



# - RAY ASTRONOMY 2019

*Current Challenges and New Frontiers in the Next Decade*

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## The soft gamma-ray sky observed with INTEGRAL's IBIS-PICsIT detector

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Multi-messenger astronomy entered a new phase after the detection of gravitational waves, fast radio bursts and a recent progress in the neutrino astrophysics. It is evident that the observations over the whole electromagnetic domain become more and more important. Detailed spectral information in the soft gamma-ray band (100 keV - 100 MeV) is essential to study the physical processes responsible for the non-thermal emission, e.g. the jet physics or antimatter annihilation.

The IBIS high energy detector PICsIT on board INTEGRAL satellite is one of the few instruments observing currently the sky in the soft gamma-ray band since 2002. Thanks to the coded-mask technique the PICsIT's angular resolution is unprecedented. Despite the high instrumental background, due to cosmic rays, a careful, fully-Bayesian data analysis allowed to detect several dozens of high-energy sources, providing unique results in the 240-1000 keV energy range.

In this review a spectral catalog of all detected objects will be presented. Examples of the modeling of the spectra will be shown with an emphasis to the broad-band study for a diagnosis of the non-thermal plasma and jet emission in various accreting systems such as bright Active Galactic Nuclei, transient and persistent galactic black holes. In addition, the presence of the positron annihilation features will be addressed for several objects.

### Topic

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