

# Neutrino astronomy at ECAP



## *Mediterranean sea*

- Data acquisition 2008 – 2022
- ECAP contribution: Data analysis



## *Mediterranean sea (in construction)*

- 2 Science cases
  - ORCA (Toulon): Neutrino oscillations
  - ARCA (Sicily): Neutrino astronomy
- ECAP contribution:
  - Data analysis (neutrino oscillations, myons in air showers)
  - Hardware (optical modules, acoustic calibration)
  - Software (services, open data, ...)
  - Machine/deep learning applications

 **Rodrigo G. Ruiz – Status of the KM3Net Experiments**



## *South pole*

- Data acquisition since 2010
- ECAP contribution:
  - Reconstruction and simulation
  - Data analysis (neutrino astronomy, search for magnetic monopoles, ...)
  - R&D of future IceCube-Gen2 (optical modules)
  - Machine/deep learning applications

 **Thorsten Glüsenkamp – Overview IceCube**

## **RNO-G** *Greenland (in construction)*

- In construction, data acquisition running
- ECAP contribution:
  - Building/calibration of amplifiers
  - instrument installation
  - Main data center
  - Data simulation and analysis



# Gamma astronomy (and more) at ECAP

IAC - Y



Namibia

- Data analysis (gamma/hadron separation, 3D background modeling, machine learning)
- High level science (novae, PWN, Fermi bubbles, galactic centre, joint analysis with Fermi)
- Stellar Intensity Interferometry

🧠 Tina Wach – Detailed multi-instrument analysis of the very high energy  $\gamma$ -ray emission in the region of HESS J1813-178

🧠 Thomas Lang – Satellite trails in H.E.S.S. data

WCT - Y



Mexico

- Array of Water Cherenkov Telescopes
- Data acquisition since
- ECAP contribution:
  - Reconstruction and simulation

SD+FD - UHECR



Argentina

- Machine/deep learning applications
- Anisotropy modelling

🧠 Jonas Glombitza – Machine Learning for Astroparticle Physics

radio



Germany



Southern Hemisphere  
(in construction)

- cosmic rays and lightning

IAC - Y



Chile, La Palma (in planning/construction)

- Hardware (telescope pointing camera, Cherenkov camera development)
- Data analysis (machine learning)

WCT - Y + CR



South America (in planning)

- Performance estimation
- Reconstruction
- Machine learning
- Cosmic ray anisotropy/composition

Interferometer - GW



Central Europe (in planning)

- Developing electronics