HUDSON
RIVER
MUSEUM

The Space Shape Scavenger Hunt

Ages: 6+

Duration: Spend 20 minutes or make it an ongoing project!

Introduction: Chewed gum, lightbulbs, ice cubes, bananas. . . . What do all of these have in common? Nothing—except that each has a look-alike in space! Unlike what you may expect, not all celestial objects are simple spheres, like planets, or disks, like the Milky Way galaxy.

Materials and tools needed: It's up to you! Whatever you find that resembles one of the space shapes described on the subsequent pages is fair game. Some places to look for look-alikes: the vegetable drawer, the freezer, outside in the yard, a box of fresh pastries, etc.

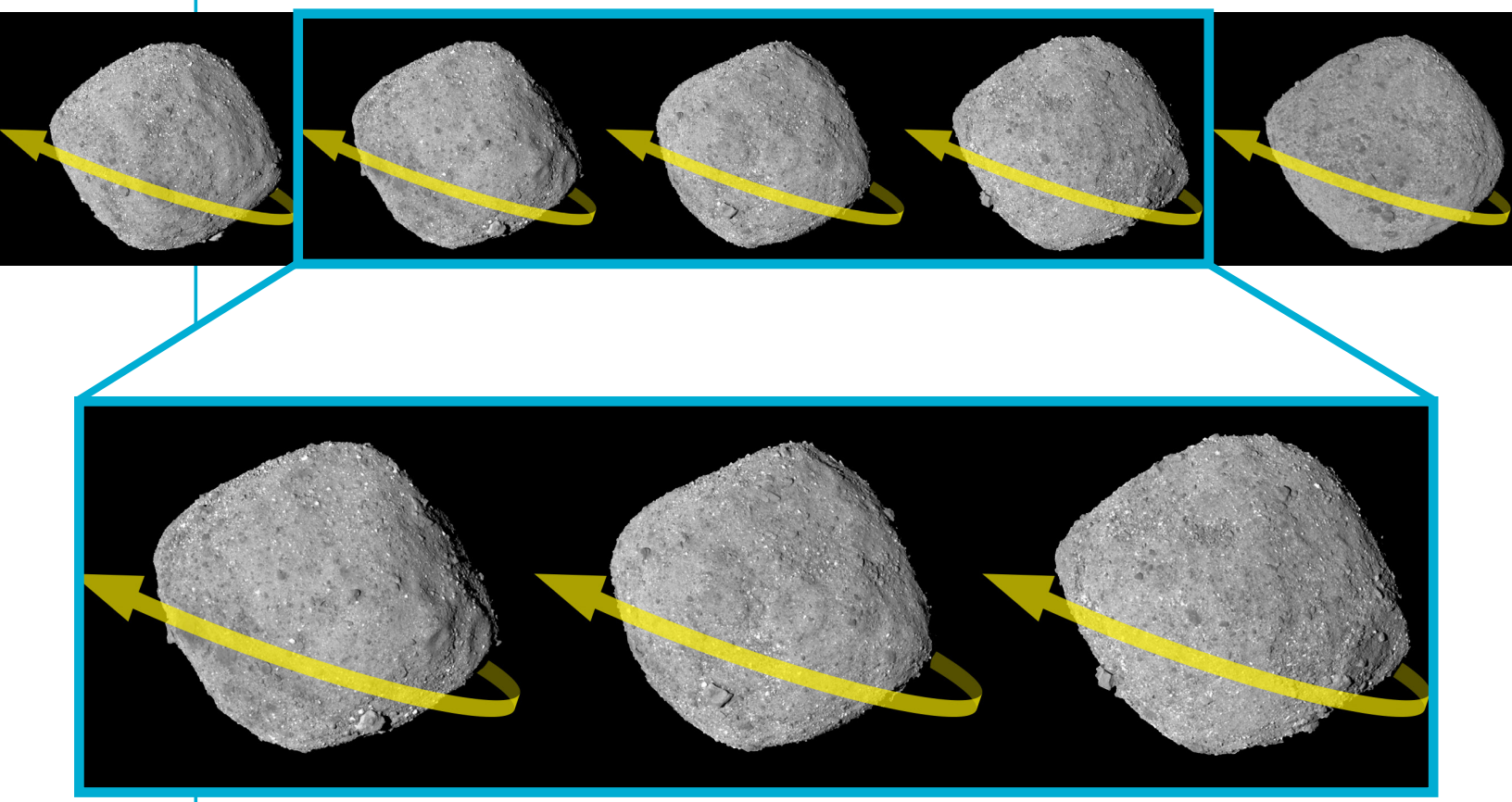
Instructions: This is a scavenger hunt for objects in and around your home that are shaped like objects in space. For each of the following celestial bodies, read through the description and look closely at the image(s) provided. Some of the shapes are common and others are more unusual. For the latter, we've lined up several views of the same object as it rotates. Then, search for an object that most resembles it. Happy hunting!

Share your finds: Take a photo of the household object(s) you found and post it/them to Instagram using the hashtags #MuseumFromHome and #SpaceShapes, and tag @HudsonRiverMuseum.

Asteroid 101955 Bennu

925 feet wide

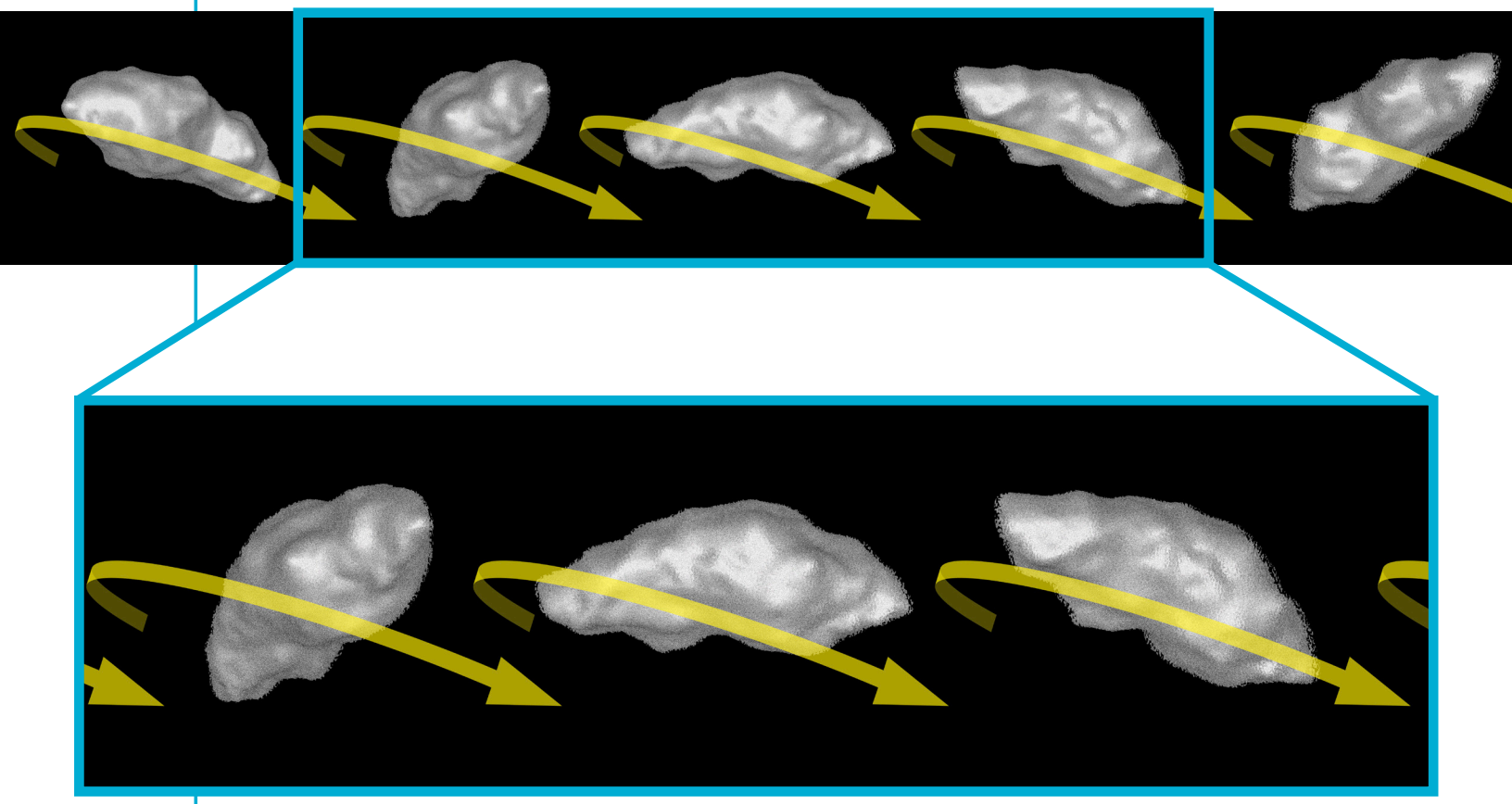
Bennu is a small asteroid, a rocky body orbiting the sun, with a fairly regular shape. It is not much more than a globular mound of rocky debris, a little thicker around the equator than through the poles. The “101955” in its name refers to the fact that it was the 101,955th asteroid discovered out of the 958,000 or so that we know of. A robotic mission called OSIRIS-REx is currently orbiting the Sun close to Bennu while scientists search for the best spot on the asteroid for it to descend, grab a sample, and return to Earth.



Asteroid 1620 Geographos

3 × 1.2 × 1.4 miles

Geographos passes so close to the Earth that scientists picked it as one of the first targets for an asteroid-exploring mission, in 1994. Unfortunately, that spacecraft—the repurposed Clementine lunar mission—malfunctioned before it reached its destination. What we know about Geographos' shape has been determined by beaming radar at it from the surface of the Earth.

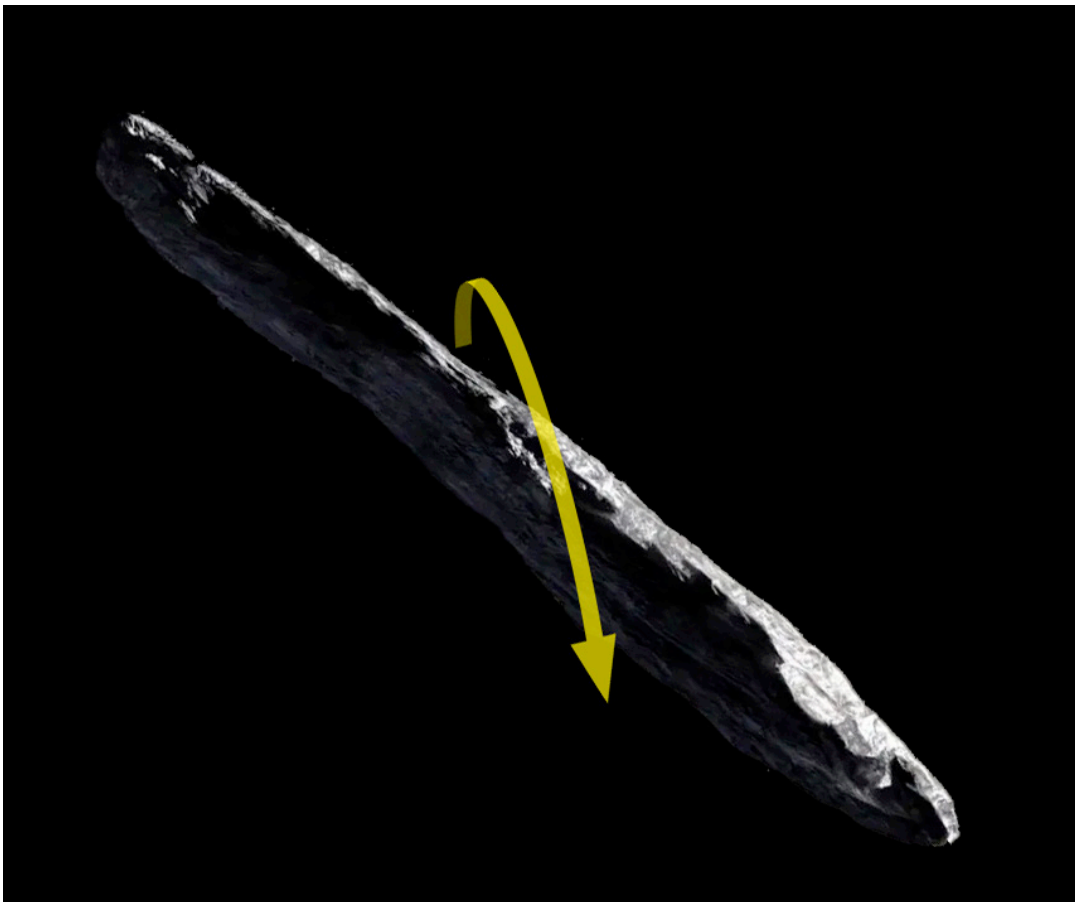


1I/2017 U1 ‘Oumuamua (Hawaiian for “First Scout from Afar”)

750 feet long by 100 feet wide or 3000 feet long by 300 feet wide
(We are not sure!)

In 2017, this object was discovered zipping toward the Sun, moving faster, and on a straighter path than is normal for a comet or asteroid. It turns out that ‘Oumuamua was something never before seen: a visitor to our system, having been thrown out of its own star system aeons, or billions of years, ago. Now that it has flown by the Sun and is back on its way into deep space, it will likely be millions of years before it encounters another star.

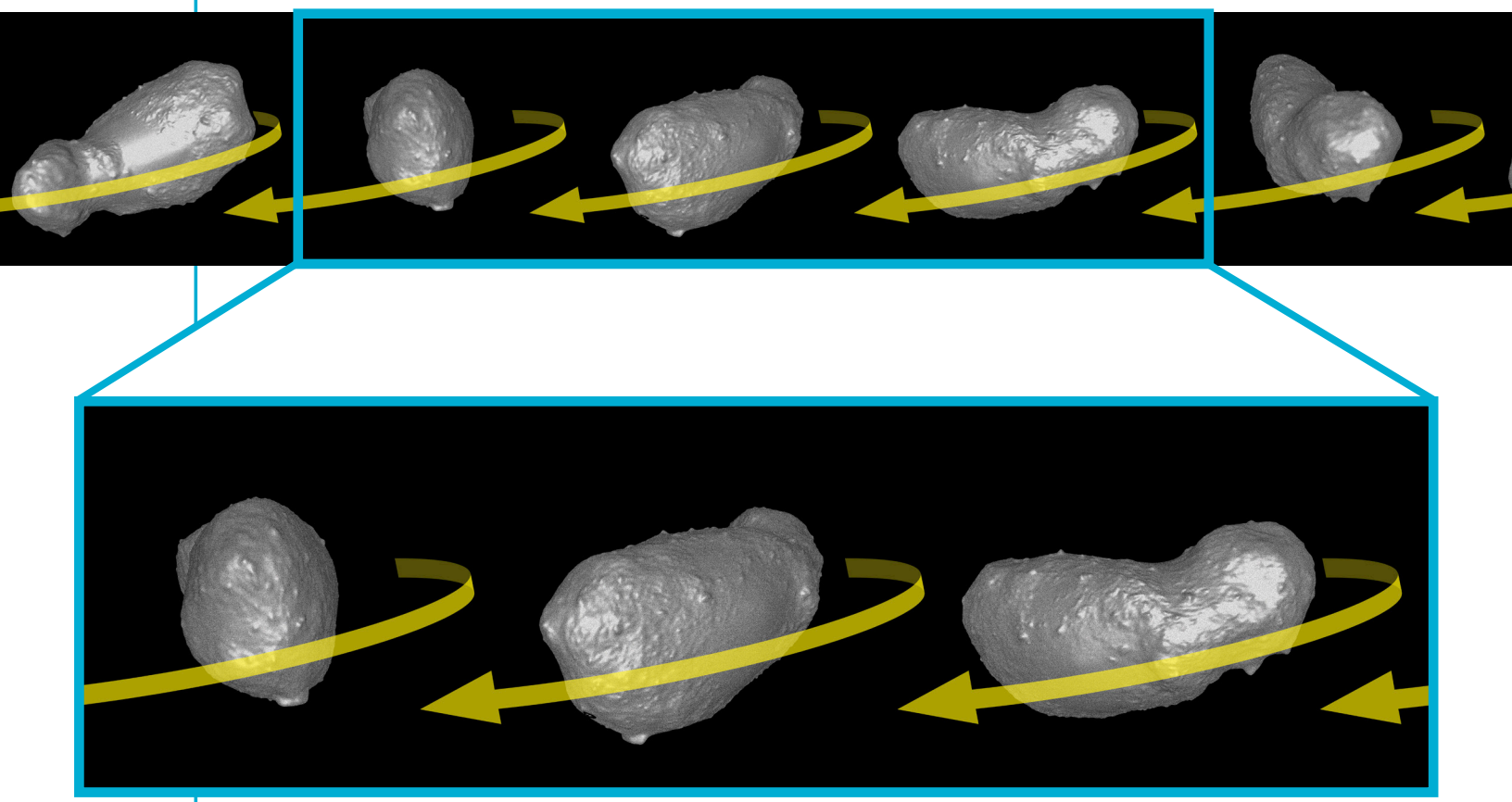
We don’t know much about it, other than its overall shape (about ten times longer than it is wide, like a paper towel tube) and its density (very, very low, airier than a block of styrofoam). One idea—a little crazy, and almost certainly not true—is that it was a visiting alien spaceship. Another idea—also crazy, but taken seriously by many researchers—is that ’Oumuamua is basically a giant, delicate “snowflake” made of hydrogen, born in an ultra-cold dust cloud between the stars.



Asteroid 25143 Itokawa

1,750 feet × 960 feet × 680 feet

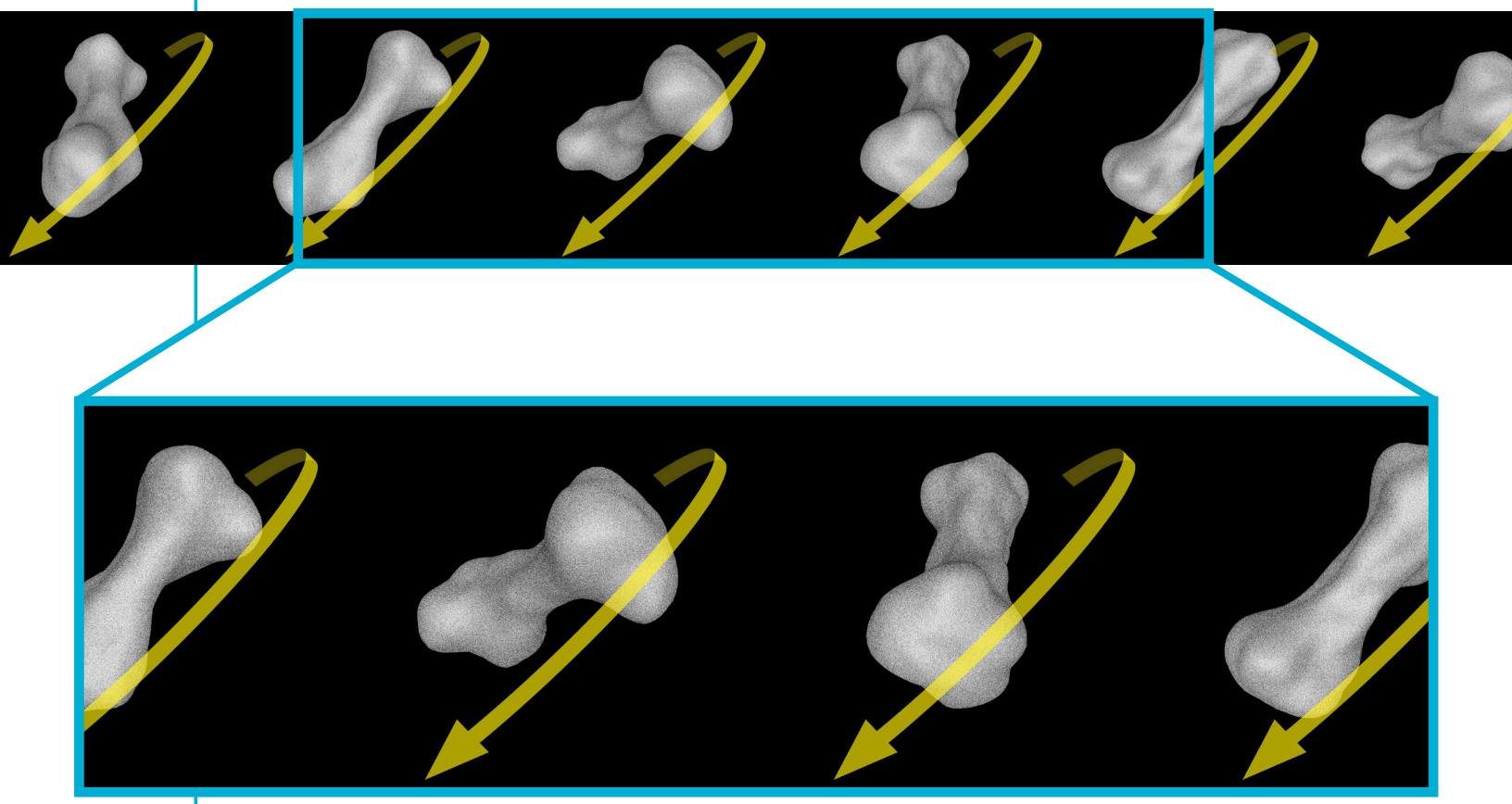
Itokawa was the first asteroid targeted by a sample-return mission, the Japanese Hayabusa space probe, which collected dust particles from the asteroid's surface in 2005 and returned it back to Earth for analysis. Like Bennu, Itokawa is basically a pile of rubble loosely held together by gravity. The smooth-looking areas on the asteroid are probably neck-deep in fine, dusty, silt-like deposits, which are barely held in place by Itokawa's minuscule surface gravity. This fine material is loose enough that an astronaut could probably pass their hand through it like water.



Asteroid 216 Kleopatra

135 × 58 × 50 miles

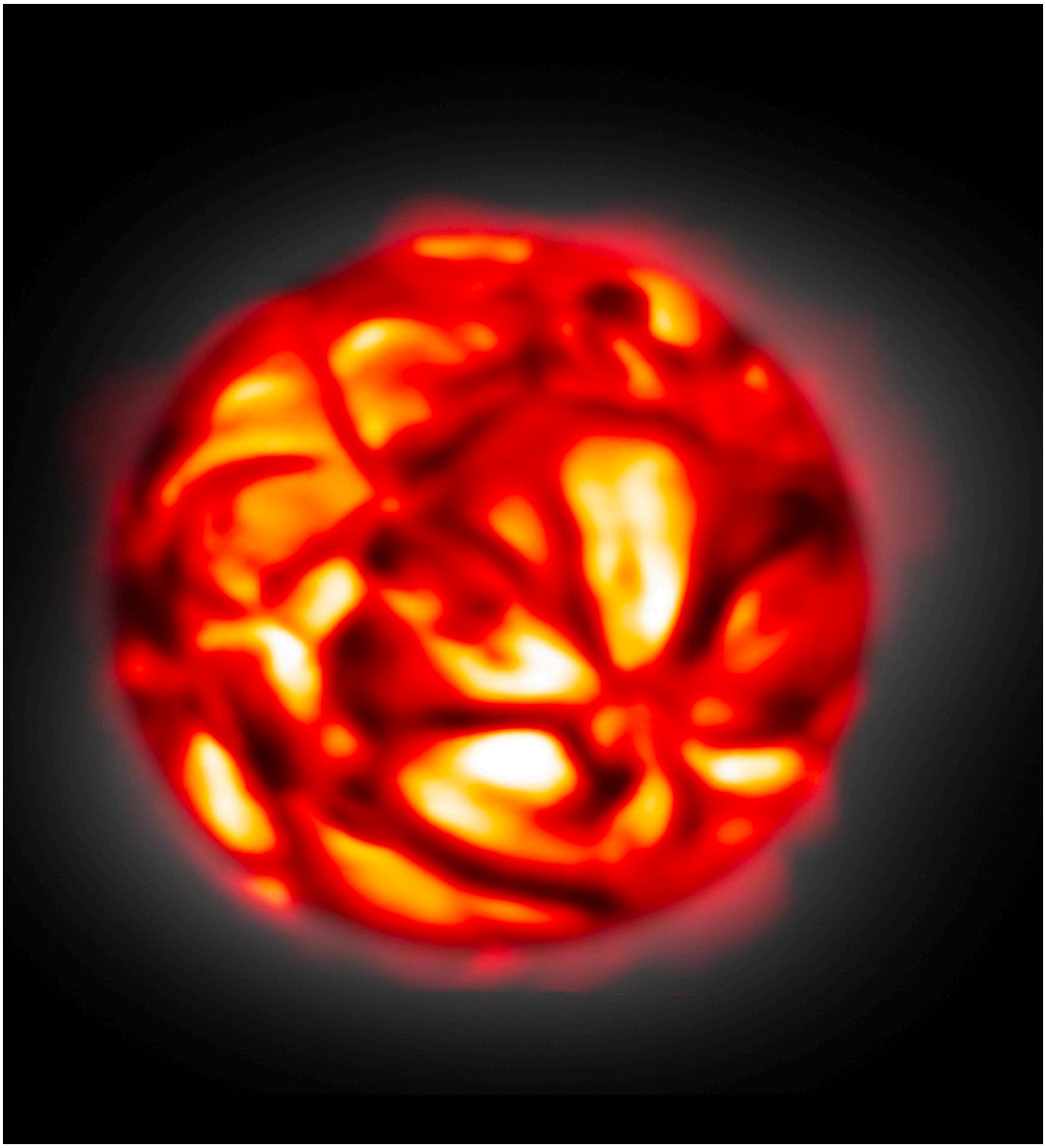
Kleopatra was discovered in 1880, but it wasn't until 1999 that astronomers got a hint of its weird shape. Images made with Earth-based radar and telescopes suggest that Kleopatra is a "contact binary," with two relatively solid chunks connected by a bridge of looser rubble. It even has two moons, Alexhelios and Cleoselene.



Red Supergiant Star Betelgeuse

1 billion miles wide

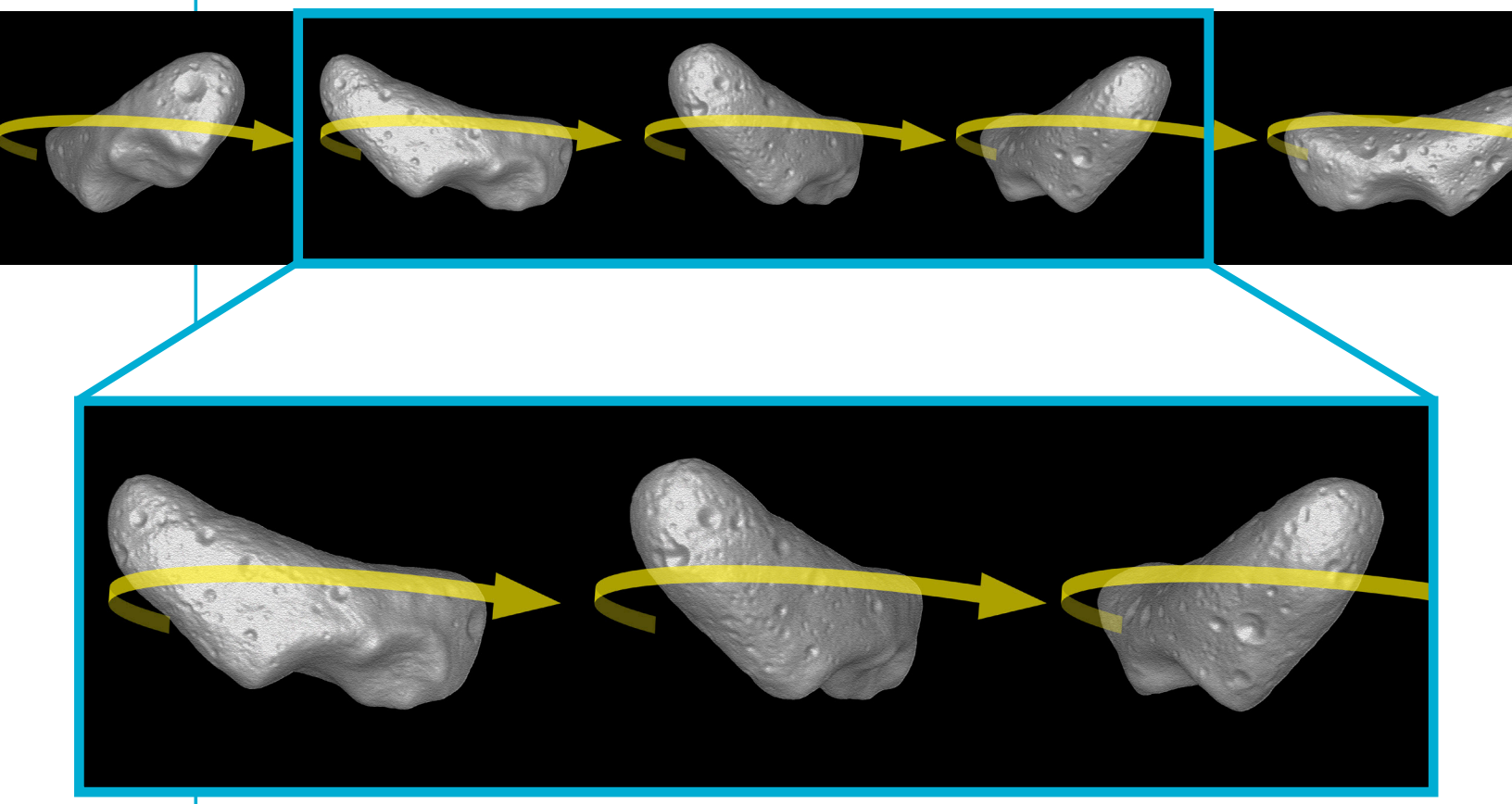
This star is a thousand times wider than the Sun—about as big around as the orbit of Jupiter. As large as it is, it's only about 12 times more massive ("heavier") than the Sun, so the gravity at its fiery surface is far weaker. With such relatively weak gravity attempting to hold it together, astronomers theorize that Betelgeuse is not a smooth sphere. Hotter parts of the surface will bubble up, swell outward, spread out, and cool, then slowly fall back down. This occurs on the Sun as well, but on a much smaller scale due to the stronger surface gravity. On Betelgeuse, these hot and cool bubbles are millions of miles across, while on our Sun, they are tiny—only about the size of France.



Asteroid 433 Eros

21 × 7 × 7 miles

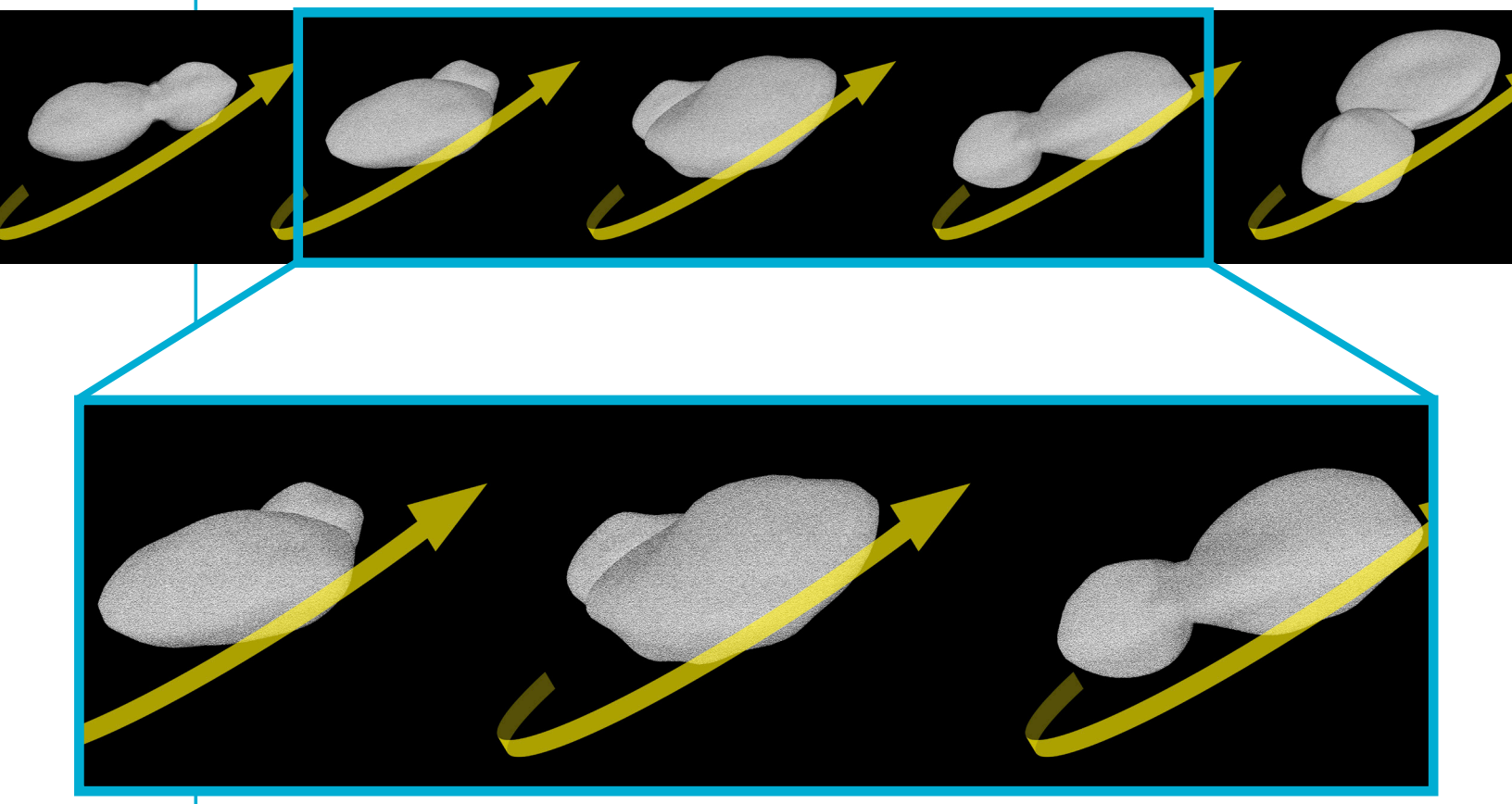
Eros was the first asteroid that was orbited by a spacecraft. NEAR Shoemaker reached Eros in 2000, orbited it for a year, and then gently descended to the rubble- and dust-covered surface. What look like giant impact craters on its surface might not be craters but rather places that have opened or collapsed as impacts jumbled the asteroid's insides.



Kuiper Belt Asteroid 486958 Arrokoth

21.5 x 12 x 6 miles

After the New Horizons spacecraft explored Pluto in 2015, astronomers tweaked its course to fly by this object, the most distant body ever visited by a spacecraft. Like Pluto, it is part of the Kuiper Belt, a bunch of icy bodies that orbit the Sun out beyond Neptune. One end of it is smaller and rounder than the other. It's thought that it formed after a larger body was shattered, then collected into two large pieces, which then spiraled and gently stuck together.

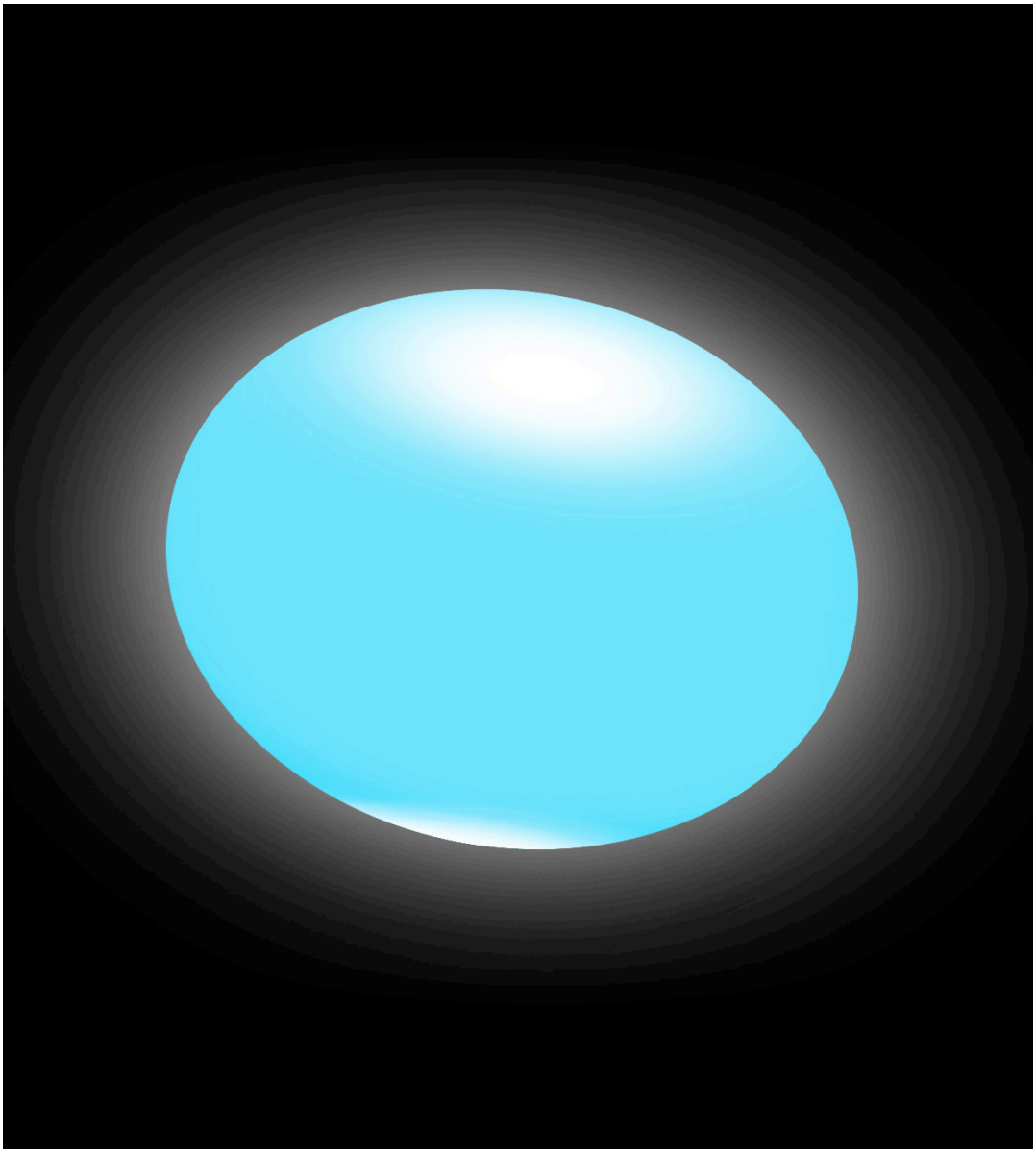


Blue Giant Star Regulus

4 million miles wide

The shape of this star is closer to the Sun's neat roundness than to the lumpiness of Betelgeuse. It is not, however, a perfect sphere; it completes a rotation in about 15 hours, as opposed to the Sun's 30 days. This rapid rotation flattens the star at the poles. This also makes the poles hotter, brighter, and whiter, because the denser material here conducts more heat from the star's core.

The overall color of Regulus, with its whitish-blue equator and bluish-white poles, tells astronomers that it has a surface temperature of more than 12,000 degrees—about twice the surface temperature of the Sun.



Comet 67P/Churyumov-Gerasimenko

2.7 x 2.5 x 2.5 miles

An object with a shape as complex as its name, this image depicts the nucleus of a comet. Like all comets, which are celestial objects consisting of a nucleus of ice and dust, Comet 67P stays frozen when far from the Sun, and loses ice and dust when its orbit takes it closer to the Sun. It was the target of the ambitious Rosetta mission from the European Space Agency, which spent ten years, from 2006 to 2016, chasing down the comet. The two lobes seem to be glued together by ices. After many more orbits, the gradual vaporization of these ices will cause it to split into two or more pieces.