



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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Green Peas - the X-ray brightest star forming galaxies?

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Reionization of the Universe after the Dark Ages played an important role in the galaxy formation and observability. The source of the ionizing radiation is, however, not yet clearly determined. The main contribution is commonly attributed to strong AGN activity or tremendous star formation. Green Peas represent a class of compact high star-forming galaxies that have recently been found to show signatures of the escape of the ionizing flux. Despite the intensive studies of Green Peas in UV and optical domain, their X-ray properties were not known. We performed the first measurements of three Green Pea galaxies in the X-ray domain with the XMM-Newton satellite and constrained their X-ray spectral properties and flux at high energies. We found that two sources have their X-ray luminosity exceeding 10^{42} erg/s, which is unusual for a purely star-forming galaxy and is more than half order of magnitude larger than predicted from the known empirical relations between the X-ray flux and the star formation rate, considering also their metallicity. Our results thus indicate that some Green Pea galaxies may produce significantly more high-energetic flux than other similar star-forming galaxies. The measured variety of the X-ray characteristics of Green Pea galaxies challenges our full understanding of the relation between the X-ray luminosity and the star formation rate in compact dwarf galaxies and we will discuss some possible explanations, including the presence of a hidden active nucleus, ultra-luminous X-ray sources, different stellar population or X-ray excess due to hot gas.

Topic

Compact and diffuse sources in galaxies and in the Galactic Center

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