Leveraging the diversity of GRB afterglows detected by SVOM

Since its launch, the SVOM satellite has detected over 90 GRBs with its ECLAIRs instrument. While recovering standard events that were previously observed with past missions, SVOM exhibits a new population of softer events with properties resembling those of GRBs. For all those events, interpreting the afterglow emission powered by the decelerating relativistic jet remains the most powerful way to analyse their properties (such as the jet energy and its geometry, the interstellar medium density, or particle acceleration properties) and provide an interpretation of their physical origin.
I will present the diversity of afterglow properties from radio to very high energies (~ TeV) using my model, which includes several different physical processes. I will particularly highlight the impacts of jet structures and arbitrary viewing angles, synchrotron self-Compton scattering including the Klein-Nishina regime, and self-absorption; at the forward and reverse shocks. Based on results from the studies of several different GRBs, I will show how this complete model helps shedding light on the diversity of events detected by SVOM and observed by other followup facilities (especially in radio and in the TeV range), and highlight the challenging features that such models will inevitably struggle to reproduce. I will underscore the importance of having a complete and computationally-efficient model to analyse the large number of ECLAIRs detections.