

How did we miss that? Astronomers reveal they have found the biggest thing in the universe : and say it would take 4 BILLION years to cross if you were travelling at the speed of light

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- Large quasar group (LQG) is made up of quasars, galaxies from the early days of the universe
- Structure is so large that it challenges modern cosmological theory, researchers admit

British astronomers have found the biggest structure in the universe - so large that it would take a spacecraft travelling at the speed of light 4 billion years to cross it.

The large quasar group (LQG) is made up of quasars, galaxies from the early days of the universe.

This particular group is so large that it challenges modern cosmological theory, researchers said.



An artist's impression of ULAS J1120+0641, a very distant quasar powered by a black hole with a mass two billion times that of the Sun

Dr Roger Clowes from UCLan's Jeremiah Horrocks Institute led the study.

'While it is difficult to fathom the scale of this LQG, we can say quite definitely it is the largest structure ever seen in the entire universe,' he said.

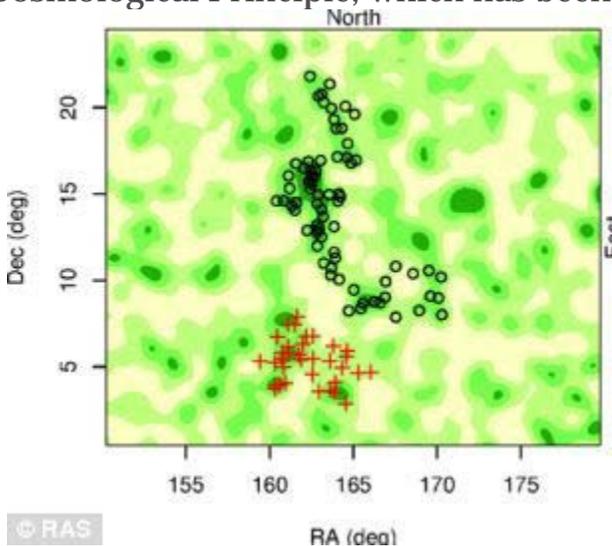
'This is hugely exciting – not least because it runs counter to our current understanding of the universe.

'The universe doesn't seem to be as uniform as we thought.'

Since 1982 it has been known that quasars tend to group together in clumps or 'structures' of surprisingly large sizes, forming large quasar groups or LQG - but researchers have not seen one on this scale before.

'Travelling at the speed of light, it would still take 4 billion light years to cross,' he said.

'This is significant not just because of its size but also because it challenges the Cosmological Principle, which has been widely accepted since Einstein.



The Sky distribution of the 73 quasars that make up the new giant structure

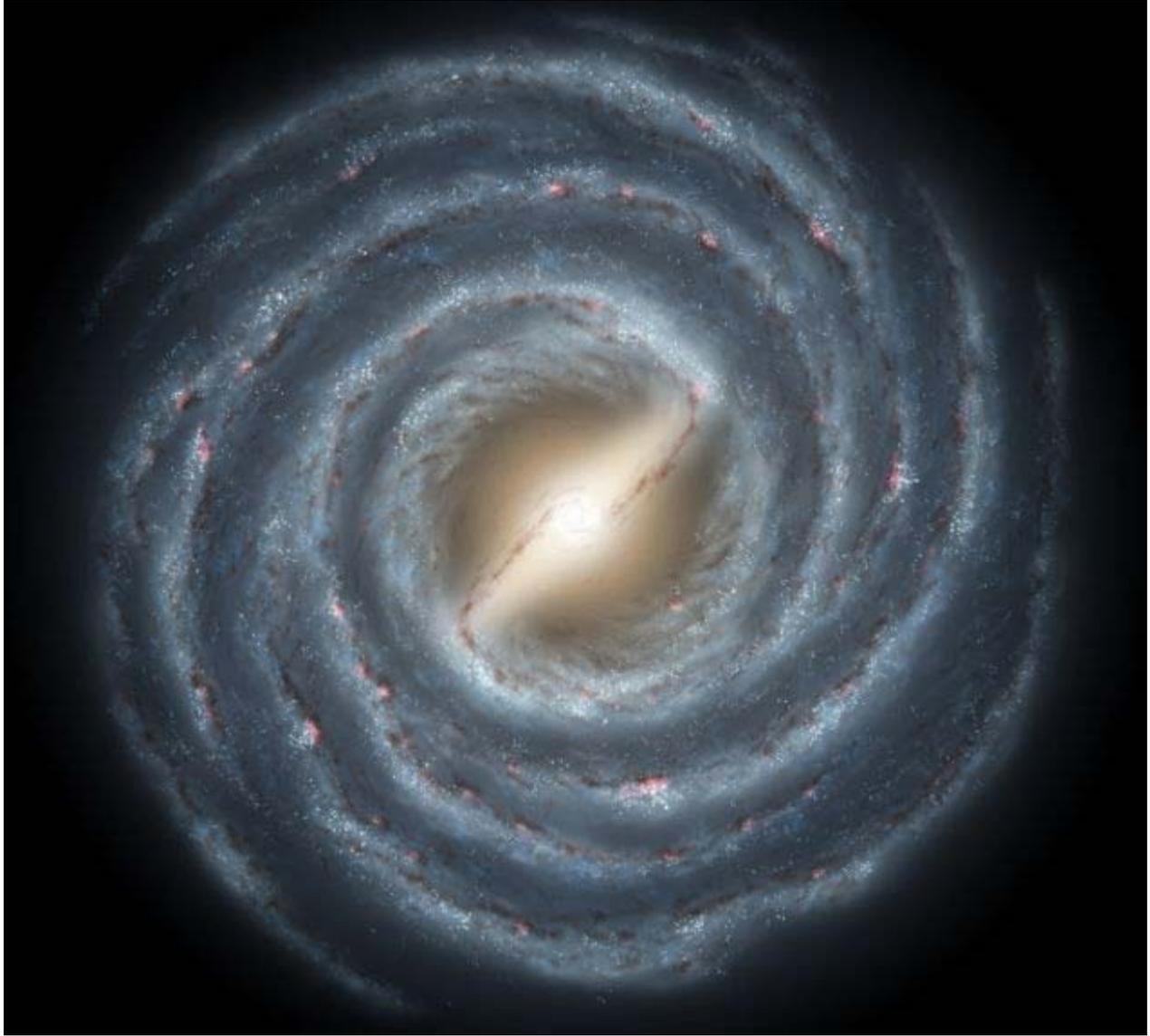
'Our team has been looking at similar cases which add further weight to this challenge and we will be continuing to investigate these fascinating phenomena.'

The modern theory of cosmology is based on the work of Albert Einstein, and depends on the assumption of the Cosmological Principle.

The Principle is assumed but has never been demonstrated observationally 'beyond reasonable doubt'.

To give some sense of scale, our galaxy, the Milky Way, is separated from its nearest neighbour, the Andromeda Galaxy, by about 2.5 million light-years. Whole clusters of galaxies can be 6-10 million light years across but LQGs can be 650 million light years or more across.

Although, based on the Cosmological Principle and the modern theory of cosmology, calculations suggest that astrophysicists should not be able to find a structure larger than 1.2 billion light years.



Our galaxy, the Milky Way, is separated from its nearest neighbour, the Andromeda Galaxy, by about 2.5 million light-years - but the new structure measure 4 BILLION light years

However, Dr Clowes' discovery has a typical dimension of 1.6 billion light years.

But because it is elongated, its longest dimension is 4 billion light years - that is some 1,650 times larger than the distance from the Milky Way to Andromeda.