Fourth Year Report on Luminous Binary Supersoft X-Ray Sources

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1 Summary

One of the key accomplishments of the two preceding years was our development of an algorithm to select SSSs in external galaxies which have been observed by Chandra or XMM-Newton. By applying this algorithm to data from a number of galaxies, we discovered an extension of the class of SSSs to sources that are somewhat harder (100 – 300 eV, instead of tens of eV), but which are nevertheless much softer than canonical X-ray sources. We call these new sources quasisoft sources (QSSs).

During this past year, we have built on and extended this work. We have (1) continued to identify SSSs and QSSs in external galaxies, (2) worked on models for the sources and find that black hole models seem promising for a subset of them, and (3) have studied individual systems, especially M101-ULX1. This special system has been observed as an SSS in its high state, with a luminosity in excess of 10^{41} erg s^{-1}. It has also been observed as a QSS when it is less luminous, and as a hard source in its low state. It is one of the best candidates to be an accreting intermediate-mass black hole.

We have several papers in preparation. Below we list papers which are complete, including only new work and papers whose status has changed (e.g., been accepted for publication) since our last report.

In addition, our work on QSSs has received some publicity. It was the subject of a Chandra press release and was picked up by several media outlets.

2 Publications


