

BBC FROM THE BIG BANG TO TODAY: A COSMIC ERAS TOUR

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Sky at Night

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A strand of the cosmic web

Filament picture shows part of the structure that underpins the whole Universe

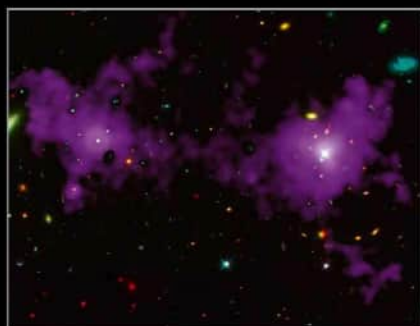
After hundreds of hours of observing time with the Very Large Telescope at the European Southern Observatory in Chile, a team of astronomers have managed to create the most detailed image ever of one single filament of gas connecting galaxies together (shown in purple, below).

The cosmos is strung together by these tenuous filaments of gas that, combined, form an interconnected mesh known as the 'cosmic web' which funnels gas between galaxies and provides the scaffolding on which our Universe is built.

These filaments are extremely difficult to capture, as they're incredibly dim, but the light from the filament stretches three million lightyears between two actively growing galaxies.

"By capturing the faint light emitted by this filament, which travelled for just under 12 billion years to reach Earth, we were able to precisely characterise its shape," explains Davide Tornotti. "For the first time, we could trace the boundary between the gas residing in galaxies and the material contained within the cosmic web through direct measurements."

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▲ The direct high-definition image shows a single filamentary structure connecting two active galaxies

The astronomers' image captures a solitary filament from the vast cosmic web that stretches across the Universe, part of which is shown here in a computer simulation