

Selected Publications

Corresponding Author Papers

1. Sharma, A. Multi-Messenger Connection in High-Energy Neutrino Astronomy. *Universe*. **10**, 326 (2024)
- Review article on the role of multi-messenger astronomy in the advancement of neutrino astrophysics in the current era; under the special issue Neutrinos Across Different Energy Scales. Invited contribution. Sole authorship.
2. A. Marinelli, J. R. Sacahui, A. Sharma and M. Osorio-Archila, “Analysing the gamma-ray activity of neutrino emitter candidates: comparing TXS 0506+056 with other blazars,” *Mon. Not. Roy. Astron. Soc.* **506** (2021) no.3, 3760-3772 doi:10.1093/mnras/stab1312 [arXiv:1909.13198 [astro-ph.HE]].
- Describes the work carried out during my PhD, and looks at the gamma-ray activity of a set of blazars to quantify their neutrino emission potential and observability through ground-based Cherenkov neutrino telescopes. The author names appear in order of seniority, however most of the work including plots and calculations were carried out by me. My supervisor guided with the ideas for the work. I came up with ideas for the blazar sequence calculation, apart from writing many sections of the paper. The team from Guatemala calculated some duty cycles.
3. J. R. Sacahui, A. V. Penacchioni, A. Marinelli, A. Sharma, M. Castro, J. M. Osorio and M. A. Morales, “Study of blazar activity in 10 year Fermi-LAT data and implications for TeV neutrino expectations,” *Rev. Mex. Astron. Astrofis.* **57** (2021) no.2, 251-268 doi:10.22201/ia.01851101p.2021.57.02.01 [arXiv:2011.13043 [astro-ph.HE]].
- Idea originated from the group in Guatemala, to provide completeness to the work described previously on the gamma-ray activity of blazars. I provided the Fermi light curves, flux distribution plots as well as worked on the blazar sequence section.

Corresponding Author Proceedings

1. R. Abbasi *et al.* [IceCube], “A model-independent analysis of neutrino flares detected in IceCube from X-ray selected blazars,” *PoS ICRC2021* (2021), 971 doi:10.22323/1.395.0971 [arXiv:2107.08159 [astro-ph.HE]].
- Describes the motivation, methodology, dataset, catalogues and expected sensitivities for my analysis of neutrino flares from soft X-ray selected blazars. After studying the gamma-ray and neutrino connection during my PhD, it was a logical step forward to consider the correlation between X-rays and high-energy neutrinos, during my first postdoc. The study was later unblinded but no significant excess ($> 3\sigma$) was found from any blazar direction post the binomial tests. Could not be turned into a peer-reviewed publication since my contract ended before the internal reviews within the collaboration could be finished and the paper could be drafted. All the work was carried out by me, under the guidance of Dr. Erin O’Sullivan.
2. C. L. Gualda *et al.* [IceCube], “Studies of systematic uncertainty effects on IceCube’s real-time angular uncertainty,” *PoS ICRC2021* (2021), 1045 doi:10.22323/1.395.1045 [arXiv:2107.08670 [astro-ph.HE]].
- Summarizes the initial studies performed to understand and quantify the systematic uncertainties in the angular errors of IceCube real-time alerts. The investigation was complementary to my examination of discrepancy in the offline and online angular uncertainties in the alerts, and my role was to guide the small task group of the authors who were all PhD and masters students. My own contribution to examine a particular reconstruction algorithm is not included in the study since persistent errors with older software versions did not allow for conclusive progress.
3. A. Marinelli *et al.* [KM3NeT], “KM3NeT/ARCA Expectations for the Low Latitude Bubbles,” *PoS ICRC2019* (2020), 956 doi:10.22323/1.358.0956
- We calculated the neutrino expectations from the low-latitude Fermi Bubbles for KM3NeT/ARCA full configuration. The idea was developed by my advisor, Dr. Antonio Marinelli, the mask for the bubbles was supplied by Dr. Rosa Coniglione, while I modified and used the code I developed for other sensitivity calculations to conclude the work. The motivation was to also look at the potential Galactic (extended) sources of neutrinos for my PhD, apart from the extra-galactic (point-like) ones that I was already studying.