## A Guide to COSMIC TEMPERATURES

Explore the temperatures of the universe, from the coldest cold to the hottest temperatures known. This guide is built around the Kelvin scale, the absolute temperature scale used by scientists.

Black hole corona 1 billion K 1.8 billion° F Universes's first second 1 10 billion K 18 billion°F

Supernova/shell

300 million K

550 million<sup>®</sup>.F

Large Hadron Collider 5.5 trillion K 9.9 trillion°F

> Highest temperature ever measured

The corona of plasma around accreting black holes

Maximum temperature of Sun's atmosphere

## Perseus galaxy cluster 50 million K 90 million° F

Typical temperature of protons in a supernova shock wave

Hydrogen ionizes 158,000 K 284,000° F

Solar corona 3 million K 5.4 million° F

Hydrogen atoms lose an electron to become plasma

• Surface of Rigel 11,000 K 20,000 F

100

Bright star in Orion

10

Earth's core 5,600 K 10,000°F 5,300°C

Death Valley 330 K

134°F 56.7°C

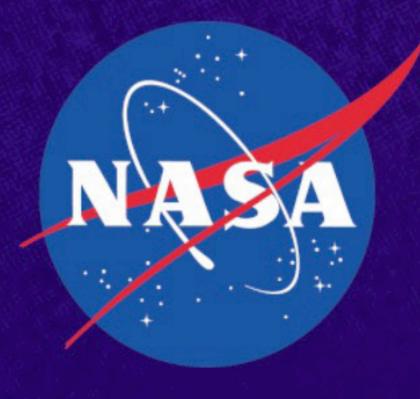
XRISM's Resolve sensor 0.05 K -459.58°F -273.10°C

Neptune 72 K -330°F -201°C

Earth's highest natural surface temperature

Absolute zero OKelvin -459.67°F -273.15°C Boomerang Nebula 1 K Coldest-known natural environment!

Average atmospheric temperature at 1 bar level



National Aeronautics and Space Administration