

Bachelor / Master project at DESY

Search for fast radio bursts and short transients in H.E.S.S. archival data

Project Description

FRBs present a recent mystery in the field of transient astrophysics, with very little about the events being known, beyond the recent evidence that some of their sources are extragalactic. This science topic is investigated in studies by HESS, which carries out follow-up observations following radio detection triggers. Given the considerable rate of FRBs over the entire sky (~1000 per day), and the >10 year exposure of HESS, at least one to these FRBs should have serendipitously been caught within the HESS field of view.

We have tools in place in HESS to search for run-wise variability online and offline. However, tools do not presently exist to search for ms - minute timescale variability from FRBs or other short transients, which lie within the field of view. The aim of the project is to develop an algorithm based on Bayesian blocks or alike to search for intra-run variability, quantify their performance, and perform a blind search offline, and (if time permits) implement an online algorithm.

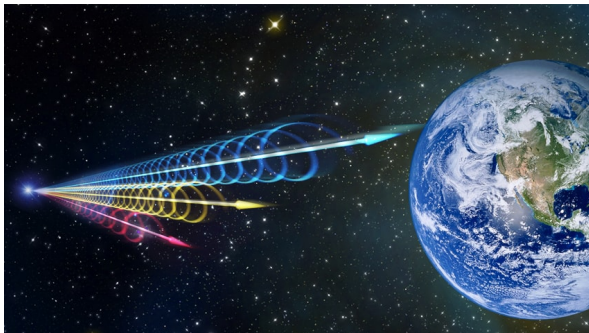


Photo credit: Jingchuan Yu, Beijing Planetarium

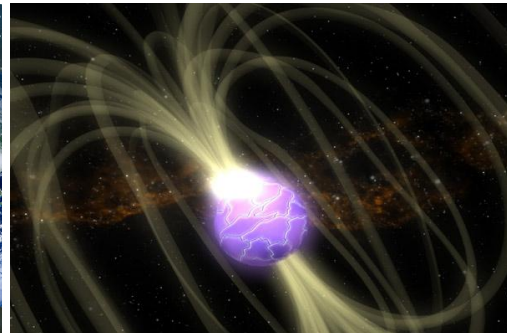


Illustration: NASA



The H.E.S.S. telescopes in Namibia