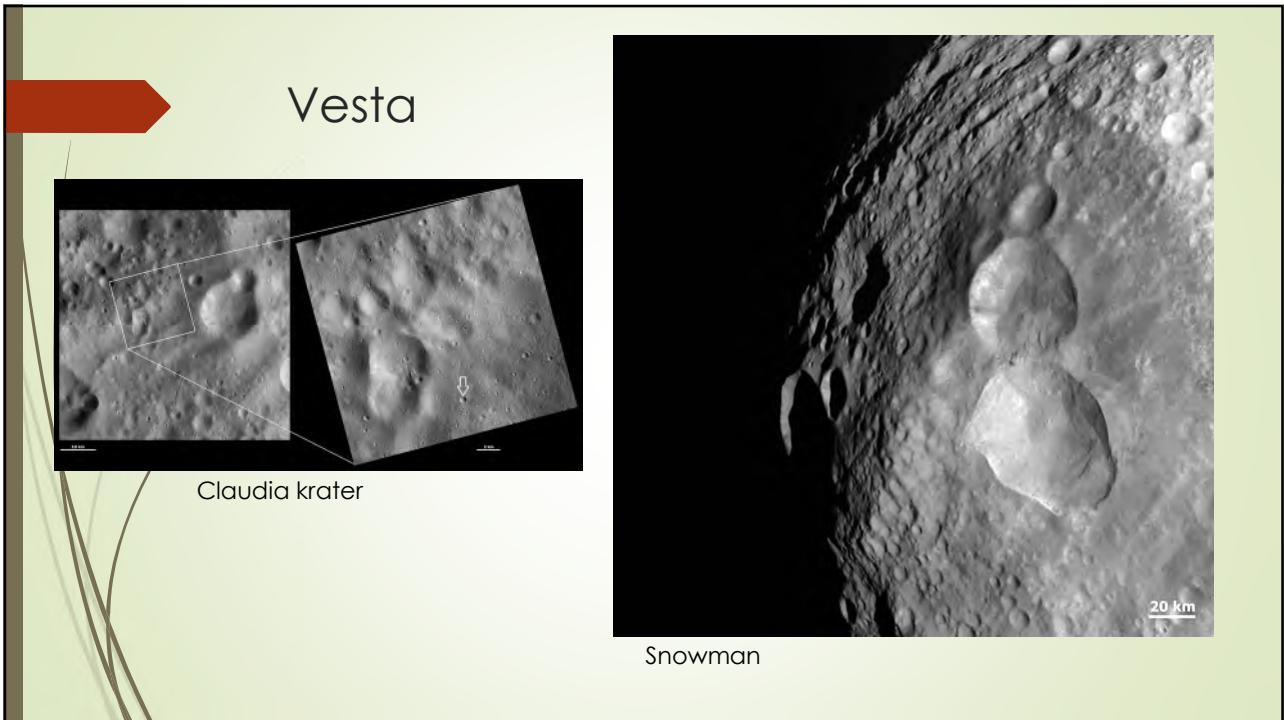
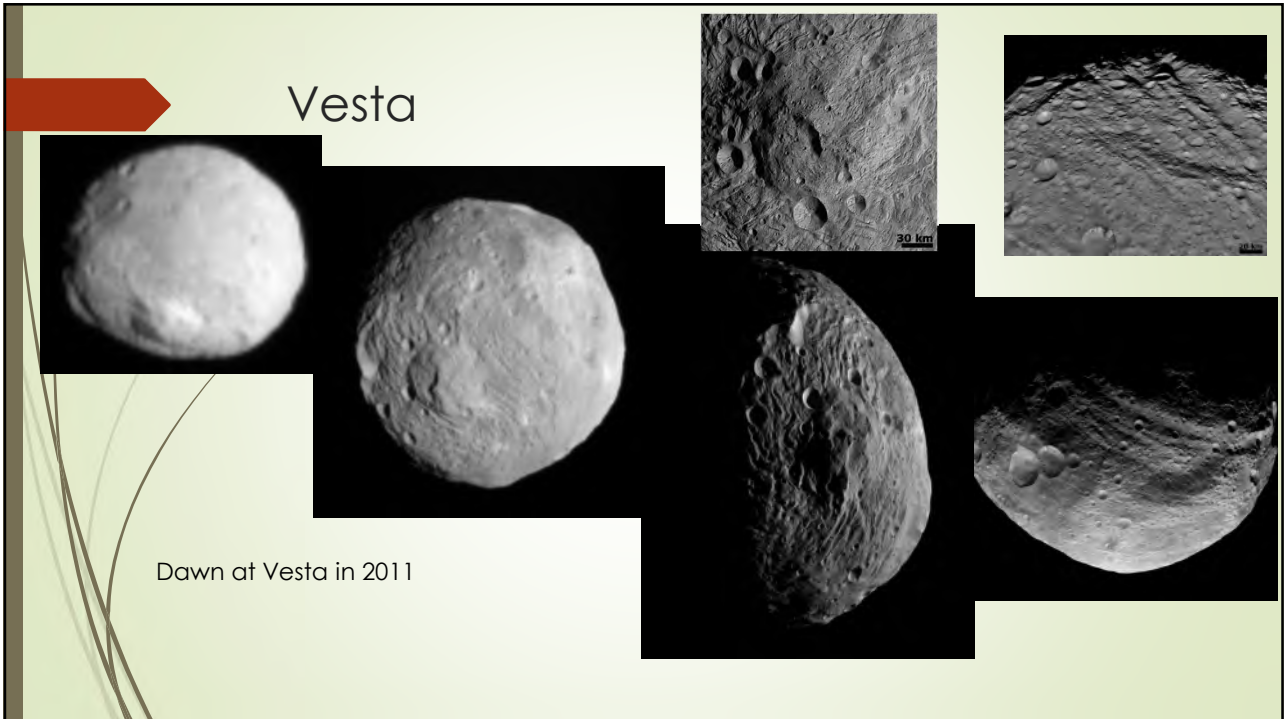


Voyager 1 & 2



New Horizons





## 1 Ceres

Dimensies: 966 km

Temperatuur:  $-143^{\circ}$  /  $-73^{\circ}$  C

Afstand: 414 miljoen km

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



## Ceres

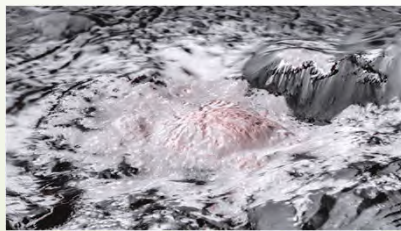
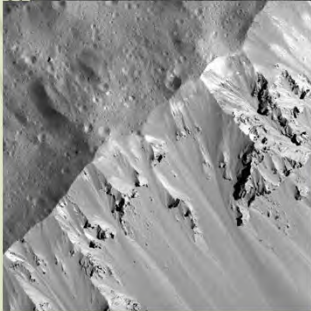


Dawn at Ceres in 2015

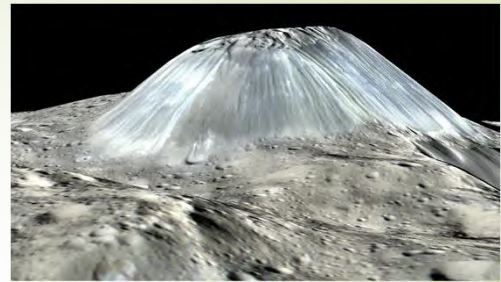
# Ceres



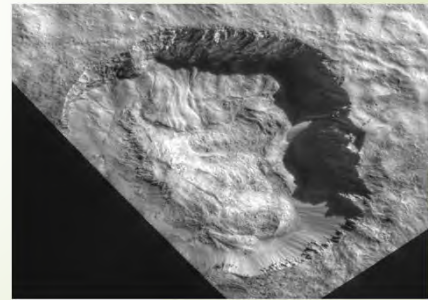
Occator krater, Cerealia facula (li), Vinalia faculae (re)



Cerealia facula



Ahuna mons, 5 km hoog



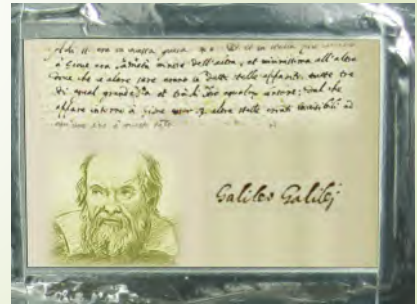
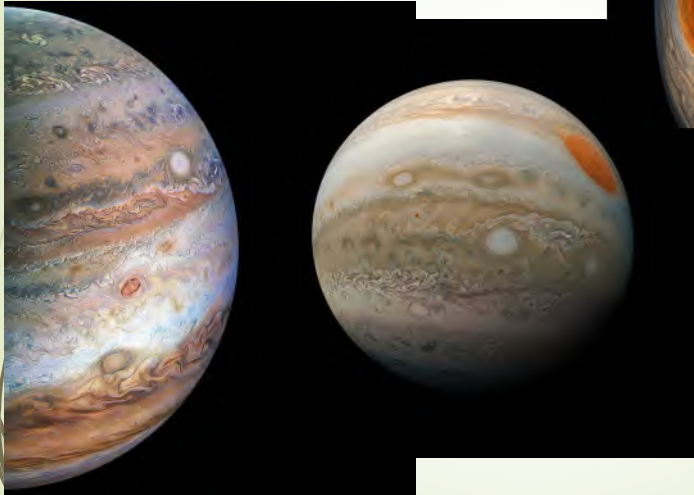
Kratervloer Juling

# Juno

Lancering 2011  
Einde missie ...  
Jupiter-systeem



# Jupiter



# Ganymedes

Juni 2021



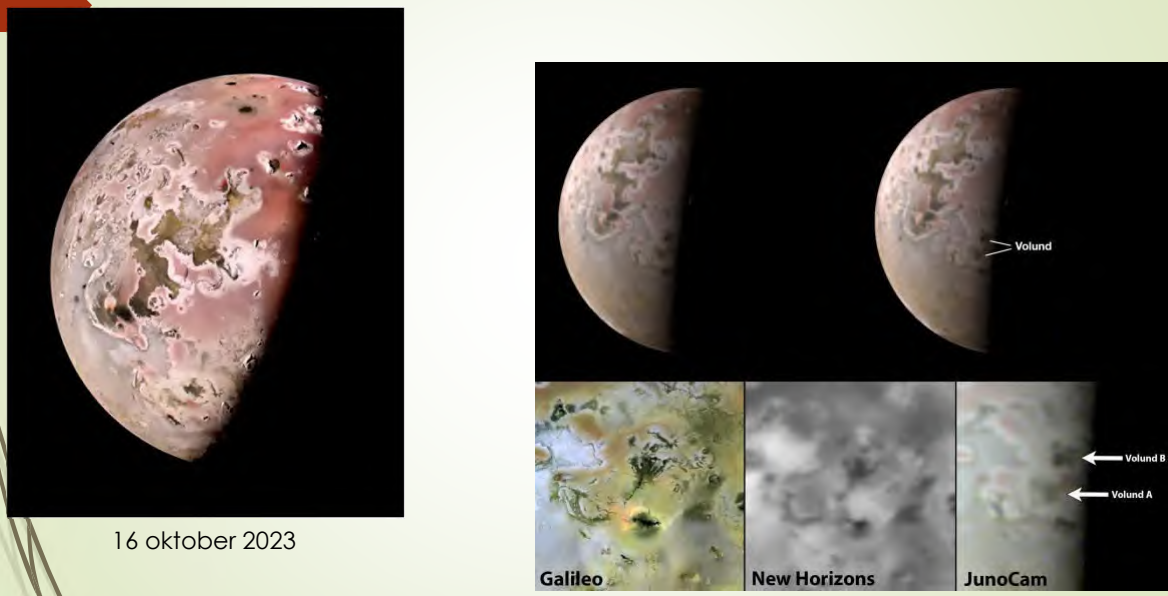
# Europa



September 2022

# Io

2023 + 2024

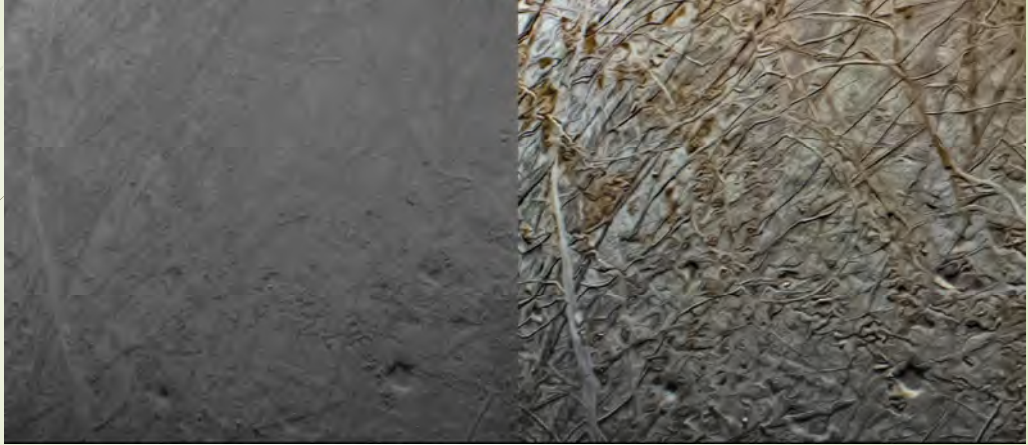


16 oktober 2023

Galileo 1996      New Horizons 2007      JunoCam 2023

Volund  
Volund B  
Volund A

## Juno, doe je mee?



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

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

### IMAGE PROCESSING GALLERY

[Welcome!](#) [PJ-1 Images](#) [Gallery Organization](#) [About JunoCam Images](#)

This is where we will post raw images. We invite you to download them, do your own image processing, and we encourage you to upload your creations for us to enjoy and share. The types of image processing we'd love to see range from simply cropping an image to highlighting a particular atmospheric feature, as well as adding your own color enhancements, creating collages and adding advanced color reconstruction.

For those of you who have contributed – thank you! Your labors of love have illustrated articles about Juno, Jupiter and JunoCam. Your products show up in all sorts of places. I have used them to report to the scientific community. We are writing papers for scientific journals and using your contributions – always with appropriate attribution of course. Some creations are works of art and we are working out ways to showcase them as art.

If you have a favorite "artist" you can create your own gallery. Click on "Submitted by" on the left, select your favorite artist(s), and then click on "Filter". For other tips about the gallery click on the "Gallery Organization" tab.

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

## Je kunt zelf meedoen

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

### THINK TANK

[Welcome](#) [Tools of the trade](#) [Reports](#)

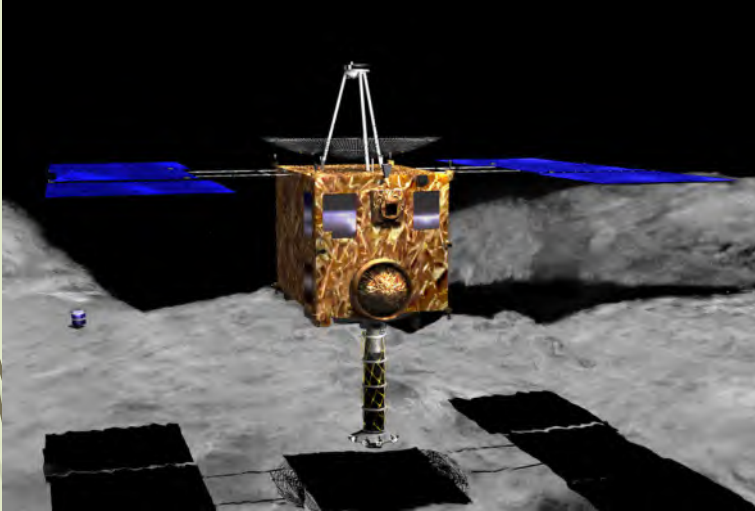
The JunoCam webpages are designed to open the door to the public to participate in the steps a spacecraft instrument team follows in implementing their experiment: Planning, Discussion, Voting (decision-making) and Processing. We are pleased to add "Think Tank" as the next step in this sequence. Eventually we will add the final endpoint: "Results".

This section will be a bit more wonky. You are invited to see the science sausage-making in action. There will be links to engineering files that we call kernels. There will be discussion threads on science topics we think can be addressed by particular images. You will see maps that connect features in JunoCam images to the historical record and context.

If you would like to be involved in this group please [contact us](#).

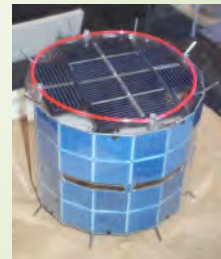


## Hayabusa 1



Lancering 2003  
Landing 2005  
25143 Itokawa  
+ Sample return 2010

Last contact nov 2005



Minerva

## 25143 Itokawa

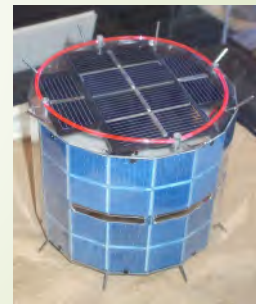


630 x 250 km  
Water in deeltjes  
(olivijn, pyroxeen, albiet)

# Hayabusa2

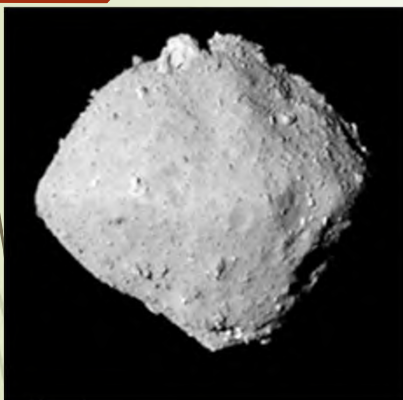


Lancering 2014  
 Landing 2019  
 162173 Ryugu  
 + Sample return 2020

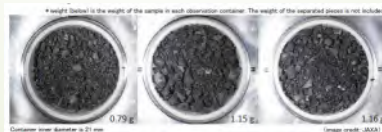
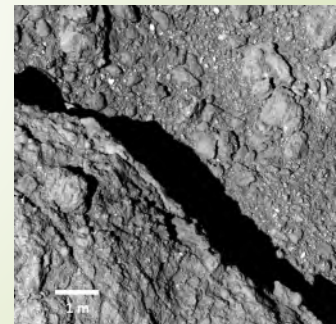
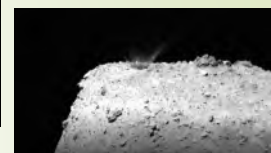
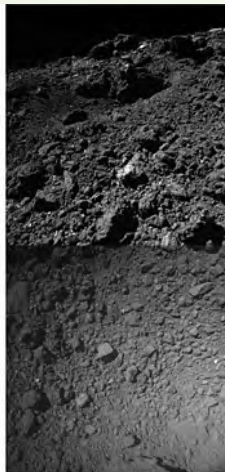


# 162173 Ryugu

Impactor: 2 kg koper (april 2019)

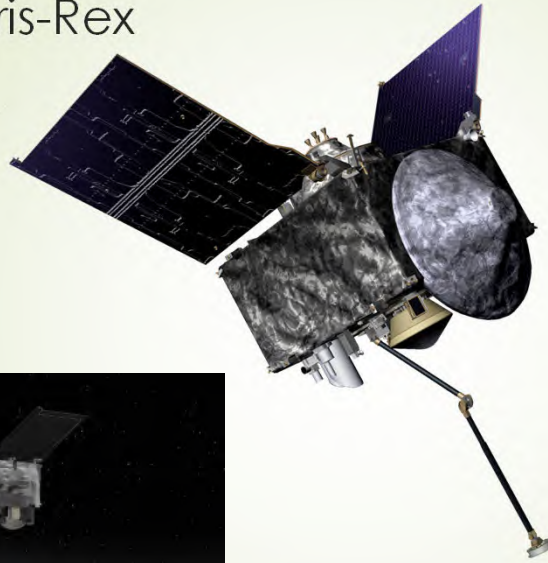


Juni 2018 – nov 2019  
 1004 x 876 m  
 Jong opp (9 mjn j)  
 Weinig stof  
 77 kraters



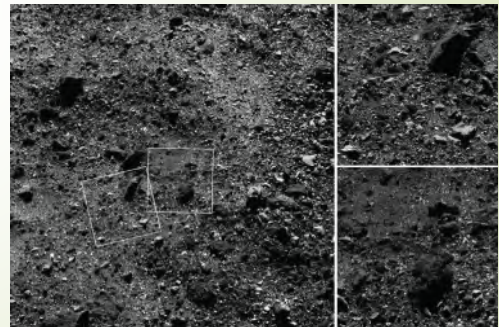
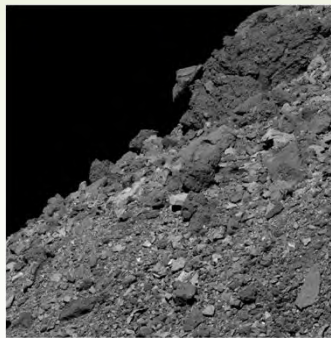
# Osiris-Rex

Lancing 2016  
101955 Bennu  
+ Sample return sept 2023  
-> Osiris-Apex



# 101955 Bennu

490 m  
Sample return  
koolstof

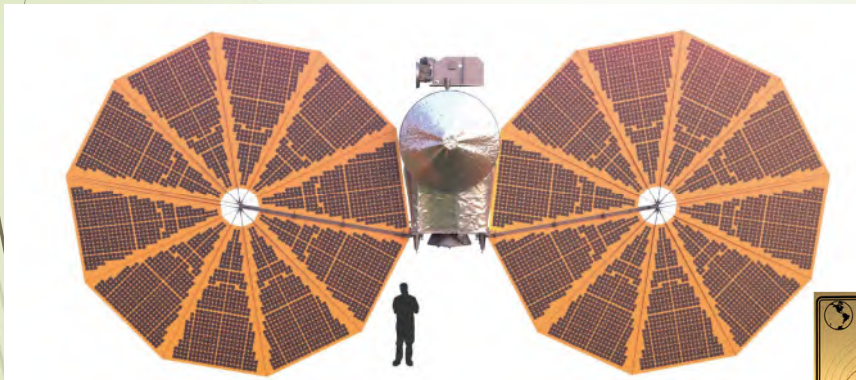


## Osiris-Apex (Apophis Explorer)

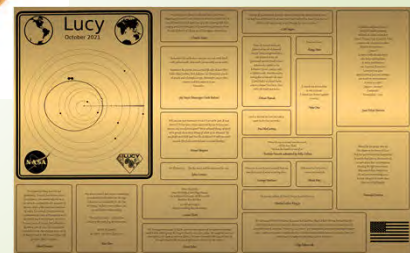


Vertrek sept 2023  
99942 Apophis  
(18 mnd)  
Aankomst 2029

## Lucy



Lanciering 2021  
Planetoiden +  
Trojans van Jupiter  
...



# 152830 Dinkinesh !!



790 m  
Maantje dubbel !

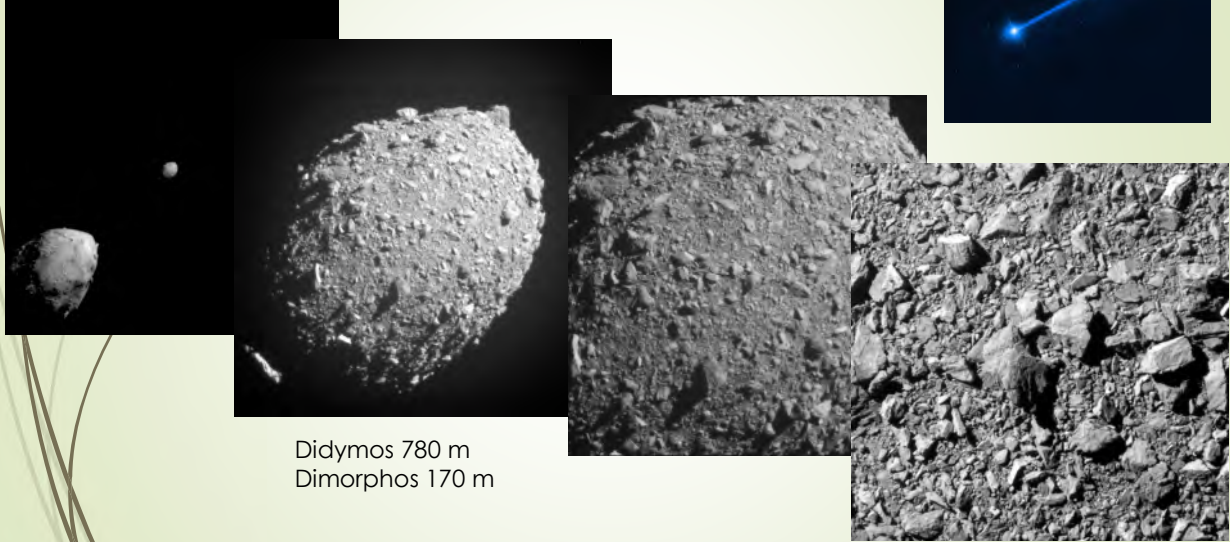
Asteroid	Flyby Date
<b>Dinkinesh</b> (pronounced DIN-ke-nesh) and an <b>unnamed satellite</b> (discovered during the flyby)	Nov. 1, 2023
<b>DonaldJohanson</b>	April 20, 2025
<b>Eurybates</b> ("yoo-RIB-a-teez" or "you-ri-BAY-teez") and its satellite <b>Queta</b> ("KEH-tah")	Aug. 12, 2027
<b>Polymele</b>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

# DART Double Asteroid Redirection Test



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

## Didymos & Dimorphos



Didymos 780 m  
Dimorphos 170 m

## HERA

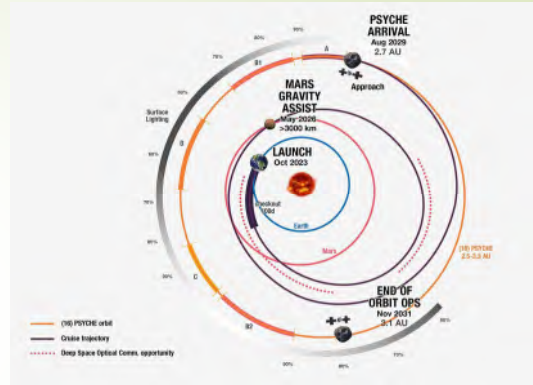


Lancering okt 2024  
Dimorphos

Resultaat Dimorphos  
impact?

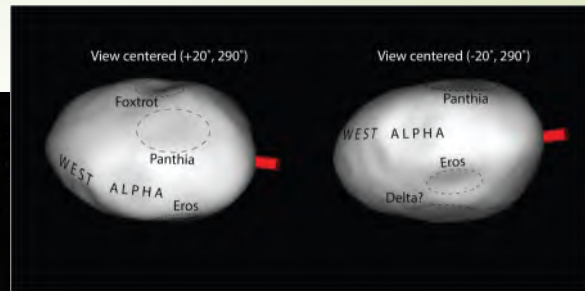
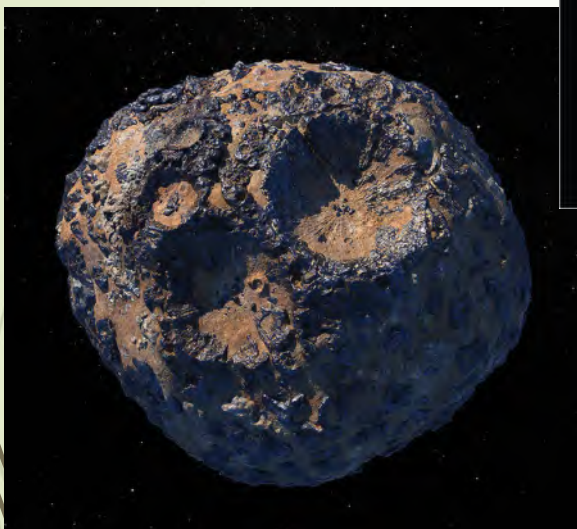
6 mnd

# 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



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

Aankomst

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

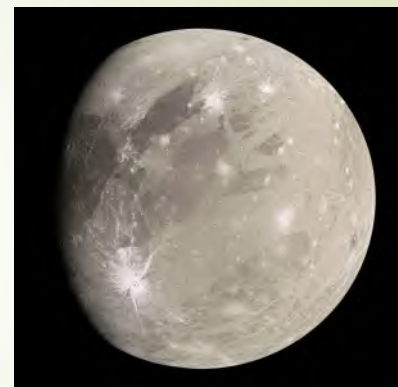
## Europa, Callisto, Ganymedes



Europa  
1560 km



Callisto  
2410 km



Ganymedes  
2634 km



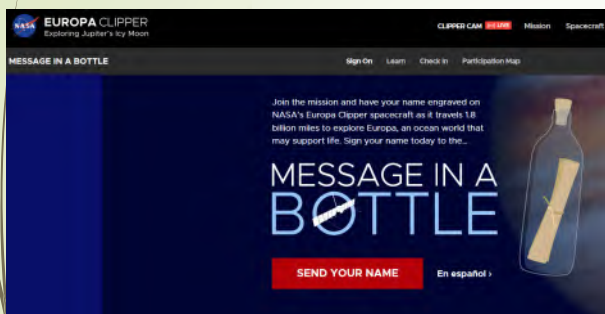
## Europa Clipper



Lancering okt 2024  
Europa multiple flyby  
Aankomst 2030



## Europa Clipper



Message in a bottle

**Sign the message... get on board!**

Your name will fly on the Europa Clipper spacecraft as it travels 1.8 billion miles on its voyage to Jupiter's moon Europa.

First Name \*

Last Name \*

NEXT

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

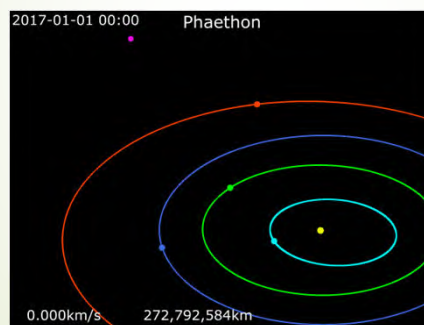
jaxa

## Destiny



Lancering 2025  
3200 Phaethon  
Aankomst 2029  
Flyby

## 3200 Phaethon (1983 TB)



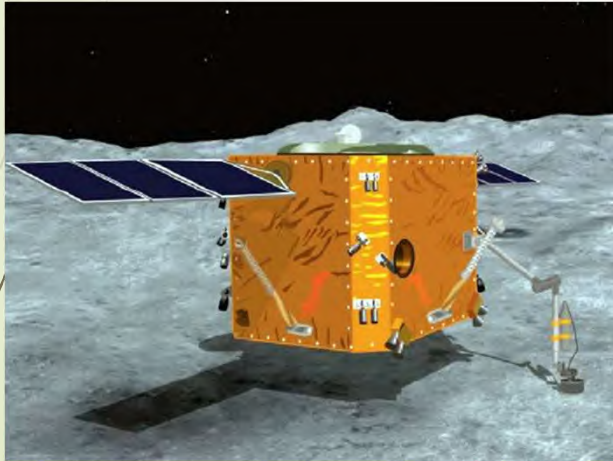
Dimensies 6 x 4 km  
Omloop 523,6 d  
Afstand 190 miljoen km

Mogelijk gevaarlijke  
asteroïde!

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)

### EARTH'S PET ROCK

China plans to launch a mission that would collect material from the asteroid 2016 HO3 and return it to Earth. The rock is a 'quasi-satellite' of Earth that loops around the planet as it orbits the Sun.

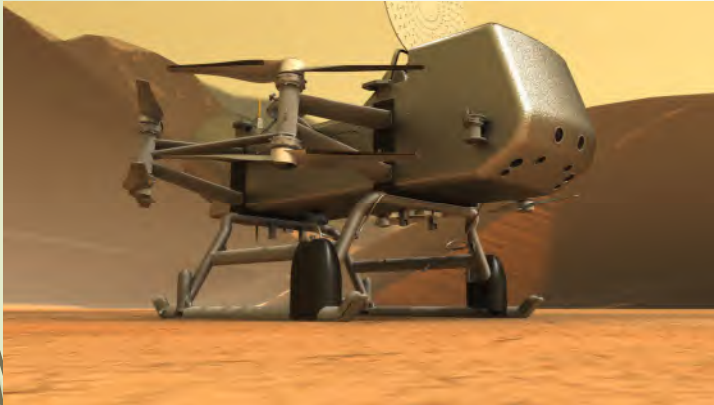


40 x 100 m



480 m

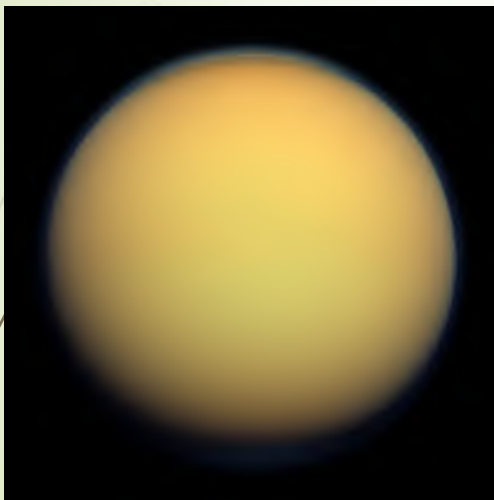
## DragonFly



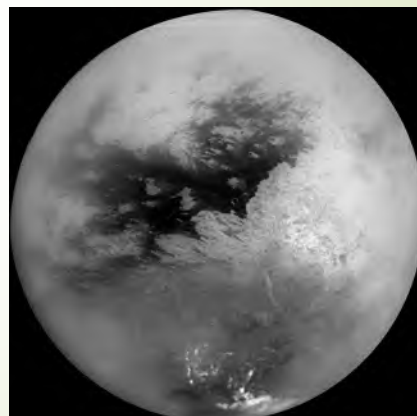
Lancering juni 2027  
Titan  
Landing 2034  
Rotorcraft op Titan  
(drone)

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

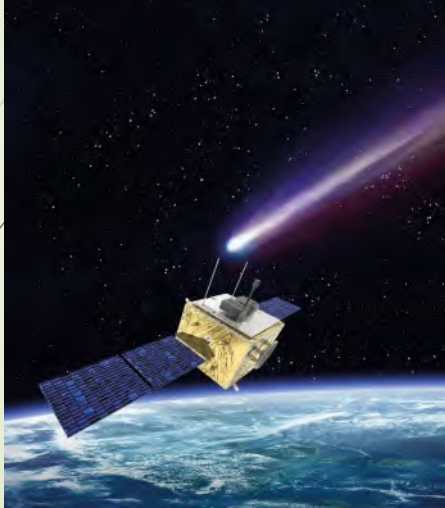
## Titan



Dimensie 5150 km  
DragonFly zal landen in Shangri-La



## Comet Interceptor

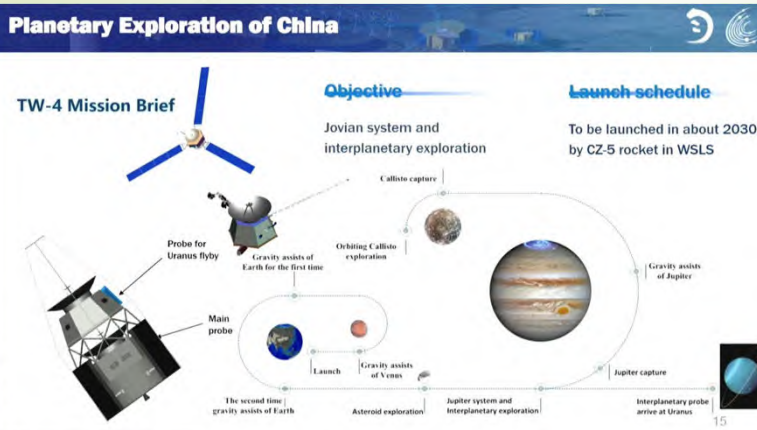


Lancering 2029  
Lang periodieke komeet

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



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

## Phobos & Deimos

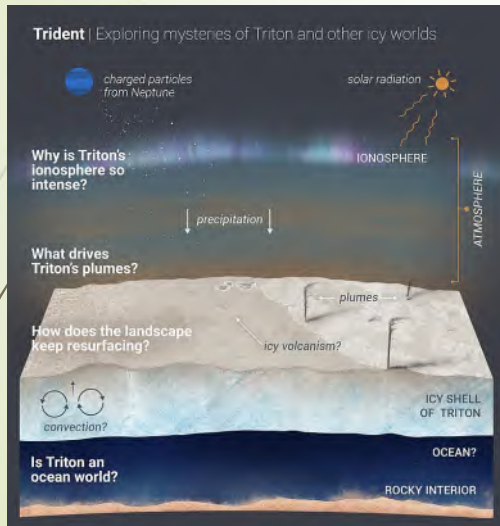


26 x 23 x 18 km



16 x 12 x 10 km

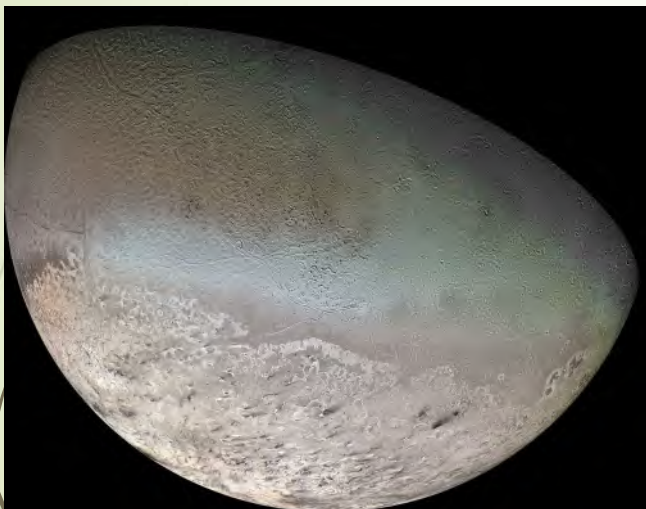
## Trident



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

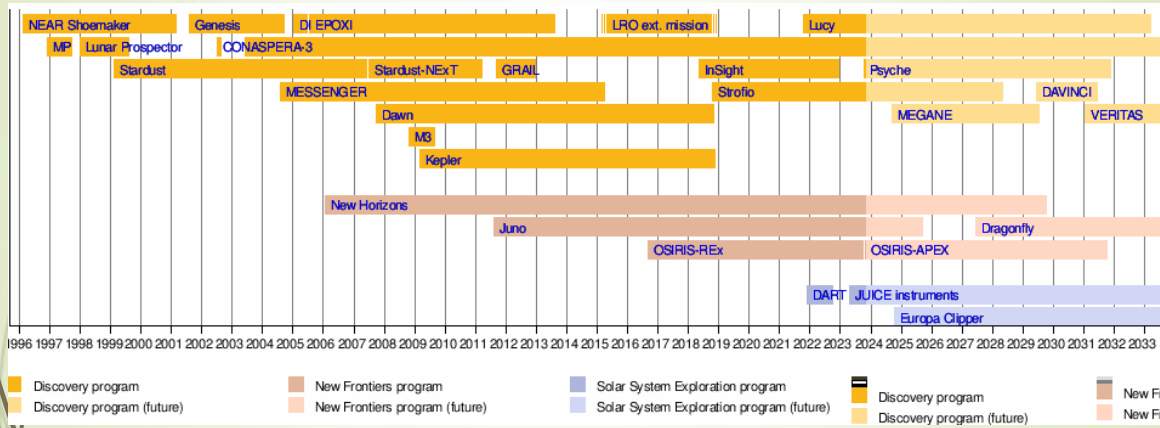
1) New Horizons	Pluto, Arrokoth	2006-...
2) Juno	Jupiter + manen	2011-...
3) Osiris-Rex	101955 Bennu	2016-2023
	Osiris-Apex	2023-...
4) Dragonfly	Titan drone	2027

## 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...