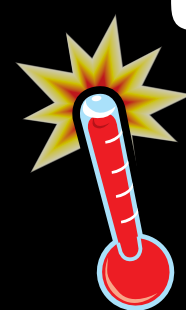


LITTLE
POSTER
OF

EXTREME UNIVERSE



Science and
Technology
Facilities Council



HOTTEST

What do you think the hottest object in the Universe is? Lava from a volcano? The Earth's core? The centre of the Sun? True, the Sun is very very hot indeed but, compared to the hottest objects in the cosmos, the Sun's temperature is really quite tame!

The Sun is the hottest object in our Solar System. It's surface is a pretty scorching

5,500°C

but, like all stars, it is at its hottest deep in its centre where the core is an incredible

15 million °C

BLUE SUPERGIANTS

Supergiants are stars that can be hundreds of times larger than the Sun and have many thousands of times more mass.

All that extra mass means that they burn very hot indeed and can have a surface temperature that exceeds

50,000°C

It is possible that the largest supergiants may have core temperatures of more than

1 billion °C

(1,000,000,000 °C)

The Sun compared to a blue supergiant

The hottest object ever recorded is a quasar (the blazing centre of an active black hole). Quasar 3c273 was measured at an astonishing

10 trillion °C

COLDEST



You'd probably expect the coldest place in the Solar System to be on a distant planet like Uranus. But the title actually goes to a crater near the Moon's north pole where the temperature was recorded at a super cool

-246°C

BOOMERANG NEBULA

This rapidly expanding nebula is the coldest object ever recorded. It is even colder than the leftover background temperature of the Big Bang – measuring a whisker above absolute zero – at

-272.15°C

The nebula's rapid expansion actively cools the gases within it (just as expansion chills the coolant in a refrigerator).



10 billion
KG

DENSEST

NEUTRON STAR

A neutron star has so much mass that the atoms in its core are subjected to so much pressure all the empty space is squeezed out. This leaves a core with a colossal density of

**100,000,
000,000,
000kg per cubic cm**



Osmium is the densest known naturally occurring material on Earth. Osmium is a metallic element that is twice as dense as lead.

**0.22kg
per cubic cm**

The densest objects in the Universe make a neutron star look like a fluffy cloud in comparison. The singularity at the heart of black hole is so dense that laws of physics as we know them fall apart - giving a black hole singularity a density of

**INFINITYkg
per cubic cm**



BIGGEST

If there's one thing everyone knows about space is that space is really really big. It's so big that boring old measurements like miles and kilometres are just too small and astronomers like to use the distance light can travel in a year (a light year) as their unit of choice. One light year is equal to about 9 trillion km!

Compared to the planets of our Solar System, the Sun is absolutely enormous – all of the planets could fit within in the Sun – but compared to many other stars, the Sun is almost insignificantly small.

The Sun
Aldebaran
Pollux

The Sun (that tiny little yellow dot) has a diameter of

1.4 million km

Pistol star

VY Canis Majoris (a red hypergiant star) has a diameter of

2 billion km

Aldebaran

Betelgeuse

Betelgeuse

VY Canis Majoris

MILKY WAY

There's no denying that the spiral galaxy we call home is enormous. Our Sun is just one tiny speck among more than 100 billion other stars and it measures more than

**100,000
light years**

ESO 383-76

The Milky Way is tiny whne compared to he biggest galaxy that has been discovered. This supergiant elliptical galaxy has an estimated diameter of

**1,760,000
light years**