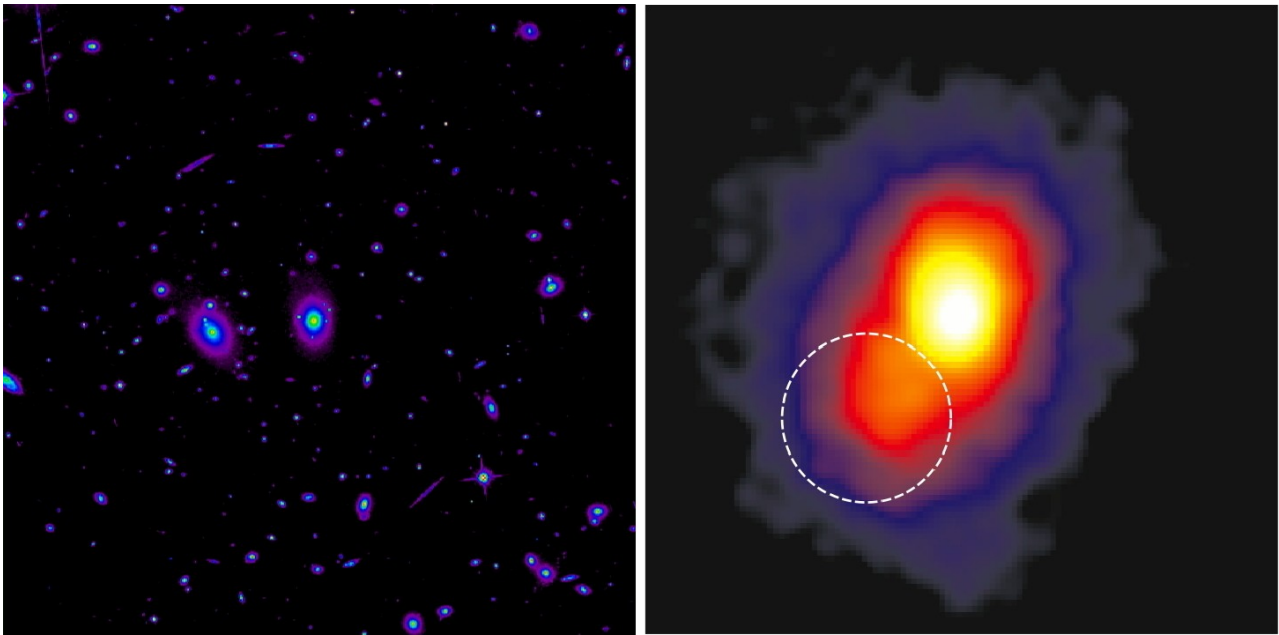


Observational study of structure and formation of clusters of galaxies; Development of high-resolution X-ray microcalorimeters

Naomi OTA [Physics Course]



RXJ1347 galaxy cluster. Left: Visible light image shot by the Hubble Space Telescope (The Multimission Archive at the STScI). Right: X-ray image shot by the Chandra satellite. In both images, a side of the figure is 110 arc sec, which corresponds to about 2 million light years.

How did this universe evolve and become what it is like now? Observations of the largest celestial bodies in the universe called galaxy clusters will give an important clue to solve such a fundamental problem. In the visible light, a galaxy cluster appears as a group of about 1000 galaxies, however, it is thought that a substantial amount of as-yet-unidentified dark matter is hidden within the object. By studying the nature of hot gas contained in the cluster and jointly analyzing other wavelengths' data, we aim to unravel the mystery of the evolution of the universe that is filled with dark matter and dark energy. We also join the international X-ray missions such as Athena and DIOS and develop X-ray calorimeters for future high-resolution spectroscopic observations.

Keywords : clusters of galaxies, structure formation in the universe, X-ray astrophysics, observational cosmology, high-resolution X-ray calorimeters