KM3NeT INFRADEV – H2020 – 739560

Regulations for cooperation models, authorship rights and intellectual property rights

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Abstract

The KM3NeT Research Infrastructure will, over a period of at least a decade, produce a large amount of unique scientific data that are to be made available to the scientific communities concerned and to the broader general public. This requires the set-up of tools, procedures, documentation and rules to provide this service. This document lists the rules and regulations for authorship rights and intellectual property rights which ensure the reusability of KM3NeT open science products through the application of open licenses for the whole research community.

I.   Copyright notice

II.   Delivery slip

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III.   Document log

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IV.   Application area

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

V.   Terminology

ARCA   = Astroparticle Research with Cosmics in the Abyss
            (KM3NeT neutrino astroparticle physics telescope)
BSD   = Berkeley Software Distribution (here: according license)
CC   = Creative Commons
CTA   = Cherenkov Telescope Array
ESFRI   = European Strategy Forum on Research Infrastructures

FAIR   = Findable Accessible Interoperable Reproducible
IVOA   = International Virtual Observatory Alliance
MIT   = Massachusetts Institute of Technology (here: according license)
MoU   = Memorandum of Understanding
OA   = Open Access
ODC   = Open Data Commons
ORCA   = Oscillation Research with Cosmics in the Abyss
          (KM3NeT neutrino particle physics detector)
SKA   = Square Kilometre Array

VI.   List of figures

None

VII.   List of tables

None

VIII.   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 project is funded by the European Commission's Horizon 2020 framework and its objectives comprise, amongst others, the preparation of Open Data Access (work package 4).

IX.   Executive summary

The KM3NeT Research Infrastructure will, over a period of at least a decade, produce a large amount of unique scientific data that are to be made available to the scientific communities concerned and to the broader general public. This requires the set-up of tools, procedures, documentation and rules to provide this service. The use of KM3NeT open science products also requires a sound legal basis while at the same time encouraging engagement of researchers to involve themselves in scientific exchange. In this document, the application of open licenses for KM3NeT data, software and other media is covered. As the KM3NeT Collaboration also invites collaboration on scientific exploitation of pre-publication data, bilateral agreements will be offered to interested parties. However, as this access mode would by definition not result in providing open data, these collaboration models fall beyond the scope of this report.

X.   Table of Contents

1. Introduction

KM3NeT is a large Research Infrastructure (RI) that will consist of a network of deep-sea neutrino detectors in the Mediterranean Sea with user ports for Earth and Sea sciences. The main science objectives, a description of the technology and a summary of the expected costs are presented in the KM3NeT 2.0 Letter of Intent [1].

KM3NeT will open a new window on our Universe, but also forward the research into the properties of neutrinos. With the ARCA telescope, KM3NeT scientists will search for neutrinos from distant astrophysical sources such as supernovae, gamma ray bursts or active galactic nuclei. Using the same technology, the ORCA detector will provide data of unprecedented quality on neutrino oscillations, exploiting neutrinos generated in the Earth's atmosphere. Arrays of thousands of optical sensors will detect the faint light generated in the deep sea by charged particles originating from collisions of the neutrinos with atomic nuclei. The facility will also house instrumentation for Earth and Sea sciences for long-term and on-line monitoring of the deep-sea environment and the sea bottom at a depth of several kilometres [2].

The KM3NeT Collaboration has developed a data policy plan [3] reflecting the research, educational and outreach goals of the facility. During an embargo time of two years, access to the data will be restricted to the KM3NeT Collaboration for processing and calibrating the raw data, and ensuring their quality and correctness. During this period, the exploitation of the data is exclusively granted to the Collaboration members as a return for constructing, maintaining and operating the facility. The Collaboration commits itself to generating high-quality reconstructed event data suited for a wider user community during the embargo period. These data will subsequently be made publicly available under an open-access policy on a web-based service and will not only allow the public to validate the scientific results presented by the Collaboration but also to perform individual analyses.

The contribution of KM3NeT to the body of scientific knowledge will depend to a large extent on the quality of the open data. A data management plan and relevant control mechanism that ensures a correct handling of the KM3NeT data along all the production and processing chains has been presented in [3] and [4]. From an open-access perspective, the data management plan also is compliant with the FAIR (Findable - Accessible - Interoperable - Reproducible) data principles, which were specifically designed to enable and enhance the reuse of scholarly data by third parties [5], [6].

In this document, a key requirement for reusability of FAIR scientific products is addressed, the licensing of data, software and other media used in and for scientific publications. To this end, the KM3NeT collaboration has adopted licensing principles for the choice and application of standard open licenses. The application of these principles leads to the choice of licenses to be used by the KM3NeT collaboration for their various open science products, which is introduced below. In addition to that, the regulation for the sharing of copyright within the KM3NeT Collaboration and an implementation plan for the introduction of a common licensing scheme for KM3NeT is addressed.

2. Approach to intellectual property rights from the open science perspective

2.1 The Open Access paradigm

The Open Access (OA) paradigm consists of a set of principles and practices with the aim of providing society with free and unrestricted access to knowledge. Although a single formal definition for OA does not exist, the foundations of the current open philosophy were laid during the early 2000s by three public statements. These are known as the "Budapest Open Access Initiative", the "Bethesda Statement of Open Access Publishing", and the "Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities" [7]. While the Bethesda and Budapest statements define the minimal requirements for Open Access publications of scientific results, the Berlin statement generalises these ideas and provides a definition for Open Access Contributions where, in addition to the peer-reviewed journal literature, other products associated to scientific research such as raw data, meta-data, software and other materials, are also considered. These additional contributions to the Open Access regime, namely Open Data and Open Software, can be summarized under the term Open Science.

2.2 Intellectual property rights regarding Open Science

To ensure legal security for the user of Open Science resources, science products like publications of scientific papers, software, and data are required to carry a license in which the copyright holder (i.e. creator) grants the user the right to reuse and modify the material. Applying open licenses is considered an essential part of the "reusability"-requirement of FAIR data[1] and a key requirement for Open Science. These licenses should be machine-readable and distributed with the products to allow easy traceability. As copyright is invoked by the act of creation of the scientific product and generally regulated under the terms of employment of the scientist and his or her contribution to the common scientific endeavour, assigning the copyright to the correct copyright holder and reaching an agreement on the sharing of intellectual property rights within the Collaboration is another key requirement to grant a legally sound environment for Open Science.

2.3 KM3NeT Open Science products

KM3NeT subscribes to the Berlin statement. In this context, KM3NeT will ensure that all the technical and legal barriers for accessing the products derived from its activities are removed, while guaranteeing that credit and authorship are preserved.

Beyond this basic requirement, licenses need to be specific to their use, and various open initiatives provide licenses tailored to specific needs. Therefore, the choice of licenses for a given open science

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[1] see requirement R1.1 for reusability,
https://www.rd-alliance.org/group/fair-data-maturity-model-wg/outcomes/fair-data-maturity-model-specification-and-guidelines

product will follow these well-established reference licenses, as this also ensures easy recognition of the licensing terms by the user.

Licensing domains relevant to KM3NeT include but are not limited to

- Open Access material, including journal publications, graphics and media, for which the widely-used Creative Commons[2] license can be used;
- Open Software, focusing on software produced by and for the KM3NeT Collaboration ("bespoke" software), for which interoperability amongst the wide choice of licenses is a key consideration; and
- Open databases and data sets, which can be separated in a license covering copyright on the database itself (sui generis database rights), copyright on the structuring of the database, and a license on the data itself if the data generation is sufficiently complex to warrant a copyright.

3. Implementation of intellectual property rights management in KM3NeT

3.1. Policy for Open Science Licensing

As decided by the Institute Board of the KM3NeT Collaboration, licensing in KM3NeT should, if not limited by other circumstances, follow the following principles:

1) Permissive license - Copyright licenses to products produced within the KM3NeT collaboration and for the KM3NeT collaboration should put minimal restrictions on the reuse of the products and should therefore be permissive.

2) Attribution - It should be ensured that the use of KM3NeT products is attributed to the creators, i.e. to the copyright holder according to the best current understanding of the legal situation, and to the KM3NeT Collaboration where possible. Where attribution to the KM3NeT Collaboration is not possible, the attribution should be indicated by additional metadata provided with the product according to standards set by the Collaboration.

3) No Share-Alike - As share-alike clauses might lead to compatibility issues at a later stage, they should be carefully considered and are not recommended, in particular as they also contradict rule 1).

4) No Warranty - Liability for the use of KM3NeT products should be limited as far as the national jurisdiction allows. Licenses therefore are to carry a "no warranty" clause.

5) Standard application - The license should be machine-readable to allow the easy distribution of the licensing information alongside the product. Standard license templates will be provided for the KM3NeT Collaboration members to apply to their products.

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[2] https://creativecommons.org/

3.2 Licenses by products

3.2.1 Software licensing

For software, licensing can cover a broad spectrum between fully copyright-protected commercial software and "as free as possible" open software. Within this, various versions of widely used licenses exist. For the choice of software licenses, the conditions under which the software is produced have to be taken into account.

1. **Off-the-shelf software** is used "as-is". In this case the license distributed with the software is outside the control of KM3NeT.
2. **Derived software** is developed within the KM3NeT Collaboration but includes software packages which come with a license. As these licenses might require redistribution, the derived software carries a mixture of licenses. Here, a derived license according to the above principles and, if possible, following the standard software license choice should be applied.
3. **"Bespoke" software** is developed within the KM3NeT Collaboration for the generation and exploitation of the data of the experiment without additional dependencies. Here, the license can be freely chosen.

As the community use does not indicate any preferred version for open software licenses, several licenses meeting the criteria of wide use and no share-alike ("copyleft") clause exist. Within the KM3NeT computing and software working group, a preference for the MIT[3] and BSD-3-clause license was found. After consultation and in harmonisation with the CTA and SKA consortia, the BSD-3-clause license[4] will be adopted for standard use in KM3NeT at the current stage.

3.2.2 Documentation and supplementary material

For supplementary material, the Creative Commons Attribution 4.0 International License (CC-BY 4.0)[5] is widely used and meets the policy principles, as it grants such all baseline rights as redistribution and modification, but under the condition of author attribution. CC International licenses 4.0 act as international licenses by incorporating clauses allowing for deviation from the license according to national regulations.

The CC-BY 4.0 license will also be considered a standard for the publication of official plots of KM3NeT data and articles and contributions in scientific journals or in open science repositories. Where possible, the KM3NeT Collaboration aims to provide these materials as Open Access publications, although a deviation from this standard is possible to meet the conditions of the publisher where necessary.

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[3] MIT license text: https://opensource.org/licenses/mit-license.php

[4] BSD-3-clause license text: https://opensource.org/licenses/BSD-3-Clause

[5] CC-BY license text: https://creativecommons.org/licenses/by/4.0/

3.2.3 Data and databases

Following the above principles and opting for a license that is specific for the use for databases, a license by the OpenDataCommons (ODC-By)[6] will be applied for general data bases, including attribution. For the data itself, the use of CC-BY 4.0 is chosen, as it is already offered as a default option within the Virtual Observatory software and widely used for datasets. Licenses are applied to the data after a predefined embargo period, as the exploitation within the embargo time is covered by the Memorandum of Understanding of the Collaboration.

4. Implementation plan

4.1   Attribution

In the applicable Memorandum of Understanding for phase 1 of KM3NeT as well as in the follow-up MoU currently in preparation, intellectual property rights are regulated (Article 14 of MoU phase 1), which, shortly summarised, assigns copyright of any product to the contributing institutions. Note that the copyright holder might in most cases not coincide with the author and / or contributors, as copyright for dedicated material to KM3NeT is mostly governed by the employment status of the creator at their respective institutions and additional clauses from funding contracts.

As the copyright notices and license should cite the actual copyright holder, this would in most cases require to name the contracting institutions rather than the creator/researcher, or various institutions for joint efforts, or the full list of KM3NeT members and institutions regarding high-level products into which the full collaborative effort was invested.

As no legal entity at this moment exists to hold copyright for the KM3NeT Collaboration, it is chosen to cite as copyright holder "the KM3NeT Collaboration" where possible, and link the license as matter of completeness to the full list of authors and member institutions at the time of licensing. In addition to that, (primary) authors and contributors should be listed separately from the license. This would indicate shared copyright for the collaborative efforts, and also allow for copyright infringement claims by all participating institutions should the need arise.

4.2   Application of Licenses to KM3NeT Science Products

Guidelines on how to apply the chosen licenses have been made available within the Collaboration. For future approved publications of research results, data and software, the authors apply these licenses to their work. Where relicensing is appropriate or no licenses have yet been allocated to the research products, authors are encouraged to also apply the licenses retroactively. Licensing to the KM3NeT Collaboration follows internal reviewing processes, e.g. for open-access material approval by the Publication Committee, and for software and data a review by the Open Science Committee, endorsed by the Institute Board.

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[6] Open Data Commons Attribution License: http://opendatacommons.org/licenses/by

4.3   Cooperation models beyond Open Science

For all products in the open domain, no specific cooperation models beyond the license agreement are currently envisioned, as the sharing of the research products is, beyond attribution, not bound to any conditions. However, in the spirit of fostering joint research, access to restricted or embargoed software or data might be granted on the basis of bilateral agreements with third-party researchers or institutions. As this specific scientific cooperation is not part of the Open Science regime, these cooperation models will not be addressed in this report but developed at a later stage.

However, third-party scientists are encouraged to search cooperation with KM3NeT and are offered the possibility to submit their analysis for KM3NeT Collaboration approval. Quality standards and internal KM3NeT reviewing will then be applied to adopt an analysis as KM3NeT-associated. In this case KM3NeT will offer full support to refine and optimise the analysis if required, to assess systematic effects and to prepare the publication. The authors of the primary analysis will share authorship with the KM3NeT authors, with the analysis proponents listed first.

5. References

1: Adrián-Martínez, S. et al. (2016). Letter of Intent for KM3NeT 2.0. Journal of Physics G: Nuclear and Particle Physics, 43 (8), 084001.

2: The KM3NeT Project: https://www.km3net.org/

3: KM3NeT-InfraDev (2017). The KM3NeT Data Management Plan (D4.1 KM3NeT2.0_WP4_D4.1).

4: KM3NeT-InfraDev (2019). KM3NeT report on monitoring and quality control setup (D4.5 KM3NeT2.0_WP4_D4.5)

5: The FAIR principles: Wilkinson, Mark D.; Dumontier, Michel; Aalbersberg, IJsbrand Jan; Appleton, Gabrielle; et al. https://www.nature.com/articles/sdata201618. Scientific Data. p. 160018.

6: The FAIR principles: https://ec.europa.eu/info/sites/info/files/turning_fair_into_reality_0.pdf

7: Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, 2003: https://openaccess.mpg.de/Berliner-Erklaerung