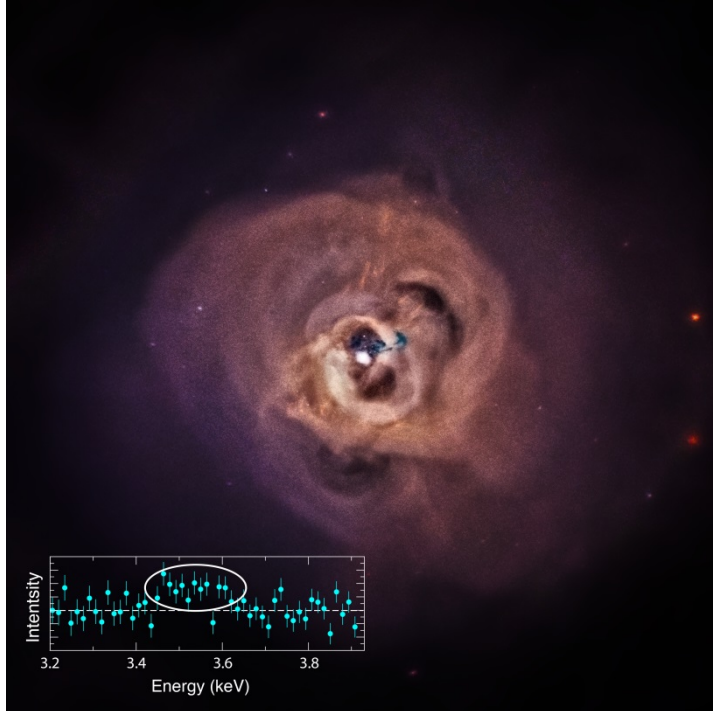




Chandra Science Highlight

Perseus Cluster: Mysterious X-ray Signal Intrigues Astronomers



Scale:

Image is about 11 arcmin across
(about 768,000 light years)

Distance Estimate:

250 million light years

A new study of the central region of the Perseus galaxy cluster has revealed a mysterious X-ray signal in the data. This signal is represented in the circled data points in the X-ray spectrum shown in the inset.

- The unidentified X-ray emission line is centered on 3.56 keV.
- One intriguing possible explanation of this X-ray emission line is that it is produced by the decay of sterile neutrinos, a type of particle that has been proposed as a candidate for dark matter.
- Independent evidence for an emission line at the same energy in XMM-Newton observations of other clusters, the galaxy M31 and the outskirts of the Perseus cluster strengthens the case that the emission line is real and not an instrumental artifact.
- Additional data are needed to confirm the existence of the emission line and to rule out other explanations.

Reference: Bulbul, E. et al, 2014, ApJ (accepted); arXiv:1402.2301

Credit: X-ray: NASA/CXC/SAO/E.Bulbul, et al.

Instrument: Chandra ACIS Observation

**CXC Operated for NASA by the
Smithsonian Astrophysical Observatory**



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