

## FIVE REASONS TO STUDY ASTEROIDS AND COMETS

Funding for small object studies – asteroids and comets – has increased over the past several decades, mainly since astronomers realized that space rocks sometimes do strike the Earth. **Now scientists believe they have a good handle on the paths through space of the major asteroids, the ones that would literally rock our world if they collided with us. And, fortunately, no major asteroid is known for certain to be on a collision course with Earth at the present time. But small asteroids do pass us all the time, too, in a mass range capable of causing local damage. Some close-passing asteroids are discovered only after they've passed closest. What's more, scientists have come to recognize, in the most profound way, that asteroids can serve as resources for humanity, especially as we venture out into space. Thus NASA is still all-in for studying asteroids, and on November 7, 2018, it released these six reasons why:**

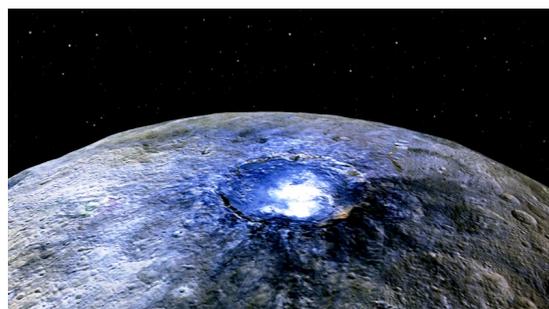
### 1. Asteroids can serve as pit stops – and provide resources – for future space exploration.

Decades ago, visionaries began in earnest speaking of asteroids and comets as places to mine for resources needed by space-faring humans. NASA pointed out:

*There are no gas stations in space yet, but scientists and engineers are already starting to think about how asteroids could one day serve as refueling stations for spacecraft on the way to farther-flung destinations.*

*These small worlds might also help astronauts restock their supplies. For example, asteroid Bennu [target of the ongoing OSIRIS-REx mission] likely has water bound in clay minerals, which could perhaps one day be harvested for hydrating thirsty space travelers.*

*Scientists also suggest asteroids might be mined, and the materials in space used in space for further exploration.*



This is Ceres, the 1st asteroid ever to be discovered, in 1801. The Dawn spacecraft has orbited it and obtained stunning close-up images of the Occator Crater, home to Ceres' most famous bright spots of salt deposits.

### 2. Some asteroids or comets may be hazards to Earth.

When speaking of hazardous asteroids, there are almost 19,000 known near-Earth asteroids. NASA specifically mentioned asteroid Bennu. As it happens, this asteroid is one of the most potentially hazardous asteroids to Earth currently known, even though the odds of its colliding with Earth are relatively small. NASA said:

*... scientists estimate Bennu has a 1-in-2,700 chance of impacting our planet during one of its close approaches to Earth in the late 22nd century. Right now, scientists can predict Bennu's path quite precisely through the year 2135, when the asteroid will make one of its close passes by Earth. Close observations by OSIRIS-REx will get an even tighter handle on Bennu's journey, and help scientists working on safeguarding our planet against hazardous asteroids to better understand what it would take to deflect one on an impact trajectory.*

### 3. Asteroids and comets may have delivered the elements of life to Earth.

Scientists believe that – as Earth formed, and afterward – asteroid objects delivered these materials to our planet. These objects did not have oceans themselves, but rather water molecules bound up in minerals. A substantial percentage of Earth's water is thought to have come from small bodies like this.

### 4. Essentially, asteroids were the building blocks of planets.

Our solar system as we know it today formed from grains of dust – tiny particles of rock, metal and ice – swirling in a disk around our infant Sun. Most of the material from this disk fell into the newborn star, but some bits avoided that fate and stuck together, growing into asteroids, comets and even planets. Lots of leftovers from that process have survived to this day. The growth of planets from smaller objects is one piece of our history that asteroids and comets can help us investigate.

### 5. Asteroids and comets help astronomers trace solar system evolution.

Most of the material that formed our solar system, including Earth, didn't live to tell the tale. It fell into the Sun or was ejected beyond the reaches of our most powerful telescopes; only a small fraction formed the planets. Asteroids are remnants of these early days, when the stuff of planets swirled with an uncertain fate around the Sun.

AK, with EarthSky and Wikipedia Notes