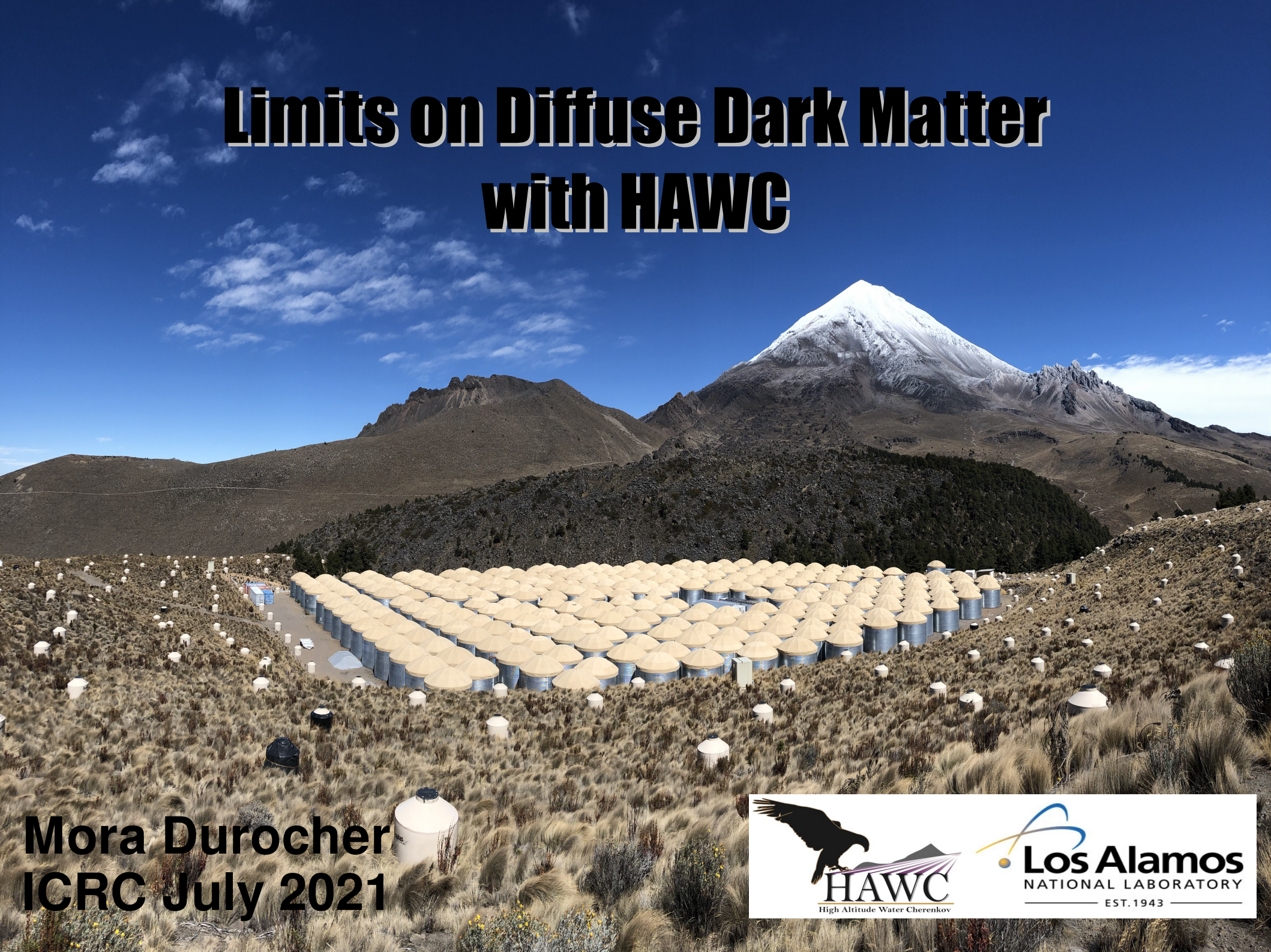
Limits on Diffuse Dark Matter with HAWC



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HAWC
High Altitude Water Cherenkov

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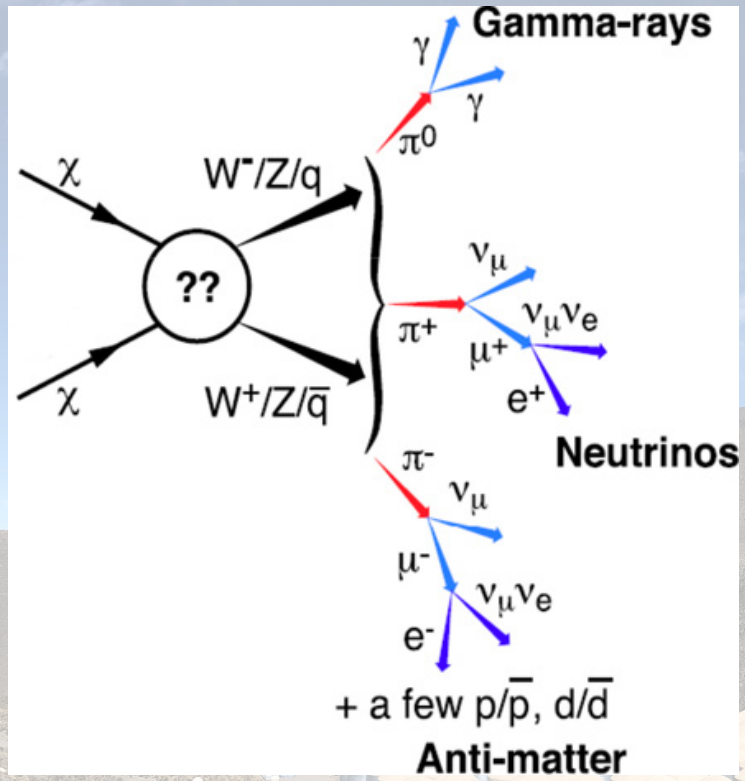
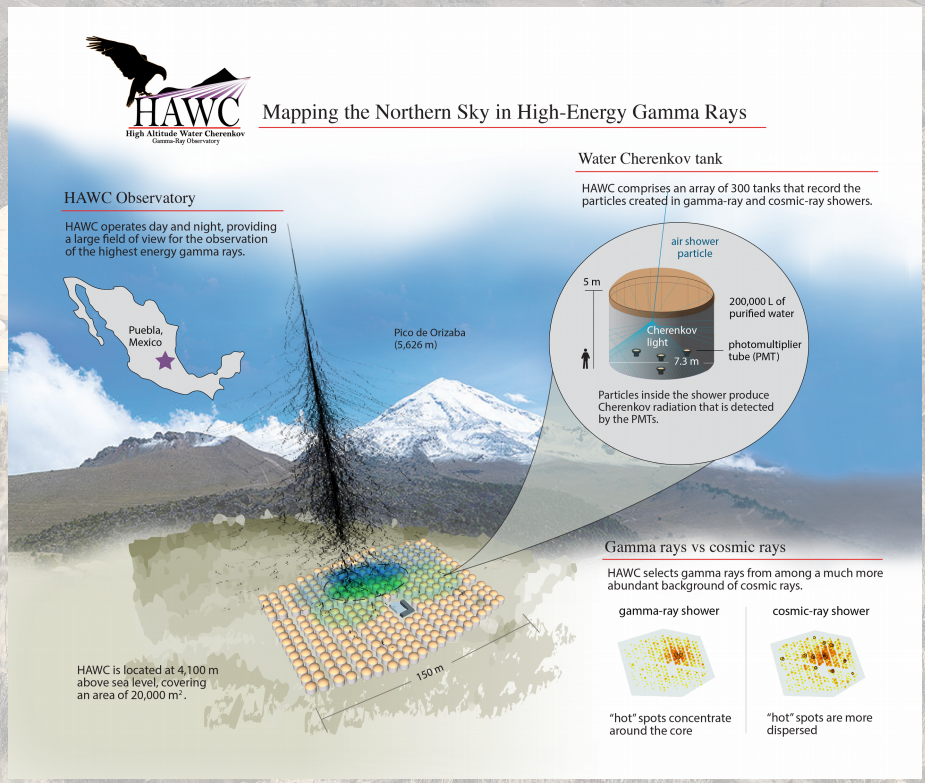
EST. 1943

Diffuse Gamma-Ray Background

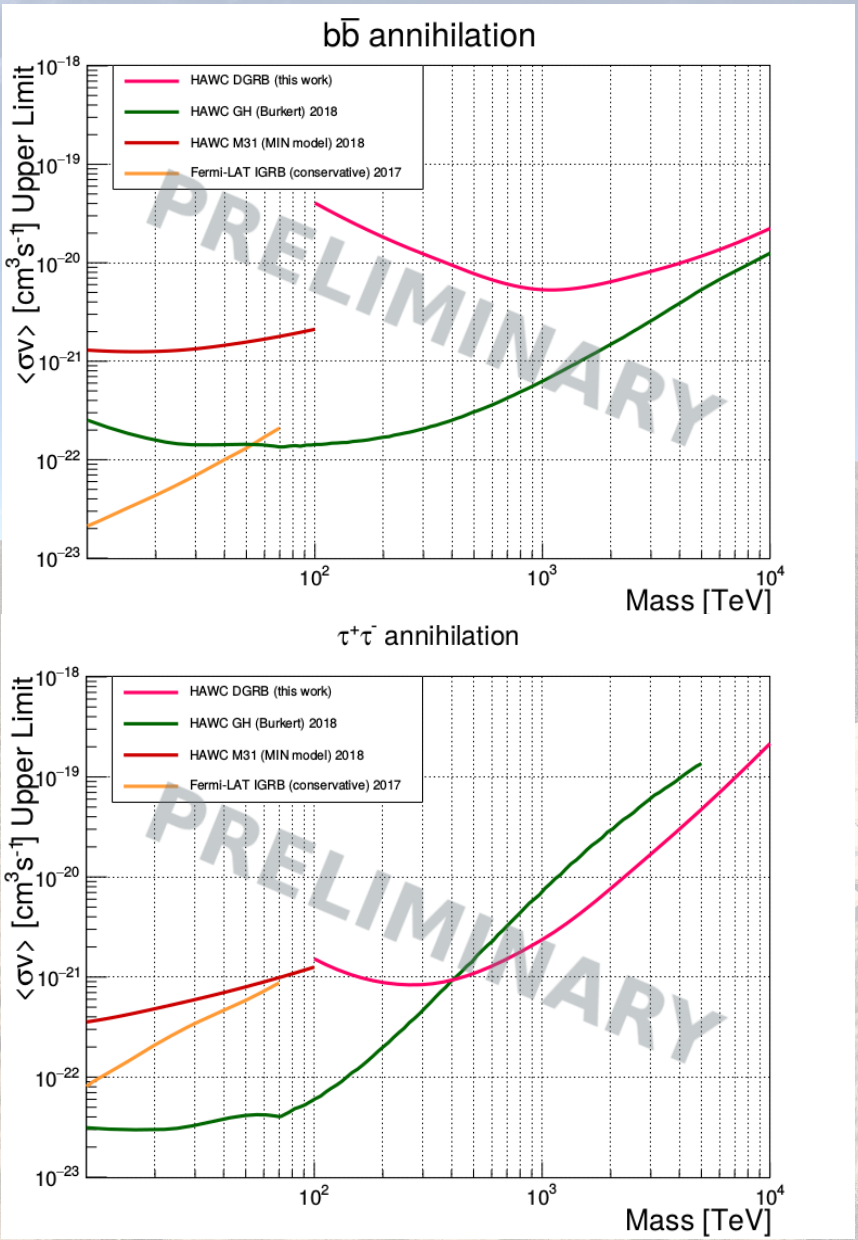


The Diffuse Gamma-Ray Background (DGRB) is expected to be mainly produced by isotropic gamma rays, emitted by the interaction of high-energy cosmic rays with matter and radiation in our Galaxy. At TeV energies, dark matter annihilations or decays from an extended galactic halo may also contribute to the DGRB.



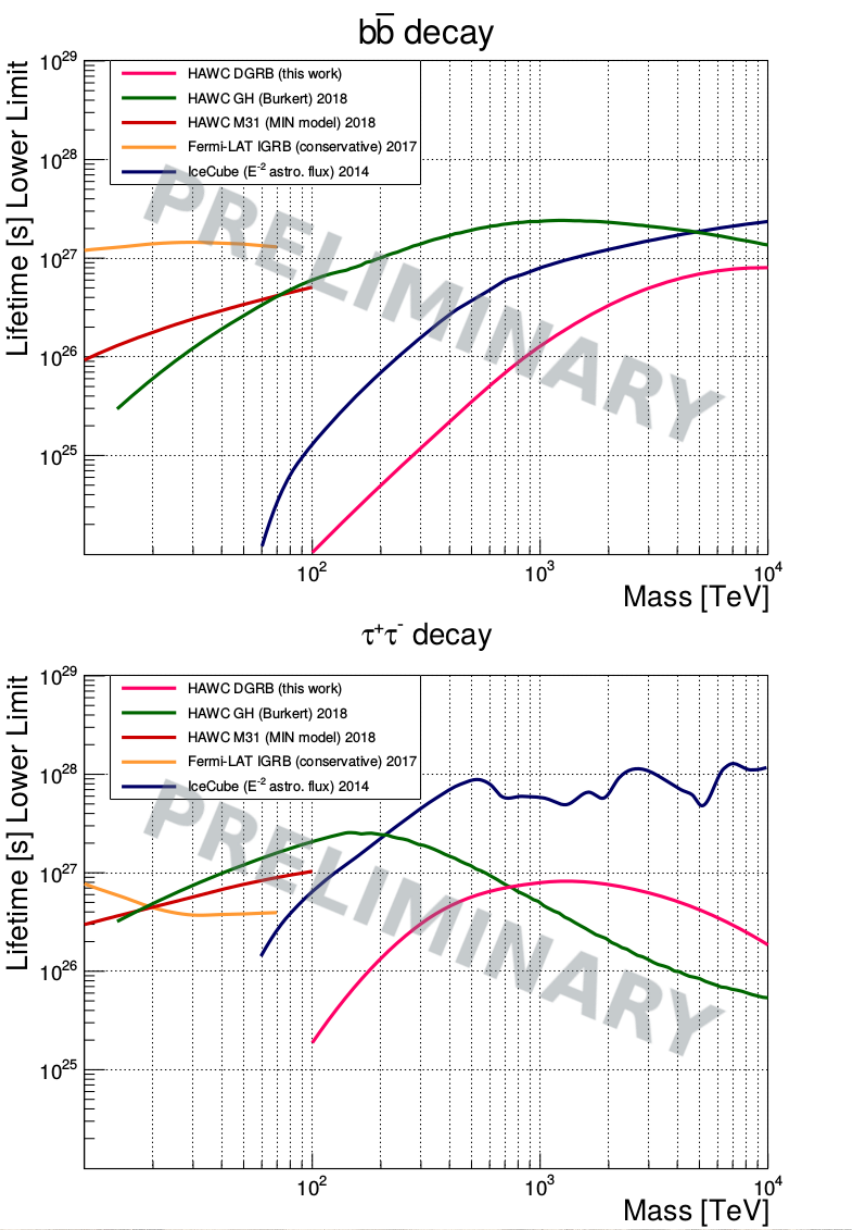
We use 535 days of data from the High Altitude Water Cherenkov (HAWC) gamma-ray observatory to explore the more conventional channels for dark matter annihilation and decay interactions, which are the $b\bar{b}$ and $\tau^+\tau^-$ channels.

Cross-Section Upper-Limits



- Inject isotropic and spatial-model independent gamma-ray emissions from galactic dark matter annihilation interactions into bottom quarks and tau leptons.
- Perform maximum likelihood analysis on our DGRB data with respect to spectra of chosen dark matter masses.
- Calculate the 95% confidence level cross-section upper-limits.
- Compare to recent dark matter searches with HAWC and the Fermi-LAT Isotropic Gamma-Ray Background (IGRB).

Lifetime Lower-Limits



- Perform the same procedure to obtain the 95% confidence level lifetime lower-limits of dark matter decay interactions into bottom quarks and tau leptons.
- Also compare to recent dark matter searches with HAWC and other experiments.
- Our limits push into an energy range higher than the Fermi-LAT IGRB and the HAWC Andromeda Galaxy constraints.
- Better limits for interactions involving tau leptons when compared to the HAWC Burkert Galactic Halo limits.