## What is the building?

The Daniel K. Inouye Solar Telescope is the largest telescope in the world dedicated to studying the Sun.

## Who built it?

The National Solar Observatory built and operates the Daniel K. Inouye Solar Telescope for the National Science Foundation. Construction began in 2010. Scientists released the first images in early 2020.

## Why on Haleakalā?

Haleakalā offers a site above the clouds, with a clear blue sky, stable atmosphere that is relatively free of dust. Perfect conditions for looking at the Sun.

## How big?

The mirror of the Inouye Solar Telescope is almost 14-feet across.

## Where do the pictures go?

NSO collects and stores images and data collected from the telescope in large computers in Boulder, Colorado. The observatory collects more than 9 terabytes of data every day; that's more than 4 million cell phone

## Why built?

The Inouye Solar Telescope's nearly 14-foot mirror gives us the highest resolution images of the Sun ever and will produce the ongoing measurements of the magnetic fields in the Sun's corona.

## How does light tell us about the Sun?

Light interacts with different elements in different ways. We can tell what elements are inside the Sun by studying the light. And different wavelengths of light show us different layers of the Sun. Magnetic fields change the light as well. By studying these changes, scientists can determine the strength and direction of the Sun's magnetic fields. This is important because the magnetic field is what causes solar eruptions.

# Questions about the Inouye Solar Telescope

## How do they keep the mirrors from melting?

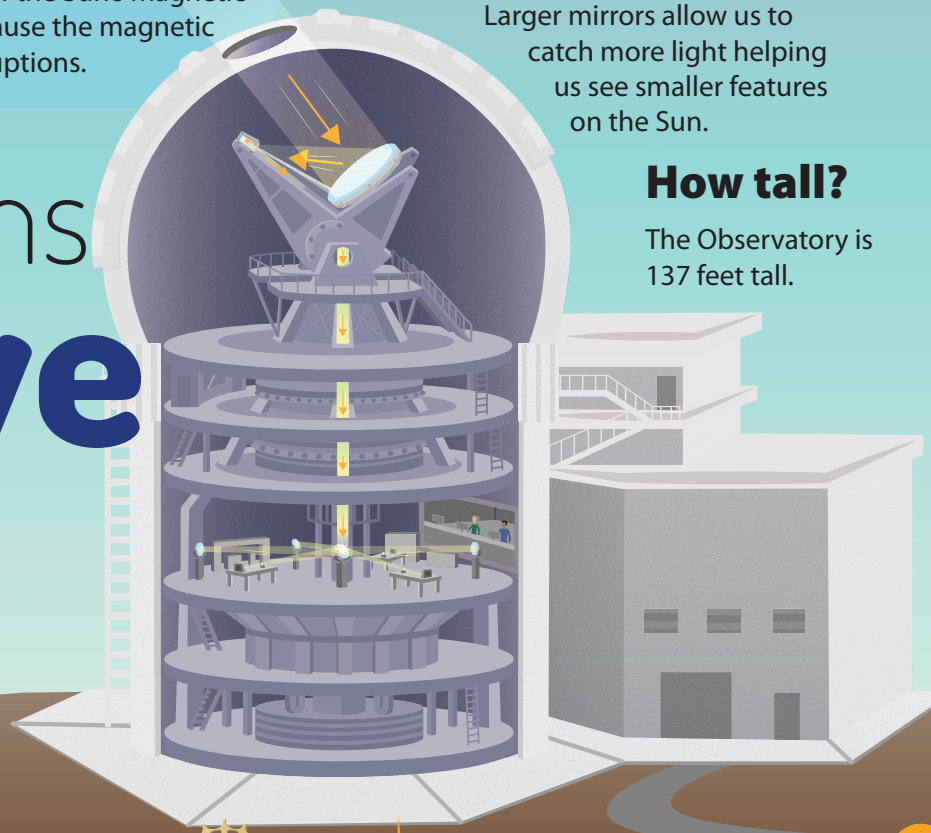
Pointing a 13-foot mirror at the Sun produces a lot of heat. (At the place where we focus the Sun's light, we could pop a bag of popcorn in about 30 seconds). More than seven miles of pipes distribute coolant, partly chilled by ice created in a building next to the observatory, throughout the entire building.

## Why so big? Why are big mirrors needed?

Larger mirrors allow us to catch more light helping us see smaller features on the Sun.

## How tall?

The Observatory is 137 feet tall.



NSF NSO National Solar Observatory AURA DKIST DANIEL K. INOUYE SOLAR TELESCOPE

# Questions about the Sun

## What is the Sun?

The Sun is a star; a giant hot ball of glowing gases. The Sun is a medium-sized star. The Sun is just one of billions of stars in the galaxy. Also, the Sun is a giant magnet.

## How big?

109 Earths could fit across the face of the Sun. More than 1 million Earths could squeeze inside the Sun. It makes up 99.8% of the mass of the entire solar system (including all the planets, moons, asteroids and comets)

## How far away?

The Sun is about 93 million miles away from Earth. It takes light from the Sun 8.3 minutes to reach Earth.

## How hot is the Sun?

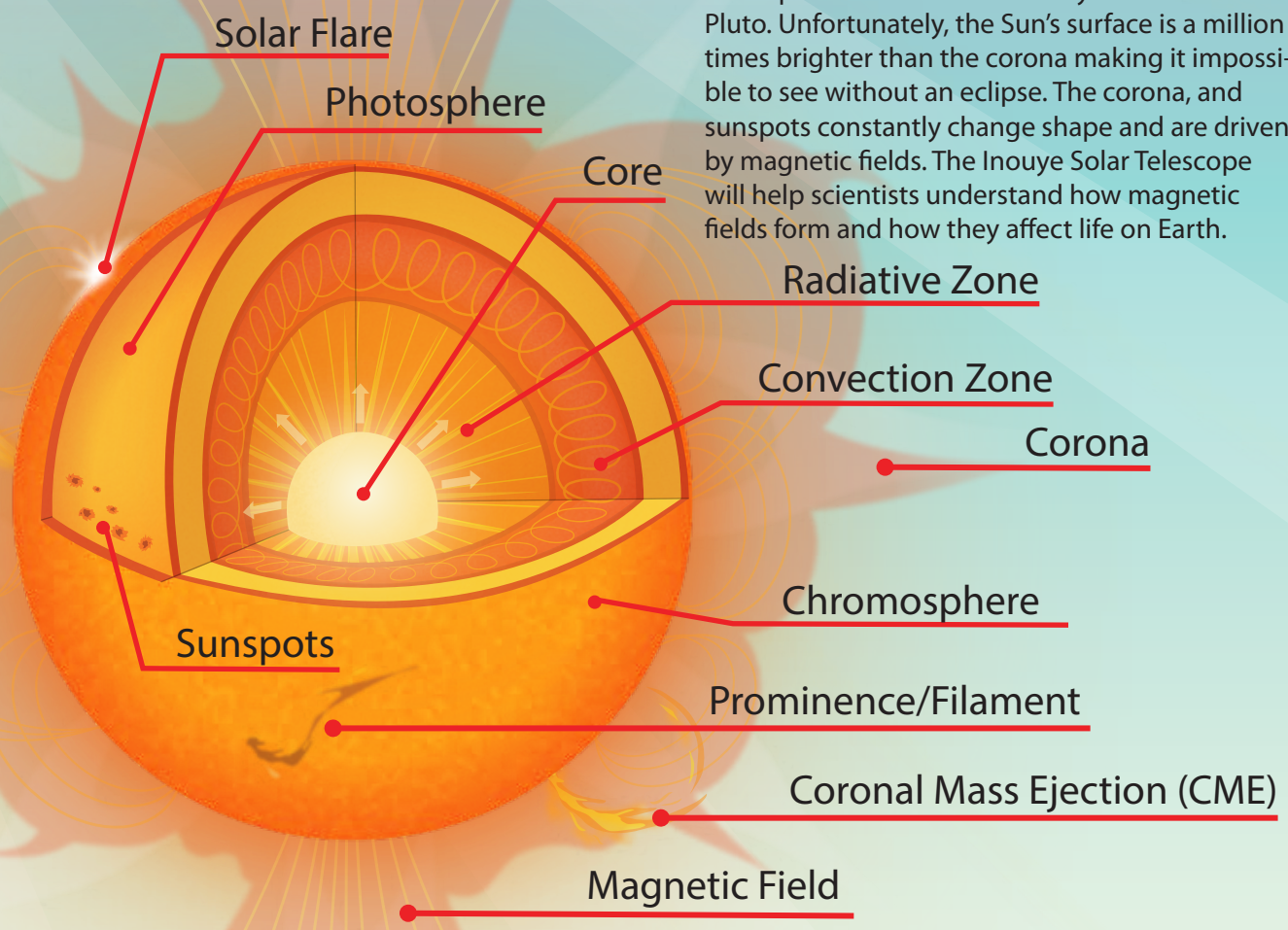
**Core:** 27 million degrees F.
**Photosphere:** about 10,000 F.
**Sunspots in the photosphere:** about 7,300 F
**Corona:** soars to millions of degrees F.

## How old?

The Sun is about 4.5 billion years old. It's only halfway through its life.

## How does the Sun shine?

The Sun, like all other stars, is made mostly of hydrogen. Very high temperatures and pressures in the core of the Sun cause hydrogen atoms to fuse together to make helium. The process is called nuclear fusion. This releases incredible amounts of energy. Every second, the Sun produces enough energy to power the entire world for 500,000 years.




## Why study the Sun?

Electric currents inside the Sun generate a magnetic field that is carried throughout the solar system along with electrically charged gas known as the solar wind. We live inside the atmosphere of the Sun.

The Sun's magnetic fields affect our satellites, GPS, astronauts, power grid, and electronics here on Earth. Understanding and predicting this space weather is an important reason to study the Sun.

The wispy, white glow that we see coming from the Sun during total solar eclipses is called the corona. The corona is just a part of the solar atmosphere that extends far beyond the orbit of Pluto. Unfortunately, the Sun's surface is a million times brighter than the corona making it impossible to see without an eclipse. The corona, and sunspots constantly change shape and are driven by magnetic fields. The Inouye Solar Telescope will help scientists understand how magnetic fields form and how they affect life on Earth.