

Draw me a neutrino: the first KM3NeT art contest

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While the KM3NeT neutrino detector is being deployed in the Mediterranean Sea, the Collaboration launched a contest searching for illustrations of the neutrinos it will detect. The participants in the contest were invited to submit their interpretation of a neutrino, using any technique. More than 500 drawings were submitted from sixteen different countries. The winners were selected by a jury of scientists, artists and science communicators based on the originality and creativity of the drawings, as well as the harmony with the properties and origin of the neutrinos. After announcing the results in an online ceremony with a large international audience, the winning drawings have been put on display in a dedicated KM3NeT Virtual Neutrino Art Centre. In this contribution, we will explain the motivation for the contest and will describe how it was organized. We will also show the winning drawings and present the results of an impact study carried out during the contest.

1. Description of the contest and motivation

In December 2019, the KM3NeT Collaboration launched its first drawing contest, called "*Draw me a neutrino*". Participants from Ecuador, France, Georgia, Greece, Italy, Morocco, South Africa, and Spain were invited to submit their best interpretation of a neutrino, offering to them the possibility of directly interacting with the KM3NeT teams active in such countries. The drawings submitted in each of these countries participated in a national contest and later in an international one. In parallel, a contest was opened to participants from the rest of the world.

The rules of the contest allowed to prepare the drawings using any technique (digital included). The criteria used for evaluation of the drawings were based on originality and creativity, and the harmony with the properties and origin of the neutrinos. The juries set up for the evaluation comprised scientists, artists and science communicators.

There was no age limit for participating in the contest and the participants were divided into three different age groups:

- Pre-schoolers and primary-school students were asked to draw an electron neutrino;
- Teenagers, who have already been in contact with physics, were in charge of drawing a muon neutrino;
- Adults were invited to tackle the tau neutrino.

The purpose of the contest was to familiarize in an appealing way the broad public with the science carried out with KM3NeT. We aimed in particular at:

- Creating awareness of particle physics and astronomy to a young community that may become interested in science in the future;
- Engaging and informing their families and teachers;
- Providing an original approach to introduce research and science in schools;
- Creating/reinforcing the link between the Collaboration with the schools and the public;
- Promoting around the world the science carried out by KM3NeT.

Due to the increasing restrictions introduced worldwide due to the COVID-19 pandemic, the initial deadline for submissions was extended until the end of June 2020. The final ceremony to announce the winners took place in fall 2020.

2. Description of the website

A multi-lingual website with information about the neutrino, its nature and origin as well as the detection technique used in KM3NeT was created for the initiative [1]. Setting up and maintaining the website, which also served for registration of the contestants and submission of their drawings, turned out to be amongst the most time consuming activities for the contest, due to the need to keep all pages in the different languages harmonized. On the other hand, a multi-lingual site was

an essential need for this contest, in an attempt to be appealing for people of any age from as many countries in the world. An illustration of the website showing the list of languages is shown in Fig. 1.

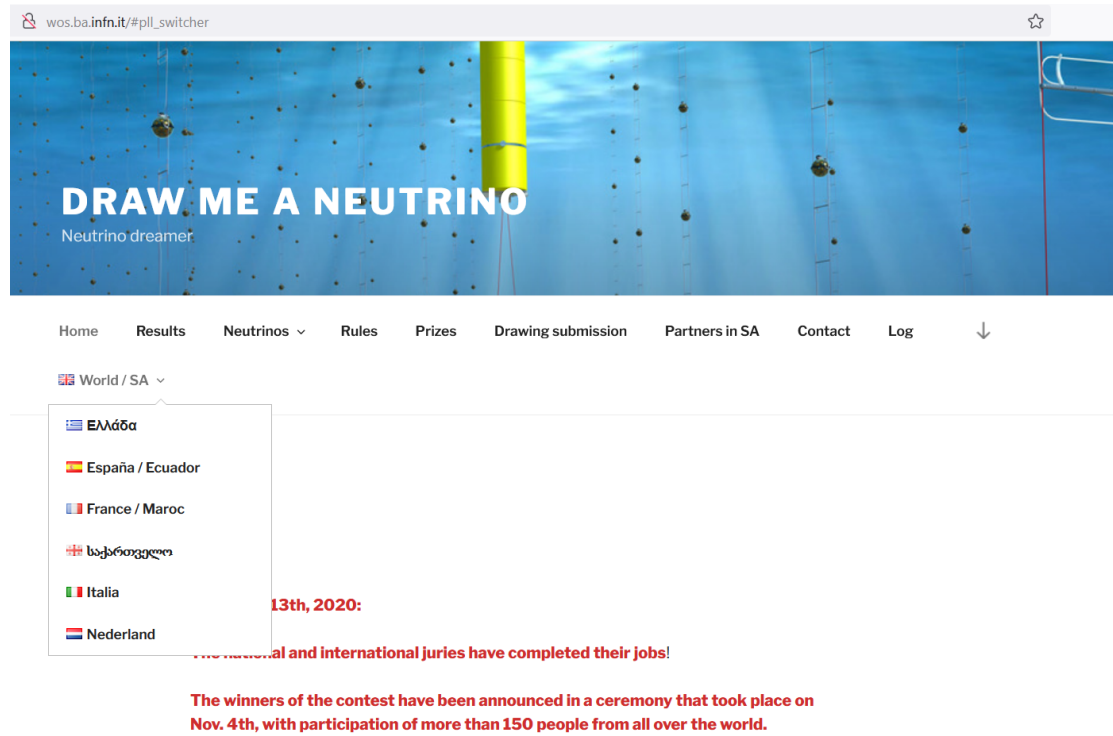


Figure 1: Screenshot of the website of the contest. See [1].

The logo and some examples of infographics prepared for the contest are shown in Fig. 2. The website collected more than 25,000 visits in total, with more than 7,000 in the last month of the contest. The participants could also ask questions, which were answered through posts on the KM3NeT social channels. According to the survey included in the submission form, most of the participants learnt about the contest through school or friends.

3. Sample of submitted drawings

The winners of the contest were announced during an online ceremony in fall 2020 that attracted more than 150 participants from all over the world. Figures 3, 4, and 5 show some of the winning drawings selected by the national and international jury committees, which included physicists as well as experts in science communication and artists. The prizes for the winners included: gadgets, electronics products and the possibility for the authors to give their names to one of the KM3NeT optical modules.

An online exhibition was then created with the winning drawings and can be still visited - see Fig. 6 and Fig. 7.



Figure 2: Left: Logo of the contest; right: Examples of infographics that have been produced for the drawing contest website.

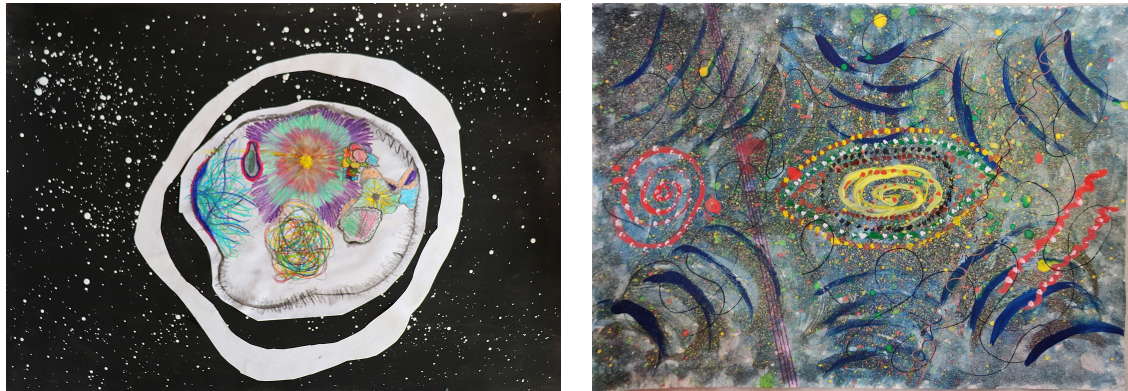


Figure 3: The drawing "*The microscopic miracle!*" in mixed technique (acrylic paint, charcoal, wood paint, collage) by Amalia S. Kosmatou, Greece (left) and the untitled drawing in mixed technique by Chahna Jain, India (right), were first in the electron-neutrino category respectively in the International and World contest.

4. Response and Impact assessment

In total, we received 521 drawings: 259 (50%) electron neutrinos, 182 (35%) muon neutrinos, and 79 (15%) tau neutrinos, sent from 16 different countries: Australia, Belgium, Bulgaria, Canada, Ecuador, France, Georgia, Greece, India, Italy, Morocco, the Netherlands, Russia, Spain, Switzerland, and the UK. It should be noted that a substantial fraction of the drawings (68%) came from countries that are not members of the KM3NeT Collaboration.

The age distribution of the participants (which can be inferred from the categories of drawings), as a function of their countries of residence, is shown in Fig. 8, together with other statistics related to the contest. We note that 56% of the participants recognized themselves as women/girls, 42% as men/boys, 1% as non-binary, and the remaining participants preferred not to say.

In view of assessing the impact of the contest on the participants, the submission form contained a short survey with the following questions:

- Did you know about KM3NeT before participating to this contest?

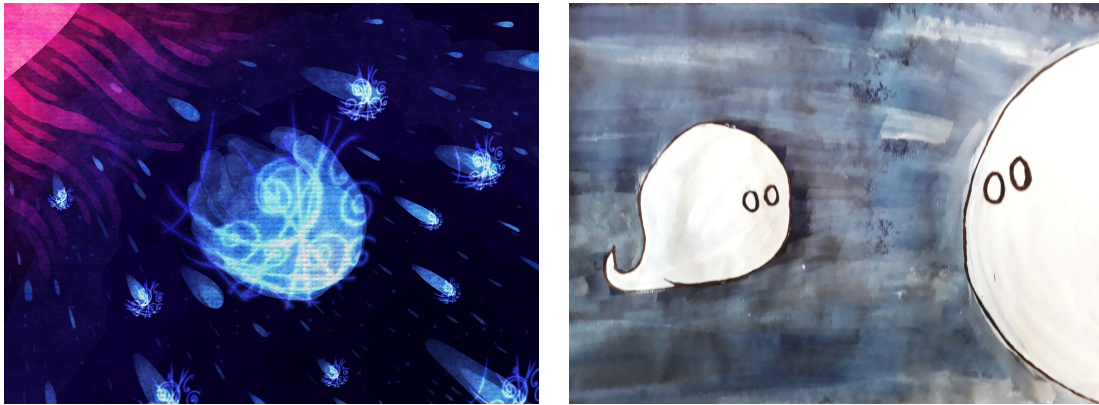


Figure 4: The digital drawing "*Ghost particle is on its way*" by Mariam Darjania, Georgia (left) and the mixed-technique (acrylic painting and markers) drawing "*Ghost particle*" by Aadishri V. Kher, India (right) were first in the muon-neutrino category respectively in the International and World contest.

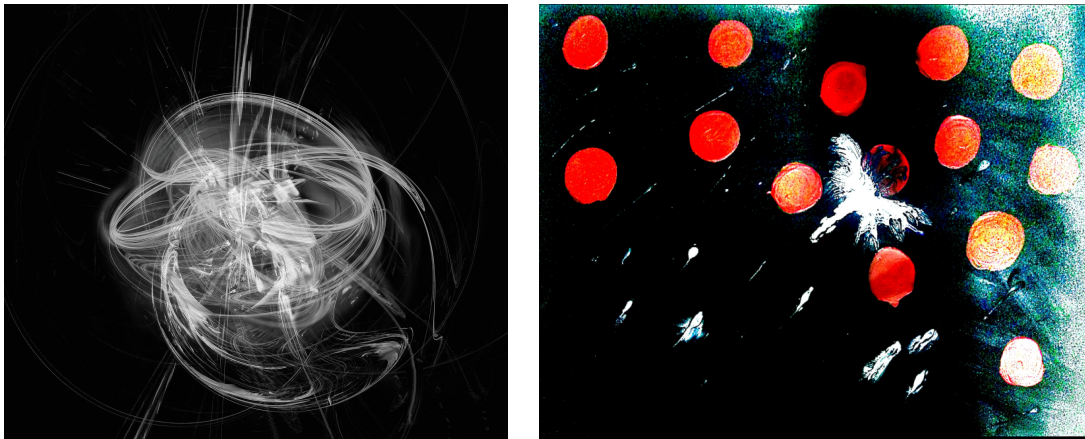


Figure 5: The digital drawing "*Ghostino*" by Evangelos Zacharopoulos, Greece (left) and the drawing "*Once in a life time*" by Vs. sai Karthik, India (right) were first in the tau-neutrino category respectively in the International and World contest.

- Did you know about the neutrino before participating to this contest?
- What is, in your opinion, the main characteristic of the neutrino and how would you describe the neutrino in one word?
- What is, in your opinion, the main characteristic of KM3NeT and how would you describe KM3NeT in one word?
- How did you get to know about this contest?

The analysis of the survey results shows that 86% of the participants did not know KM3NeT before the contest and as many as 60% learned about neutrinos for the first time because of the contest. The most common answers to the question "How would you describe the neutrino in one word?" were: tiny, elusive, invisible, neutral, abundant, particle, fascinating. The most common

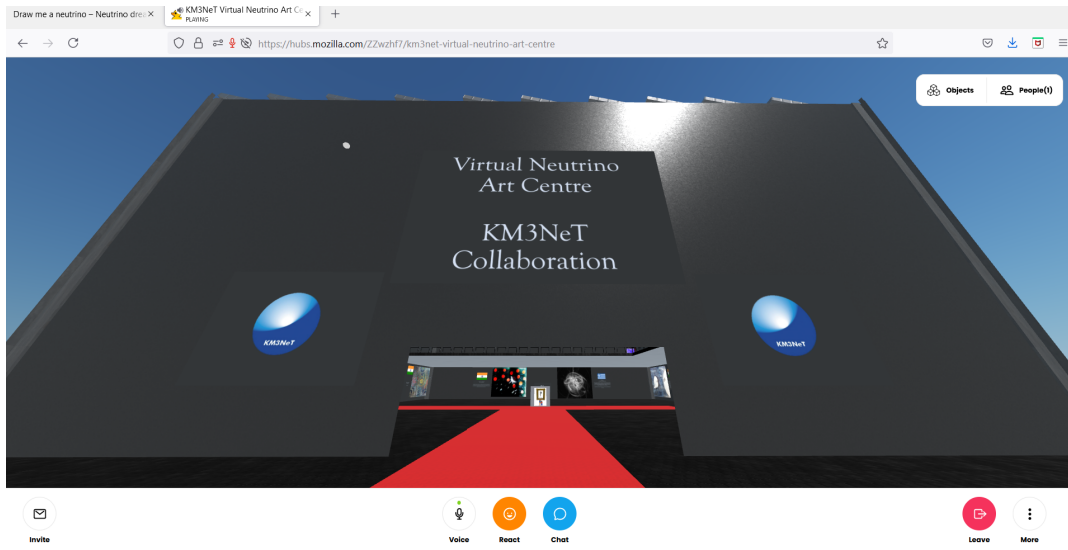


Figure 6: A red carpet invites to visit the three-floor neutrino art gallery of KM3NeT, where the best drawings from the contest are exhibited. See [2].

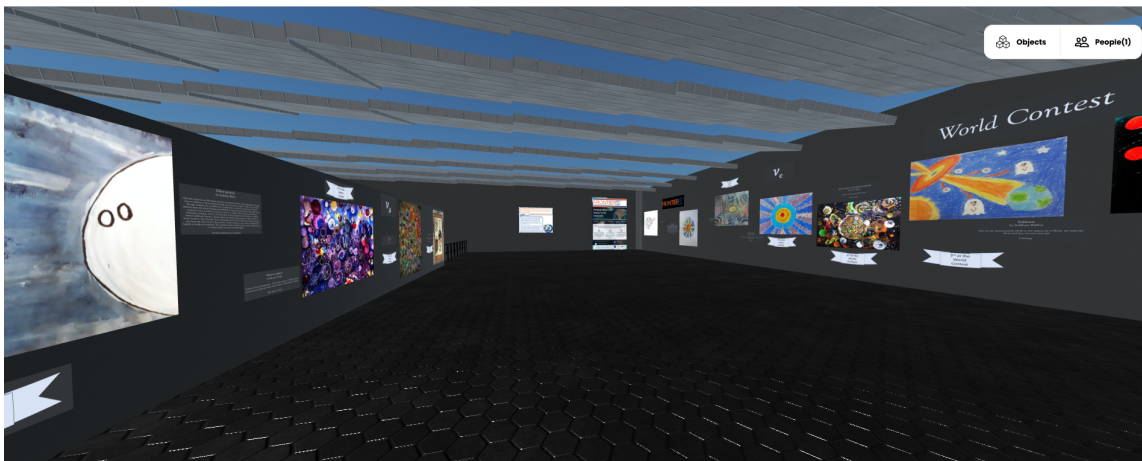


Figure 7: One of the halls of the art gallery of the contest. See [2].

answers to the question "How would you describe KM3Net in one word?" were: innovative, interesting, (powerful) telescope, research, detector, and research infrastructure.

Through this contest, the collaboration has developed several partnerships with organisations specialized in outreach such as SPACE India [3]), European or national projects for science education such as FRONTIERS [4], Art&Science across Italy [5] and LabEx UnivEarthS [6], as well as local schools in most of the aforementioned countries.

We expect that the biggest impact of this first contest is yet to come as the drawings will now be used for communication on KM3NeT scientific and technical progress. Furthermore, we plan to organise similar contests in the future, building on the success of this first edition.

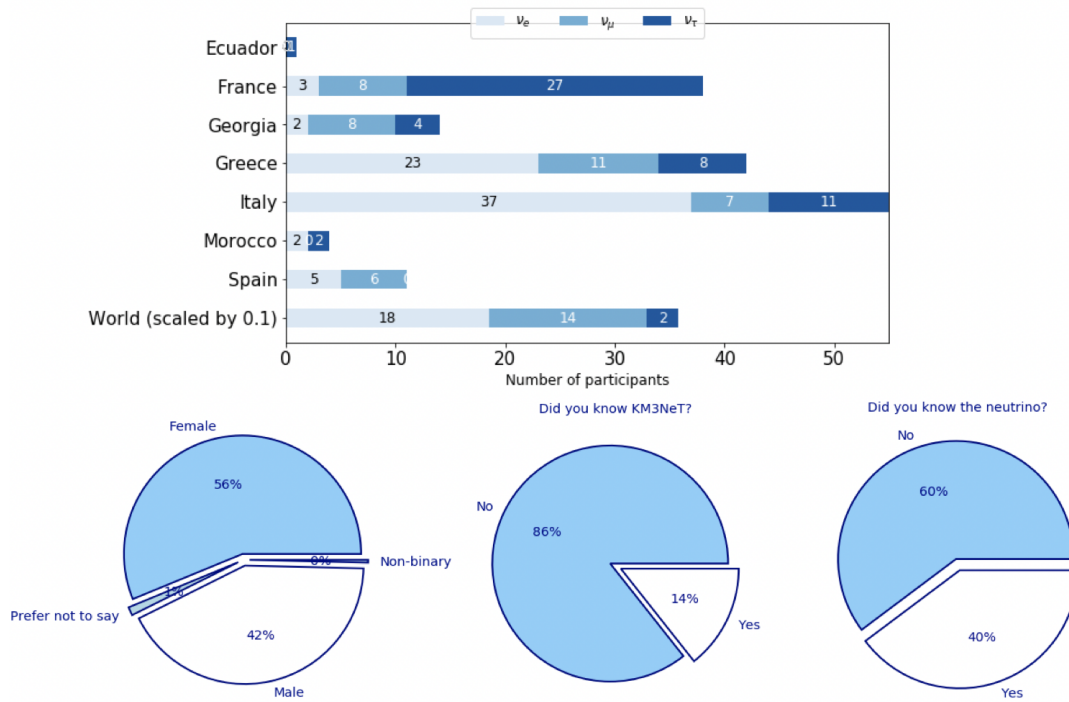


Figure 8: Statistics related to the *Draw me a neutrino* contest.

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