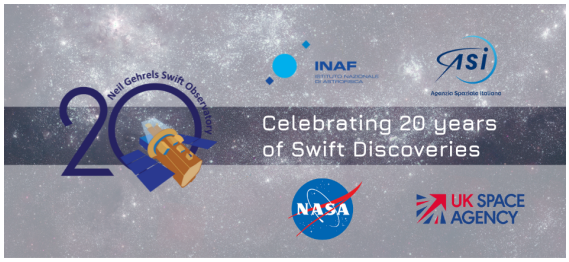

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LeHaMoC: an open-source leptohadronic code for multi-messenger modeling

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Recent associations of high-energy neutrinos with active galactic nuclei (AGN) have rekindled interest in leptohadronic models of radiation from astrophysical sources. The rapid growth in multi-messenger data acquisition highlights an emerging need for fast numerical models capable of application to large source samples. In this contribution, we introduce LeHaMoC, an open-source, versatile leptohadronic code. LeHaMoC is specifically designed for modeling time-variable, non-thermal emission from compact astrophysical sources, including blazar jets, AGN coronae, and gamma-ray bursts (GRBs). We showcase recent applications, such as blazar SED fitting using Bayesian inference techniques, modeling X-ray and γ-ray variability in blazars, and exploring high-energy neutrino associations. Additionally, we discuss its role in training deep neural networks - an essential step toward achieving more efficient computations and exploring larger parameter spaces.

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