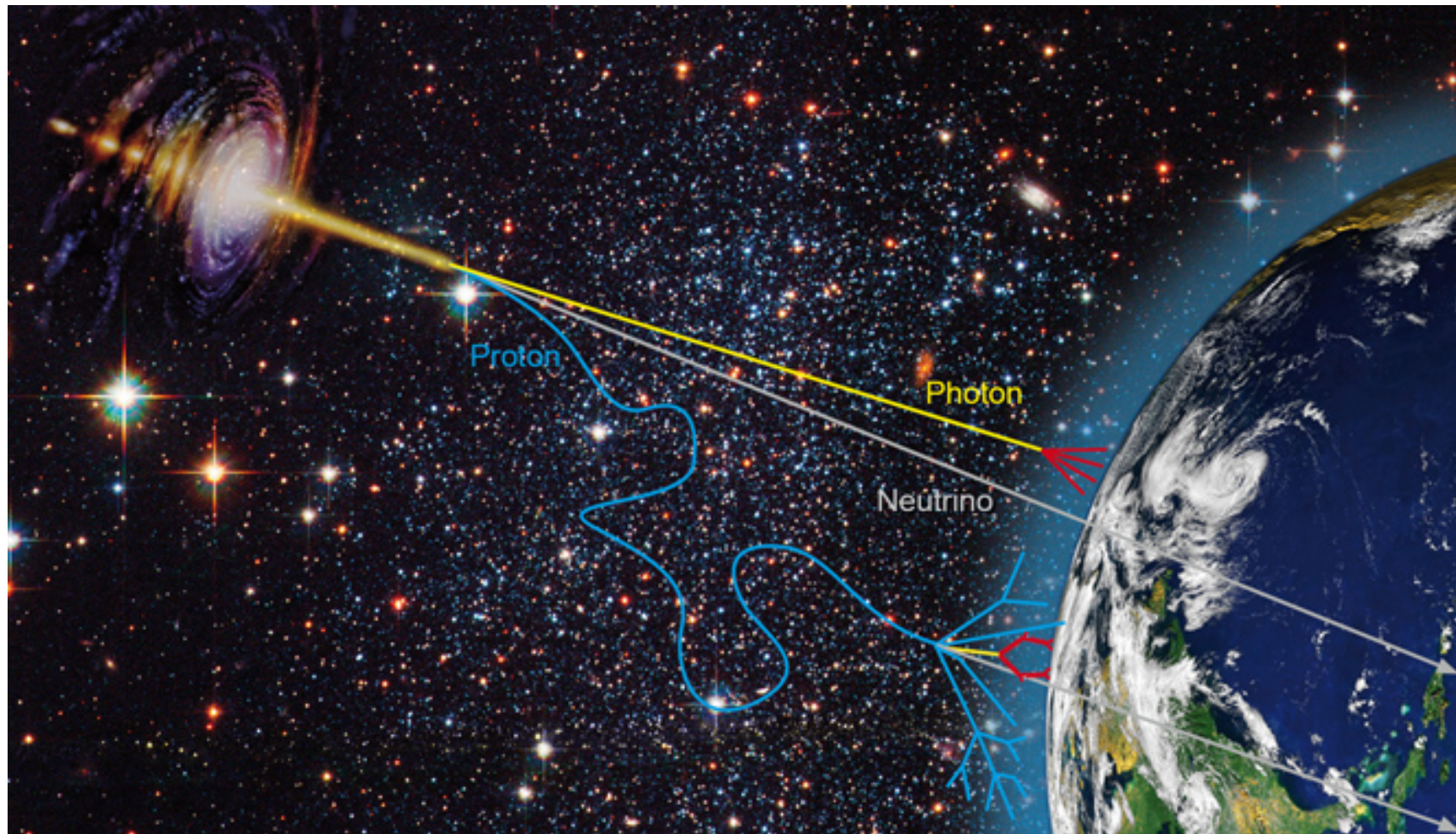


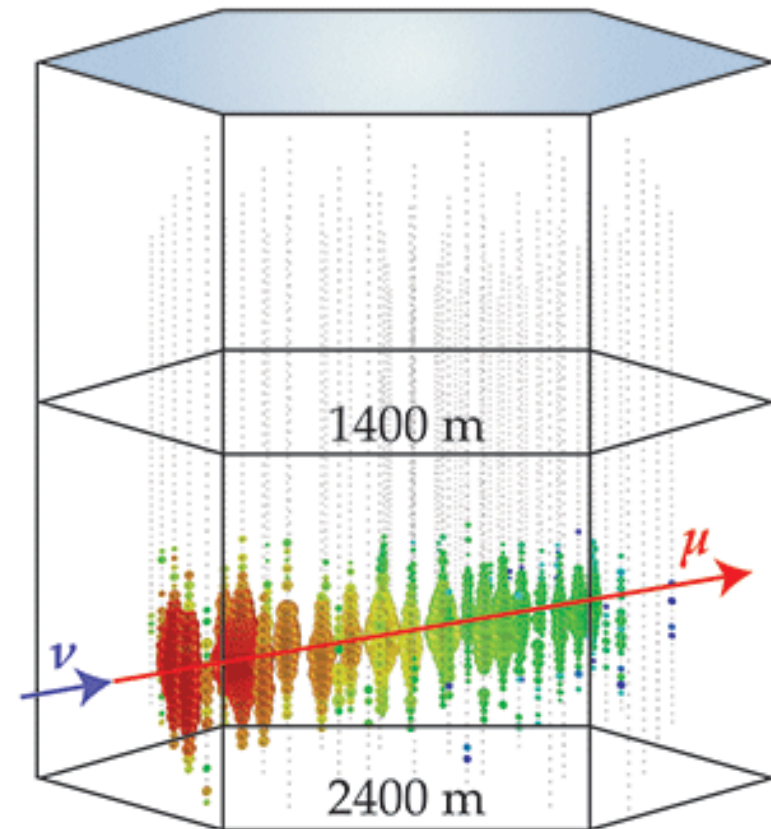
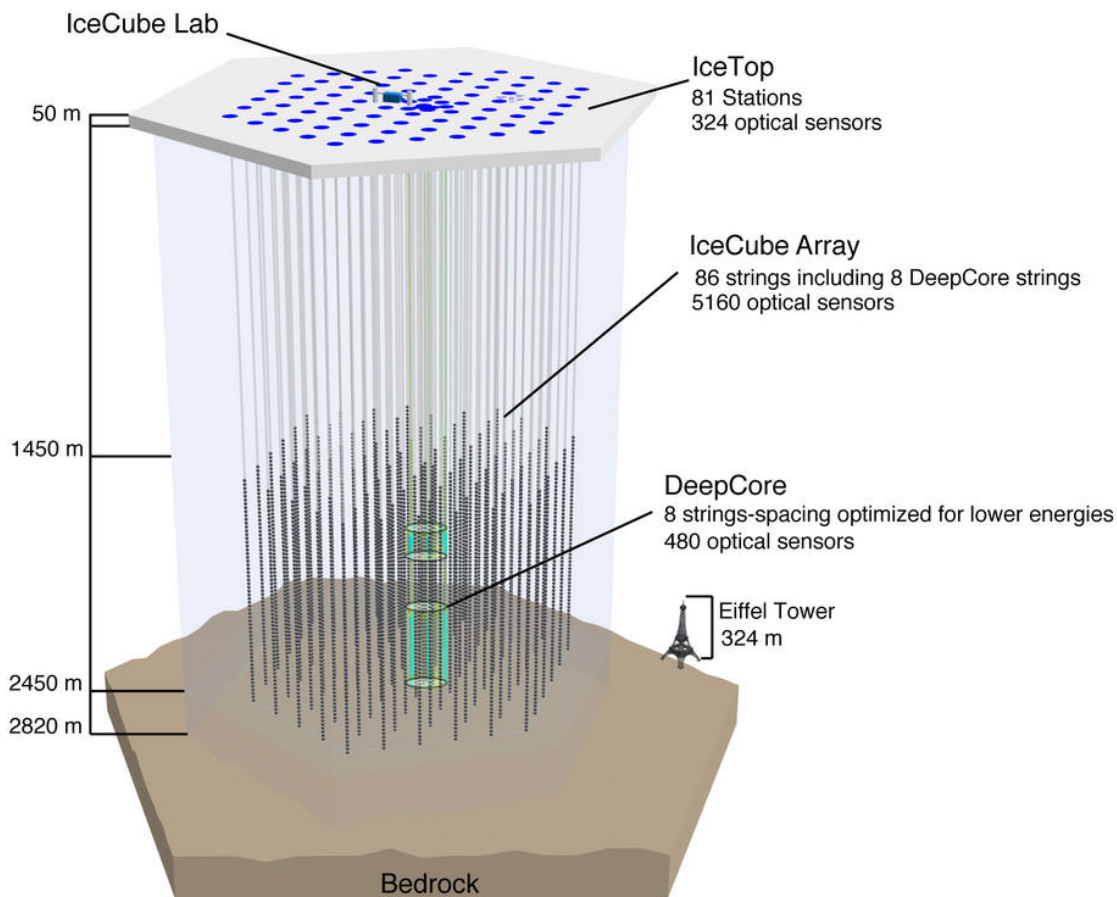
Multi-messenger Astronomy



Only photons and neutrinos point back to the source

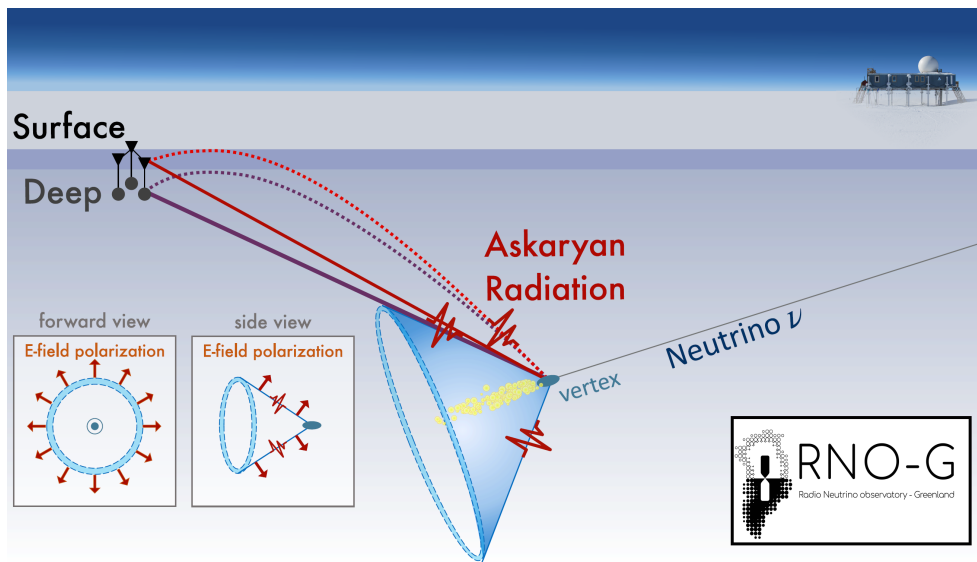
The IceCube Neutrino Observatory at the South Pole (Optical sensors)

<https://www.icecube.wisc.edu>



Radio detection of neutrino induced particle showers (Reaching out to higher energies)

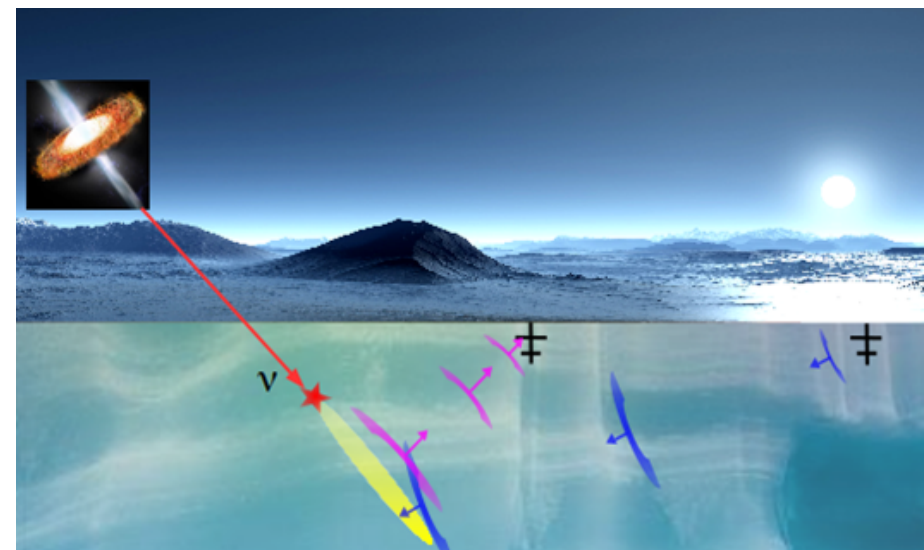
Radio Neutrino Observatory Greenland



<https://www.rno-g.org>

First 7 stations already taking data

The Radar Echo Telescope (RET)

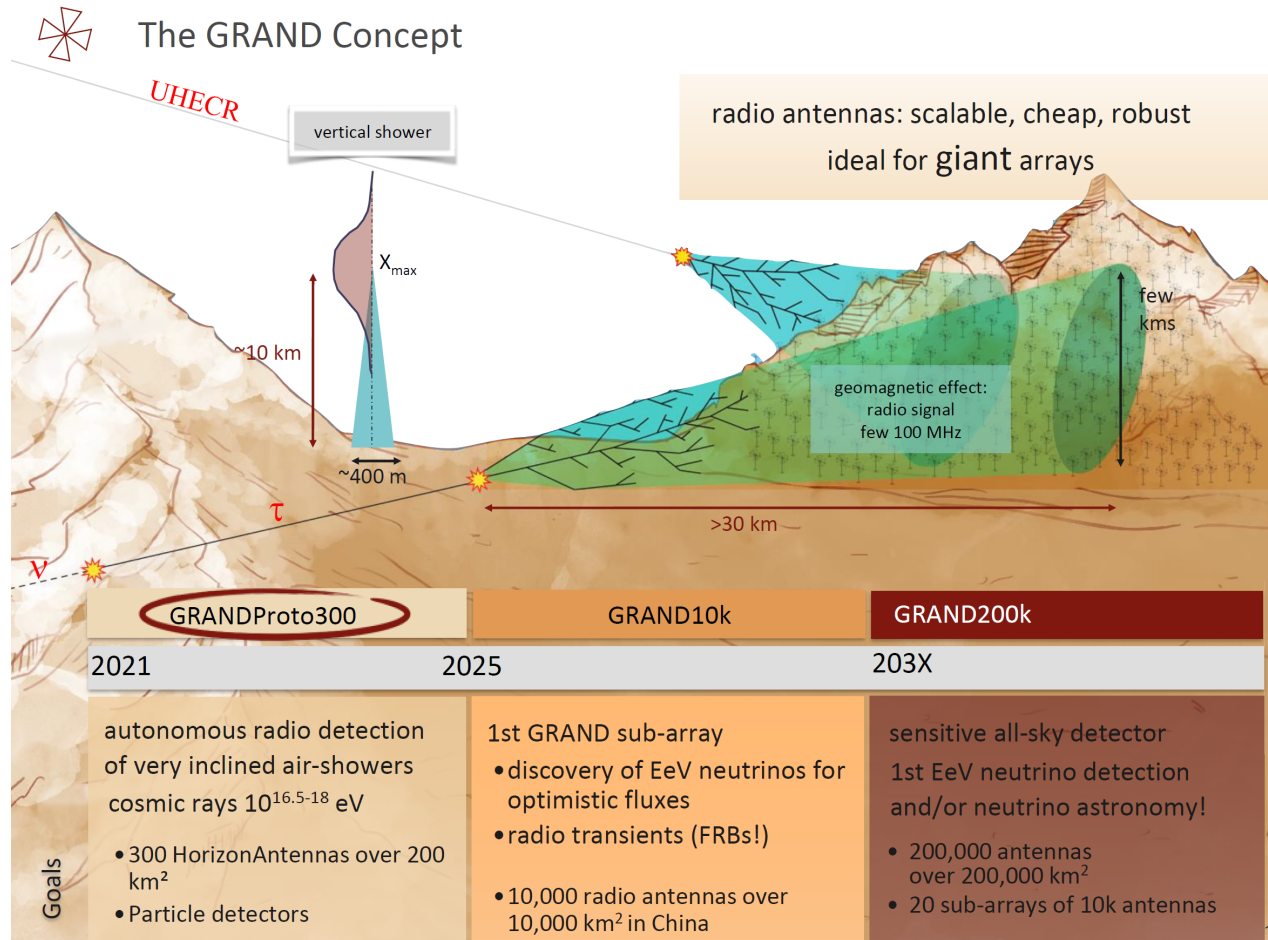


<https://www.radarechotelescope.org>

Prototype taking data in Greenland

The Giant Radio Array for Neutrino Detection (GRAND) project

<https://grand.cnrs.fr>



Prototype of 300 antennas being prepared

Possible student projects

- Investigation of steady cosmic sources with IceCube data
- Search for neutrino signals from cosmic transients with IceCube data
- Modeling of neutrino production processes
- Investigation of Gamma Ray Burst light curves
- Calibration and analysis of RNO-G data
- Analysis of RET test c.q. prototype data
- Modeling of radio signals c.q. radar reflections from particle showers
- Participation in GRAND preparations

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