

# ASTER OID HUNTERS ERS

Carrie Nugent

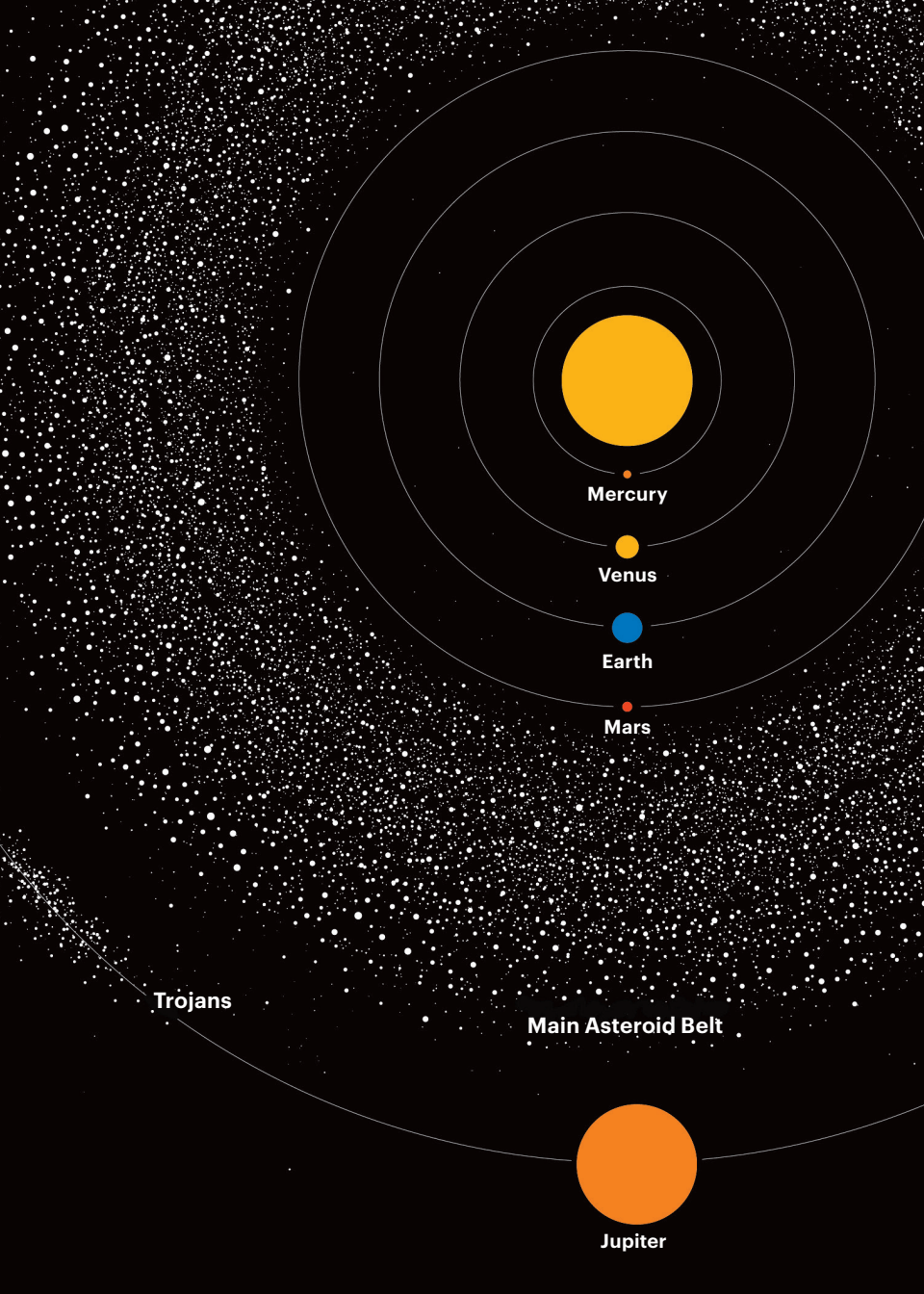


# Asteroid Hunters

CARRIE NUGENT

ILLUSTRATIONS BY MIKE LEMANSKI

TED Books  
Simon & Schuster  
New York London Toronto Sydney New Delhi



Mercury

Venus

Earth

Mars

Trojans

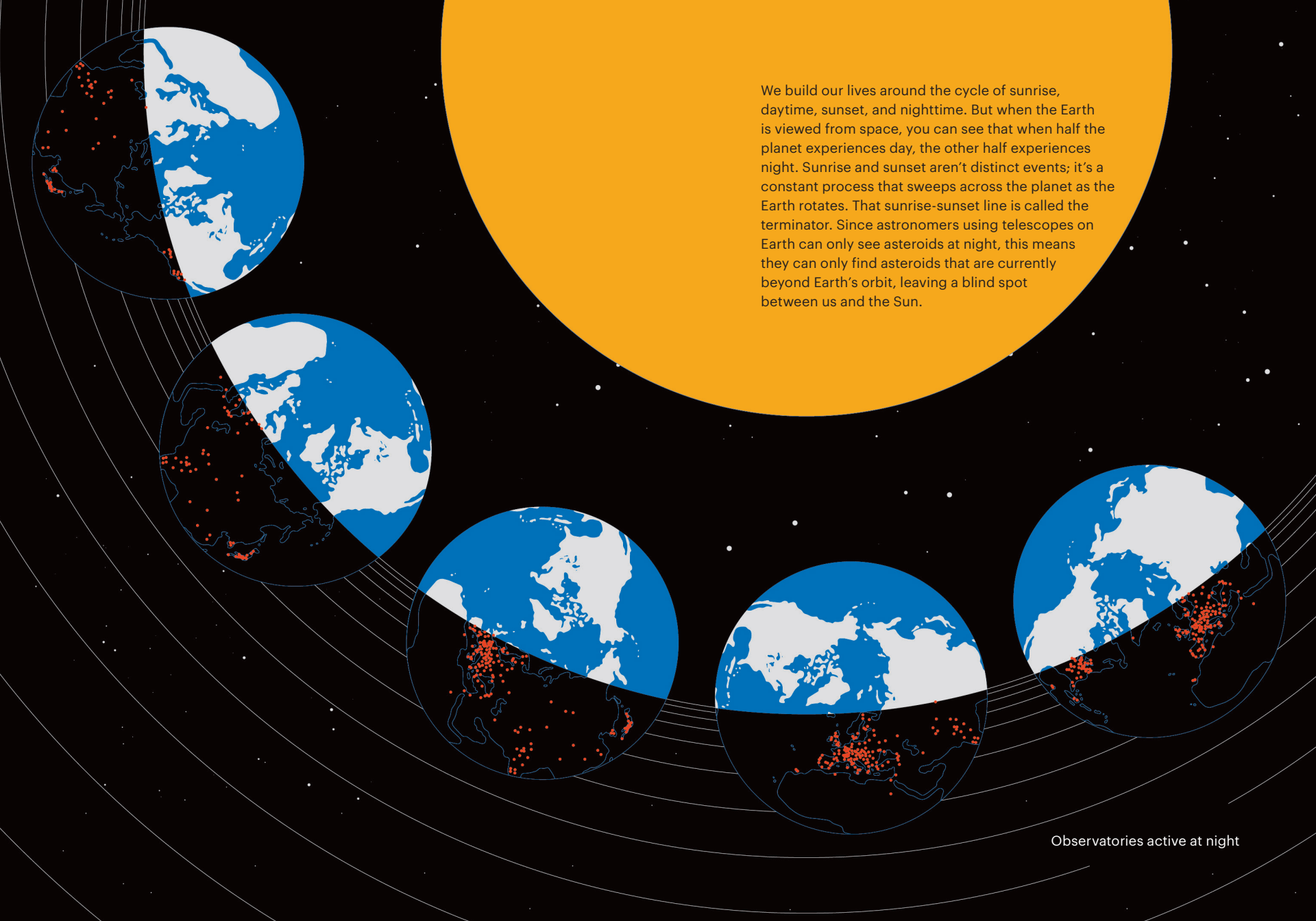
Main Asteroid Belt

Jupiter



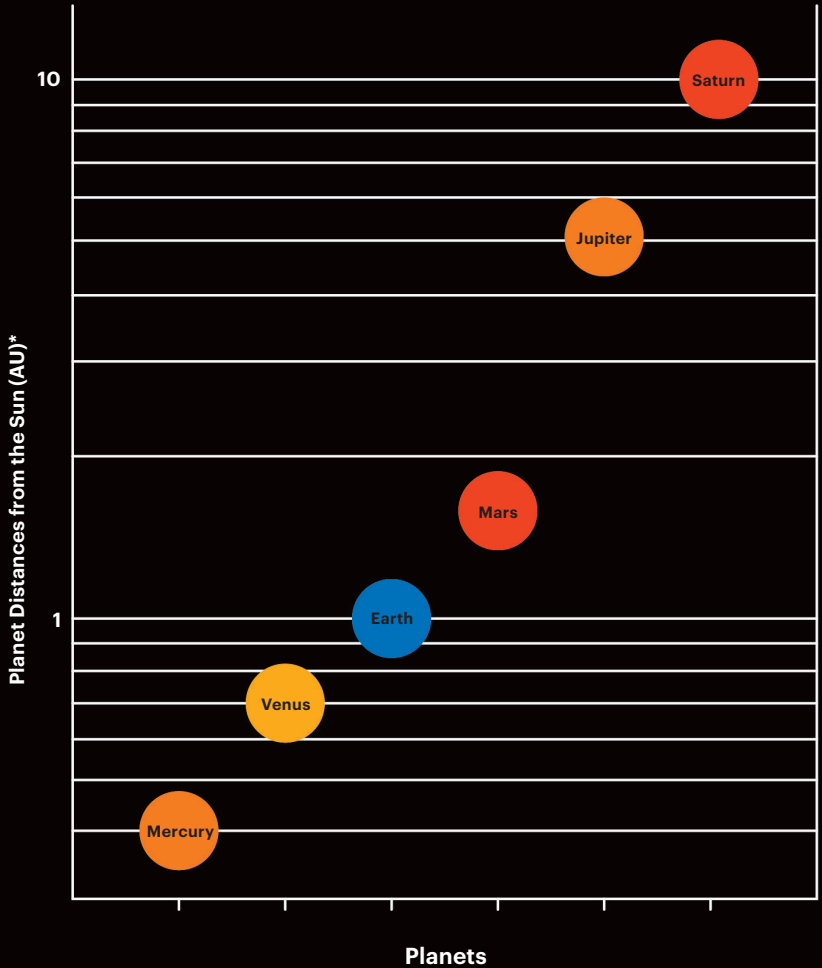
Streaking faster than a fighter jet, a small asteroid exploded over the city of Chelyabinsk, Russia, in 2013. Causing injuries but no deaths, the explosion sent low-frequency sound waves across the globe.



The diagram illustrates Earth's rotation and the terminator line. A large yellow circle represents the Sun. Five smaller blue circles represent Earth at different stages of rotation. The terminator line, shown as a white arc, separates the illuminated (day) side from the dark (night) side. Red dots representing asteroids are shown in the dark regions of each Earth. The Earths are arranged in a semi-circle, with the Sun to the right. The background is black with white stars and white orbital lines.

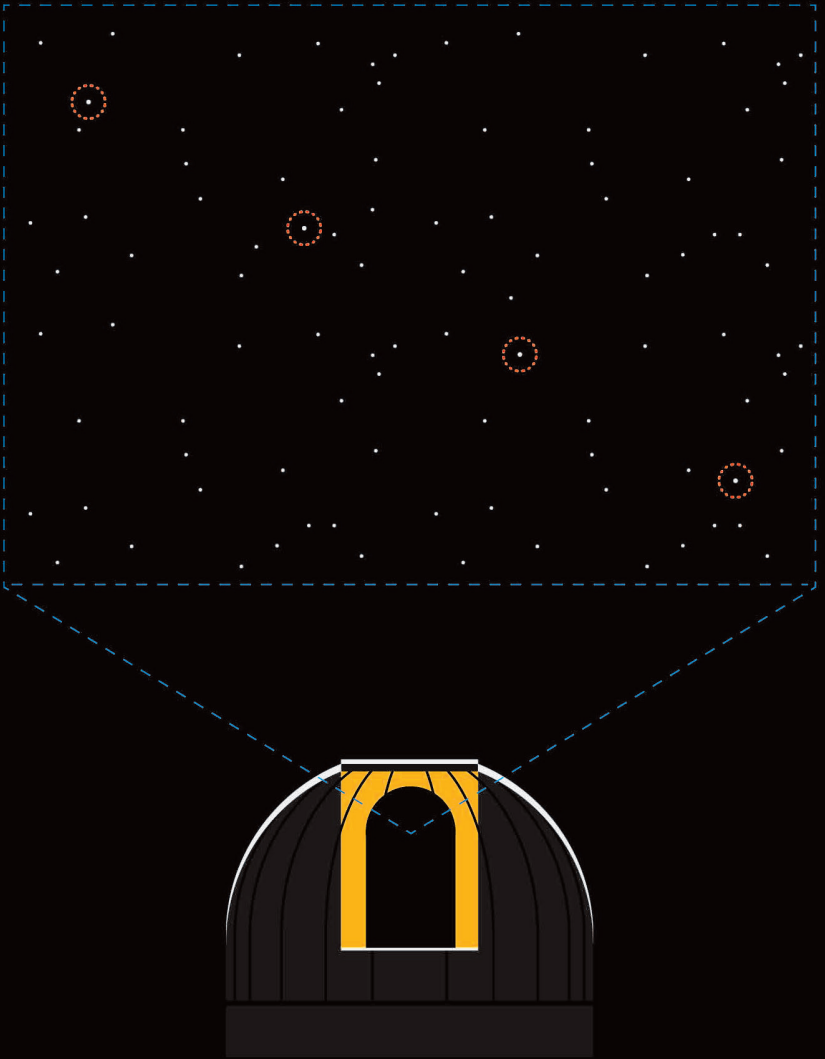
We build our lives around the cycle of sunrise, daytime, sunset, and nighttime. But when the Earth is viewed from space, you can see that when half the planet experiences day, the other half experiences night. Sunrise and sunset aren't distinct events; it's a constant process that sweeps across the planet as the Earth rotates. That sunrise-sunset line is called the terminator. Since astronomers using telescopes on Earth can only see asteroids at night, this means they can only find asteroids that are currently beyond Earth's orbit, leaving a blind spot between us and the Sun.

Observatories active at night



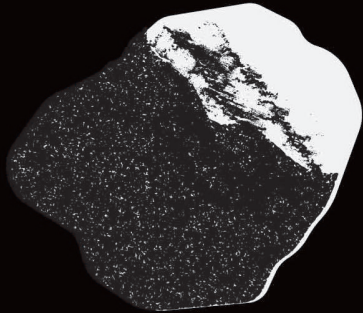
\*AU = Astronomical Unit.

Equal to 149.6 million kilometers, the mean distance from the center of the earth to the center of the sun



Asteroids are only distinguishable from stars by their motion, so asteroid hunters need to take several images of the same patch of sky to spot an asteroid moving between the stars.

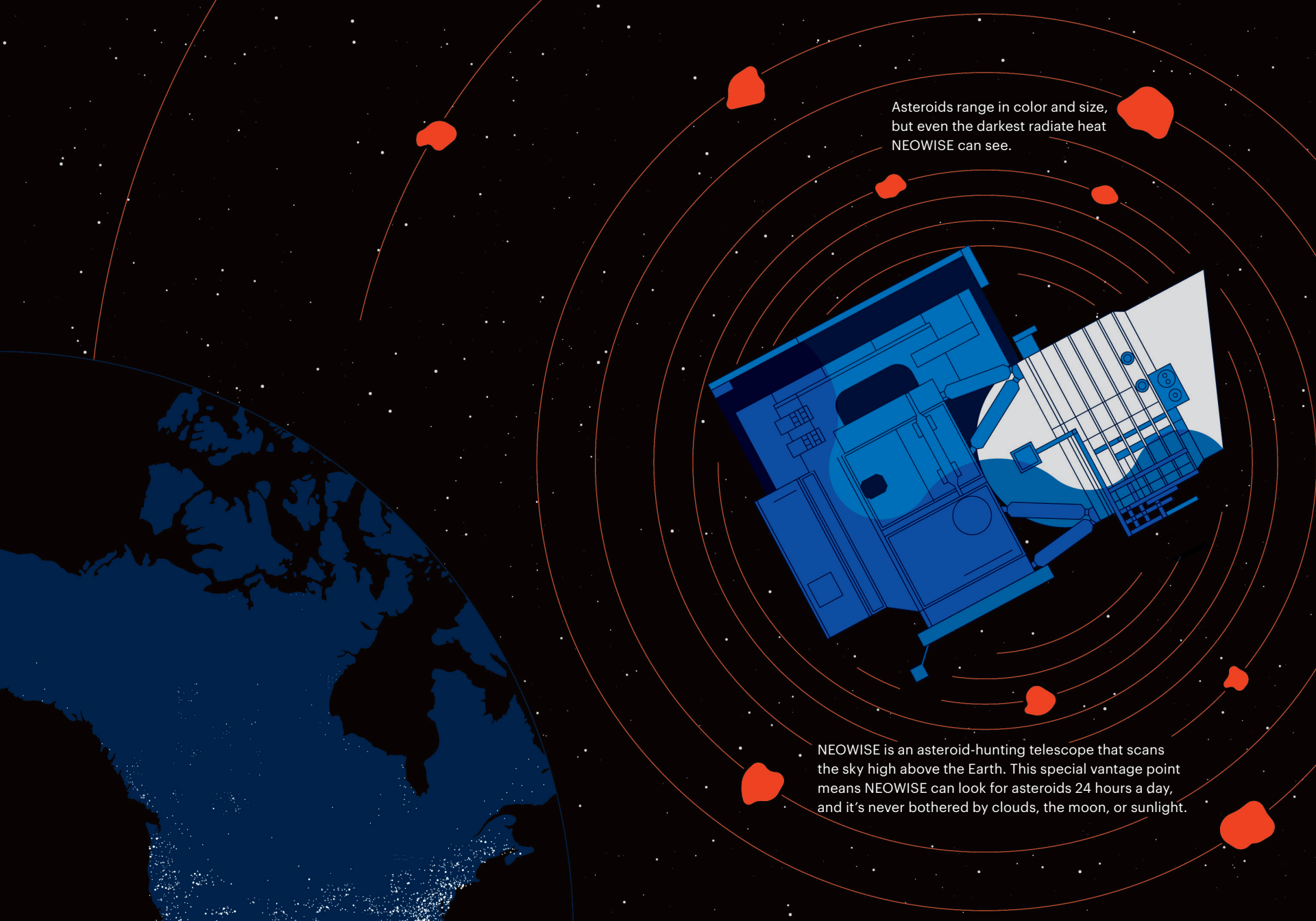
From far away, asteroids look like points of light. But up close, each one has a unique shape and surface.



Tracking an asteroid over several nights lets astronomers precisely measure its orbit around the sun.

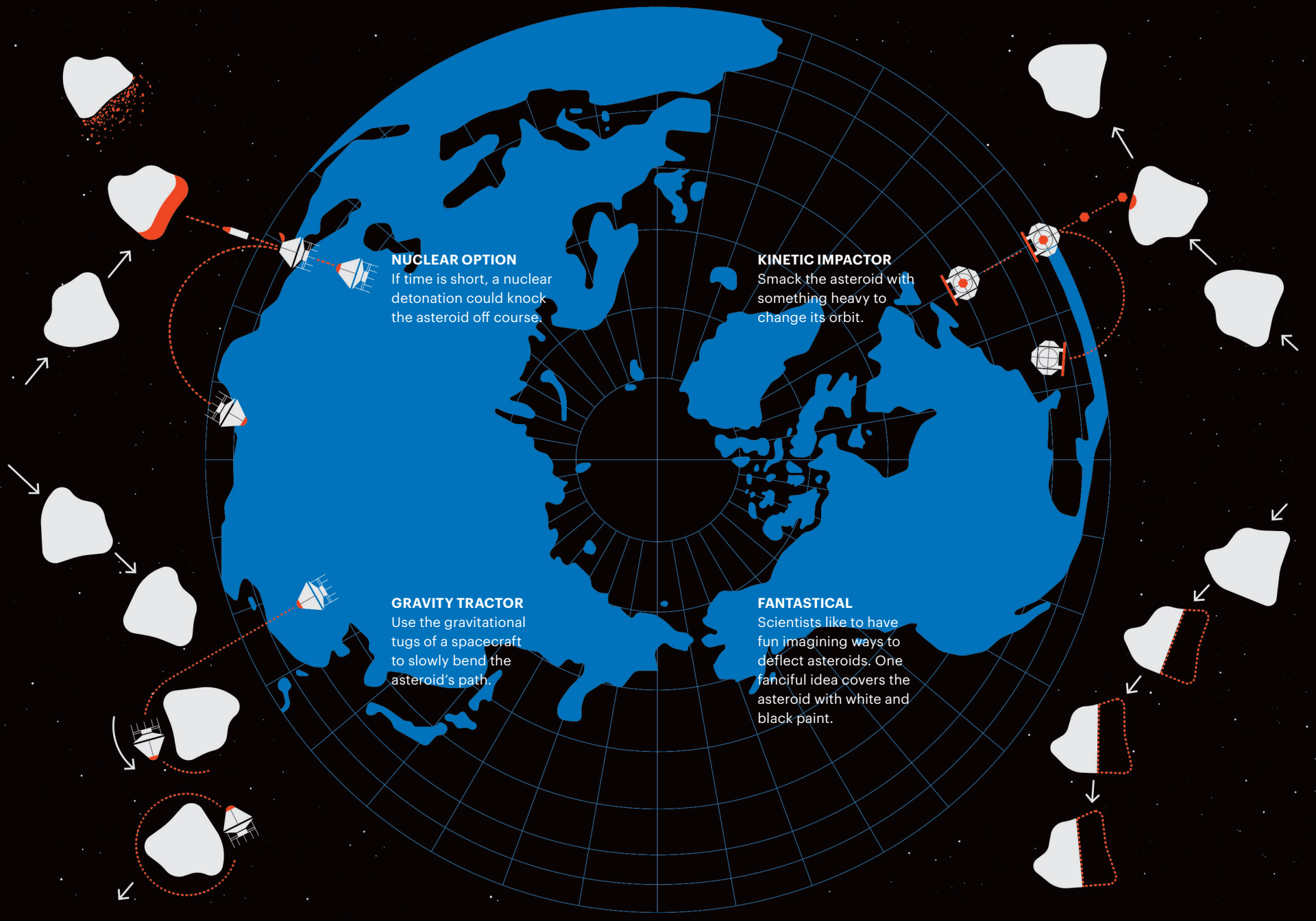






Asteroids range in color and size, but even the darkest radiate heat NEOWISE can see.

NEOWISE is an asteroid-hunting telescope that scans the sky high above the Earth. This special vantage point means NEOWISE can look for asteroids 24 hours a day, and it's never bothered by clouds, the moon, or sunlight.



**NUCLEAR OPTION**

If time is short, a nuclear detonation could knock the asteroid off course.

**KINETIC IMPACTOR**

Smack the asteroid with something heavy to change its orbit.

**GRAVITY TRACTOR**

Use the gravitational tugs of a spacecraft to slowly bend the asteroid's path.

**FANTASTICAL**

Scientists like to have fun imagining ways to deflect asteroids. One fanciful idea covers the asteroid with white and black paint.