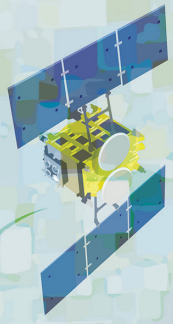

I'll meet you at 5km/s,
with a gift of your name.

Asteroid 2001 CC21 Naming Campaign

We are seeking a name for asteroid 2001 CC21, which is scheduled for flyby exploration in July 2026 during the Hayabusa2 Extended Mission

Application Period

2023.12/6 [Wed] » 2024.5/9 [Thu]

Application Requirements

- Entry Rules: Please suggest a name that in accordance with the International Astronomical Union rules for naming asteroids (see reverse side).
- Note: Only one entry per person (in case of multiple entries, only the last entry is valid).
- How to apply: Please See the "Asteroid 2001 CC21 Naming Campaign" website and submit your suggestion using the application form (QR codes on right).
  (※ Any personal information submitted will not be used for any purpose other than this campaign.)
- Selector's Specials: Those who select the final name choice will receive a commemorative gift from the Hayabusa2 Extended Mission team. (※ Winning applicants will be notified by email)

Campaign site

Application form

Name selection process

Selection

Priority will be given to names that have a high number of suggestions (although the name with the most proposals will not necessarily be selected).

Elementary and junior high school students nominated by the YAC (Japan Space Youth Association) and KU-MA (Children, Space, Future Association, an NPO) will help with the selection process.

Proposal to the International Astronomical Union

The proposed name will be submitted to the International Astronomical Union (IAU) by the US LINEAR (LIncoln Near-Earth Asteroid Research) team, who discovered 2001 CC21, in the summer of 2024.

Decision

Announcement from the IAU Minor Planet Center (MPC). (JAXA will also make an announcement.)

Asteroid 2001 CC21 Naming Campaign

Asteroid naming conventions

The International Astronomical Union has the following rules for naming asteroids. Please suggest a name that does not violate any of the following points:

- 16 alphabetical characters or less in length
- Preferably one word
- Pronounceable
- Non-offensive
- Not too similar to an existing name of a minor planet or natural planetary satellite
- The names of individuals or events principally known for political or military activities are unsuitable until 100 years after the death of the individual or the occurrence of the event
- Names of pet animals are discouraged
- Names of a purely or principally commercial nature are not allowed
- NEO (Near-Earth Objects) generally have names derived from mythology

  2001 CC21 is a NEO, so the last condition is relevant in this case. If possible, therefore consider a name for 2001 CC21 that is related to mythology. That said, there are exceptions to this rule, such as asteroid Itokawa. Itokawa is a NEO, but has a non-mythological name. So you are also welcome to suggest a name outside mythology.

Reference:
International Astronomical Union (IAU)
www.iau.org/public/themes/naming/

About the ultra-close flyby exploration of asteroid 2001 CC21

Hayabusa2 plans to conduct a flyby exploration of 2001 CC21 in July 2026, when the asteroid and spacecraft will pass each other at an ultra-high speed of 5 km/s (18,000 km/h!). Hayabusa2 was originally built as a spacecraft for asteroid rendezvous, and is not designed for flyby missions, which involve observing asteroids passing by at high relative speeds from a distance. Because of this, the Hayabusa2 flyby mission will approach as close to the asteroid as orbital guidance precision allows, and observe the asteroid until just before the closest approach, while keeping the attitude of the spacecraft as unchanged as possible.

A trajectory that would collide with the asteroid would keep the spacecraft attitude unchanged until the very end, and the asteroid could be tracked and captured with the onboard cameras. Very similar characteristics are true for a trajectory that passes by the asteroid's edge. At the time of closest approach during a close flyby, the angular velocity needed to keep the asteroid in view will be extremely high, but just prior to this point, the onboard cameras can be directed at the asteroid without significantly changing the spacecraft attitude, as in the collisional case. During this time, the spacecraft will get as close as possible to the asteroid, allowing observations at high resolution from close proximity.

We are currently considering how close we can approach. We would like to achieve an orbital guidance precision that is high enough to be capable of hitting the asteroid, and then instead, just pass by the asteroid edge. This kind of technology is equivalent to that needed to collide a spacecraft into an asteroid in order to adjust its orbit, which makes the flyby mission one that can also contribute to planetary defense.

JAXA
Inquiry Form

Hayabusa2 Extended Mission
https://www.hayabusa2.jaxa.jp/en/

What kind of asteroid is 2001 CC21?

Asteroid 2001 CC21 (※1) was discovered by the US LINEAR team (※2) on February 3, 2001. After discovery, the orbit of the asteroid was accurately determined through repeated observations, and the asteroid was assigned the designation number 98943. Once an asteroid has a designation number, it can be given a name. The team that discovers the asteroid and that are the first to estimate the asteroid orbit can propose a name to the International Astronomical Union. Therefore, the LINEAR team are able to propose a name for 2001 CC21, but accepted a request from the Hayabusa2 Extended Mission team for a name to be proposed by Japan.

Telescope observations have taught us a lot about 2001 CC21 (※3). The asteroid orbit is about the same length as the Earth, but it moves around the Sun at a slightly different angle from our own orbit. The rotation period for the asteroid is approximately 5 hours. The asteroid was reported to have a L-type spectral class in early observations, but more recent observations (from 2022) have indicated it may be more likely to be an S-type asteroid. If 2001 CC21 proves to be S-type, then the spectral type will be the same as asteroid Itokawa. The size of 2001 CC21 is not well known, with estimates varying between about 440m to 700m. Not much is also known about the asteroid shape. It seems to be elongated, similar to Itokawa, rather than a more spherical shape like Ryugu.

※1) Notation such as 2001 CC21 is a provisional designation for an asteroid and is assigned when the asteroid is discovered and the orbit estimated.
※2) The team also discovered asteroids Itokawa and Ryugu. This is the third time that Japan has proposed a name for an asteroid for the LINEAR team, following Itokawa and Ryugu.

※3) What we know about asteroid 2001 CC21

Item	Value	Explanation
Orbit semi-major axis	1.03 au	Half the diameter of the longer elliptical orbit
Orbit eccentricity	0.22	Degree of deviation of the elliptical orbit from a circular orbit
Orbital inclination angle	4.8 degrees	Inclination of orbital plane from the ecliptic plane
Perihelion distance	0.81 au	Closest distance to the Sun during the orbit
Aphelion distance	1.26 au	Furthest distance to the Sun during the orbit
Orbital period	1.05 years	Time to go around the Sun once
Rotation period	5.0 hours	Time for one rotation
Rotation axis orientation	Almost perpendicular to the ecliptic plane	
Spectral type	S-type (recent observations)	Characteristics of the reflected sunlight from the asteroid surface
Size	About 440m to 700m	
Shape(axis ratio)	0.5	Ratio of the shortest axis to the longest axis

(1 au = average distance between the Earth and Sun. Approximately 150 million km)