

Monterey 22.-25.09.16



KM3NET Italy

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## The next generation Neutrino Telescope

Located in the deepest seas of the Mediterranean, once completed, it will have a detector **volume of several cubic kilometers** and will open a new window on our Universe.

With the telescope physicists of KM3NeT will **search for neutrinos from distant astrophysical sources** such as supernovae, gamma ray bursters or colliding stars.

An array of **thousands of optical sensors** will detect the faint light in the deep sea from charged particles originating from collisions of the neutrinos and the Earth (ARCA) and a detector dedicated to particle physics research exploiting oscillations in atmospheric neutrinos (ORCA).

ARCA (Astroparticle Research with Cosmic in the Abyss) will study the cosmic neutrino flux providing essential data concerning its origin, energy spectrum and flavor composition. With the ARCA telescope 87% of the sky will be mapped including most of the Galaxy and the Galactic Center, where some interesting unexplained phenomena are observed with other astro-particle detectors and the discovery of the emitting sources for which no hints are available at the moment. ARCA will be installed at the KM3NeT-It (<http://www.km3net.org/research/research-infrastructure/km3net-it-site/>) site, about 100 kilometer off-shore Sicily, Italy, and will be anchored at a depth of about 3500 m.



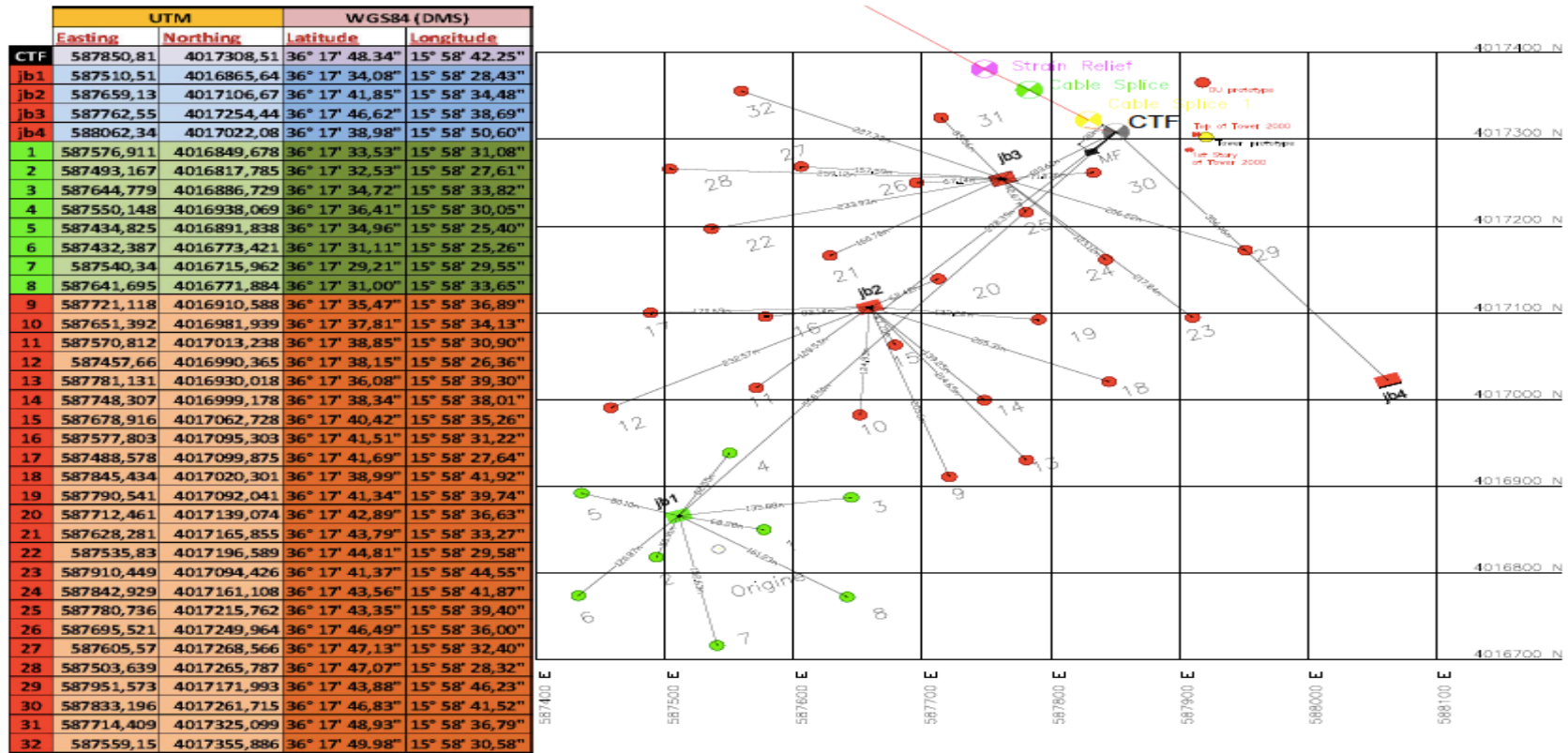
## The next generation Neutrino Telescope

The document that describes these two apparatuses ARCA (Astroparticle Research with Cosmic in the Abyss) off the Italian coast (South Sicily) and Orca (Oscillation Research with Cosmic in the Abyss) off the French coast (Toulon), was very recently published in:

Journal of Physics G, "Letter of Intent for KM3NeT 2.0", it's available at:  
<http://dx.doi.org/10.1088/0954-3899/43/8/084001>

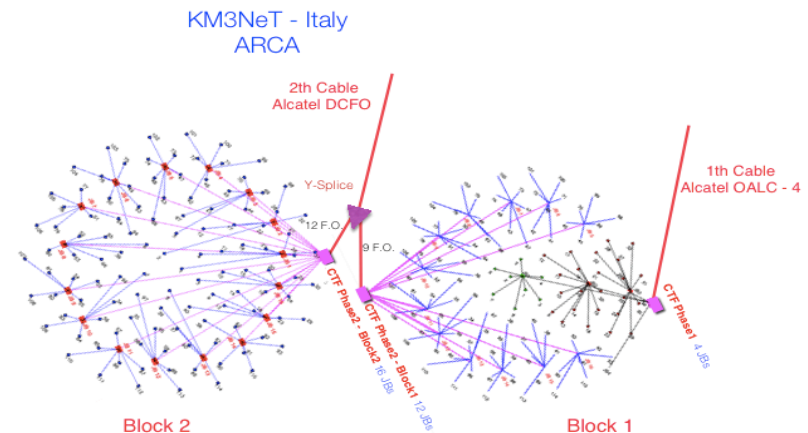


# Phase I @ Italian Site



## Km3NeT - Italy Phase I Main Data

- ☛ Depth 3.500 m
- ☛ Distance from shore 100 km
- ☛ Main Electro Optical cable Alcatel OALC 4 - 20 FO G655
- ☛ 1 Cable Termination Frame
- ☛ 4 Junction Boxes
- ☛ 32 Detection Units
- ☛ Height DU 700 m
- ☛ Total electrical power 10 kW





# Tools and Equipment



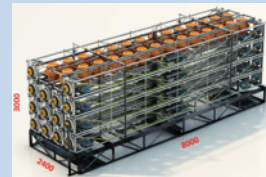
- Multi Service Vessel ATide
- 30 t hydraulic A-Frame with 4500m lift lines
- Heavy work class ROV rated up to 4500 mwd (125 hp)
- DP2



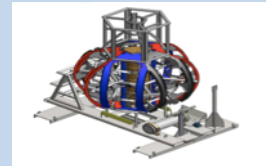
Cable Termination Frame - CTF



Junction Box - JB



Tower - T 2000x



String - S 1000x



Interlink Cables - IL  
IL dry (CTF – JB) up to 600 m  
IL oil (JB – DU) up to 300 m



Cable Tray - CT



# Challenges

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- Change out of Cable Termination Frame
- Recovery of Junction Box
- Recovery of 1 Tower (unsuccessful)
- Recovery of 1 String
- Long term wet storage of cables
- In storage maintenance of equipment

Currently undergoing a full technical review