



Chandra Science Highlight

NASA's Chandra Finds Galaxy Cluster Collision on a "WHIM"



- Astronomers have found evidence for “missing” mass in the form of gigantic strands, or filaments, of superheated gas.
- This difficult-to-detect matter is known as the “warm-hot intergalactic medium” or WHIM.
- Scientists have used NASA’s Chandra X-ray Observatory to look for the WHIM for years, but few searches have been successful.
- A new Chandra study of colliding galaxy clusters in Abell 98 provides new signs for the existence of the WHIM.

Distance estimate: About 1.4 billion light-years.

Credits: X-ray: NASA/CXC/CfA/A. Sarkar; Optical: NSF/NOIRLab/WIYN

Instrument: ACIS

Reference: Sarkar, A., et al., 2022, ApJL, 935, L23;
[arXiv:2208.03401](https://arxiv.org/abs/2208.03401)

Caption: Abell 98 is a system of galaxy clusters in the early stages of a collision, shown here in a composite image from Chandra (blue and purple) and the WIYN telescope (red and white). Astronomers have used this Chandra data to search for some of the “normal” matter (not dark matter) missing from most observations of the local universe. Scientists have proposed that at least some of this unaccounted-for mass could be hidden in gigantic strands known as the “warm-hot intergalactic medium,” or WHIM. They identified some of the WHIM in Abell 98 in a bridge of X-ray emission between galaxy clusters near the top and bottom of the image. <https://chandra.si.edu/photo/2022/a98/>

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