



# The Asteroid Alphabet

— Toutatis —



Journey with us through the alphabet as we learn about Earth's rocky neighbors – the asteroids! There are interesting asteroid characters in our solar system, including an asteroid that has its own moon and even one that is shaped like a dog bone! For each letter of the alphabet, we will showcase an asteroid in our solar system and demonstrate its orbit around the Sun. Visit the Galleries page of AsteroidMission.org – home of the Asteroid Alphabet cards – to collect them all!

Asteroids orbit the Sun in many different areas of our solar system. The Main Belt asteroids lie between Mars and Jupiter. There are also asteroids whose paths around the Sun bring them close to Earth. Those asteroids are called Near-Earth Asteroids, or NEAs. Another group of asteroids, called Trojans, can be found orbiting different planets in gravitationally-neutral areas.

The latest Asteroid Alphabet card is below! Be sure to check out the Instructions for Assembly and Helpful Hints for putting together this new addition to your Asteroid Alphabet card collection!



**4179 TOUTATIS**

CNSA became the fourth space agency to explore an asteroid when the Chang'e 2 mission flew by Toutatis in 2012. Though it is classified as a potential Earth-impactor, the probability of Toutatis impacting Earth in the next six centuries is essentially zero.

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Discovered: Jan. 4, 1989    Discoverer: C. Pollas

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**ORBITAL CHARACTERISTICS**  
Orbital Eccentricity: 0.63  
Inclination: 0.4 degrees  
Orbital Period: 4.03 years  
Perihelion Distance: 0.24 AU  
Aphelion Distance: 4.13 AU



**ASTEROID CHARACTERISTICS**  
Dimensions: 4.4 x 2.2 x 1.8 kilometers  
Rotation Period: 5.4 and 7.4 days (tumbling)  
SMASII Spectral Type: Sk  
Image of Toutatis  
Image Credit: CNSA



**OSIRIS-REX**  
ASTEROID SAMPLE RETURN MISSION

National Aeronautics and  
Space Administration  
[www.nasa.gov](http://www.nasa.gov)

## Instructions for Assembly

1. Print this page out.
2. Cut along the dotted lines, leaving a white border around the card.  
*Kids, be sure to get an adult's supervision during this step!*
3. Fold along the solid center line, so that the blank sides are facing each other.
4. Tape along edges.

## Helpful Hints

- Using cardstock or a thicker paper will result in a sturdier card.
- For best results, print in color and use double-sided tape or a gluestick to affix the two sides together.

## ORIGINS • SPECTRAL INTERPRETATION • RESOURCE IDENTIFICATION • SECURITY • REGOLITH EXPLORER

*Exploring Our Past, Securing Our Future Through Pioneering Asteroid Science*

NASA's Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer (OSIRIS-REx) mission is the first U.S. mission to fly to, study, and retrieve a pristine sample of an asteroid and return it to Earth for further study. The OSIRIS-REx spacecraft's target is asteroid Bennu, the most accessible carbonaceous asteroid and one of the most potentially hazardous to Earth late in the 22nd century. Its bulk properties have been well studied by ground and space-based telescopes, greatly reducing mission risk and providing strong evidence for the presence of material available for sampling.