



**KM3NeT PRESS RELEASE - 15/04/2021**

## **Six KM3NeT/ARCA detection units operational in the deep sea**

During a week-long sea campaign, 8-14 April 2021, the seafloor infrastructure offshore Sicily has been successfully upgraded. In addition, five new detection units of the kilometre cube neutrino telescope KM3NeT/ARCA have been connected and are operational.

Located in the Mediterranean Sea at a depth of 3500 m, about 80 km offshore Capo Passero, Sicily, the ARCA telescope together with its sister detector ORCA, located offshore Toulon, France will allow scientists to identify the astrophysical sources of high-energy cosmic neutrinos and to study the fundamental properties of the neutrinos, the most elusive and pervasive of the known elementary particles. The two detectors will also provide unprecedented opportunities for Earth and Sea science studies.

Once complete, the KM3NeT/ARCA detector will form an array of more than two hundred detection units. Each of these 700 m tall structures comprises 18 modules equipped with ultra-sensitive light sensors that register the faint flashes of light generated by neutrino interactions in the pitch-black abyss of the Mediterranean Sea.

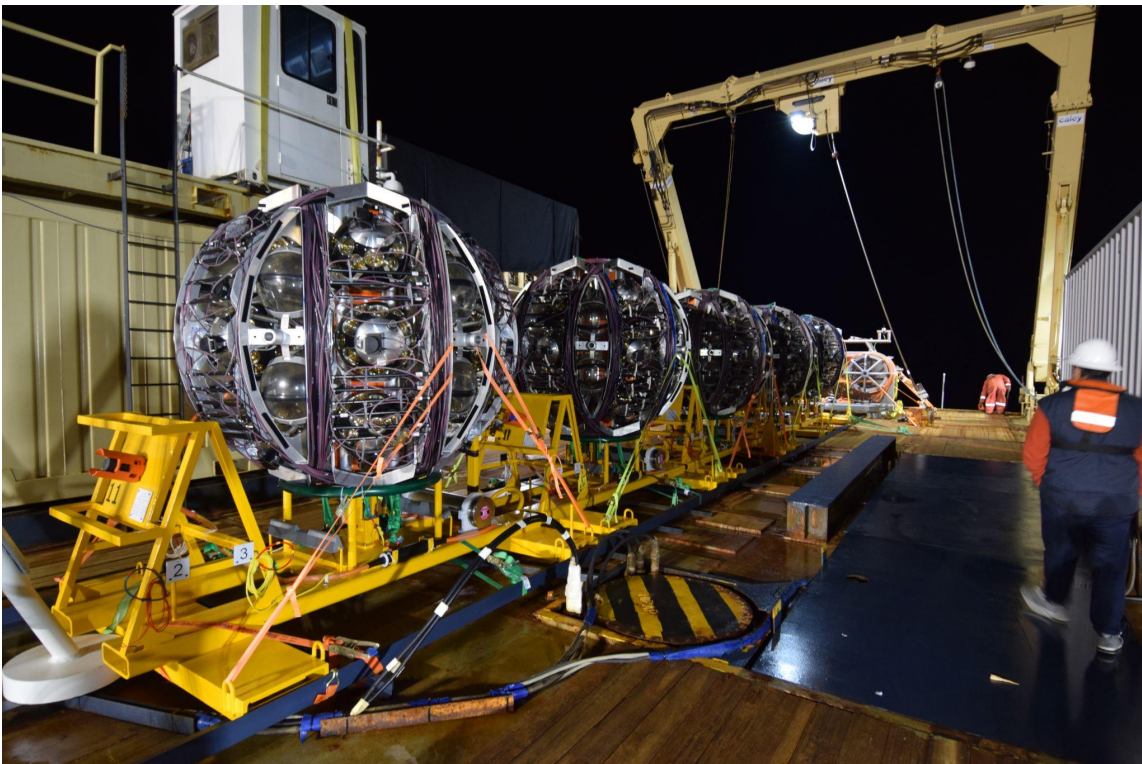
During the first part of the sea operation, a new junction box, a hub for the power distribution and data transmission of the detection units, was added to the sea floor infrastructure. The junction box is connected via an electro-optical cable to the recently renovated onshore INFN laboratory located in Portopalo di Capo Passero.

In the second part of the operation, five new KM3NeT detection units were deployed, individually connected by a remotely operated submersible to the junction box and unfurled to their final vertical configuration. As a final step, the first detection unit of the apparatus, which had been deployed as early as 2015, was connected to the new junction box.

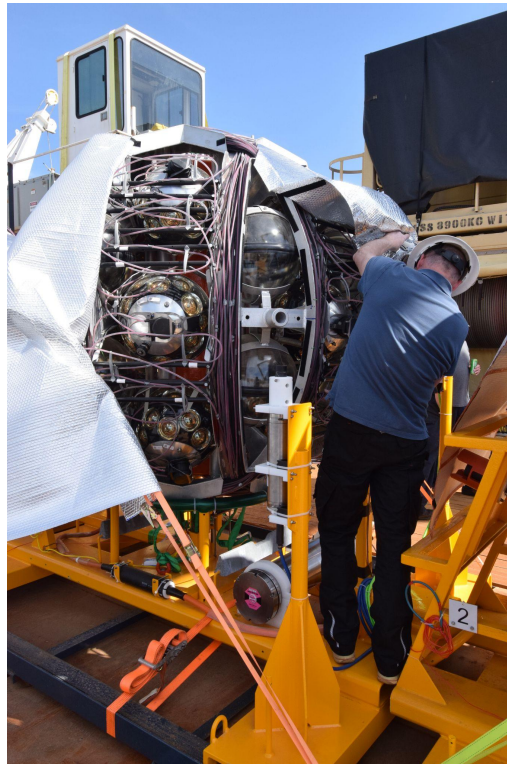
In total, six detection units are now in operation, representing the initial core of the KM3NeT/ARCA neutrino telescope. With the six ORCA detection units already taking data, the KM3NeT neutrino observatory has now comparable sensitivity to that of its predecessor, the ANTARES neutrino telescope.

KM3NeT is an international collaboration of over 250 scientists from more than fifty scientific institutes around the World. KM3NeT has been included in the list of high priority projects selected by the European Strategy Forum on Research Infrastructures (ESFRI). Paschal Coyle, Spokesperson of the Collaboration emphasises: *“The successful deployment and operation of multiple ARCA detection units is another major step forward for the KM3NeT project. Now it’s full steam ahead with the construction of the hundreds of detection units to be deployed at the French and Italian sites.”*

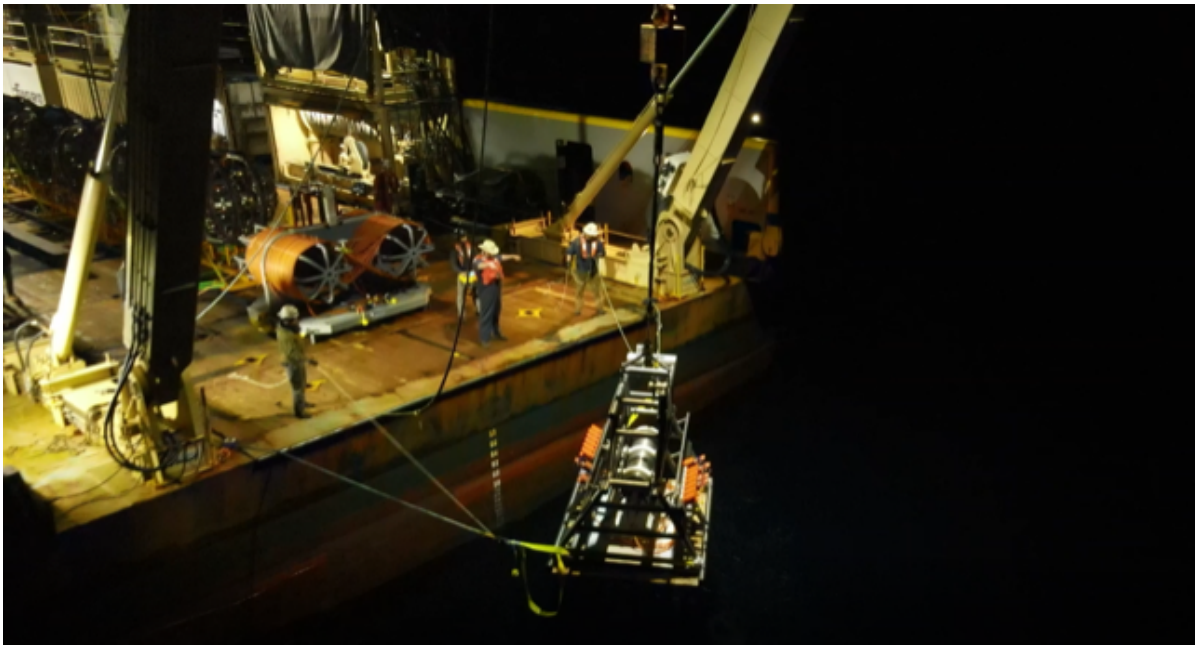
The activities in Italy are supported by the Sicilian Region in the framework of the IDMAR project. The goal of IDMAR is to upgrade the sea research infrastructures in Sicily, including the KM3NeT/ARCA site. *“This campaign demonstrates once again the technological capabilities of KM3NeT and IDMAR to manage such complex marine operations”*, says Giacomo Cuttone, Scientific Director of the IDMAR project.



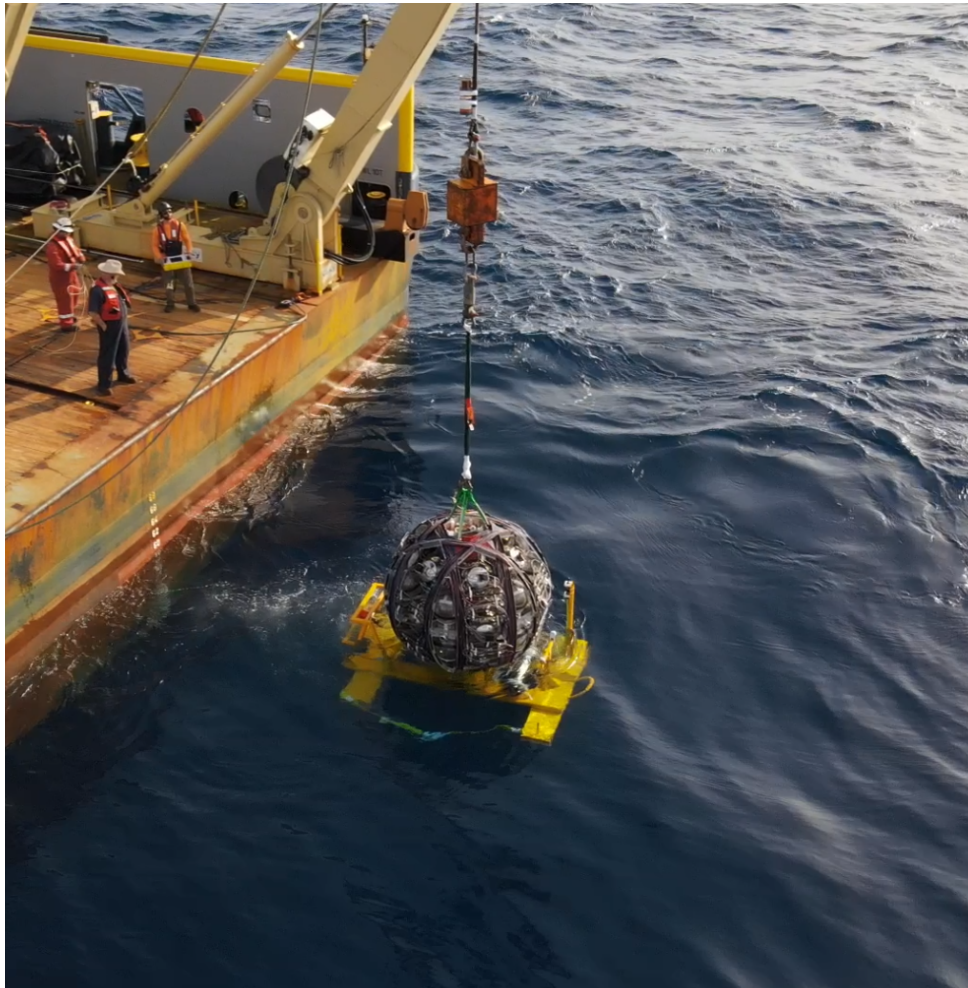
*The five detection units of KM3NeT onboard the deployment ship.*



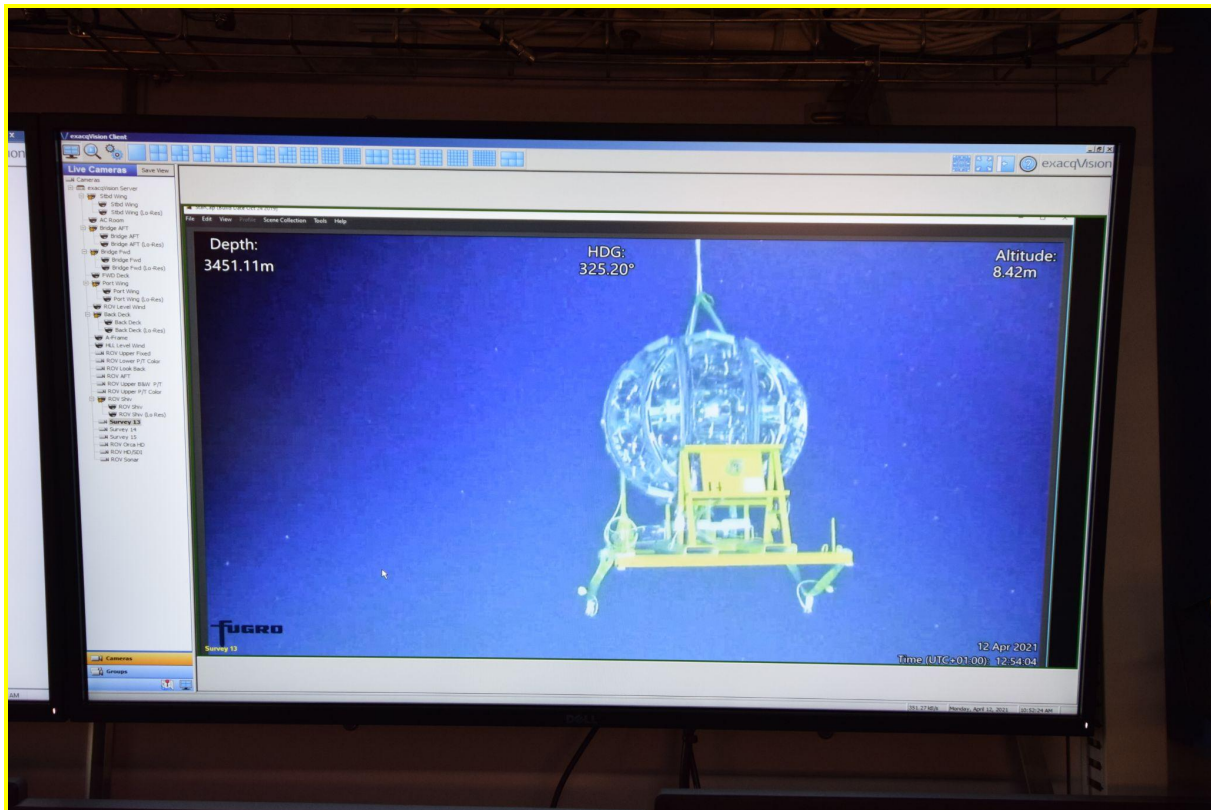
*Preparation of a detection unit for deployment.*



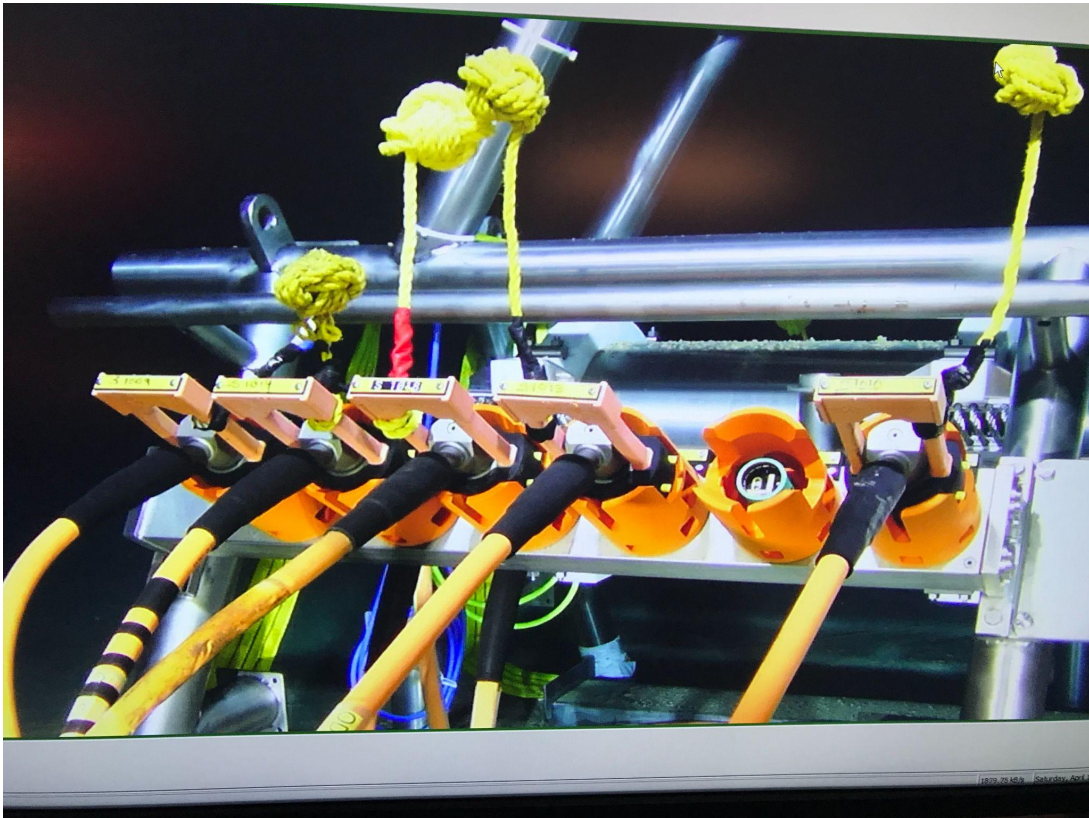
*Deployment of the new junction box for the sea floor infrastructure.*



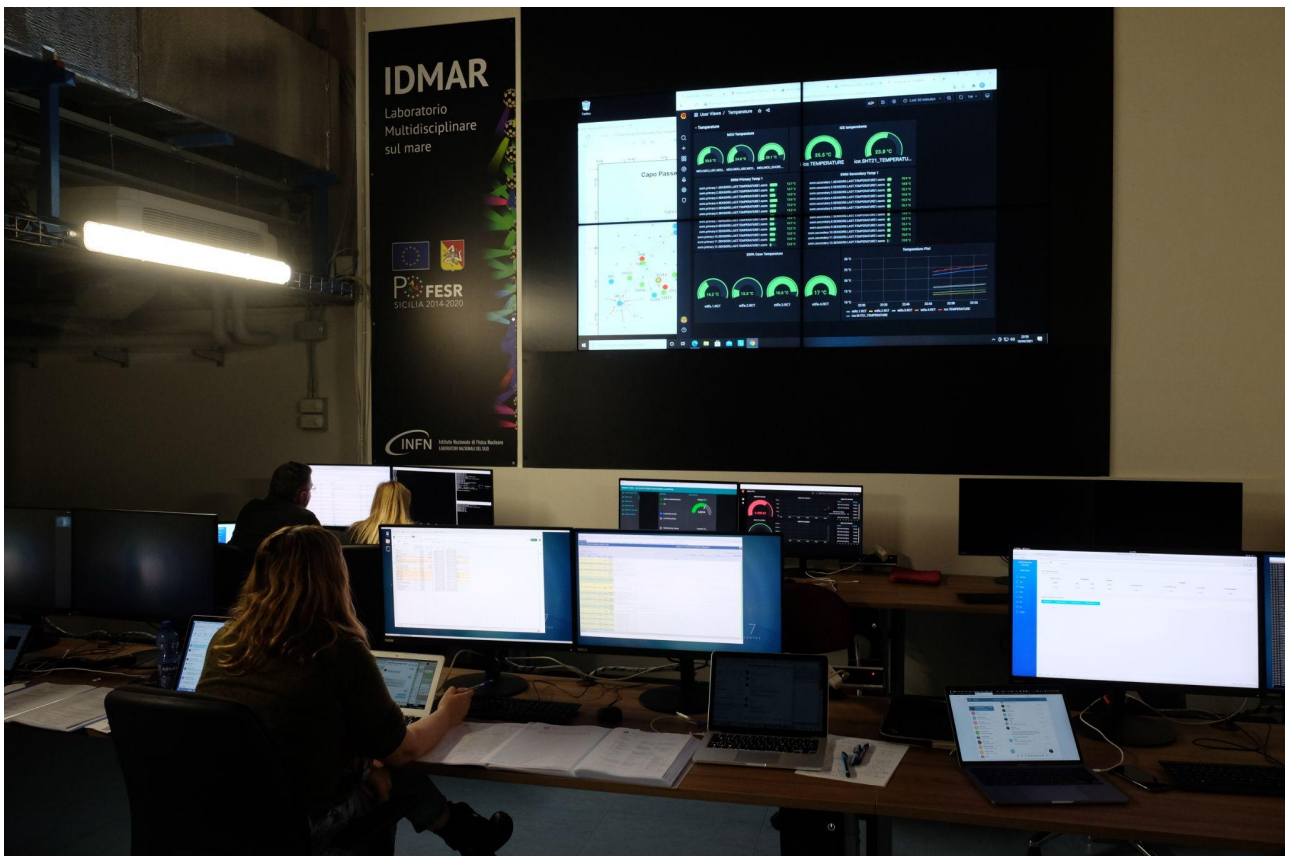
*Deployment of a detection unit of KM3NeT.*



*One of the detection units of KM3NeT reaching the sea floor.*



*Connections on the submarine junction box (3,500 m depth).*



*Control of the operation from the shore laboratory in Portopalo di Capo Passero (the operation was performed in full respect of the anti-COVID-19 safety measures).*

END of PRESS RELEASE

For editors, not for publication.

**Additional information:**

*ARCA-Astroparticle Research with Cosmics in the Abyss*

*ORCA-Oscillation Research with Cosmics in the Abyss*

*Link to a video of the overboarding of the junction box (aerial view):*

<https://youtu.be/QwOg3T97wv8>

*Link to a video of the overboarding of a detection unit:*

[https://youtu.be/iVx\\_WKXtgt4](https://youtu.be/iVx_WKXtgt4)

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**KM3NeT web site:**

<https://www.km3net.org>