

## Celebrating 20 years of Swift Discoveries



Contribution ID: 50

Type: **Contributed talk**

# Interpreting the 10 MeV emission line in GRB 221009A as high-latitude emission from an annihilating pair bubble

*Tuesday 25 March 2025 14:30 (15 minutes)*

Ever since the early years in the Swift mission, it has been clear that the low-end of the gamma-ray burst (GRB) luminosity distribution has yet to be unveiled, holding the key to the intrinsic rate of GRBs and possibly to their jet structure. Yet, some of the trickiest riddles that GRB astronomy posed to us in the last few years came at the opposite end of the luminosity distribution, where the outrageously bright GRB 221009A shattered the statistics based on several decades of previous GRB observations. Even letting aside the statistics, many properties of this GRB and of its afterglow still lack a convincing explanation. Among these, a bright, narrow spectral fracture at around 10 MeV, discovered in Fermi/GBM data around 300 s after the initial precursor, has yet to be fully explained.

In this talk, I will present a scenario that is capable to explain this feature and the apparent temporal evolution of its properties. At the same time, the model explains some puzzling aspects of the TeV afterglow and sheds light on some properties of the progenitor collapsing star.

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**Session Classification:** GRB central engines and jets