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NuSTAR Discovery of Galactic Center Hard X-ray Emission

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The Galactic Center region contains one of the highest concentration of X-ray sources in the Milky Way. Recently NuSTAR, with its sub-arcminute spatial resolution, has discovered an unresolved hard (20-40 keV) X-ray emission within the central 10 pc. This emission is consistent with either stellar origins, such as large populations of intermediate polars, low-mass X-ray binaries, or millisecond pulsars, or diffuse origins, such as cosmic-ray outows from the supermassive black hole Sagittarius A*. However, each of these explanations implies source properties peculiar to this central region. In particular, the implied average white dwarf mass for the intermediate polar population is $> 0.8 M_{\odot}$. The relation of this population to the much lighter $\sim 0.5 M_{\odot}$ population implied by previous Chandra and XMM-Newton measurements of the surrounding ~ 50 pc, or to the ~ 0.5-$0.8 M_{\odot}$ populations implied by previous Galactic bulge and ridge, nearby field, or SDSS survey measurements, is unclear. We present in this contribution details of the central hard X-ray discovery, as well as follow-up work on a possible intermediate polar interpretation. Using the broad-band (3-79 keV) energy resolution of NuSTAR and observations of the intermediate polars TV Columbae and IGR J17303-2601, we argue that both the broad-band NuSTAR measurement of the central 10 pc and the low-energy measurements of the surrounding ~ 50 pc could be attributed to a single population of intermediate polars with mean white dwarf mass $\sim 0.85 M_{\odot}$.

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