



How Big Is the Universe and What Else Is Out There?

KS4 PHYSICS

KS3 SCIENCE

Ages 11-14 ⌚ 3 min read

Just How Big Is the Universe?

Imagine trying to count every grain of sand on every beach in the world. Now imagine that's not even close to how many stars are out there. The **universe** is so incredibly huge that our brains struggle to understand it. Scientists think there are at least **2 trillion galaxies**, and each galaxy contains millions or even billions of stars.

To put this in perspective, our own **Milky Way galaxy** is home to around **200-400 billion stars**—and it's not even the biggest galaxy we know about. If you tried to count every star one per second, it would take millions of years.

Think of it like this: if the entire universe was a beach, our galaxy would be just one grain of sand on that beach.

What's Beyond What We Can See?

Here's something mind-bending: there might be even more universe beyond what we can actually see. Because light takes time to travel, we can only see stars and galaxies whose light has had time to reach us. The farthest things we can observe are about **13.8 billion light-years away**—which is also roughly the age of the universe itself.

But the universe could extend much, much further. Imagine being in a dark room with a torch—you can only see what the torch beam reaches, but there's definitely stuff beyond that light.

Think of it like sitting in a cinema: you can only see the screen and nearby seats in the darkness, but you know the whole building extends beyond what your eyes can reach.

What Else Fills This Space?

The universe isn't just stars and galaxies. It also contains **black holes** (regions where gravity is so strong that nothing escapes), **nebulae** (giant clouds of gas and dust where new stars are born), **dark matter** (invisible stuff we can only detect by its

gravity), and **dark energy** (a mysterious force making the universe expand faster and faster).

Scientists keep discovering new things, like **exoplanets** (planets orbiting other stars) and extreme objects like **neutron stars**. The universe is constantly changing, with stars being born and dying in spectacular explosions called **supernovas**. We're living in an endlessly fascinating cosmos that we're only just beginning to understand.