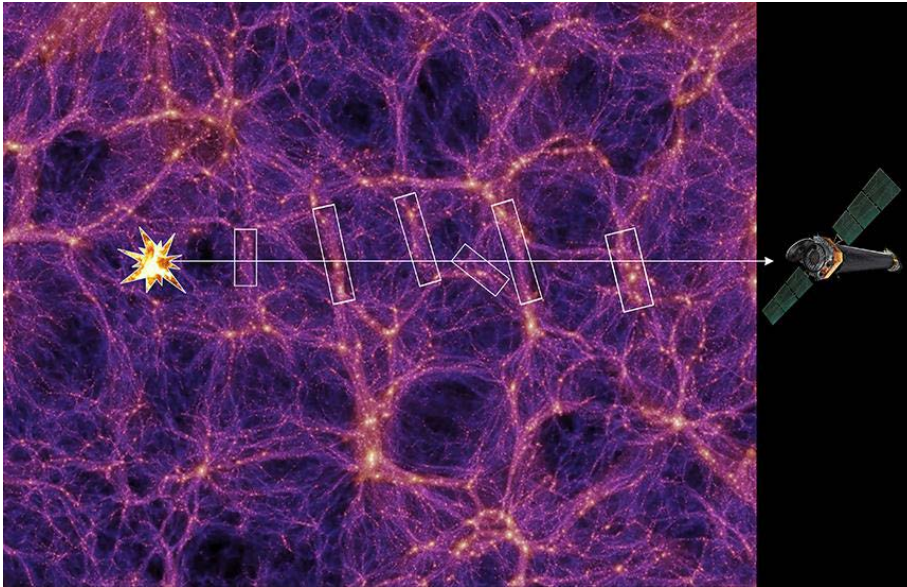




Chandra Science Highlight

Detection of the Missing Baryons



Caption: An illustration of the light path of X-rays from a distant quasar, showing how the X-rays are absorbed by gas in filaments along the line of sight.

Distance estimate to quasar: 3.4 billion light years; absorbing clouds are located at distances ranging from 0.96 to 2.67 billion light years.

- Independent, well-established observations provide a good estimate of the amount of baryonic matter — meaning hydrogen, helium and other elements — existed just after the Big Bang.
- A census of the mass of all the normal matter in stars, planets, dust, interstellar and intergalactic gas in the present-day Universe indicates about a third of it is missing.
- Researchers have used Chandra to find strong evidence that the missing baryons reside in vast intergalactic filaments of hot (temperature greater than 100,000 K) gas.
- The discovery involved stacking the data from 17 absorption line regions along the line of sight to a distant quasar to detect an OVII ion absorption line signal at a 3.3-sigma confidence level.

Credits: NASA/CXC/K.Williamson, and Springel, V et al. 2005
Nature 435, 629

Instrument: ACIS-LETG

Reference: Kovács O. et al., 2019, Apj (in press);
<https://arxiv.org/abs/1812.04625>

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