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INTEGRAL/IBIS 9-year Galactic Hard X-Ray Survey⋆

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ABSTRACT

Context. The INTEGRAL observatory operating in a hard X-ray/gamma domain gathered a large observational data set over nine years since 2003. Dominant fraction of the observing time was dedicated to the Galactic source population study making the possibility of the deepest Galactic survey in hard X-rays ever compiled.
Aims. The aim of the current Galactic survey is to make a basis for Galactic source population studies, and perform mapping of the Milky Way in hard X-rays over the maximum exposure available at $|b| < 17.5°$.
Methods. We used sky reconstruction algorithms specially developed for the high quality imaging of INTEGRAL/IBIS data.
Results. We present sky images, sensitivity maps, and catalogs of detected sources in three energy bands: $17-60$, $17-35$, and $35-80$ keV in the Galactic plane at $|b| < 17.5°$. The total number of sources in the referenced $17-60$ keV band includes 402 (392) objects exceeding a 4.7σ (5σ) detection threshold on the 9-years time-averaged map. Among the identified sources with known and tentatively identified nature, 251 are Galactic objects (107 low-mass X-ray binaries, 81 high-mass X-ray binaries, 35 cataclysmic variables, and 28 of other types) and 111 are extragalactic objects, including 108 active galactic nuclei (AGNs) and 3 galaxy clusters. The sample of Galactic sources with $S/N > 5\sigma$ has an identification completeness of $\sim 91\%$, which is valuable for population studies.

Key words. Surveys – X-rays: general – Catalogs

1. Introduction

A large fraction of astrophysical phenomena could not be studied via observations of individual sources, but rather require studies of their statistics. Last decades have provided us great opportunities for studies of populations of compact sources (black holes, neutron stars, white dwarfs) in our Galaxy and nearby galaxies.

In particular, surveys of the sky in hard X-rays were performed with the IBIS telescope (Ubertini et al., 2003) of INTEGRAL observatory (Winkler et al., 2003) and Burst Alert Telescope (BAT; Barthelmy et al., 2005) at the *Swift* observatory (Gehrels et al., 2004). In contrast to *Swift*, with a nearly uniform all-sky survey, especially useful for studies of active galactic nuclei (AGN; Tueller et al., 2010; Cusumano et al., 2010; Ajello et al., 2012), the INTEGRAL observatory provides the sky survey with exposure that is more concentrated to the Galactic plane (GP) and has better angular resolution, which is essential in these crowded regions. This makes the *Swift*/BAT and INTEGRAL/IBIS surveys complementary to each other.

The INTEGRAL observatory has been successfully operating in orbit since its launch in 2002. Over last years INTEGRAL data allowed us to construct a high quality catalogues (Revnivtsev et al., 2004b, 2006; Molkov et al., 2004; Krivonos et al., 2005, 2007b, 2010b; Bird et al., 2006, 2007, 2010), to reveal new types of sources (Courvoisier et al., 2003; Revnivtsev et al., 2003d; Sguera et al., 2006), to calculate statistics of active galactic nuclei (Sazonov et al., 2007; Bassani et al., 2006; Beckmann et al., 2009), of low mass X-ray binaries (Revnivtsev et al., 2008a), high mass X-ray binaries (Lutovinov et al., 2005b, 2007; Bodaghee et al., 2007, 2012), cataclysmic variables (Revnivtsev et al., 2008b; Scaringi et al., 2010).

In our previous papers (Krivonos et al., 2010a,b), we presented the 7-year hard X-ray all-sky survey in the energy range $17-60$ keV based on the improved sky reconstruction method for the IBIS telescope. The sensitivity of the survey was significantly improved by suppressing the systematic noise.

Here we present the selected 9-year averaged sky images, sensitivity maps, and catalogue of the sources detected in the Galactic plane ($|b| < 17.5°$) in three energy bands: $17-60$, $17-35$, and $35-80$ keV. This survey is the most sensitive X-ray survey of the Galaxy, existing so far and it can be: 1) a basis for studies of statistics of different types of sources in our Galaxy, and 2) a guiding line for new surveys of a new generation of hard X-ray focusing telescopes (e.g. NuSTAR Harrison et al. (2010), Astro-H Takahashi et al. (2010)).

The full set of sky maps is available at the SkyView Virtual Observatory[1] (McGlynn et al., 1998) and Russian Science Data Center[2] for the INTEGRAL observatory at Space Research Institute (IKI), Moscow.

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[1] http://skyview.gsfc.nasa.gov/
[2] http://hea.iki.rssi.ru/integral

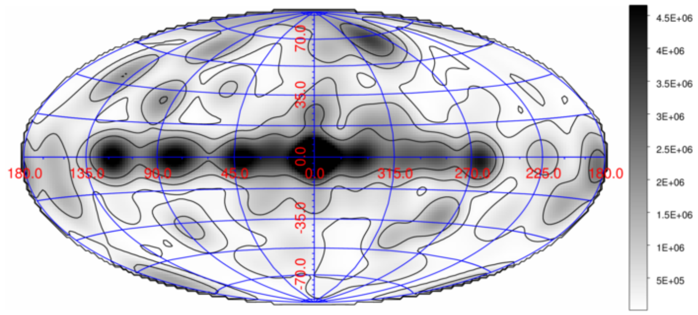

Fig. 1. Dead time-corrected exposure map of the INTEGRAL all-sky survey (January 2011, public data). The grid gap in the Galactic latitude is 17.5° which is a half-height of the current Galactic survey. Blue contours represent exposure levels of 10, 150, 800, 2000 and 4000 ks. The effective exposure in the GC region is 12 Ms, which corresponds to 26 Ms of a nominal time.

Table 1. The Galactic survey sky mapping configuration.

Mosaics name	glon	glat	width × height
GAL-Survey−GC	0.0°	0.0°	35° × 35°
GAL-Survey+50	+50.0°	0.0°	70° × 35°
GAL-Survey−50	−50.0°	0.0°	70° × 35°
GAL-Survey+115	+115.0°	0.0°	70° × 35°
GAL-Survey−115	−115.0°	0.0°	70° × 35°
GAL-Survey−AC	180.0°	0.0°	70° × 35°

2. Survey

In order to conduct the current Galactic survey, we selected publicly available INTEGRAL data from December 2002 to January 2011 (spacecraft revolutions 26-1013). Every individual INTEGRAL observation with typical exposure time of 2 ks (so called *Science Window*, *ScW*) was analyzed with a specially developed software package (see e.g. Krivonos et al. 2010a and references therein) to produce sky images in three energy bands: $17-60$, $17-35$, and $35-80$ keV. In contrast to our previous surveys the flux scale in each *ScW* sky image was adjusted using the flux of the Crab nebula measured in the nearest observations. This procedure was used to account for the ongoing detector degradation and loss of a sensitivity at low energies.

In total we obtained 73489 sky images in each band, which comprises $\sim$ 132 Ms of the effective (dead time-corrected) exposure. The survey sky mapping was organized in 6 overlapped Galactic Cartesian projections centered at zero Galactic latitude as listed in Table 1. The latitude coverage of the survey $|b| < 17.5°$ was chosen with the IBIS/ISGRI field of view ($28° \times 28°$) and standard $5° \times 5°$ observational pattern in mind. Thus, we used all observations performed by INTEGRAL in the Galactic plane. Fig. 1 demonstrates the INTEGRAL exposure map of publicity available observations up to January 2011.

The survey sky coverage versus the 5.0σ limiting flux is shown in Fig. 2. The peak sensitivity of the survey is 3.3×10^{-12} erg s^{-1} cm^{-2} ($\sim$ 0.23 mCrab in 17-60 keV) at a 5σ detection level. As it can be seen from the Figure the survey covers 90% of the geometrical area (12680 degrees) down to the flux limit of 2.2×10^{-11} erg s^{-1} cm^{-2} ($\sim$ 1.56 mCrab) and 10% of the total area down to the flux limit of 5.6×10^{-12} erg s^{-1} cm^{-2} ($\sim$ 0.4 mCrab).

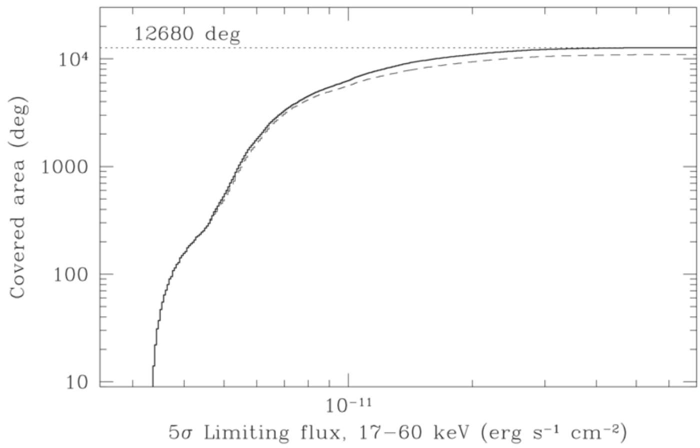

Fig. 2. Sky area as a function of the limiting flux for the source detection with a 5σ significance (solid line). The black dashed curve shows the sky coverage with the masked area around bright sources listed in Table 2. The dotted line represents the geometrical area.

2.1. Systematic noise

INTEGRAL/IBIS deep sky mosaics are usually affected by a systematic noise caused by the source confusion in the region of GC and the imperfect sky reconstruction (Krivonos et al., 2010a).

A large field of view (FOV) of the INTEGRAL/IBIS telescope leads to a high probability to have some bright X-ray source within the instrument FOV during any galactic observations. Therefore, in order to work at the level of the wanting Poisson noise, the INTEGRAL/IBIS telescope image reconstruction procedure should have a dynamic range of 10^3 and more, which is very difficult to achieve due to the imperfect modelling of the mask shadow, the individual pixels sensitivity, the variability of the background pattern, etc.

In spite of that the latest version of the IBIS sky image reconstruction allows us to reach the dynamic range of the images $\sim 10^3$, some sky artefacts are still present around bright sources, such as Crab, Sco X-1, Cyg X-1, Cyg X-3, Vela X-1, GX 301-2, and GRS 1915+105 (see a sky mosaic at $l = 50°$ in Fig. 3). To prevent false detections we masked out circular regions around bright sources with radii listed in Table 2. Note that known sources with $S/N > 10\sigma$ falling inside these regions were included in the source catalogue. A rejecting of areas with a high systematic noise significantly improved the quality of the survey mosaics, which is demonstrated in Fig. 4, where we show a distribution of S/N values of pixels in the sky mosaic at $l = 50°$. As seen from Fig. 4, the masked sky image does not contain strong deviations from the Gaussian distribution in contrast to the original image. Masked areas around bright sources reduces the geometrical area of the survey by 14% (Fig. 2).

Systematic effects are less important in harder energy bands. Fig. 5 shows that a sky image of the GC region in the $35-80$ keV energy range practically free from the systematic noise, which is confirmed by the signal-to-noise distribution of image pixels in Fig. 6.

2.2. Detection threshold

Given IBIS/ISGRI angular resolution of the survey sky map contains $\sim 3 \times 10^5$ statistically independent pixels. Taking into account a minor contribution of the systematic noise we adopted a

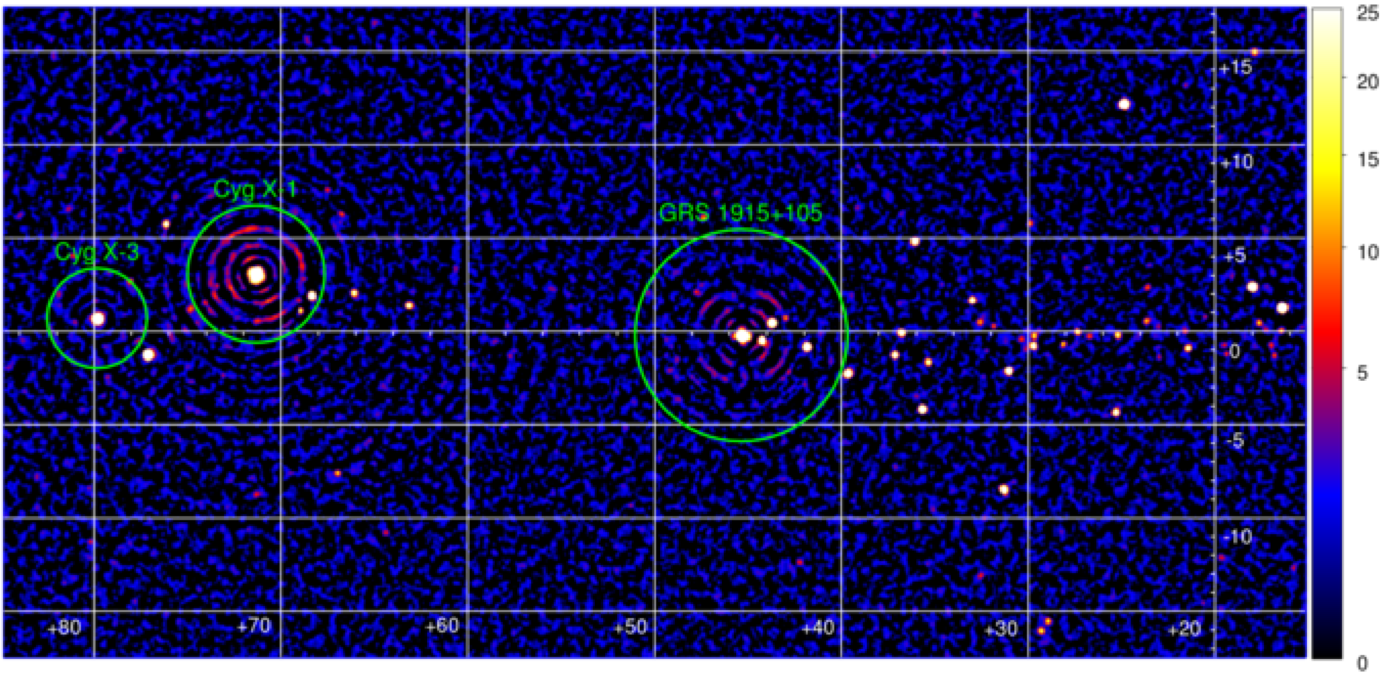

Fig. 3. INTEGRAL/IBIS hard X-ray (17 − 60 keV) map of the sky region of Cyg X-1, Cyg X-3, and GRS 1915+105 at $l = 50^\circ$ (*GAL-Survey+50* in Table 1) with masked area shown as green circles. The corresponding Signal-to-Noise ratio distribution of pixels is shown in Fig. 6.

Table 2. Exclusion radius around bright sources.

Name	Exclusion radius, deg.
Crab	23.3
Sco X-1	14.0
Cyg X-1	3.8
Cyg X-3	2.7
Vela X-1	3.0
GX 301-2	2.0
GRS 1915+105	5.7

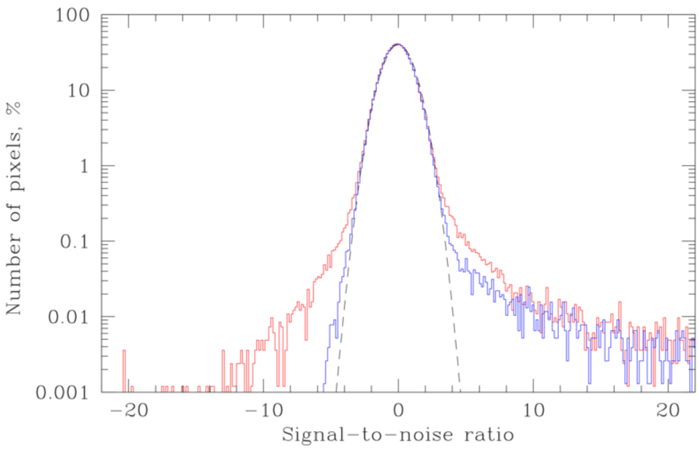

Fig. 4. Signal-to-noise ratio distribution of a number of pixels in the 17 − 60 keV map of Fig. 3. Red and blue histograms show distributions of pixels in full and masked images, respectively. The dashed line represents the normal distribution with unit variance and zero mean.

conservative detection threshold of $(S/N)_{\rm lim} > 5.0\sigma$ to ensure that the final catalog contains no more than one spurious source.

A source detection in the region of ∼17 degrees around GC should be taken with a special care because of the possible false peaks induced by the systematic noise. The latter is revealed by a distorted shape significantly different from the instrumental point-spread function (PSF) which is a 2D Gaussian ($\sigma = 5'$). The sky map of the GC region contains 8 peaks above 5σ in the reference 17 − 60 keV energy band. All these candidate sources have a very distorted shape, and none of them have been detected in the 35 − 80 keV energy range, which also points out to a possibility of a false detection. Therefore all excesses in the GC region have been attributed to the systematic noise.

3. Catalog of sources

The full list of sources is presented in Table 4, and its contents are described below.

Column (1) "Id" – source sequence number in the catalog.

Column (2) "Name" – source name. Their common names are given for sources whose nature was known before their detection by INTEGRAL. Sources discovered by INTEGRAL or those whose nature was established thanks to INTEGRAL observations are named "IGR"

Columns (3,4) "RA, Dec" – source equatorial (J2000) coordinates.

Column (5,6,7) "Flux" – time-averaged source flux in the 17 − 60 keV, 17 − 35 keV and 35 − 80 keV energy bands respectively.

Column (8) "Type" – general astrophysical type of the object: LMXB (HMXB) – low- (high-) mass X-ray binary, AGN – active galactic nucleus, SNR – supernova remnant, CV – cataclysmic variable, PSR – isolated pulsar or pulsar wind nebula (PWN), SGR – soft gamma repeater, RS CVn – coronally active binary star, SymbStar – symbiotic star, Cluster – cluster of galaxies. The question mark indicates that the specified type is not firmly determined, so it should be confirmed. Determination

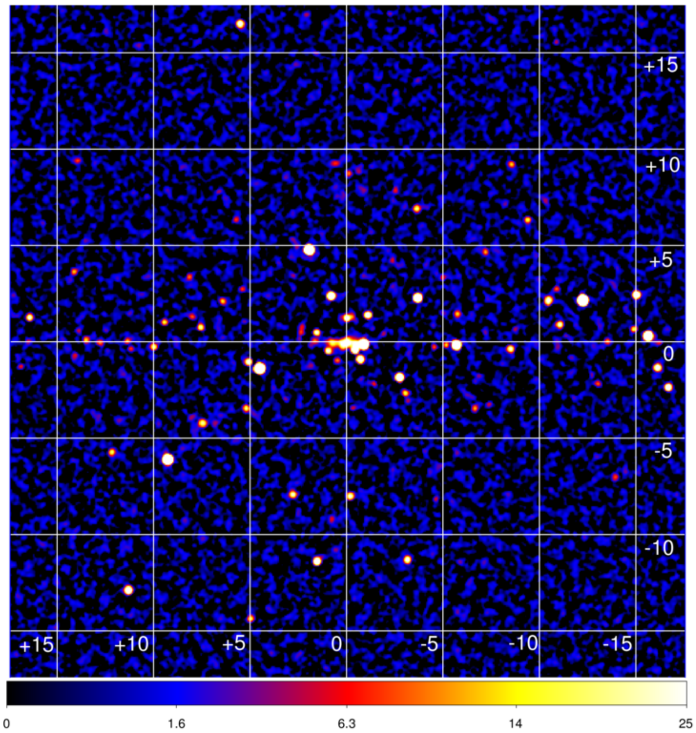

Fig. 5. INTEGRAL/IBIS hard X-ray ($35-80$ keV) map of the sky region around the GC. The total exposure is about 26 Ms in the GC region. The image shown is in terms of S/N ratio with color map ranging from 0 to 25. Such color scheme is used to emphasize sky background variations. The black and blue colors correspond to pixel values from 0 to 2. The red pixels have values of around 5. The yellow to white color transition corresponds to 15 and more. Fig. 6 demonstrates a corresponding Signal-to-Noise ratio distribution of pixels.

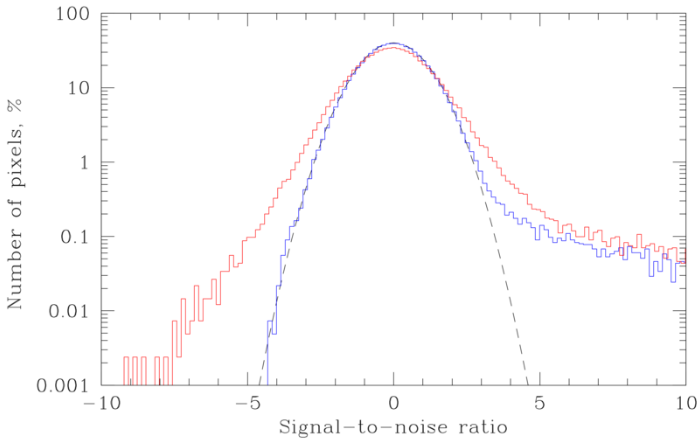

Fig. 6. Signal-to-noise ratio distribution of a number of pixels in the hard X-ray image shown in Fig. 5. The dashed line represents the normal distribution with unit variance and zero mean. Red and blue histograms show pixel distributions for images in energy band $17-60$ keV (high systematic noise, see text) and $35-80$ keV, respectively.

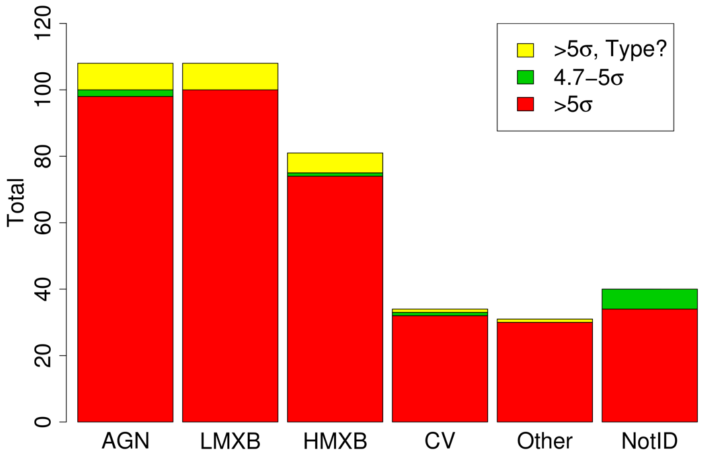

Fig. 7. Chart for source classes detected at $S/N > 5\sigma$ (red), $4.7\sigma < S/N < 5\sigma$ (green) in the reference $17-60$ keV energy range (see Table 4 for details). Yellow bar denotes number of sources with a tentative association with a given type of objects.

of the sources nature is complicated and permanently ongoing process. During compilation of the catalog we were selecting the most recent or reliable, from our point of view, identifications from the literature. In some cases (when references are not given) the identifications have been done using recent observations of the Chandra, XMM-Newton and Swift observatories, Simbad and NED databases as well as the $2MASS$ catalogue.

Column (9) "Ref." – references. These are mainly provided for new sources and are related to their discovery and/or nature.

Column (10) "Notes" – additional notes such as type subclass, redshift information, alternative source names. Redshift of the extragalactic sources was obtained from the SIMBAD and NED database.

4. Concluding remarks

We present detailed source statistics in Table 4 and chart for source types in Fig. 7. Current Galactic survey has identification completeness of $(N_{Tot} - N_{NotID})/N_{Tot} = 1 - 34/392 \approx 0.91$, which provides strong statistical basis for population studies. Particularly, in the complement paper by Lutovinov et al., (2012, in prep.) we used the Galactic source sample and sensitivity maps from the current survey to study the HMXBs luminosity function and their spatial distribution in the Galactic disk.

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Table 4. Census for Galactic and extragalactic sources at $|b| < 17.5^{\circ}$

Energy range, keV	AGN	LMXB	HMXB	CV	Other	NotID	Total
$17-60$	98+2*+8^{s}	99+8^{s}	74+1*+6^{s}	33+1*+1^{s}	30+1^{s}	34+6*	392+10*
$17-35$	83+4*+7^{s}	96+1*+7^{s}	74 +5^{s}	34+1^{s}	28	25+2*	360+7*
$35-80$	72+3*+3^{s}	78+1*+5^{s}	65+1*+4^{s}	13	26	9	275+5*

Notes. Number marked with a star denotes number of known catalogued sources with $4.7\sigma < S/N < 5\sigma$. The number of sources with a tentative classification is denoted with S index. All the sources with S index are above the 5σ detection threshold. Fig. 7 shows the chart for source classes detected in the $17-60$ keV energy band.

Table 3. The catalog of sources† detected during the INTEGRAL/IBIS 7-year all-sky survey.

Id	Name	RA deg	Dec deg	$F_{17-60\ keV}$* erg $cm^{-2}s^{-1}$	$F_{17-35\ keV}$* erg $cm^{-2}s^{-1}$	$F_{35-80\ keV}$* erg $cm^{-2}s^{-1}$	Type	Ref.**	Notes***
1	IGR J00040+7020	1.009	70.326	0.85 ± 0.12 (7.4)	0.50 ± 0.08 (6.5)	0.39 ± 0.12 (3.3)	AGN	1	Sy2 z=0.096;
2	IGR J00234+6141	5.740	61.684	0.73 ± 0.09 (8.5)	0.55 ± 0.06 (9.6)	< 0.18	CV	2,3	
3	TYCHO SNR	6.332	64.140	0.88 ± 0.09	0.56 ± 0.06 (9.7)	0.46 ± 0.09 (5.0)	SNR		
4	SWIFT J0025.8+6818	6.374	68.357	0.83 ± 0.10 (8.2)	0.45 ± 0.07 (6.6)	0.69 ± 0.11 (6.6)	AGN		Sy2 z=0.012; =IGR J00255+6821; ↵ ↳ 2MASX J00253292+6821442;
5	V709 Cas	7.204	59.292	5.10 ± 0.09	3.31 ± 0.06	2.16 ± 0.10	CV	4	
6	IGR J00291+5934	7.263	59.572	2.33 ± 0.09	1.27 ± 0.06	1.58 ± 0.09	LMXB	5,6	V* V1037 Cas
7	IGR J00335+6126	8.331	61.463	0.61 ± 0.09 (7.0)	0.37 ± 0.06 (6.2)	0.37 ± 0.09 (4.0)	AGN	7,8	Sy1.5 z=0.105; ↵ ↳ =IGR J00333+6122;
8	87GB003300.9+593328	8.973	59.828	1.17 ± 0.09	0.82 ± 0.06	0.45 ± 0.10 (4.7)	AGN	9	Blazar z=0.086;
9	IGR J00370+6122	9.286	61.382	0.80 ± 0.09 (9.1)	0.43 ± 0.06 (7.2)	0.53 ± 0.09 (5.7)	HMXB	10	
10	Gamma Cas	14.179	60.715	4.88 ± 0.10	3.72 ± 0.06	1.20 ± 0.10	Star		
11	1A 0114+650	19.514	65.289	10.99 ± 0.10	7.35 ± 0.07	4.56 ± 0.11	HMXB		
12	4U0115+63	19.630	63.743	37.69 ± 0.10	27.99 ± 0.07	9.77 ± 0.11	HMXB		
13	4U0142+61	26.594	61.751	2.63 ± 0.12	1.02 ± 0.08	2.88 ± 0.13	AXP		
14	RJ0146.9+6121	26.674	61.360	1.32 ± 0.12	0.73 ± 0.08 (8.8)	0.55 ± 0.13 (4.3)	HMXB		
15	IGR J01545+6437	28.688	64.624	0.65 ± 0.13 (5.1)	0.36 ± 0.09 (4.2)	0.36 ± 0.13 (2.7)	AGN	11,12	Sy2 z=0.034; LEDA 166414?
16	IGR J02095+5226	32.411	52.447	2.94 ± 0.25	1.84 ± 0.17	1.61 ± 0.26 (6.2)	AGN	13	Sy1 z=0.0492; LEDA 138501; ↵ ↳ 1ES 0206+522; ↳ IGR J02097+5222;
17	IGR J02164+5126	34.103	51.441	1.73 ± 0.28 (6.3)	0.93 ± 0.19 (5.0)	0.78 ± 0.29 (2.7)	AGN	8,14	Sy2 z=0.422;
18	QSO B0212+73	34.419	73.839	1.91 ± 0.25 (7.5)	0.97 ± 0.17 (5.7)	1.54 ± 0.26 (5.8)	AGN		Quasar z=2.367; ↵ ↳ SWIFTJ0218.0+7348;
19	LSI +61 303	40.114	61.210	1.96 ± 0.18	1.05 ± 0.12 (8.8)	1.45 ± 0.18 (7.9)	HMXB		IGR J02403+6113; V* V615 Cas
20	4U 0241+61	41.233	62.463	4.03 ± 0.18	2.10 ± 0.12	3.07 ± 0.19	AGN		Sy1 z=0.044557;
21	SWIFT J0250.2+4650	42.608	46.792	1.48 ± 0.27 (5.4)	0.86 ± 0.19 (4.6)	< 0.55	AGN?	15	2MASX J02502722+4647295;
22	IGR J02501+5440	42.644	54.720	1.15 ± 0.24 (4.9)	0.85 ± 0.16 (5.3)	0.68 ± 0.24 (2.8)	AGN	7,1	Sy2 z=0.015; ↵ ↳ =IGR J02504+5443 (LEDA 166445);
23	PERSEUS CLUSTER	49.982	41.515	3.55 ± 0.19	2.78 ± 0.13	1.16 ± 0.21 (5.4)	Cluster		Thermal emission dominates;
24	IGR J03249+4041	51.272	40.713	0.98 ± 0.19 (5.2)	0.52 ± 0.13 (4.2)	0.87 ± 0.21 (4.2)	AGN	16,17	Sy2 z=0.0476; interacting galaxies; ↵ ↳ LEDA 097012; ↳ 2MASX J03251221+4042021; ↳ =PBC J0325.1+4042; =RX J0325.2+4042; ↳ =SWIFT J0324.9+4044;
25	GK Per	52.798	43.882	2.44 ± 0.20	1.55 ± 0.13	0.97 ± 0.21 (4.5)	CV		
26	IGR J03334+3718	53.355	37.304	1.51 ± 0.17 (8.7)	0.74 ± 0.12 (6.3)	0.92 ± 0.19 (4.7)	AGN	18,19	Sy1 z=0.05583;
27	V0332+53	53.751	53.173	165.13 ± 0.25	109.49 ± 0.17	30.19 ± 0.25	HMXB		
28	4U 0352+30	58.846	31.041	42.41 ± 0.19	23.38 ± 0.13	28.46 ± 0.21	HMXB		X Per;
29	IGR J04059+5416	61.499	54.276	1.23 ± 0.25 (4.9)	0.85 ± 0.17 (4.9)	0.60 ± 0.25 (2.4)			
30	3C111	64.582	38.025	5.99 ± 0.20	3.16 ± 0.13	4.30 ± 0.22	AGN		Sy1 z=0.0485;
31	IGR J04221+4856	65.527	48.948	1.03 ± 0.19 (5.3)	0.66 ± 0.13 (5.0)	0.69 ± 0.21 (3.3)	AGN	20,21	Sy1 z=0.114; ↵ ↳ 1RXS J042201.0+485610;
32	RX J0440.9+4431	70.241	44.532	5.74 ± 0.18	3.51 ± 0.12	3.03 ± 0.20	HMXB	22	
33	UGC03142	70.982	28.993	2.56 ± 0.24	1.37 ± 0.16 (8.3)	1.92 ± 0.25 (7.7)	AGN		Sy1 z=0.021828; ↵ ↳ 1RXS J044350.8+285845;
34	LEDA 168563	73.034	49.550	2.57 ± 0.19	1.41 ± 0.13	1.62 ± 0.21 (7.6)	AGN		Sy1 z=0.029; ↵ ↳ 1RXS J045205.0+493248;
35	IGR J04571+4527	74.302	45.468	1.32 ± 0.19 (7.1)	1.03 ± 0.12 (8.3)	< 0.41	CV	12	non-magnetic CV; ↵

Table 3. Continued.

Id	Name	RA[‡] deg	Dec[‡] deg	$F_{17-60\ keV}$[⋆] erg cm^{-2}s^{-1}	$F_{17-35\ keV}$[⋆] erg cm^{-2}s^{-1}	$F_{35-80\ keV}$[⋆] erg cm^{-2}s^{-1}	Type	Ref.[⋆⋆]	Notes[⋆⋆⋆]
									↳ 1RXS J045707.4+452751;
36	V1062 Tau	75.617	24.776	0.90 ± 0.18 (5.0)	0.68 ± 0.13 (5.4)	0.60 ± 0.18 (3.3)	CV		
37	IGR J05081+1722	77.036	17.345	1.53 ± 0.18 (8.6)	0.67 ± 0.12 (5.4)	1.19 ± 0.18 (6.5)	AGN		Sy2 z=0.0177; ↵ ↳ 2MASX J05081967+1721483;
38	IRAS 05078+1626	77.685	16.499	5.39 ± 0.18	3.04 ± 0.12	3.08 ± 0.18	AGN		Sy1 z=0.017879;
39	RX J0525.3+2413	81.390	24.223	0.86 ± 0.15 (5.9)	0.59 ± 0.10 (5.7)	< 0.29	CV	23	
40	PKS 0528+134	82.774	13.573	1.17 ± 0.17 (6.8)	0.58 ± 0.12 (4.9)	0.74 ± 0.18 (4.1)	AGN		Quasar z=2.07; ↵ ↳ high systematic noise from Crab;
41	Crab	83.630	22.016	1360.35 ± 0.14	788.72 ± 0.10	830.54 ± 0.14	PSR		
42	A 0535+262	84.730	26.316	87.32 ± 0.15	44.86 ± 0.10	96.24 ± 0.15	HMXB		
43	BY Cam	85.718	60.852	2.34 ± 0.39 (6.0)	1.53 ± 0.26 (5.9)	1.05 ± 0.42 (2.5)	CV	4	
44	IGR J05470+5034	86.817	50.604	1.28 ± 0.27 (4.8)	0.73 ± 0.18 (4.1)	0.79 ± 0.30 (2.7)			
45	NGC 2110	88.047	-7.462	14.87 ± 0.25	7.89 ± 0.17	10.75 ± 0.26	AGN		Sy2 z=0.007579;
46	MCG 8-11-11	88.727	46.435	10.72 ± 0.28	6.05 ± 0.19	6.55 ± 0.31	AGN		Sy1 z=0.020484;
47	SWIFT J0558.0+5352	89.531	53.912	2.22 ± 0.33 (6.7)	1.32 ± 0.22 (6.0)	0.87 ± 0.36 (2.4)	CV		V* V405 Aur; DQ Her type
48	IRAS 05589+2828	90.551	28.467	3.23 ± 0.17	1.74 ± 0.12	2.11 ± 0.17	AGN		Sy1 z=0.033; ↵ ↳ =SWIFT J0602.2+2829;
49	4U 0614+091	94.282	9.136	25.51 ± 0.31	16.00 ± 0.21	12.61 ± 0.33	LMXB		
50	IGR J06415+3251	100.368	32.861	3.11 ± 0.36 (8.7)	1.93 ± 0.24 (8.0)	1.54 ± 0.38 (4.0)	AGN	24	Sy2 z=0.017195; ↵ ↳ =SWIFT J0641.3+3257;
51	MXB 0656-072	104.573	-7.209	3.83 ± 0.20	2.52 ± 0.14	1.10 ± 0.21 (5.3)	HMXB		
52	SWIFT J0732.5-1331	113.147	-13.512	2.12 ± 0.20	1.37 ± 0.14 (9.7)	1.10 ± 0.21 (5.3)	CV		DQ Her type
53	IGR J07563-4137	119.071	-41.645	1.05 ± 0.14 (7.4)	0.56 ± 0.10 (5.7)	0.77 ± 0.14 (5.3)	AGN	25,26	Sy2 z=0.021; ↵ ↳ =IGR J07565-4139;
54	IGR J07597-3842	119.930	-38.719	2.85 ± 0.16	1.49 ± 0.11	1.83 ± 0.16	AGN	27,28	Sy1.2 z=0.04;
55	ESO 209-G012	120.490	-49.759	1.65 ± 0.13	0.91 ± 0.09	1.10 ± 0.13 (8.3)	AGN		Sy1 z=0.039587;
56	IGR J08297-4250	127.450	-42.848	0.50 ± 0.10 (5.0)	0.28 ± 0.07 (4.1)	0.36 ± 0.10 (3.5)			
57	Vela pulsar	128.834	-45.181	8.97 ± 0.09	4.95 ± 0.06	5.98 ± 0.10	PSR		
58	4U 0836-429	129.349	-42.897	15.83 ± 0.10	9.01 ± 0.07	9.50 ± 0.10	LMXB		
59	FAIRALL 1146	129.629	-35.990	1.67 ± 0.14	1.04 ± 0.10	0.86 ± 0.15 (5.8)	AGN		Sy1 z=0.031789;
60	IGR J08390-4833	129.699	-48.524	0.84 ± 0.10 (8.7)	0.48 ± 0.07 (7.3)	0.29 ± 0.10 (2.9)	CV	29,30	
61	Vela X-1	135.531	-40.556	256.94 ± 0.11	186.29 ± 0.08	68.98 ± 0.11	HMXB		
62	IGR J09026-4812	135.652	-48.230	1.58 ± 0.10	0.86 ± 0.07	1.05 ± 0.10	AGN	31	Sy1 z=0.0391;
63	IRAS 09149-6206	139.041	-62.340	2.04 ± 0.18	1.14 ± 0.12 (9.3)	1.10 ± 0.19 (5.9)	AGN		Sy1 z=0.05715;
64	IGR J09189-4418	139.730	-44.305	0.51 ± 0.11 (4.7)	0.23 ± 0.07 (3.2)	0.38 ± 0.11 (3.4)			
65	X 0918-548	140.105	-55.205	4.48 ± 0.13	2.86 ± 0.09	2.44 ± 0.13	LMXB		
66	MCG-5-23-16	146.922	-30.947	11.84 ± 0.35	6.64 ± 0.24	7.45 ± 0.37	AGN		Sy2 z=0.008226; ↵ ↳ ESO 434-G040;
67	IGR J09522-6231	148.097	-62.545	0.99 ± 0.14 (6.9)	0.54 ± 0.10 (5.6)	0.77 ± 0.15 (5.3)	AGN	29	Sy1.9 z=0.252; ↵ ↳ =IGR J09523-6231;
68	SWIFT J0958.0-4208	149.419	-42.126	1.35 ± 0.19 (7.0)	0.92 ± 0.13 (7.0)	0.69 ± 0.20 (3.4)			
69	GRO J1008-57	152.450	-58.292	4.94 ± 0.12	3.19 ± 0.08	2.05 ± 0.12	HMXB		
70	IGR J10095-4248	152.454	-42.810	2.17 ± 0.23 (9.4)	1.06 ± 0.16 (6.7)	1.55 ± 0.24 (6.5)	AGN		ESO 263-G013; ↵ ↳ Sy2 z=0.032859;
71	IGR J10100-5655	152.529	-56.912	1.02 ± 0.12 (8.3)	0.66 ± 0.08 (7.8)	0.47 ± 0.13 (3.7)	HMXB	32,28	IGR J10101-5654
72	IGR J10109-5746	152.778	-57.802	1.51 ± 0.12	1.00 ± 0.08	0.62 ± 0.12 (5.0)	CV	33,34	RXP J101103.0-574810; ↵ ↳ Symbiotic binary;
73	3U 1022-55	159.415	-56.794	1.07 ± 0.12 (9.2)	0.75 ± 0.08 (9.4)	0.31 ± 0.12 (2.7)	HMXB		

Table 3. Continued.

Id	Name	RA‡ deg	Dec‡ deg	$F_{17-60\ keV}$* erg cm^{-2}s^{-1}	$F_{17-35\ keV}$* erg cm^{-2}s^{-1}	$F_{35-80\ keV}$* erg cm^{-2}s^{-1}	Type	Ref.**	Notes***
74	IGR J10386-4947	159.688	-49.782	1.24 ± 0.17 (7.5)	0.49 ± 0.11 (4.3)	0.85 ± 0.17 (5.0)	AGN	35	Sy1 z=0.060; ↵ ↳ SWIFT J1038.8-4942;
75	IGR J10404-4625	160.140	-46.397	1.77 ± 0.24 (7.5)	0.82 ± 0.16 (5.1)	1.67 ± 0.24 (7.0)	AGN	25,36	LEDA 93974; Sy2 z=0.024027;
76	IGR J10447-6027	161.162	-60.437	0.74 ± 0.11 (6.6)	0.38 ± 0.08 (4.9)	0.47 ± 0.11 (4.2)		37,38	2MASSJ10445192-6025115;
77	ETA CAR	161.240	-59.714	0.66 ± 0.11 (5.9)	0.28 ± 0.08 (3.6)	0.50 ± 0.11 (4.4)	Star		
78	IGR J11187-5438	169.594	-54.662	0.65 ± 0.12 (5.3)	0.33 ± 0.09 (3.9)	0.41 ± 0.12 (3.3)			
79	1A 1118-61	170.231	-61.922	4.75 ± 0.11	2.90 ± 0.08	1.90 ± 0.11	HMXB		WRAY 15-793; 2E 1118.7-6138; ↵ ↳ SWIFT J1120.9-6155;
80	Cen X-3	170.311	-60.625	64.71 ± 0.11	54.09 ± 0.08	7.84 ± 0.11	HMXB		
81	IGR J11305-6256	172.773	-62.950	2.85 ± 0.11	1.94 ± 0.08	0.94 ± 0.11 (8.2)	HMXB	39,40	
82	IGR J11361-6003	174.082	-60.067	0.80 ± 0.11 (7.2)	0.46 ± 0.08 (5.9)	0.43 ± 0.11 (3.8)	AGN	1	LINER Sy2 z=0.014; ↵ ↳ =IGR J11366-6002;
83	IGR J11435-6109	175.994	-61.128	3.67 ± 0.11	2.20 ± 0.08	1.96 ± 0.11	HMXB	41,40,8	
84	IGR J11459-6955	176.526	-69.943	0.97 ± 0.17 (5.7)	0.41 ± 0.12 (3.5)	0.66 ± 0.17 (3.9)	AGN	12	Sy 1.2, z=0.244; ↵ ↳ 2MASS J11455362-6954017; ↳ SWIFT J1145.6-6956;
85	A1145.1-6141	176.863	-61.971	23.91 ± 0.11	15.47 ± 0.08	10.75 ± 0.11	HMXB		C86;
86	X1145-619	177.000	-62.207	2.43 ± 0.11	1.47 ± 0.08	1.13 ± 0.11 (9.9)	HMXB		C85;
87	IGR J12026-5349	180.690	-53.837	2.92 ± 0.15	1.60 ± 0.10	1.71 ± 0.15	AGN	33,26	WKK0560; Sy2 z=0.028368;
88	1ES 1210-646	183.266	-64.879	1.15 ± 0.12 (9.4)	0.83 ± 0.09 (9.7)	0.36 ± 0.12 (2.9)	HMXB	42	4U 1210-64
89	IGR J12134-6015	183.366	-60.251	0.63 ± 0.12 (5.4)	0.28 ± 0.08 (3.4)	0.56 ± 0.11 (5.0)	HMXB?		1RXS J121324.5-601458;
90	GX 301-2	186.654	-62.772	220.81 ± 0.12	174.28 ± 0.08	29.58 ± 0.12	HMXB		
91	XSS J12270-4859	186.990	-48.887	1.82 ± 0.21 (8.7)	0.95 ± 0.14 (6.6)	1.21 ± 0.21 (5.6)	CV	43	
92	IGR J12349-6434	188.730	-64.564	4.53 ± 0.12	2.79 ± 0.08	2.13 ± 0.12	SymbStr	44,45	V* RT Cru;
93	WKK 1263	190.372	-57.828	1.70 ± 0.13	0.88 ± 0.09	0.99 ± 0.13 (7.8)	AGN		Sy1.5 z=0.024; ↵ ↳ =IGR J12415-5750;
94	IGR J12480-5829	192.013	-58.458	0.70 ± 0.12 (5.7)	0.27 ± 0.09 (3.2)	0.65 ± 0.12 (5.2)	AGN	11,12	Sy1.9 z=0.028; ↵ ↳ =IGR J1248.2-5828;
95	4U 1246-588	192.405	-59.095	4.09 ± 0.12	2.53 ± 0.08	2.29 ± 0.12	LMXB	46,47	
96	2S1254-690	194.416	-69.283	2.76 ± 0.14	2.46 ± 0.10	< 0.29	LMXB		
97	4U 1258-61	195.316	-61.601	2.15 ± 0.12	1.30 ± 0.08	0.95 ± 0.12 (8.1)	HMXB		V* V850 Cen
98	1RXP J130159.6-635806	195.495	-63.969	2.17 ± 0.12	1.48 ± 0.08	1.08 ± 0.12 (9.1)	HMXB	48	C99;
99	PSR B1259-63	195.699	-63.836	1.35 ± 0.12	0.81 ± 0.08 (9.9)	1.00 ± 0.12 (8.4)	HMXB		C98;
100	NGC 4945	196.365	-49.469	15.62 ± 0.17	7.38 ± 0.11	13.03 ± 0.17	AGN		Sy2 z=0.001908;
101	IGR J13107-5551	197.696	-55.874	1.64 ± 0.13	0.79 ± 0.09 (8.8)	1.22 ± 0.13 (9.2)	AGN	33,1	IGR J13109-5552; ↵ ↳ PMN J1310-5552; Sy1 z=0.104;
102	IGR J13186-6257	199.621	-62.958	0.99 ± 0.11 (8.6)	0.68 ± 0.08 (8.6)	0.48 ± 0.12 (4.2)	HMXB?	49	
103	4U 1323-619	201.651	-62.134	11.49 ± 0.11	7.04 ± 0.08	5.90 ± 0.12	LMXB		
104	4U 1344-60	206.899	-60.618	5.49 ± 0.11	3.04 ± 0.08	3.46 ± 0.12	AGN		Sy1.5 z=0.013;
105	IGR J14003-6326	210.128	-63.419	1.14 ± 0.12 (9.9)	0.73 ± 0.08 (9.2)	0.75 ± 0.12 (6.3)	PWN	50,51	ms pulsar
106	IGR J14091-6108	212.274	-61.142	0.60 ± 0.11 (5.2)	0.47 ± 0.08 (5.9)	< 0.24			
107	Circinus galaxy	213.292	-65.341	16.85 ± 0.12	9.43 ± 0.08	9.93 ± 0.12	AGN		Sy2 z=0.001421;
108	IGR J14175-4641	214.267	-46.684	1.31 ± 0.14 (9.1)	0.67 ± 0.10 (6.9)	0.81 ± 0.15 (5.3)	AGN	33,28	Sy2 z=0.076;
109	4U 1416-62	215.284	-62.681	1.04 ± 0.12 (9.0)	0.65 ± 0.08 (8.2)	0.48 ± 0.12 (4.0)	HMXB		
110	IGR J14257-6117	216.413	-61.306	0.73 ± 0.12 (6.3)	0.41 ± 0.08 (5.1)	0.45 ± 0.12 (3.7)			Swift J1424.8-6122
111	IGR J14298-6715	217.457	-67.237	1.04 ± 0.13 (8.0)	0.58 ± 0.09 (6.5)	0.45 ± 0.13 (3.4)	LMXB	50,1	1RXS J142959.9-671447
112	NGC 5643	218.169	-44.189	1.02 ± 0.14 (7.3)	0.50 ± 0.09 (5.4)	0.76 ± 0.15 (5.2)	AGN		Sy2 z=0.003943;
113	IGR J14331-6112	218.264	-61.266	0.90 ± 0.12 (7.8)	0.63 ± 0.08 (8.0)	0.35 ± 0.12 (2.9)	HMXB	50,1	

Table 3. Continued.

Id	Name	RA‡ deg	Dec‡ deg	$F_{17-60\ keV}$⋆ erg $cm^{-2}s^{-1}$	$F_{17-35\ keV}$⋆ erg $cm^{-2}s^{-1}$	$F_{35-80\ keV}$⋆ erg $cm^{-2}s^{-1}$	Type	Ref.⋆⋆	Notes⋆⋆⋆
114	IGR J14471-6414	221.603	-64.275	0.99 ± 0.12 (8.1)	0.39 ± 0.08 (4.6)	0.97 ± 0.13 (7.6)	AGN	50,1	Sy1.2 z=0.053;
115	IGR J14471-6319	221.806	-63.285	0.75 ± 0.12 (6.2)	0.36 ± 0.08 (4.4)	0.65 ± 0.12 (5.2)	AGN	33,28	Sy2 z=0.038;
116	IGR J14488-4009	222.199	-40.148	0.71 ± 0.13 (5.4)	0.47 ± 0.09 (5.4)	0.30 ± 0.14 (2.2)	AGN?	52	Sy2 (?); IGR J14488-4008
117	IGR J14493-5534	222.322	-55.596	1.41 ± 0.12	0.76 ± 0.08 (9.2)	0.92 ± 0.12 (7.4)	AGN	29	2MASX J14491283-5536194;
118	IGR J14515-5542	222.900	-55.684	1.48 ± 0.12	0.80 ± 0.08 (9.8)	1.08 ± 0.12 (8.7)	AGN	32,28	WKK 4374; Sy2 z=0.018;
119	IGR J14536-5522	223.403	-55.354	1.02 ± 0.12 (8.5)	0.77 ± 0.08 (9.4)	0.34 ± 0.12 (2.8)	CV	32,43	Polar
120	IGR J14552-5133	223.836	-51.577	1.07 ± 0.13 (8.5)	0.60 ± 0.09 (7.1)	0.67 ± 0.13 (5.2)	AGN	33,28	WKK 4438; Sy1 z=0.016;
121	IC 4518A	224.421	-43.130	1.75 ± 0.13	0.97 ± 0.09	0.86 ± 0.13 (6.3)	AGN		Sy2 z=0.016261;
122	SWIFT J1508.6-4953	227.154	-49.874	0.75 ± 0.12 (6.3)	0.43 ± 0.08 (5.3)	0.65 ± 0.12 (5.4)			PMN J1508-4953; ↵ ↳ Radio-source; ;
123	IGR J15094-6649	227.341	-66.828	1.79 ± 0.14	1.16 ± 0.10	0.58 ± 0.15 (4.0)	CV	33,43	
124	PSR 1509-58	228.483	-59.143	10.94 ± 0.12	5.73 ± 0.08	7.93 ± 0.12	PSR		
125	4U 1516-569	230.169	-57.168	5.84 ± 0.12	5.16 ± 0.08	0.39 ± 0.12 (3.4)	LMXB		
126	IGR J15335-5420	233.373	-54.358	0.55 ± 0.11 (5.1)	0.33 ± 0.07 (4.4)	0.42 ± 0.11 (3.9)			
127	IGR J15360-5750	234.002	-57.814	1.44 ± 0.12	0.78 ± 0.08 (9.9)	0.94 ± 0.12 (8.1)	AGN?	33,53	=IGR J15359-5750; ↵ ↳ CXO J153602.7-574853;
128	IGR J15390-6226	234.793	-62.474	1.00 ± 0.13 (7.5)	0.53 ± 0.09 (5.9)	0.52 ± 0.14 (3.8)	LMXB?	54	SWIFT J1539.2-6227
129	IGR J15414-5030	235.389	-50.491	0.63 ± 0.10 (6.1)	0.39 ± 0.07 (5.4)	0.39 ± 0.10 (3.8)	CV?	49	Galactic source; ↵ ↳ =IGR J15415-5029;
130	4U 1538-522	235.597	-52.386	21.58 ± 0.10	16.61 ± 0.07	4.73 ± 0.10	HMXB		
131	XTE J1543-568	236.024	-56.729	0.55 ± 0.11 (4.9)	0.17 ± 0.08 (2.2)	0.37 ± 0.11 (3.3)	HMXB		
132	4U 1543-624	236.963	-62.571	3.22 ± 0.14	2.64 ± 0.09	0.42 ± 0.14 (3.0)	LMXB		
133	NY Lup	237.057	-45.477	5.99 ± 0.11	3.72 ± 0.07	2.99 ± 0.11	CV		1RXS J154814.5-452845
134	1E 1547.0-5408	237.729	-54.295	1.52 ± 0.10	0.65 ± 0.07 (9.1)	1.39 ± 0.10	PSR		
135	XTE J1550-564	237.746	-56.475	19.41 ± 0.11	9.32 ± 0.08	15.98 ± 0.11	LMXB		
136	IGR J15539-6142	238.423	-61.679	0.88 ± 0.14 (6.5)	0.33 ± 0.09 (3.6)	0.77 ± 0.14 (5.6)	AGN	50,55	ESO 136-6; Sy2 z=0.014997;
137	ESO 389- G 002	238.712	-37.661	0.89 ± 0.15 (6.0)	0.62 ± 0.10 (6.1)	0.48 ± 0.15 (3.2)	AGN	12	Sy2 z=0.0194; ↵ ↳ =IGR J15549-3740;
138	4U 1556-605	240.303	-60.704	0.80 ± 0.13 (6.0)	0.57 ± 0.09 (6.3)	< 0.27	LMXB		
139	IGR J16058-7253	241.481	-72.901	1.59 ± 0.22 (7.3)	0.86 ± 0.15 (5.9)	1.00 ± 0.23 (4.3)	AGN	56	SWIFT J1605.7-7250; ↵ ↳ two AGNs?;
140	WKK 6092	242.998	-60.631	1.49 ± 0.13	0.85 ± 0.09 (9.2)	1.09 ± 0.14 (8.0)	AGN		Sy1 z=0.016; ↵ ↳ =IGR J16119-6036;
141	4U 1608-522	243.179	-52.424	24.14 ± 0.10	15.22 ± 0.07	12.39 ± 0.10	LMXB		
142	IGR J16167-4957	244.141	-49.978	1.67 ± 0.09	1.18 ± 0.07	0.40 ± 0.09 (4.3)	CV	57,4	1RXS J161637.2-495847;
143	IGR J16175-5059	244.350	-50.937	0.62 ± 0.09 (6.5)	0.30 ± 0.07 (4.5)	0.64 ± 0.09 (6.8)	PSR		PSR J1617-5055
144	IGR J16181-5407	244.525	-54.113	0.53 ± 0.10 (5.3)	0.32 ± 0.07 (4.6)	0.24 ± 0.10 (2.4)			2PBC J1618.1-5405
145	IGR J16185-5928	244.648	-59.465	1.20 ± 0.13 (9.4)	0.63 ± 0.09 (7.1)	0.69 ± 0.13 (5.4)	AGN	33,28	WKK 6471; Sy1 z=0.035;
146	IGR J16195-4945	244.881	-49.741	2.10 ± 0.09	1.44 ± 0.07	0.85 ± 0.09 (9.2)	HMXB	57,58	AX J161929-4945;
147	IGR J16195-2807	244.882	-28.132	2.72 ± 0.23	1.88 ± 0.17	1.36 ± 0.22 (6.1)	LMXB	25,59	SyXB; 1RXS J161933.6-280736; ↵ ↳ =IGR J16194-2810;
148	IGR J16207-5129	245.194	-51.503	3.78 ± 0.10	2.27 ± 0.07	1.84 ± 0.09	HMXB	57,58	
149	4U 1624-49	247.006	-49.203	4.44 ± 0.09	4.02 ± 0.07	0.23 ± 0.09 (2.5)	LMXB		
150	IGR J16283-4838	247.068	-48.659	0.84 ± 0.09 (8.9)	0.53 ± 0.07 (8.1)	0.36 ± 0.09 (3.9)	HMXB	60,61	
151	IGR J16287-5021	247.125	-50.368	0.55 ± 0.09 (5.8)	0.52 ± 0.07 (7.9)	< 0.19	LMXB	12	
152	IGR J16293-4603	247.369	-46.081	0.56 ± 0.10 (5.8)	0.33 ± 0.07 (4.9)	0.19 ± 0.09 (2.0)	LMXB	62,63	SyXB?
153	IGR J16318-4848	247.952	-48.816	29.84 ± 0.09	18.59 ± 0.07	13.12 ± 0.09	HMXB	64,65	
154	IGR J16320-4751	248.008	-47.877	20.98 ± 0.09	14.60 ± 0.07	6.54 ± 0.09	HMXB	66,67,68	AX J1631.9-4752

Table 3. Continued.

Id	Name	RA‡ deg	Dec‡ deg	$F_{17-60\ keV}$* erg $cm^{-2}s^{-1}$	$F_{17-35\ keV}$* erg $cm^{-2}s^{-1}$	$F_{35-80\ keV}$* erg $cm^{-2}s^{-1}$	Type	Ref.**	Notes***
155	4U 1626-67	248.075	-67.465	21.36 ± 0.21	17.50 ± 0.14	2.82 ± 0.22	LMXB		
156	IGR J16336-4733	248.396	-47.559	4.80 ± 0.09	2.80 ± 0.07	2.69 ± 0.09			C157;
157	4U 1630-47	248.524	-47.390	24.29 ± 0.09	14.52 ± 0.07	13.71 ± 0.09	LMXB		C156,159;
158	ESO 137-G34	248.829	-58.085	1.19 ± 0.12 (9.6)	0.65 ± 0.09 (7.5)	0.95 ± 0.12 (7.6)	AGN		Sy2 z=0.009113;
159	IGR J16358-4726	248.992	-47.407	0.89 ± 0.09 (9.4)	0.49 ± 0.07 (7.4)	0.49 ± 0.09 (5.3)	LMXB	69,70	C157; symbiotic X-ray binary
160	Triangulum A	249.546	-64.377	1.45 ± 0.19 (7.6)	1.05 ± 0.13 (8.1)	0.41 ± 0.19 (2.1)	Cluster		z=0.051;
161	IGR J16385-2057	249.643	-20.914	0.93 ± 0.17 (5.5)	0.65 ± 0.13 (5.0)	0.61 ± 0.15 (4.0)	AGN		1RXSJ163830.9-205520; ↵ ↳ Sy1 z=0.0269;
162	AX J163904-4642	249.774	-46.705	6.08 ± 0.10	4.95 ± 0.07	0.98 ± 0.09	HMXB	71	
163	4U 1636-536	250.229	-53.754	30.36 ± 0.10	20.66 ± 0.07	12.02 ± 0.10	LMXB		
164	IGR J16418-4532	250.463	-45.536	4.91 ± 0.10	3.42 ± 0.07	1.63 ± 0.09	HMXB	72,73	
165	GX 340+0	251.448	-45.613	37.46 ± 0.10	34.17 ± 0.07	1.66 ± 0.09	LMXB		
166	IGR J16465-4507	251.648	-45.118	1.66 ± 0.10	1.21 ± 0.07	0.61 ± 0.09 (6.4)	HMXB	74,75	C167;
167	IGR J16479-4514	252.023	-45.210	4.87 ± 0.10	3.11 ± 0.07	2.15 ± 0.09	HMXB	76,68	2MASS J16480656-4512068;
168	IGR J16482-3036	252.053	-30.575	2.32 ± 0.11	1.27 ± 0.08	1.79 ± 0.12	AGN	25,36	Sy1 z=0.031; ↵ ↳ 2MASX J16481523-3035037;
169	IGR J16493-4348	252.369	-43.822	2.60 ± 0.10	1.59 ± 0.07	1.38 ± 0.10	HMXB	77,78	2MASS J16492695-4349090;
170	IGR J16500-3307	252.488	-33.113	1.75 ± 0.11	1.27 ± 0.07	0.62 ± 0.11 (5.7)	CV	25,1	IP; 1RXS J164955.1-330713;
171	NGC 6221	253.048	-59.219	1.69 ± 0.14	1.02 ± 0.10	0.92 ± 0.14 (6.4)	AGN		Sy2 z=0.004750; ↵ ↳ May contain flux from ESO 138-G1;
172	XTE J1652-453	253.075	-45.345	1.73 ± 0.10	1.04 ± 0.07	1.01 ± 0.09	LMXB?	79	Black hole candidate;
173	GRO J1655-40	253.499	-39.845	10.41 ± 0.10	5.69 ± 0.07	7.14 ± 0.10	LMXB		
174	IGR J16547-1916	253.706	-19.269	1.33 ± 0.14 (9.3)	1.02 ± 0.11 (9.6)	0.61 ± 0.14 (4.3)	CV	12,80	IP; RXS J165443.5-191620;
175	IGR J16560-4958	253.963	-49.987	0.54 ± 0.10 (5.4)	0.25 ± 0.07 (3.6)	0.44 ± 0.10 (4.5)			
176	IGR J16558-5203	254.034	-52.081	2.13 ± 0.11	1.16 ± 0.07	1.50 ± 0.10	AGN	57,28	Sy1.2 z=0.054;
177	IGR J16562-3301	254.089	-33.038	2.23 ± 0.09	1.13 ± 0.07	1.83 ± 0.10	AGN	81	BL Lac; SWIFT J1656.3-3302;
178	MAXI J1659-152	254.761	-15.256	14.61 ± 0.17	9.59 ± 0.13	6.67 ± 0.16	LMXB	82	Black hole candidate;
179	AX J1700.2-4220	255.077	-42.338	1.61 ± 0.10	0.93 ± 0.07	0.76 ± 0.10 (8.0)	HMXB	43	
180	OAO 1657-415	255.203	-41.655	82.92 ± 0.10	53.23 ± 0.07	35.96 ± 0.09	HMXB		
181	XTE J1701-462	255.243	-46.195	3.22 ± 0.10	2.98 ± 0.07	$<$ 0.19	LMXB		
182	IGR J17014-4306	255.337	-43.092	0.72 ± 0.10 (7.2)	0.46 ± 0.07 (6.6)	0.34 ± 0.10 (3.6)	Star		SWIFT J1701.3-4304; ↵ ↳ 2MASS J17012815-4306123;
183	XTE J1701-407	255.415	-40.868	3.19 ± 0.10	1.83 ± 0.07	2.01 ± 0.10	LMXB	83	
184	GX 339-4	255.707	-48.790	102.50 ± 0.10	55.41 ± 0.07	70.55 ± 0.10	LMXB		
185	4U 1700-377	255.985	-37.845	247.76 ± 0.09	158.55 ± 0.06	111.86 ± 0.09	HMXB		
186	GX 349+2	256.434	-36.420	52.33 ± 0.09	48.61 ± 0.06	0.91 ± 0.09	LMXB		
187	IGR J17062-6143	256.562	-61.703	2.00 ± 0.19	1.17 ± 0.13 (9.2)	1.21 ± 0.19 (6.4)		84	=SWIFT J1706.6-6146;
188	4U 1702-429	256.565	-43.036	16.36 ± 0.10	10.96 ± 0.07	6.84 ± 0.10	LMXB		
189	1RXS J170849.0-400910	257.204	-40.149	1.45 ± 0.09	0.75 ± 0.06	1.18 ± 0.09	AXP		
190	4U 1705-440	257.228	-44.104	23.03 ± 0.10	17.22 ± 0.07	6.86 ± 0.10	LMXB		
191	4U 1705-32	257.229	-32.320	1.93 ± 0.08	1.17 ± 0.05	1.10 ± 0.08	LMXB		
192	IGR J17091-3624	257.289	-36.405	8.96 ± 0.08	4.70 ± 0.06	6.27 ± 0.09	LMXB	85,86	C194;
193	XTE J1709-267	257.399	-26.654	0.99 ± 0.08	0.61 ± 0.06	0.58 ± 0.08 (7.0)	LMXB		
194	IGR J17098-3628	257.485	-36.448	5.57 ± 0.08	2.99 ± 0.06	3.70 ± 0.09	LMXB?	87,88	C192;
195	XTE J1710-281	257.552	-28.132	3.13 ± 0.08	1.77 ± 0.05	1.97 ± 0.08	LMXB		
196	RX J1713.7-3946	258.042	-39.921	0.48 ± 0.09 (5.3)	0.34 ± 0.06 (5.4)	0.21 ± 0.09 (2.3)	SNR		G347.3-0.5; extended source;
197	4U1708-40	258.115	-40.841	0.80 ± 0.09 (8.6)	0.90 ± 0.06	$<$ 0.19	LMXB		
198	Oph cluster	258.116	-23.348	4.83 ± 0.09	3.94 ± 0.06	0.81 ± 0.09 (8.9)	Cluster		

Table 3. Continued.

Id	Name	RA[‡] deg	Dec[‡] deg	$F_{17-60\ keV}$[*] erg $cm^{-2}s^{-1}$	$F_{17-35\ keV}$[*] erg $cm^{-2}s^{-1}$	$F_{35-80\ keV}$[*] erg $cm^{-2}s^{-1}$	Type	Ref.[**]	Notes[***]
199	V2400 Oph	258.153	-24.247	3.24 ± 0.08	2.30 ± 0.06	1.04 ± 0.09	CV		
200	SAXJ1712.6-3739	258.156	-37.643	5.55 ± 0.08	3.34 ± 0.06	3.03 ± 0.09	LMXB		
201	IGR J17157-5449	258.924	-54.805	0.72 ± 0.13 (5.5)	0.34 ± 0.09 (3.8)	0.54 ± 0.13 (4.2)	Star?		HD 155573; ↵ ↳ 1RXS J171535.6-545015;
202	IGR J17164-3803	259.123	-38.040	0.87 ± 0.08	0.66 ± 0.06	0.31 ± 0.09 (3.6)			
203	NGC 6300	259.254	-62.819	5.38 ± 0.21	2.95 ± 0.14	3.44 ± 0.22	AGN		Sy2 z=0.003706;
204	IGR J17174-2436	259.335	-24.606	0.64 ± 0.08 (8.2)	0.43 ± 0.05 (8.0)	0.24 ± 0.08 (3.0)			
205	IGR J17197-3010	259.889	-30.172	0.40 ± 0.07 (5.8)	0.24 ± 0.05 (5.0)	0.21 ± 0.07 (3.0)	LMXB	89	Symbiotic binary
206	IGR J17195-4100	259.906	-41.015	2.57 ± 0.09	1.79 ± 0.06	1.02 ± 0.10	CV	57,43	1RXS J171935.6-410054;
207	XTE J1720-318	259.998	-31.759	0.91 ± 0.07	0.45 ± 0.05 (9.5)	0.63 ± 0.07 (8.9)	LMXB		
208	IGR J17200-3116	260.021	-31.285	2.15 ± 0.07	1.55 ± 0.05	0.58 ± 0.07 (8.2)	HMXB	57,28	1RXS J172006.1-311702;
209	IGR J17204-3554	260.094	-35.912	0.69 ± 0.08 (9.2)	0.37 ± 0.05 (7.0)	0.51 ± 0.08 (6.6)	AGN	25,90	
210	IGR J17233-2837	260.850	-28.622	0.64 ± 0.07 (9.7)	0.35 ± 0.05 (7.6)	0.44 ± 0.07 (6.4)			1RXS J172323.7-283805
211	EXO 1722-363	261.297	-36.284	9.21 ± 0.07	6.66 ± 0.05	2.52 ± 0.08	HMXB		
212	IGR J17254-3257	261.353	-32.964	1.98 ± 0.07	1.16 ± 0.05	1.10 ± 0.07	LMXB	57,91	1RXS J172525.5-325717;
213	4U 1724-30	261.887	-30.800	22.45 ± 0.06	13.39 ± 0.04	11.98 ± 0.07	LMXB		Terzan 2;
214	IGR J17303-0601	262.588	-5.984	4.24 ± 0.17	2.56 ± 0.11	2.18 ± 0.19	CV	57,92	1RXS J173021.5-055933;
215	IGR J17306-2015	262.601	-20.272	1.60 ± 0.09	1.02 ± 0.06	0.71 ± 0.09 (7.9)			
216	IGR J17315-3221	262.818	-32.306	0.43 ± 0.06 (6.6)	0.34 ± 0.04 (7.6)	< 0.13			
217	GX 9+9	262.936	-16.957	13.11 ± 0.11	12.21 ± 0.08	0.41 ± 0.11 (3.6)	LMXB		
218	GX 354-0	262.991	-33.833	56.28 ± 0.07	40.00 ± 0.05	19.36 ± 0.07	LMXB		
219	GX 1+4	263.011	-24.743	71.47 ± 0.07	40.77 ± 0.05	40.93 ± 0.07	LMXB		
220	IGR J17320-1914	263.013	-19.209	0.94 ± 0.09	0.59 ± 0.06 (9.3)	0.45 ± 0.10 (4.7)	CV	4	V2487 Oph;
221	IGR J17331-2406	263.250	-24.147	0.48 ± 0.07 (7.0)	0.25 ± 0.05 (5.2)	0.31 ± 0.07 (4.4)		93	
222	RapidBurster	263.351	-33.391	4.18 ± 0.07	3.21 ± 0.05	1.05 ± 0.07	LMXB		
223	IGR J17350-2045	263.746	-20.745	0.91 ± 0.08	0.49 ± 0.06 (8.7)	0.73 ± 0.08 (8.7)	AGN?		2MASS J17345863-2045292; ↵ ↳ Radio source (?);
224	IGR J17353-3539	263.848	-35.670	0.91 ± 0.07	0.60 ± 0.05	0.34 ± 0.07 (4.6)	LMXB	94	
225	IGR J17353-3257	263.856	-32.921	1.37 ± 0.06	0.78 ± 0.04	0.68 ± 0.07	HMXB	95,49	intermediate SFXT; ↵ ↳ =IGR J17354-3255;
226	IGR J17361-4444	264.076	-44.738	0.58 ± 0.11 (5.1)	0.26 ± 0.08 (3.3)	0.39 ± 0.12 (3.2)	LMXB?	96,97	=IGR J17361-4441
227	GRS 1734-292	264.370	-29.134	6.36 ± 0.06	3.71 ± 0.04	3.70 ± 0.06	AGN		Sy1 z=0.021400;
228	IGR J17379-5957	264.397	-59.956	1.04 ± 0.20 (5.2)	0.64 ± 0.14 (4.7)	0.59 ± 0.20 (3.0)	AGN		Sy2 z=0.0174; ESO 139-12;
229	SLX 1735-269	264.572	-26.992	13.64 ± 0.06	7.99 ± 0.04	7.73 ± 0.06	LMXB		
230	4U 1735-444	264.744	-44.452	26.78 ± 0.12	24.63 ± 0.08	1.13 ± 0.12 (9.3)	LMXB		
231	IGR J17391-3021	264.802	-30.347	1.07 ± 0.06	0.69 ± 0.04	0.35 ± 0.06 (5.5)	HMXB	98,99	XTE J1739-302;
232	GRS 1736-297	264.880	-29.707	0.31 ± 0.06 (5.1)	0.17 ± 0.04 (4.1)	0.18 ± 0.06 (2.9)	LMXB		
233	XTE J1739-285	264.975	-28.496	1.60 ± 0.06	1.02 ± 0.04	0.85 ± 0.06	LMXB		C235;
234	IGR J17402-3656	265.104	-36.925	0.85 ± 0.08	0.46 ± 0.05 (8.9)	0.41 ± 0.08 (5.3)	HMXB?	49	=IGR J17404-3655;
235	SLX 1737-282	265.168	-28.313	4.53 ± 0.06	2.62 ± 0.04	2.70 ± 0.06	LMXB		C233,236;
236	IGR J17407-2808	265.175	-28.133	1.45 ± 0.06	0.80 ± 0.04	0.99 ± 0.06	LMXB?	100,101	CXOU J174042.0-280724
237	IGR J17418-1212	265.487	-12.201	2.04 ± 0.13	1.11 ± 0.09	1.43 ± 0.14	AGN	102,103	2E 1739.1-1210; Sy1 z=0.037;
238	XTE J1743-363	265.744	-36.380	2.43 ± 0.07	1.59 ± 0.05	0.98 ± 0.08	HMXB		SFXT?
239	IGR J17438-0347	265.952	-3.787	0.79 ± 0.14 (5.5)	0.27 ± 0.10 (2.8)	0.42 ± 0.16 (2.6)	AGN		Quasar z=1.054; ↵ ↳ QSO B1741-038;
240	1E 1740.7-294	265.984	-29.735	46.31 ± 0.06	24.52 ± 0.04	33.19 ± 0.06	LMXB		C242,246;
241	IGR J17448-3231	266.190	-32.528	0.53 ± 0.06 (8.5)	0.43 ± 0.04 (9.9)	0.13 ± 0.07 (2.1)	AGN?	104	C247; CXOU J174437.3-323222; ↵ ↳ Blazar (?);

Table 3. Continued.

Id	Name	RA‡ deg	Dec‡ deg	$F_{17-60\ keV}$* erg $cm^{-2}s^{-1}$	$F_{17-35\ keV}$* erg $cm^{-2}s^{-1}$	$F_{35-80\ keV}$* erg $cm^{-2}s^{-1}$	Type	Ref.**	Notes***
242	KS1741-293	266.242	-29.337	4.73 ± 0.06	2.98 ± 0.04	2.32 ± 0.06	LMXB		C240;
243	GRS 1741.9-2853	266.250	-28.917	4.10 ± 0.06	2.78 ± 0.04	1.70 ± 0.06	LMXB		C244,245,248,249;
244	AX J1745.6-2901	266.401	-29.026	7.18 ± 0.06	4.82 ± 0.04	3.11 ± 0.06	NucStrCl	105,106	C242,243,245,248,249; ↵
									↳ =IGR J17456-2901;
									↳ Nuclear stellar cluster;
245	1E 1742.8-2853	266.500	-28.914	7.46 ± 0.06	5.05 ± 0.04	3.16 ± 0.06	LMXB		C243,244,248,249;
246	A 1742-294	266.525	-29.518	15.51 ± 0.06	10.72 ± 0.04	5.87 ± 0.06	LMXB		C240;
247	IGR J17464-3213	266.566	-32.233	21.03 ± 0.06	12.63 ± 0.04	11.83 ± 0.06	LMXB	107	H1743-322/XTE J1746-322;
248	1E 1743.1-2843	266.580	-28.735	5.94 ± 0.06	4.41 ± 0.04	1.80 ± 0.06	LMXB		C249,245;
249	SAX J1747.0-2853	266.761	-28.883	3.51 ± 0.06	2.40 ± 0.04	1.35 ± 0.06	LMXB		C243,244,245,248;
250	IGR J17464-2811	266.817	-28.180	1.98 ± 0.06	1.22 ± 0.04	0.99 ± 0.06	LMXB	108,109	C253; Neutron star LMXB
251	IGR J17473-2721	266.826	-27.349	2.90 ± 0.06	1.62 ± 0.04	1.78 ± 0.06	LMXB	110,111	
252	SLX1744-299/300	266.834	-30.010	9.92 ± 0.06	6.62 ± 0.04	4.31 ± 0.06	LMXB		C246;
253	IGR J17475-2822	266.868	-28.370	2.60 ± 0.06	1.57 ± 0.04	1.31 ± 0.06	MolCld	112	C250; SgrB2;
254	IGR J17475-2253	266.896	-22.872	1.02 ± 0.07	0.56 ± 0.05	0.58 ± 0.07 (8.2)	AGN	113	Sy1 z=0.0463; ↵
									↳ IGR J17476-2253;
255	GX 3+1	266.984	-26.556	14.56 ± 0.06	13.38 ± 0.04	0.49 ± 0.06 (7.7)	LMXB		C259;
256	IGR J17488-3253	267.223	-32.918	1.64 ± 0.06	0.87 ± 0.04	1.25 ± 0.07	AGN	57,28	Sy1 z=0.020;
257	AX J1749.1-2733	267.275	-27.550	1.55 ± 0.06	0.97 ± 0.04	0.71 ± 0.06	HMXB	114,115	C258;
258	AX J1749.2-2725	267.292	-27.421	1.21 ± 0.06	0.72 ± 0.04	0.62 ± 0.06 (9.8)	HMXB	116	C257;
259	GRO J1750-27	267.300	-26.647	5.57 ± 0.06	4.78 ± 0.04	0.56 ± 0.06 (8.8)	HMXB		C255;
260	IGR J17497-2821	267.399	-28.352	2.91 ± 0.06	1.60 ± 0.04	2.02 ± 0.06	LMXB	117,118	
261	SLX 1746-331	267.475	-33.215	0.60 ± 0.06 (9.3)	0.32 ± 0.04 (7.2)	0.36 ± 0.07 (5.3)	LMXB		Black hole X-ray transient;
262	4U 1746-37	267.552	-37.054	2.94 ± 0.08	2.54 ± 0.05	0.26 ± 0.08 (3.2)	LMXB		
263	SAX J1750.8-2900	267.600	-29.038	1.51 ± 0.06	1.01 ± 0.04	0.75 ± 0.06	LMXB		C265;
264	IGR J17505-2644	267.658	-26.734	0.72 ± 0.06	0.50 ± 0.04	0.28 ± 0.06 (4.4)	LMXB?	119	IGR J17507-2647
265	IGR J17507-2856	267.683	-28.922	0.71 ± 0.06	0.52 ± 0.04	0.39 ± 0.06 (6.3)		120	C263;
266	GRS 1747-313	267.695	-31.284	1.39 ± 0.06	0.99 ± 0.04	0.50 ± 0.06 (7.9)	LMXB		Terzan 6;
267	XTE J1751-305	267.815	-30.639	0.31 ± 0.06 (5.0)	0.11 ± 0.04 (2.5)	0.25 ± 0.06 (4.0)	LMXB		ms-pulsar
268	IGR J17513-2011	267.825	-20.211	1.23 ± 0.08	0.67 ± 0.05	0.95 ± 0.08	AGN	25,28	Sy1.9 z=0.047;
269	XTE J1752-223	268.064	-22.349	1.48 ± 0.07	0.75 ± 0.05	1.14 ± 0.07	LMXB		Black hole candidate;
270	SWIFT J1753.5-0127	268.367	-1.451	85.67 ± 0.14	44.64 ± 0.09	64.18 ± 0.16	LMXB		
271	AX J1753.5-2745	268.375	-27.750	0.29 ± 0.06 (4.8)	0.19 ± 0.04 (4.6)	< 0.13			
272	AX J1754.2-2754	268.566	-27.887	0.49 ± 0.06 (8.1)	0.31 ± 0.04 (7.3)	0.27 ± 0.06 (4.2)	LMXB	121	
273	IGR J17544-2619	268.601	-26.322	0.86 ± 0.06	0.67 ± 0.04	0.23 ± 0.06 (3.6)	HMXB	122,123	
274	IGR J17585-3057	269.599	-30.961	0.65 ± 0.06	0.36 ± 0.04 (8.4)	0.44 ± 0.07 (6.7)	LMXB?	124	
275	IGR J17586-2129	269.654	-21.382	2.15 ± 0.07	1.38 ± 0.05	0.79 ± 0.08	HMXB?	49	
276	IGR J17597-2201	269.936	-22.018	3.95 ± 0.07	2.40 ± 0.05	2.04 ± 0.08	LMXB	125,126	XTE J1759-220;
277	V2301 OPH	270.149	8.185	1.30 ± 0.23 (5.8)	0.87 ± 0.15 (5.8)	< 0.51	CV		AM Herculis
278	GX 5-1	270.285	-25.078	61.84 ± 0.07	55.79 ± 0.05	2.83 ± 0.07	LMXB		
279	GRS 1758-258	270.303	-25.744	65.69 ± 0.06	33.74 ± 0.04	49.71 ± 0.07	LMXB		
280	GX 9+1	270.387	-20.517	21.49 ± 0.08	19.98 ± 0.05	0.26 ± 0.08 (3.2)	LMXB		C281;
281	IGR J18027-2016	270.677	-20.278	5.71 ± 0.08	4.11 ± 0.05	1.51 ± 0.08	HMXB	127,128	C280; IGR/SAX J18027-2017;
282	IGR J18027-1455	270.696	-14.911	2.17 ± 0.10	1.18 ± 0.07	1.51 ± 0.11	AGN	57,129	Sy1 z=0.0350; ↵
									↳ RXS J180245.2-145432;
283	IGR J18044-2739	271.115	-27.671	0.67 ± 0.06	0.40 ± 0.04 (9.0)	0.32 ± 0.07 (4.8)	LMXB	130	1RXP J180431.1-273932
284	IGR J18048-1455	271.179	-14.958	0.86 ± 0.10 (8.6)	0.60 ± 0.07 (8.7)	0.28 ± 0.11 (2.6)	CV	25	
285	XTE J1807-294	271.755	-29.436	0.54 ± 0.06 (8.4)	0.32 ± 0.04 (7.0)	0.35 ± 0.07 (5.1)	LMXB		

Table 3. Continued.

Id	Name	RA[‡] deg	Dec[‡] deg	$F_{17-60\ keV}$[⋆] $erg\ cm^{-2}s^{-1}$	$F_{17-35\ keV}$[⋆] $erg\ cm^{-2}s^{-1}$	$F_{35-80\ keV}$[⋆] $erg\ cm^{-2}s^{-1}$	Type	Ref.[⋆⋆]	Notes[⋆⋆⋆]
286	IGR J18078+1123	271.939	11.369	1.20 ± 0.24 (5.0)	0.80 ± 0.16 (4.9)	0.64 ± 0.27 (2.4)	AGN	12	Sy1.2 z=0.078
287	SAX J1808.4-3658	272.106	-36.982	0.71 ± 0.09 (8.3)	0.47 ± 0.06 (8.0)	0.56 ± 0.09 (6.3)	LMXB		ms pulsar
288	SGR 1806-20	272.169	-20.413	2.97 ± 0.08	1.54 ± 0.06	2.18 ± 0.08	SGR		
289	IGR J18088-2741	272.254	-27.704	0.59 ± 0.07 (9.0)	0.42 ± 0.05 (9.2)	0.20 ± 0.07 (2.9)			
290	XTE J1810-189	272.586	-19.069	2.12 ± 0.09	1.23 ± 0.06	1.22 ± 0.09	LMXB		Burster;
291	V4722 Sgr	272.693	-26.148	2.73 ± 0.07	1.57 ± 0.05	1.60 ± 0.07	LMXB		
292	PSR J1811-1925	272.872	-19.423	0.96 ± 0.08	0.46 ± 0.06 (7.8)	0.75 ± 0.09 (8.4)	PSR/PWN		SNR G11.2-0.3;
293	IGR J18134-1636	273.373	-16.620	0.82 ± 0.10 (8.6)	0.44 ± 0.07 (6.7)	0.59 ± 0.10 (5.8)			
294	IGR J18135-1751	273.398	-17.839	1.57 ± 0.09	0.85 ± 0.06	1.06 ± 0.10	SNR/PWN	131,132	HESS J1813-178;
295	GX 13+1	273.631	-17.158	13.71 ± 0.09	11.92 ± 0.06	1.53 ± 0.10	LMXB		
296	M 1812-12	273.776	-12.096	34.25 ± 0.10	19.07 ± 0.07	21.63 ± 0.11	LMXB		
297	GX 17+2	274.006	-14.035	69.43 ± 0.10	62.21 ± 0.07	3.75 ± 0.11	LMXB		
298	IGR J18170-2511	274.303	-25.152	1.08 ± 0.07	0.79 ± 0.05	0.31 ± 0.08 (4.0)	CV	8	IP; =IGR J18173-2509;
299	IGR J18175-1530	274.392	-15.468	0.47 ± 0.10 (4.8)	0.27 ± 0.07 (3.9)	0.25 ± 0.11 (2.3)		133	
300	XTE J1817-330	274.427	-33.021	5.13 ± 0.08	3.21 ± 0.05	2.58 ± 0.08	LMXB		
301	XTE J1818-245	274.618	-24.523	3.29 ± 0.08	2.05 ± 0.05	1.89 ± 0.08	LMXB?		
302	SAX J1818.6-1703	274.687	-17.046	1.56 ± 0.10	1.04 ± 0.07	0.69 ± 0.10 (6.7)	HMXB	1	
303	AX J1820.5-1434	275.136	-14.571	1.79 ± 0.10	1.18 ± 0.07	0.70 ± 0.11 (6.3)	HMXB		
304	IGR J18214-1318	275.328	-13.315	1.85 ± 0.10	1.14 ± 0.07	1.09 ± 0.11 (9.7)	HMXB	25,134	
305	IGR J18219-1347	275.504	-13.803	0.71 ± 0.10 (6.9)	0.50 ± 0.07 (7.2)	< 0.22			
306	4U 1820-303	275.917	-30.364	40.48 ± 0.08	36.14 ± 0.05	2.28 ± 0.08	LMXB		
307	XTE J1824-141	276.116	-14.429	0.93 ± 0.10 (9.0)	0.55 ± 0.07 (7.9)	0.30 ± 0.11 (2.7)	HMXB?	135	X-Ray Pulsar; ↵ ↳ =IGR J18246-1425;
308	IGR J18249-3243	276.214	-32.726	0.82 ± 0.08 (9.8)	0.50 ± 0.06 (8.6)	0.57 ± 0.09 (6.5)	AGN	136,8	Sy1 z=0.355; PKS 1821-327?;
309	4U 1822-000	276.333	-0.007	1.87 ± 0.11	1.67 ± 0.07	< 0.24	LMXB		
310	IGR J18256-1035	276.428	-10.594	0.73 ± 0.10 (7.2)	0.52 ± 0.07 (7.6)	< 0.23			
311	4U 1822-371	276.446	-37.108	32.87 ± 0.10	27.07 ± 0.07	4.45 ± 0.11	LMXB		
312	IGR J18257-0707	276.478	-7.161	1.00 ± 0.10	0.60 ± 0.07 (8.9)	0.63 ± 0.11 (5.7)	AGN	25,40	Sy1 z=0.037; ↵ ↳ =IGRJ18259-0706;
313	LS 5039	276.551	-14.847	1.03 ± 0.10	0.57 ± 0.07 (8.1)	0.88 ± 0.11 (7.8)	HMXB		
314	IGR J18293-1213	277.318	-12.214	0.76 ± 0.10 (7.3)	0.50 ± 0.07 (7.1)	0.45 ± 0.11 (3.9)			
315	GS 1826-24	277.370	-23.798	106.43 ± 0.09	62.40 ± 0.06	60.26 ± 0.09	LMXB		
316	AX J183039-1002	277.648	-10.032	0.97 ± 0.10 (9.6)	0.58 ± 0.07 (8.5)	0.43 ± 0.11 (3.8)	AGN?	137	
317	IGR J18308-1232	277.700	-12.538	0.97 ± 0.10 (9.4)	0.58 ± 0.07 (8.3)	0.47 ± 0.11 (4.1)	CV	49	IGR J18307-1232
318	AX J1832.3-0840	278.082	-8.640	0.62 ± 0.10 (6.2)	0.48 ± 0.07 (7.1)	< 0.22	CV		
319	IGR J18325-0756	278.110	-7.951	1.45 ± 0.10	0.78 ± 0.07	0.80 ± 0.11 (7.2)	HMXB?	138,40	
320	SNR 021.5-00.9	278.386	-10.569	3.73 ± 0.10	2.11 ± 0.07	2.31 ± 0.11	SNR		
321	PKS 1830-211	278.420	-21.058	2.83 ± 0.10	1.37 ± 0.07	2.19 ± 0.11	AGN		Quasar z=2.507;
322	3C382	278.783	32.698	3.92 ± 0.53 (7.4)	2.13 ± 0.36 (5.9)	3.12 ± 0.58 (5.4)	AGN		Sy1 z=0.058137;
323	RX J1832-33	278.933	-32.993	12.15 ± 0.10	6.72 ± 0.07	7.83 ± 0.11	LMXB		
324	AX J1838.0-0655	279.507	-6.920	2.55 ± 0.10	1.36 ± 0.07	2.12 ± 0.11	SNR/PWN	139	HESS J1837-069;
325	IGR J18381-0924	279.538	-9.415	0.60 ± 0.10 (5.9)	0.30 ± 0.07 (4.3)	0.40 ± 0.11 (3.5)			
326	Ser X-1	279.988	5.039	12.42 ± 0.10	11.29 ± 0.07	0.37 ± 0.11 (3.3)	LMXB		
327	IGR J18400-2439	280.055	-24.634	0.66 ± 0.11 (6.2)	0.46 ± 0.07 (6.2)	< 0.22			
328	IGR J18410-0535	280.259	-5.593	0.95 ± 0.10 (9.5)	0.54 ± 0.07 (8.0)	0.62 ± 0.11 (5.6)	HMXB	140,141	AX J1841.0-0536;
329	1E1841-045	280.333	-4.939	3.24 ± 0.10	1.42 ± 0.07	2.95 ± 0.11	PSR/PWN		
330	AX J1845.0-0433	281.263	-4.567	1.69 ± 0.10	1.04 ± 0.07	0.76 ± 0.11 (6.8)	HMXB		
331	GS 1843+00	281.404	0.865	5.26 ± 0.10	3.16 ± 0.06	2.63 ± 0.10	HMXB		

Table 3. Continued.

Id	Name	RA‡ deg	Dec‡ deg	$F_{17-60\ keV}$* erg $cm^{-2}s^{-1}$	$F_{17-35\ keV}$* erg $cm^{-2}s^{-1}$	$F_{35-80\ keV}$* erg $cm^{-2}s^{-1}$	Type	Ref.**	Notes***
332	PSR J1846-0258	281.602	-2.973	2.14 ± 0.10	1.15 ± 0.07	1.58 ± 0.11	PSR/PWN		AXP?
333	A 1845-024	282.044	-2.427	0.69 ± 0.10 (7.1)	0.33 ± 0.07 (5.0)	0.53 ± 0.11 (4.9)	HMXB		
334	IGR J18483-0311	282.071	-3.172	5.56 ± 0.10	3.61 ± 0.07	2.43 ± 0.11	HMXB	142,68	SFXT
335	IGR J18486-0047	282.102	-0.776	1.10 ± 0.10	0.69 ± 0.06	0.51 ± 0.10 (5.0)	AGN?	49	strong radio source; ↵ ↳ high X-ray abs.; =IGR J18485-0047;
336	IGR J18490-0000	282.257	-0.026	1.45 ± 0.09	0.82 ± 0.06	0.94 ± 0.10 (9.0)	PWN	143,144	
337	IGR J18497-0248	282.436	-2.863	0.52 ± 0.10 (5.3)	0.20 ± 0.07 (3.0)	0.55 ± 0.11 (5.0)		145	NVSS J184946-024819; ↵ ↳ Radio source; ↳ SWIFT J184946.9-024813;
338	4U 1850-087	283.271	-8.706	6.36 ± 0.11	3.80 ± 0.07	3.67 ± 0.12	LMXB		
339	IGR J18538-0102	283.452	-1.047	0.52 ± 0.10 (5.5)	0.26 ± 0.06 (4.0)	0.28 ± 0.11 (2.7)	AGN	17	Sy1 z=0.145;
340	4U 1849-31	283.761	-31.160	7.88 ± 0.14	5.38 ± 0.10	3.08 ± 0.15	CV		V1223 Sgr;
341	XTE J1855-026	283.876	-2.602	12.39 ± 0.10	7.75 ± 0.07	5.79 ± 0.11	HMXB		
342	IGR J18559+1535	283.986	15.641	1.72 ± 0.11	1.01 ± 0.08	0.96 ± 0.12 (7.8)	AGN	146	Sy1 z=0.084; 2E 1853.7+1534;
343	XTE J1858+034	284.680	3.438	6.73 ± 0.09	5.55 ± 0.06	0.98 ± 0.10	HMXB		
344	HETE J19001-2455	285.039	-24.921	23.59 ± 0.16	13.43 ± 0.11	14.27 ± 0.18	LMXB		
345	XTE J1901+014	285.416	1.442	3.31 ± 0.09	2.04 ± 0.06	1.83 ± 0.10	LMXB	147,148	
346	4U 1901+03	285.914	3.206	16.89 ± 0.09	14.12 ± 0.06	2.05 ± 0.10	HMXB		
347	IGR J19072-2046	286.807	-20.765	1.13 ± 0.17 (6.8)	0.87 ± 0.11 (7.8)	< 0.37	CV		V1082 Sgr
348	SGR 1900+14	286.837	9.328	1.13 ± 0.08	0.60 ± 0.06	0.69 ± 0.09 (7.5)	SGR		
349	XTE J1908+094	287.217	9.378	0.77 ± 0.08 (9.1)	0.36 ± 0.06 (6.3)	0.63 ± 0.09 (6.8)	LMXB		
350	4U 1907+097	287.411	9.832	15.07 ± 0.08	12.61 ± 0.06	1.81 ± 0.09	HMXB		
351	X1908+075	287.702	7.600	16.91 ± 0.08	11.11 ± 0.06	7.48 ± 0.09	HMXB		
352	Aql X-1	287.816	0.583	13.62 ± 0.09	8.05 ± 0.06	7.64 ± 0.10	LMXB		
353	IGR J19113+1413	287.835	14.225	0.87 ± 0.10 (9.1)	0.55 ± 0.07 (8.4)	0.28 ± 0.11 (2.6)			
354	SS 433	287.957	4.985	10.74 ± 0.08	7.11 ± 0.06	4.41 ± 0.09	HMXB		
355	IGR J19140+0951	288.517	9.884	11.17 ± 0.09	7.13 ± 0.06	5.13 ± 0.09	HMXB	149,128	=IGR J19140+098;
356	GRS 1915+105	288.799	10.945	337.72 ± 0.09	236.40 ± 0.06	122.31 ± 0.10	LMXB		
357	4U 1916-053	289.692	-5.240	10.56 ± 0.12	6.93 ± 0.08	4.94 ± 0.14	LMXB		
358	IGR J19267+1325	291.645	13.405	0.53 ± 0.10 (5.5)	0.38 ± 0.07 (5.8)	< 0.21	CV	150	1RXS J192626.8+132153
359	IGR J19302+3411	292.535	34.164	1.25 ± 0.17 (7.5)	0.71 ± 0.11 (6.2)	0.65 ± 0.18 (3.7)	AGN	19	Sy1 z=0.06326; ↵ ↳ =SWIFTJ1930.5+3414;
360	SWIFT J1933.9+3258	293.460	32.905	1.47 ± 0.16 (9.4)	0.98 ± 0.11 (9.2)	0.76 ± 0.17 (4.6)			
361	1H 1934-063	294.377	-6.227	1.40 ± 0.16 (8.7)	1.05 ± 0.11 (9.9)	0.71 ± 0.18 (3.9)	AGN		Sy1 z=0.010254;
362	RX J1940.2-1025	295.051	-10.424	3.34 ± 0.18	2.35 ± 0.12	1.35 ± 0.20 (6.7)	CV	4	V1432 Aql;
363	NGC 6814	295.676	-10.329	4.17 ± 0.18	2.39 ± 0.12	2.82 ± 0.21	AGN		Sy1 z=0.005214;
364	IGR J19443+2117	296.006	21.306	0.93 ± 0.14 (6.6)	0.56 ± 0.09 (6.0)	0.38 ± 0.16 (2.4)	AGN?	49	=SWIFTJ194353.0+212119; ↵ ↳ =RX J1943.9+2118;
365	XTE J1946+274	296.410	27.366	5.38 ± 0.14	4.27 ± 0.10	0.91 ± 0.16 (5.7)			
366	XSS J19459+4508	296.836	44.834	1.40 ± 0.16 (9.0)	0.72 ± 0.11 (6.8)	0.80 ± 0.16 (4.9)	AGN	33,26	Sy2 z=0.0539; =IGR J19473+4452; ↵ ↳ 2MASX J19471938+4449425;
367	KS 1947+300	297.401	30.213	4.88 ± 0.14	3.00 ± 0.09	2.33 ± 0.15	HMXB		
368	3C403	298.086	2.515	1.23 ± 0.15 (7.9)	0.62 ± 0.10 (5.9)	1.00 ± 0.17 (5.8)	AGN		Sy2 z=0.059;
369	4U1954+319	298.923	32.098	15.91 ± 0.13	11.05 ± 0.09	5.91 ± 0.14	LMXB	151	Symbiotic X-ray binary;
370	Cyg X-1	299.589	35.203	965.98 ± 0.12	519.27 ± 0.08	674.58 ± 0.13	HMXB		
371	Cygnus A	299.870	40.738	6.15 ± 0.12	3.53 ± 0.08	4.18 ± 0.12	AGN		Sy2 z=0.056146; =3C 405.0;
372	SWIFT J2000.6+3210	300.095	32.191	2.83 ± 0.12	1.79 ± 0.09	1.60 ± 0.13	HMXB	152	=IGR J20006+3210;
373	IGR J20107+4534	302.643	45.568	0.68 ± 0.12 (5.5)	0.40 ± 0.09 (4.6)	< 0.24			

Table 3. Continued.

Id	Name	RA‡ deg	Dec‡ deg	$F_{17-60\ keV}$★ erg cm^{-2}s^{-1}	$F_{17-35\ keV}$★ erg cm^{-2}s^{-1}	$F_{35-80\ keV}$★ erg cm^{-2}s^{-1}	Type	Ref.★★	Notes★★★
374	IGR J20159+3713	303.881	37.188	1.20 ± 0.10	0.67 ± 0.07 (9.4)	0.72 ± 0.11 (6.6)	SNR		SNR G074.9+01.2; ↵ ↳ SWIFT J2015.9+3715;
375	IGR J20187+4041	304.641	40.685	1.78 ± 0.10	0.92 ± 0.07	1.13 ± 0.11	AGN	136,153	2MASX J20183871+4041003; ↵ ↳ IGR J2018+4043; Sy2 z=0.0144;
376	IGR J20216+4359	305.427	43.991	0.83 ± 0.11 (7.7)	0.42 ± 0.08 (5.6)	0.67 ± 0.11 (6.3)	AGN	154	Sy2 z=0.017;
377	IGR J20286+2544	307.136	25.736	3.21 ± 0.18	1.55 ± 0.12	2.69 ± 0.20	AGN	136,155	Sy2 z=0.014206; ↵ ↳ MCG +04-48-002;
378	EXO 2030+375	308.065	37.638	71.20 ± 0.10	41.69 ± 0.07	32.26 ± 0.10	HMXB		
379	Cyg X-3	308.108	40.960	167.45 ± 0.10	119.31 ± 0.07	57.55 ± 0.10	HMXB		
380	SWIFT J2033.4+2147	308.393	21.807	1.99 ± 0.26 (7.7)	1.01 ± 0.17 (5.8)	1.36 ± 0.29 (4.7)	AGN		Quasar z=0.1735; =4C +21.55;
381	SWIFT J2037.2+4151	309.277	41.843	0.63 ± 0.10 (6.4)	0.51 ± 0.07 (7.5)	< 0.20			
382	SWIFT J2044.0+2832	311.022	28.555	1.30 ± 0.17 (7.6)	0.85 ± 0.12 (7.2)	0.71 ± 0.18 (3.9)	AGN		Sy1 z=0.05; RX J2044.0+2833;
383	IGR J20569+4940	314.172	49.657	1.00 ± 0.11 (8.9)	0.53 ± 0.08 (7.0)	0.49 ± 0.11 (4.2)		156	3A 2056+493; ↵ ↳ Blazar or microQSO;
384	SAX J2103.5+4545	315.898	45.751	9.80 ± 0.10	6.30 ± 0.07	4.19 ± 0.10	HMXB		
385	SWIFT J2113.5+5422	318.421	54.401	0.65 ± 0.13 (5.1)	0.44 ± 0.09 (5.1)	< 0.27			
386	IGR J21178+5139	319.436	51.651	1.36 ± 0.12	0.65 ± 0.08 (8.3)	1.12 ± 0.12 (9.1)	AGN	136	2MASX J21175311+5139034;
387	IGR J21196+3333	319.899	33.552	1.10 ± 0.17 (6.4)	0.51 ± 0.12 (4.2)	0.87 ± 0.17 (5.1)	AGN	12	Sy1.5 z=0.051; ↵ ↳ 1RXS J211928.4+333259;
388	IGR J21237+4218	320.932	42.301	1.27 ± 0.12	0.90 ± 0.08	0.35 ± 0.12 (3.0)	CV		V2069 Cyg;
389	IGR J21247+5058	321.165	50.975	10.14 ± 0.12	5.48 ± 0.08	7.09 ± 0.12	AGN	57,129	Sy1 z=0.02;
390	IGR J21277+5656	321.928	56.934	2.74 ± 0.14	1.73 ± 0.09	1.27 ± 0.15 (8.5)	AGN	146	Sy1 z=0.014;
391	IGR J21335+5105	323.434	51.129	3.65 ± 0.12	2.36 ± 0.08	1.59 ± 0.13	CV	4	
392	IGR J21358+4729	323.975	47.479	1.48 ± 0.12	0.75 ± 0.08 (9.4)	1.00 ± 0.12 (8.1)	AGN		Sy1 z=0.02523; ↵ ↳ 1RXS J213555.0+472823;
393	SS Cyg	325.692	43.580	3.72 ± 0.13	2.60 ± 0.09	1.29 ± 0.14 (9.3)	CV		
394	Cyg X-2	326.167	38.319	28.67 ± 0.18	25.34 ± 0.12	2.28 ± 0.18	LMXB		
395	BL Lac	330.663	42.272	1.56 ± 0.18 (8.4)	0.81 ± 0.12 (6.5)	1.25 ± 0.19 (6.4)	AGN		Blazar z=0.0688;
396	4U 2206+543	331.986	54.516	10.82 ± 0.13	6.71 ± 0.09	5.59 ± 0.15	HMXB		
397	IGR J22292+6646	337.309	66.773	0.89 ± 0.13 (6.6)	0.60 ± 0.09 (6.7)	0.54 ± 0.14 (3.8)	AGN	12	Sy1.5 z=0.112; ↵ ↳ =IGR J22292+6647;
398	IGR J22534+6243	343.365	62.723	0.60 ± 0.10 (5.8)	0.32 ± 0.07 (4.6)	0.25 ± 0.11 (2.3)			
399	IGR J23206+6431	350.158	64.527	0.75 ± 0.09 (7.9)	0.36 ± 0.06 (5.8)	0.48 ± 0.10 (4.9)	AGN	154	Sy1 z=0.07173;
400	Cas A	350.847	58.810	4.91 ± 0.09	3.43 ± 0.06	2.21 ± 0.10	SNR		
401	IGR J23308+7120	352.615	71.422	0.70 ± 0.14 (5.1)	0.41 ± 0.09 (4.5)	0.34 ± 0.14 (2.4)	AGN	1	Sy2 z=0.037; ↵ ↳ USNO-A2.0 1575-05664433;
402	IGR J23523+5844	358.075	58.759	0.70 ± 0.09 (7.8)	0.39 ± 0.06 (6.5)	0.66 ± 0.09 (7.0)	AGN	154	Sy2 z=0.162; =IGR J23524+5842;

Notes. (†) For the column descriptions see Sect.3. (‡) The positional accuracy of sources detected by IBIS/ISGRI depends on the source significance (Gros et al., 2003). The estimated 68% confidence intervals for sources detected at 5–6, 10, and $> 20\sigma$ are $2.1'$, $1.5'$, and $< 0.8'$, respectively (Krivonos et al., 2007b). (⋆) Source flux was measured on the 9-year time-averaged map. The flux measured with $\sigma < 5.0$ (and 2σ upper level) is highlighted in red. If detection significance does not exceed 10σ, it is shown in braces. Flux is expressed in units of 10^{-11}erg cm^{-2}s^{-1}. (⋆⋆) (1) Masetti et al. (2008), (2) Den Hartog et al. (2005), (3) Bikmaev et al. (2006b), (4) Barlow et al. (2006), (5) Eckert et al. (2004), (6) Markwardt et al. (2004), (7) Kuiper et al. (2006b), (8) Masetti et al. (2009), (9) Donato et al. (2005), (10) den Hartog et al. (2004b), (11) Bird et al. (2010), (12) Masetti et al. (2010b), (13) Kuiper et al. (2005), (14) Watson et al. 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