



KM3NeT INFRADEV – H2020 – 739560

“KM3NeT opens a new window on our universe”

Report on the on-line communication of KM3NeT

KM3NeT INFRADEV GA DELIVERABLE: D3.3

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Abstract

In this document we report how KM3NeT communicates with its stakeholders on the internet with a website and using popular social media.

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I. DELIVERY SLIP

	Name	Partner/WP	Date
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II. DOCUMENT LOG

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III. APPLICATION AREA

This document is a formal deliverable for the GA of the project, applicable to all members of the KM3NeT INFRADEV project, beneficiaries and third parties, as well as its collaborating projects.

IV. TERMINOLOGY

A complete project glossary is provided:

OCC: Outreach and Communication Committee

ARCA: Astroparticle Research with Cosmics in the Abyss

ORCA: Oscillation Research with Cosmics in the Abyss



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VII. PROJECT SUMMARY

KM3NeT is a large Research Infrastructure that will consist of a network of deep-sea neutrino telescopes in the Mediterranean Sea with user ports for earth and sea sciences. Following the appearance of KM3NeT 2.0 on the ESFRI roadmap 2016 and in line with the recommendations of the Assessment Expert Group in 2013, the KM3NeT-INFRADEV project addresses the Coordination and Support Actions (CSA) to prepare a legal entity and appropriate services for KM3NeT, thereby providing a sustainable solution for the operation of the research infrastructure during ten (or more) years. The KM3NeT-INFRADEV is funded by the European Commission's Horizon 2020 framework and its objectives comprise, amongst others, support for Outreach and Communication (work package 3).

VIII. EXECUTIVE SUMMARY

The main goal of WP3 is to grow financial, political and public support for the international KM3NeT project by communicating its value to stakeholders and the general public. The KM3NeT Outreach and Communication Strategic Plan (D3.1) aims at positioning KM3NeT as one of the top scientific and technological projects of the 21st century. It is a cooperative effort led by the KM3NeT Outreach and Communication Committee in close collaboration with communication and outreach offices in KM3NeT member countries. Five key priorities are formulated in the Strategic Plan: (i) Communicate the value of the KM3NeT project to all its stakeholders; including the public; (ii) Ensure that stakeholders and the public understand KM3NeT to be a single coherent project; (iii) Increase



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communication activity in all partner countries; (iv) Ensure that all stakeholders are engaged with the project at the national and international level (v) Support KM3NeT managers to attract new member nations to the project. In this document we report how online communication with KM3NeT stakeholders contribute to support these strategic communication goals. All on-line communication channels have a single motto: *KM3NeT opens a new window on our universe*.



Figure 1 KM3NeT logo with the KM3NeT motto.



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1. Introduction

The KM3NeT strategy for communication with its stakeholders is set out in the KM3NeT Outreach and Communication Strategic Plan (D3.1). Five key priorities are formulated in the Strategic Plan: (i) Communicate the value of the KM3NeT project to all its stakeholders; including the public; (ii) Ensure that stakeholders and the public understand KM3NeT to be a single coherent project; (iii) Increase communication activity in all partner countries; (iv) Ensure that all stakeholders are engaged with the project at the national and international level (v) Support KM3NeT managers to attract new member nations to the project. The effort to reach these communication goals is led by the KM3NeT Outreach and Communication Committee in close collaboration with communication and outreach offices in KM3NeT member countries. To reach the above goals, on-line communication with stakeholders is an important instrument. The social media form the lively environment in which two-way interaction with stakeholders is natural and easily create a 'community feeling' among stakeholder and in the KM3NeT Collaboration itself. The website is the stable 'rock in the communication branding' with more detailed scientific, technological and organisational information. The KM3NeT Wikipedia page forms the more distant platform for the interested reader. With this toolset of a website, social media accounts and a Wikipedia page KM3NeT is working on a strong on-line presence with a recognisable scientific and technological brand. This document reports on the current status of this effort and the plans for the direct future.

2. KM3NeT website

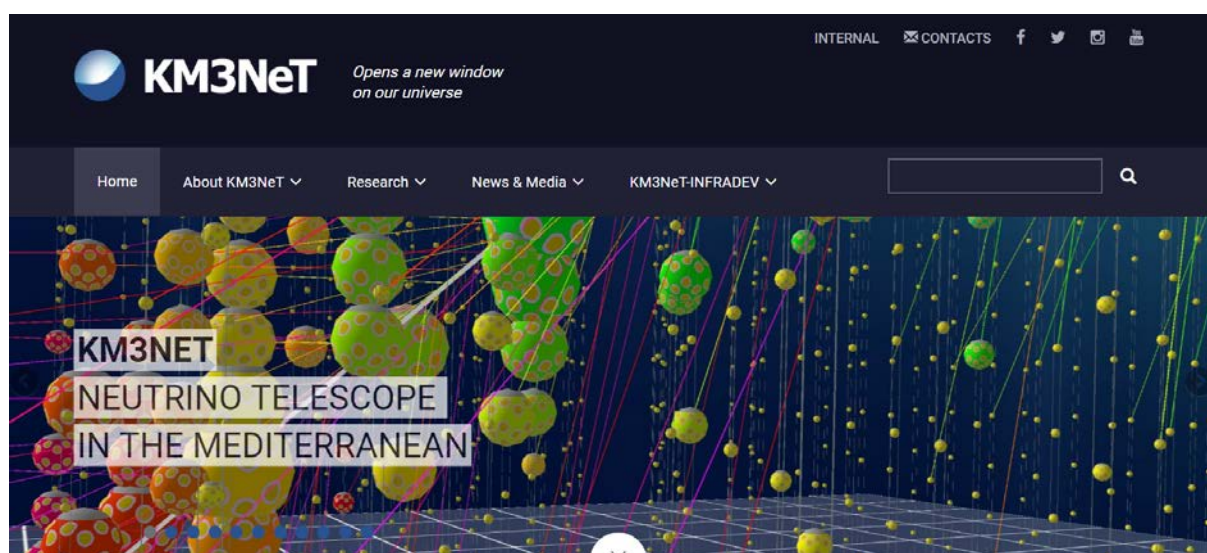


Figure 2 Header of the KM3NeT website.

The website *km3net.org* was launched in 2007 during the KM3NeT Design Study. Since then it gradually evolved to its current format and look-and-feel following the progress of the KM3NeT from a Design Study, via a Preparatory Phase to the construction of the neutrino telescopes. The KM3NeT Outreach



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and Communication Committee (OCC) is responsible for the content of the website. The Physics and Software Manager is the chair of the OCC and forms the link with the executive management of the KM3NeT project. The architecture of the website comprises four cascading menus dedicated to an audience of different stakeholders. The menu *"About KM3NeT"* aims at informing policy makers, funding authorities and potentially interested new members about the organisational structure of the KM3NeT Collaboration. Here one can find the list of institutes participating in the Collaboration and the Organisational Breakdown Structure of the project. Statements about diversity and Open Access reveal the policies of KM3NeT for an inclusive working environment and the policy of KM3NeT to provide regulated free-of-charge access to the infrastructure and its data for scientific purposes. For the interested astrophysicists, a list of publications is provided. In the near future, the newly developed *"Code of conduct and ethical behaviour"* (D5.1) and the *"Policy for Equality, Diversity and Inclusion in KM3NeT"* (D5.2) will be made public here.

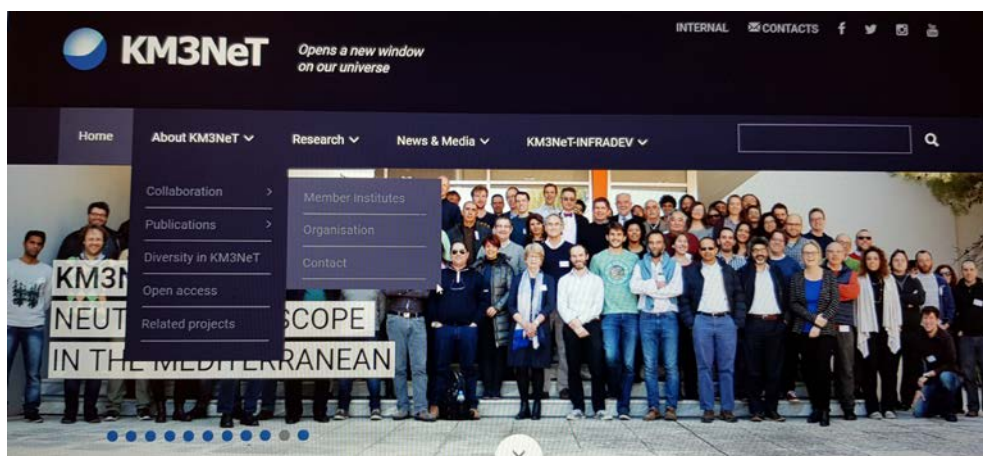


Figure 3 "About KM3NeT" cascading menu.

The cascading menu *"Research"* comprises information about the science objectives of KM3NeT, the details of the detector elements and the seafloor cable networks. A high-level overview describes the computing model of KM3NeT and the opportunities for Earth and Sea Sciences to use dedicated ports at the KM3NeT installation sites. This cascading menu aims at informing the astroparticle physics community as well as a broader audience. It provides background information for science journalists.



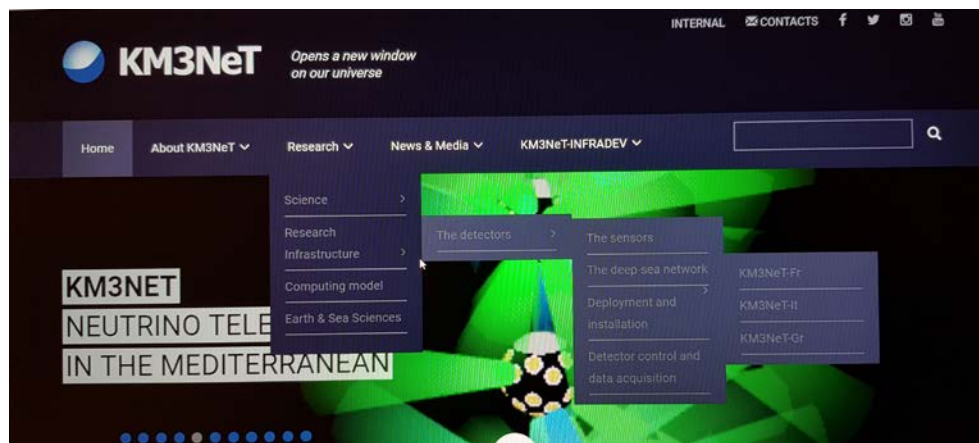


Figure 4 "Research" cascading menu.

The third cascading menu "News & Media" aims to reach out to science journalists with news items and material such as photos of detector elements, activities during sea campaigns and people at work.

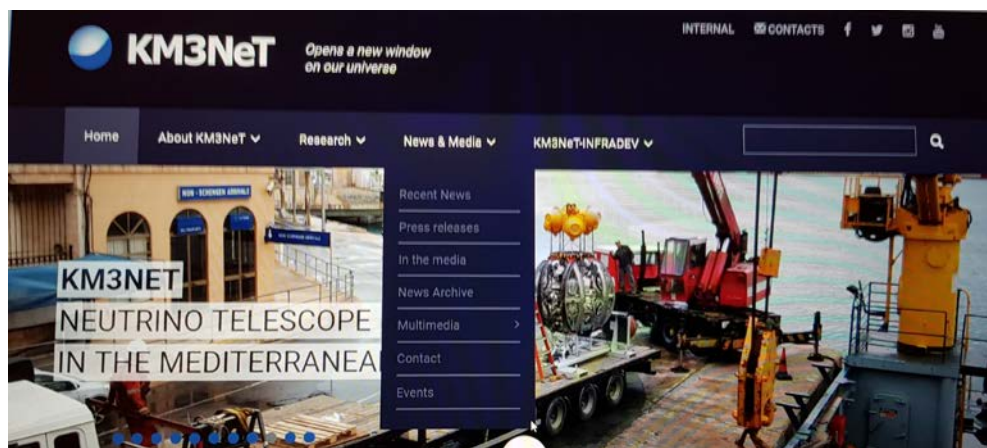


Figure 5 "News & Media" cascading menu.

Finally, at the cascading menu "KM3NeT-INFRADEV" the deliverables and description of work of the KM3NeT-INFRADEV H2020 project are published.

The KM3NeT website is kept up-to-date by the OCC as needed and important news items are issued regularly. The more static pages are updated annually. Since the transition to a WordPress based webpage, for security reasons the use of Google analytics for performance measuring is no longer allowed by the hosting server. A new performance measuring tool has not yet been decided.



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3. KM3NeT social media accounts

In 2012 the social media accounts for KM3NeT were launched. As with the website, the OCC is responsible for the contents of the posts. At first, the emphasis was at Facebook, but over time the focus moved to Twitter where science journalists and the astroparticle community are more active. More recently, the KM3NeT Instagram account is more frequently used to better reach out to the younger general public that has moved out from Facebook. Generally, the same information is posted at the three social media accounts with slightly different text to address the different target audiences. Unfortunately, due to a pause in the operation of the first detection units of the neutrino telescopes while upgrading the seafloor cable network, in 2018 the KM3NeT on-line activities had a low profile. Since early 2019, operation of the ARCA telescope at the Italian site has been resumed and the start of operation of the ORCA telescope at the French is expected to be launched soon. With two operational sites, KM3NeT will be able to enhance its on-line communication profile considerably, in particular on Instagram.



Figure 6 KM3NeT Twitter profile

4. KM3NeT Wikipedia page

The KM3NeT Wikipedia page was launched in 2007 during the Design Study. At first, it took some effort to get the page accepted, because the name KM3NeT contains a number and that is generally not accepted by the moderators of Wikipedia for a lemma. The page is updated by the OCC at an annual basis to provide scientific and technology information to the interested reader.



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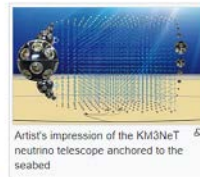


KM3NeT

From Wikipedia, the free encyclopedia

The **Cubic Kilometre Neutrino Telescope**, or **KM3NeT**, is a future European *research* infrastructure that will be located at the bottom of the *Mediterranean Sea*. It will host the next-generation neutrino telescope in the form of a water Cherenkov detector with an instrumented volume of about five cubic kilometres distributed over three locations in the Mediterranean: KM3NeT-Fr (off Toulon, France), KM3NeT-It (off Portopalo di Capo Passero, Sicily, Italy) and KM3NeT-Gr (off Pylos, Peloponnese, Greece). The KM3NeT project continues work done under the *ANTARES* (telescope built off coast of France), *NEMO* (planned telescope off coast of Italy) and *NESTOR* (planned telescope off coast of Greece) neutrino telescope projects.

KM3NeT will search for neutrinos from distant astrophysical sources like supernova remnants, gamma-ray bursts, *supernovae* or colliding stars and will be a powerful tool in the search for *dark matter* in the universe. Its prime objective is to detect neutrinos from sources in our galaxy. Arrays of thousands of optical sensor modules will detect the faint light in the deep sea from charged particles originating from collisions of the neutrinos and the water or rock in the vicinity



Artist's impression of the KM3NeT neutrino telescope anchored to the seabed



KM3NeT logo

Figure 7 KM3NeT Wikipedia page

5. On-line communication campaigns

In the KM3NeT Outreach and Communication Strategic Plan, five themes are defined for KM3NeT to tell its stories. Each of these themes are being addressed by the information on the website and in posts in the social media.

5.1 Stories being told

1. KM3NeT is the next generation neutrino observatory.

- KM3NeT is an initiative to build and operate the next generation deep-sea neutrino telescope.
- KM3NeT will collect an unprecedented quantity of cosmic and atmospheric neutrinos
- KM3NeT will serve as an open observatory to a wide astrophysics and particle physics community.
- KM3NeT will provide open access to the earth and sea science community for real-time, continuous, high frequency monitoring and observation of the deep-sea environment.

This theme is addressed by the information on the KM3NeT website and the Wikipedia page and currently less in social media posts. Once both the ARCA and ORCA sites are operational with a few detection units, the OCC will launch a new campaign “*The next generation*” with a press release and posts at the website and in the social media to emphasise this story again.

2. KM3NeT’s foundation is its exceptional scientific potential.

- KM3NeT is pushing both the low-energy and high-energy frontiers, where insight into some of the Universe’s greatest mysteries may exist.
- KM3NeT’s unique capabilities will help us to address some of the most perplexing questions in astrophysics and particle physics.
 - o Understanding the origin and role of relativistic cosmic particles
 - o Probing extreme environments



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- Exploring frontiers in physics
- KM3NeT's broad energy coverage and unprecedented angular resolution will allow us to search for the sources of cosmic rays from our galaxy to the furthest reaches of the Universe.
- KM3NeT will measure the fundamental properties of neutrinos such as oscillation parameters, and mass ordering, paving the way to an understanding of the origin of the matter/anti-matter imbalance in the Universe.
- KM3NeT will scrutinize its data hunting for signs of new physics such as sterile neutrinos, non-standard interactions, dark matter, magnetic monopoles, violation of Lorentz invariance,

This theme is addressed by the information on the KM3NeT website and the Wikipedia page. The participation of KM3NeT members in conferences and workshops offer the opportunity to address the KM3NeT scientific potential in customised posts at the website and the social media. For this, the OCC is to a large extent dependent on information provided by the KM3NeT scientists attending the conferences. It is the intention of the OCC to address this issue at the Collaboration meetings in 2019. In addition, KM3NeT will launch in 2019 the campaign "*KM3NeT papers explained*" posting threads in the social media and a news item on the web site for each KM3NeT paper that will be published.

3. Technological innovation

- KM3NeT has innovated new technologies for photo-detection, deep-sea technology, time-synchronisation over large distances and computing.
- KM3NeT-based innovations have applications in other domains?

Also this theme is addressed by the information on the KM3NeT website, the Wikipedia page, by frequent posts and threads in the social media and by the videos published in the YouTube channel of KM3NeT. The latter are mainly videos made during deployment operations and would in future need more polished versions telling the story of KM3NeT technology. This has not yet been planned.

4. Diversity of people

- People of many nationalities from across the globe are working for KM3NeT.
- Their academic and professional backgrounds are diverse: science, engineering, computing and others.

At the KM3NeT website the list of institutes participating in KM3NeT, together with a map of the cities of KM3NeT. It shows that KM3NeT is a global collaboration of scientists and engineers. In the social media campaign "*Meet our Collaboration*" individual KM3NeT members are introduced to the followers of the KM3NeT accounts. Also the campaign "*Heroes of KM3NeT*" contribute to telling the story of diversity in KM3NeT. Typical in this campaign the light is on the teams responsible for the production of KM3NeT hardware, the crews of the ships during sea operations, individuals or group receiving grants or other funding, individuals winning scientific awards, individuals achieving important scientific results or PhD students that have successfully defended their thesis. In addition, KM3NeT participates in the promotion of women in STEM, in particular by on-line posts at the International Day of Women and Girls in STEM.

5. Inspiration and education

- KM3NeT trains future scientists, engineers and technicians.
- KM3NeT inspires school teachers for modern and up-to-date science education.



- KM3NeT motivates school students to pursue the study of science.
- KM3NeT inspires scientific awareness among citizens.

For 2019, a new campaign “*Bye, bye, KM3NeT*” with short interviews of PhD students leaving the KM3NeT Collaboration after graduating, will be initiated by the OCC. Currently, on-line KM3NeT does not yet address school teachers and students. Once the telescopes are operational the Collaboration hopes to provide them on-line educational material.

5.2 On-line communication campaigns in 2019

Table 1 Schedule of KM3NeT on-line communication campaigns.

Campaign name	Theme(s)	Start	Remarks
The next generation	1	Expected in 2019	To be revived once both ARCA and ORCA are operational.
Heroes of KM3NeT	2, 4, 5	Intensify in 2019	Started a few years ago.
KM3NeT papers explained	2, 3	Revive in 2019	In cooperation with the KM3NeT Publication Committee.
KM3NeT presents	1, 2, 3	Revive in 2019	Needs cooperation of KM3NeT Conference Committee and individuals attending conferences and workshops.
KM3NeT workshops	2, 3, 5	Continue in 2019	Started a few years ago. Needs cooperation of the KM3NeT group responsible for the workshop.
Meet our Collaboration	4, 5	2018.	To be continued in 2019.
Bye, bye, KM3NeT	5	2019	Interviews with graduates leaving KM3NeT.
Learning KM3NeT	5	Not yet scheduled.	
Update of the website pages	1 – 5	Spring 2019	



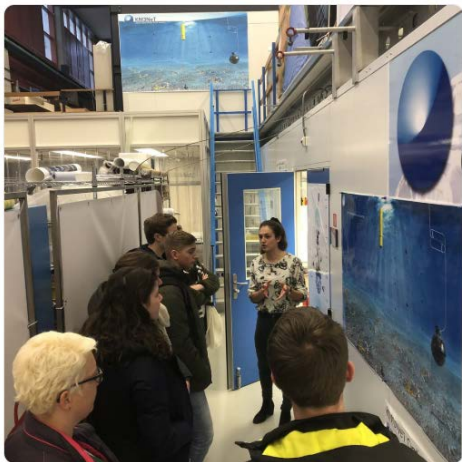


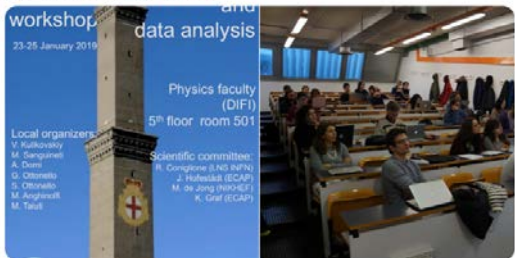
Update of the Wikipedia page	1, 2, 3	Spring 2019	
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In addition, the OCC will be active in the social media responding to posts of other (astro)particle physics experiments and observatories and to posts of relevant universities and funding authorities.

4.2 Examples of Twitter feeds

Examples of recent twitter feeds addressing the themes described above:

Table 2 Examples of Twitter feeds

<p>KM3NeT Neutrino @km3net · Jan 26</p> <p>'Viva Fysica' event of @IoP_UvA for teachers and high school students with a visit of the #KM3NeT-sensor production site at @nikhef. @MullerRasa explains the workings of the KM3NeT neutrino telescope that she will use for her search for neutrino sources.</p> 	<p>KM3NeT Neutrino @km3net</p> <p>Meet our Collaboration: Simon Bourret (just promoted PhD!) has been working in KM3NeT since 2014! Within the @APC @ParisDiderot, he performed detailed studies on mass hierarchy sensitivity and developed an analysis for Earth tomography in collaboration with @IPGP_officiel #phdlife</p>  <p>1:44 PM · 30 Nov 2018</p>
<p>KM3NeT Neutrino @km3net · Jan 10</p> <p>Speriamo che me la cavo! #KM3NeT crew from @LNS_INFN, Catania, Italy hopeful and ready for boarding the Seabed Supporter for a repair and upgrade operation at the #ARCA site near Sicily. Gogogo guys!</p> 	<p>KM3NeT Neutrino @km3net · Jan 25</p> <p>This week within the KM3NeT Collaboration: simulation workshop at @INFN in #Genova, Italy! Among the program: review current simulation codes and tune them to reach agreement with the freshly collected data! Read more: facebook.com/KM3NeT/posts/1...</p> 



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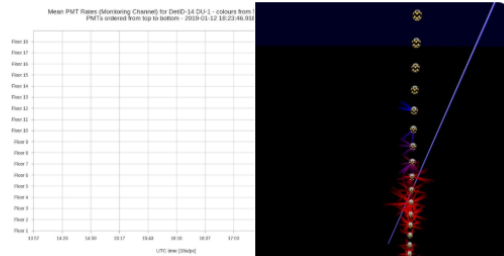
KM3NeT Neutrino @km3net · 16 Nov 2018

Did you know that #km3net will have a zero-carbon footprint? This is achieved by exploiting the favourable wind and sunshine conditions on the shores of the sites in France, Italy and Greece for generating the energy needed for operation of the neutrino telescopes.



KM3NeT Neutrino @km3net · Jan 13

Good start of 2019 for #KM3NeT: #ARCA detection unit operational again thanks to a fix of the deep-sea cable network. Many thanks to the offshore crew, shore station crew and the many #KM3NeT researchers working on analysis of the first data! 🎉 start data taking & real(!) event.



KM3NeT Neutrino @km3net

Meet our Collaboration: Anna Sinopoulou! After working on alternative geometries of the ARCA detector during her MSc studies at @ntua and @NCSR_Demokritos, she decided to continue as a #PhDstudent, searching for possible neutrino candidates from the first data-taking of KM3NeT



4:24 PM · 27 Nov 2018



KM3NeT Neutrino @km3net · 19 Dec 2018

@km3net heroes of @_nikhef have finished Nikhef's share in the production of optical modules for the first phase of the telescope. KM3NeT-phase2, here they come.



KM3NeT Neutrino @km3net · 29 Nov 2018

This week, pheno and experimental experts on neutrino oscillation are gathering at @IFIC! In the program of this @EU_H2020 workshop: @km3net of course but also @HyperKamiokande, @DUNEscience, @uw_icecube prospects/results and specific talks about oscillation phenomenology!



KM3NeT Neutrino @km3net · Jan 19

#KM3NeT is proud to have inspired photographer Jos Jansen with its design of a key element of the neutrino telescope in the abysses of the Mediterranean Sea.



The Dutch Science Park Unlocking the Secrets of the Universe

For his book Universe, photographer Jos Jansen documented a neutrino-detecting orb, data visualizations, and other ambitious projects in the Net...

wired.com



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