

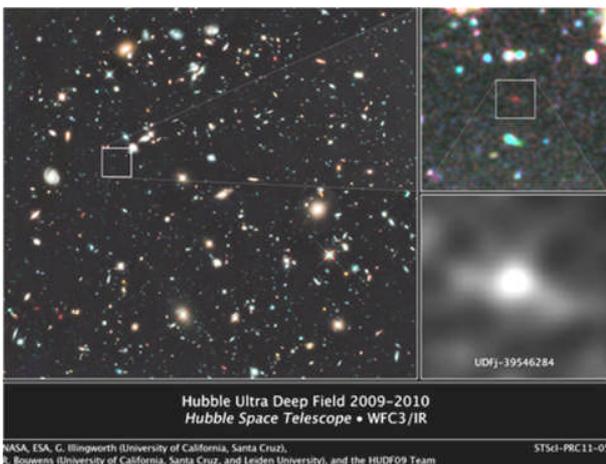
## Hubble telescope detects the oldest known galaxy



By Pallab Ghosh Science correspondent, BBC News

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This galaxy was already in existence 480 million years after the Big Bang



NASA

Capturing light from the galaxy took 111 orbits, about eight days of observing time, in 2009 and 2010.

The Hubble Space Telescope has detected what scientists believe may be the oldest galaxy ever observed.

It is thought the galaxy is more than 13 billion years old and existed 480 million years after the Big Bang.

A Nasa team says this was a period when galaxy formation in the early Universe was going into "overdrive".

The image, which has been published in Nature journal, was detected using Hubble's recently installed wide field camera.

According to Professor Richard Bouwens of Leiden Observatory in the Netherlands: "We're seeing these galaxies - 'star cities' - that are building themselves up over cosmic time."

The research team observed rapid growth over a relatively short period of time: Their sample data showed there was just one galaxy in existence about 500 million years after the Big Bang. But this rises to 10 galaxies some 150 million years later. The tally has doubled about 100 million years later.

"You start out with these little seeds in the very early Universe which would eventually have formed stars, then star clusters, baby galaxies then eventually these large majestic galaxies that we know today," according to Professor Bouwens.

"It's very exciting to see this complicated physical process actually take place somewhere that no man has seen before," Professor Bouwens told BBC News.

Thirteen billion years ago, the formation of galaxies went into overdrive

He compares the early galaxy to a toddler: It is much smaller than older galaxies like our own Milky Way and it is growing more quickly.

"We can use these measurements to learn how fast galaxies grow and build up with cosmic time," according to Professor Bouwens.

Dr Olivia Johnson of the Royal Greenwich Observatory at the National Maritime Museum says that quantifying the rapid evolution of the Universe will reveal a greater detail about what was happening in the early cosmos - such as when the first stars and galaxies formed.

### **Test theories**

"These are big, open questions in astronomy and the fact that we are finally able to look into the primordial universe for the first time is quite exciting," she said.

### **"Start Quote**

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Dr Robert Massey of the Royal Astronomical Society (RAS) says the new image from Hubble will enable astronomers to test their current theories of the evolution of the Universe. Professor Bouwens stressed that the observation had yet to be confirmed but that he and his colleagues were "pretty confident" that they had discovered the oldest galaxy caught on camera to date.

"There are many different sorts of objects that can masquerade or look very much like these distant objects. We've done lots of checks and lots of tests and we think that this candidate is OK," he said.

"It's filling in the gaps. Although we have ideas about the formation of the Universe, it is quite difficult to go from the primeval soup in the early stages of the Universe to the Universe we are in. Images like the one we have today helps plot that journey."

Astronomers are eagerly awaiting the launch of Nasa's James Webb telescope in 2014 which will be able to delve perhaps 200 million years further back in cosmic time when galaxies were just beginning.