



A new analysis of the ESA INTEGRAL/SPI satellite data ( ["Diffuse Galactic emission spectrum between 0.5 and 8.0 MeV"](#) ) of LAPTh members (Joanna Berteaud, Francesca Calore, Joaquim Iguaz and Pasquale Serpico) with researchers of the Max-Planck-Institute for extraterrestrial Physics and Univ. of Würzburg was able to set a new record in determining the diffuse Galactic soft gamma-ray photon spectrum in the 0.5-8.0 MeV band, superseding the existing best measurements (due to the Compton telescope onboard NASA's Compton Gamma-Ray Observatory) going back to two decades ago.

This energy range harbours many emission mechanisms, such as the annihilation of positrons in the interstellar medium, nuclear decays of radioactive isotopes, or the Inverse Compton scattering of electrons off the interstellar radiation field. These components are indicated in the top panel of the figure, showing the diffuse Galactic emission spectrum with its characteristic spectral features.

These measurements and their extension to lower energies have also been used to set the most stringent constraints up to date to exotic signals, such as the Hawking evaporation signal of primordial black holes of asteroid-mass scale, a candidate for dark matter recently object of numerous investigations ( ["Strong constraints on primordial black hole dark matter from 16 years of INTEGRAL/SPI observations"](#) ).