

## GRAPPA @ 5: Celebrating 5 years of astroparticle physics and cosmology in Amsterdam



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### Dark Information: Forecasting with the Fisher Matrix

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Indirect dark matter (DM) searches are one of the fundamental techniques used to probe the particle nature of DM. Given the increasing interest in the community in non-WIMP scenarios, it is vital to systematically reconsider optimal strategies for observation campaigns of current and future telescopes that cover a large range of DM models and signals. In this endeavour, it is important to correctly account for both statistical and systematic uncertainties, both related to signal and background modelling. To this end, we developed a novel and surprisingly powerful technique, which we dubbed 'information flux'. It builds on the Fisher Information matrix formalism, that is well known in cosmology. It generalises signal-to-noise maps to account for systematic effects, while leading to quantitatively accurate predictions for instrumental sensitivities. Using this formalism, we show how, for some DM models, it is quickly possible to identify the most efficient search strategy for a large range experiments, from direct detection to astronomical signals to collider searches.

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