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## Positron Annihilation in the Universe

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One of the major tasks of astrophysics is to understand the emission mechanisms of observed sources and regions in the sky. Only by pinpointing down these mechanisms, it is possible to derive physical parameters and learn about the evolution of astrophysical objects. Alas, many observations of high-energy phenomena are ambiguous, requiring more and orthogonal information. The nature of several sources, among others accreting X-ray binary systems, core-collapse and thermonuclear supernovae, cosmic-rays, stellar flares and potentially dark matter, all show signatures of positron production and annihilation. Utilising this underrated emission mechanism can shed light on unsolved problems in astrophysics and cosmology.

In this talk, I will show examples of how we can learn from these gamma-ray signatures already now with ESA's INTEGRAL observatory, and what might be possible in the context of new gamma-ray satellite missions, such as the accepted NASA mission COSI.

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