

X46a A NuSTAR and XMM-Newton Study of the Two Most Actively Star-forming Green Pea Galaxies (SDSS J0749+3337 and SDSS J0822+2241)

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Green Pea galaxies (GPs) are compact and [O III] bright galaxies that were identified in the local universe ($0.1 < z < 0.4$) by the Galaxy Zoo project. Because the GPs resemble high- z galaxies, they have been studied usually to understand an early phase of galaxy growth. Interestingly, some of them have mid-infrared (MIR) properties consistent with having active galactic nuclei (AGNs) with 2-10 keV luminosities of $\sim 10^{44}$ erg s $^{-1}$.

Motivated by the fact, we explored X-ray evidence for the presence of AGNs in the two most actively star-forming GPs, SDSS J0749+3337 and SDSS J0822+2241, which had star-formation rates (SFRs) of $\sim 120 M_{\odot}$ yr $^{-1}$ and $\sim 80 M_{\odot}$ yr $^{-1}$, respectively. Our first *NuSTAR* observations towards them detected no significant hard X-ray emission, however. By contrast, soft X-ray emission with 0.5–8 keV luminosities of $\approx 10^{42}$ erg s $^{-1}$ was significantly detected in both targets by *XMM-Newton*, as explained only by star formation (SF). If AGNs in SDSS J0749+3337 and SDSS J0822+2241 were missed due to putative AGN tori, they should be heavily obscured with hydrogen column densities along the equatorial plane above 2×10^{24} cm $^{-2}$ and 5×10^{24} cm $^{-2}$, respectively. Otherwise, no AGN exists and the MIR emission needs to be ascribed to SF.