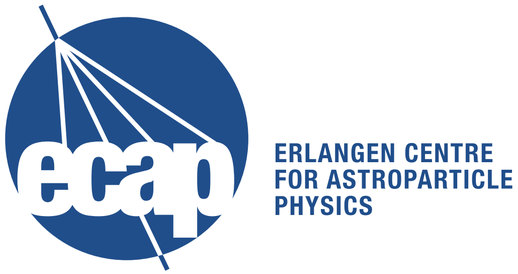


A 3D Event Display based on Makie for Cherenkov Neutrino Detectors (for now, KM3NeT)

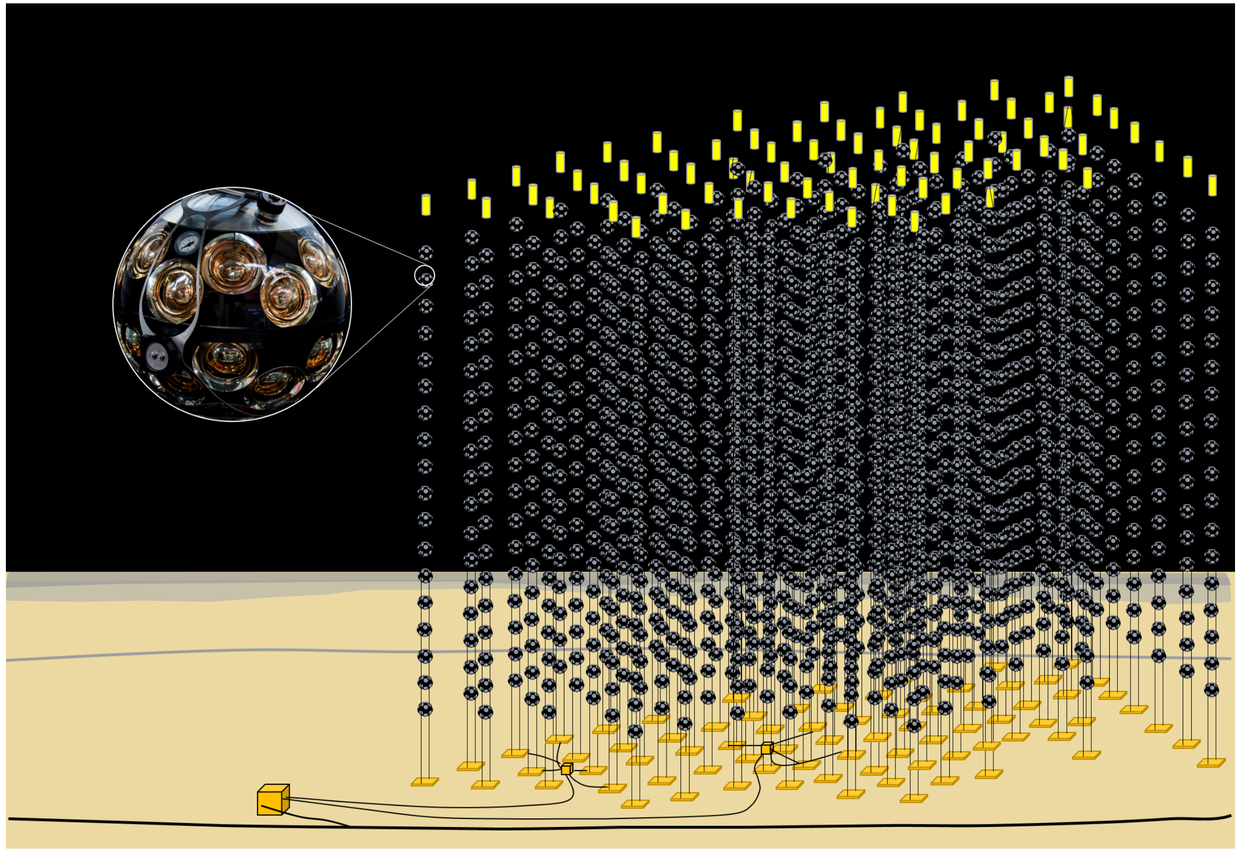
JuliaHEP 2023 - ECAP
06. - 09. November 2023

Tamas Gal – Erlangen Centre for Astroparticle Physics

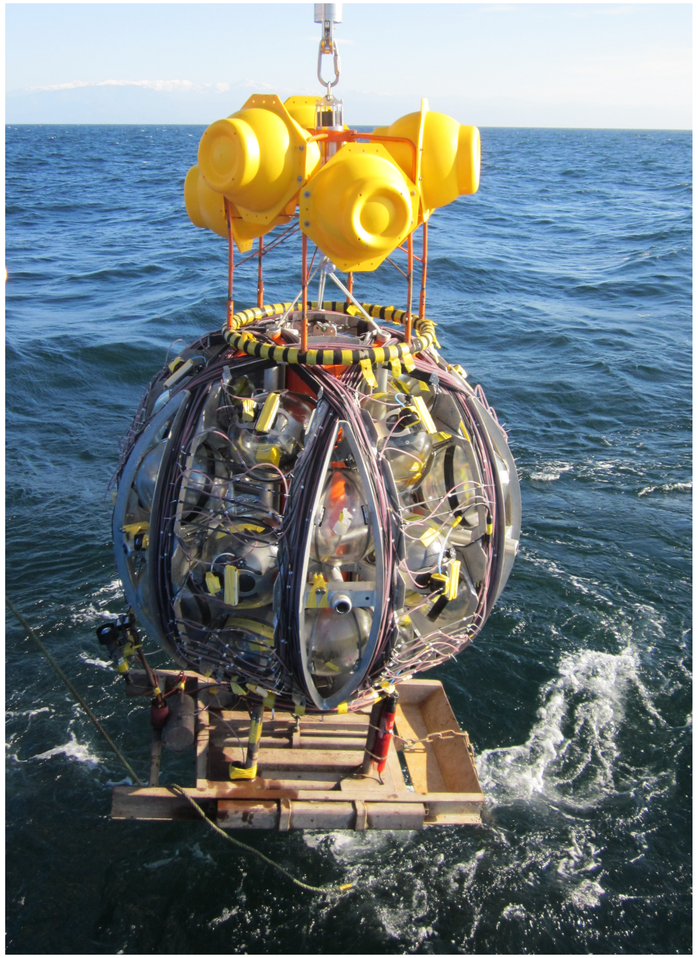
https://indico.cern.ch/event/1292759/contributions/5618595/

What is KM3NeT?

- A **Cherenkov-based neutrino telescope**
- Located in the deepest seas of the Mediterranean (up to **3.5km deep**)
- Once completed, the telescope will have detector **volumes** of several **cubic kilometres** of clear sea water
- Per detector block **115 vertical strings** (up to 800m long) holding **18 digital optical modules** (DOMs) containing **31 photomultiplier tubes** (PMT) each
- A total of **64170 PMTs per detector block]**
- Sub-nanosecond time-resolution of photons
- Down to **1 milliradian** (~0.05 degrees) **angular resolution** for reconstructed events



What is KM3NeT?



RainbowAlga.jl

- A **pure Julia** package based on (GL)Makie.jl and GLFW.jl to visualise events in 3D in an interactive way
- **Currently only** working with **KM3NeT** data (several ROOT formats and custom detector geometry and calibration dataformats)
- Can **easily be modified** to work with other **similar experiments** like IceCube, P-ONE, Antares, Baikal(-GVD), TRIDENT etc.
- The aim is to give the user full programmatic access to the actual scene (WIP)
- https://git.km3net.de/tgal/RainbowAlga.jl

RainbowAlga.jl

demo

RainbowAlga.jl