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WP6: KM3NeT in the science global context

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Summary

Work package number	6	**Start Date or Starting Event**				Month 3	
Work package title	KM3NeT in the global science context						
Participant number	1	2	3	**4**	5	6	
Short name of participant	FOM	CNRS	FAU	**UVEG**	INFN	NCSR-D	
Person/months per participant:	-	-	14	35	4	-	
Start month	1			End month		36	

Objectives

The science objectives of KM3NeT are linked to a variety of different fields of expertise which in turn are represented by different science communities, each with their individual tools, procedures, communication and dissemination channels, and research cultures. Major examples are astrophysics, particle physics, and marine sciences. Even smaller subfields, however, tend to develop their peculiarities. Examples are atmospheric neutrino simulation and modelling, experimental neutrino oscillation studies, dark matter searches, or theoretical high-energy astrophysics. The objective of this WP is to establish a sustainable cooperation of KM3NeT with these communities and thus to make available to KM3NeT their respective expertise and tools, as well as to disseminate KM3NeT data and measurement opportunities to them.

Tasks

- 6.1: Institutionalising scientific cooperation with other science communities (months 3-24)
- 6.2 Establishing a scientific exchange program for KM3NeT (months 3-30)
- 6.3 Exploring physics new physics opportunities for KM3NeT (months 13-36)

Task 6.1

This requires a coordinating scientist who is fully dedicated to establish communication with the key scientists of the different communities and the decision makers in these communities (14 FTEM, UVEG). He or she will organise working meetings and expert groups and report to the KM3NeT bodies and also to external collaborations and steering organisations such as the Global Neutrino Network (GNN) with the support of another scientist (5 FTEM, FAU) for the most busy periods.

Task 6.2

A sustainable scientific exchange program addressing experts outside the KM3NeT Collaboration and allowing KM3NeT scientists to spend guest researcher stays at non-KM3NeT institutions is to be established. This program is to be financed through the future legal entity representing KM3NeT. This requires to set up a corresponding legal framework, material and procedures for advertising the opportunities, as well as setting up selection criteria for the candidates and a selection committee. The program is to be tested for three pilot cases – one PhD student, one junior and one senior researcher. This will require effort from three different institutes involved, namely 9 FTEM at FAU, 4 FTEM at INFN and 3 FTEM at UVEG for coordination with Task 6.1.

Task 6.3

Beyond the well stablished main scientific goals of KM3NeT (the determination of the neutrino mass ordering and physics and cosmic neutrino astronomy), a wide range of other opportunities is foreseen, which can directly benefit from the output of Tasks 1 and 2 of this WP. Among these additional opportunities, the most outstanding is the discovery of dark matter, for which neutrino telescopes have unique advantages. This field is of special complexity given the variety of experimental approaches and the rich sample of theoretical models, so it is particularly well fitted for testing the global program presented in this WP. The researchers included in the pilot plans mentioned above will work to set up the tools and acquire the know-how to optimize the output of KM3NeT data for these cases. Given the time scale of the project, the natural choice for these test studies will be the available data of the KM3NeT Phase 1. In parallel, the corresponding simulations and the analysis framework to compare the results with other experiments and interpret according theoretical models will be prepared. This will require 18 FTEM (UVEG).

Deliverables and milestones

D.6.1	Six working group meetings organised and held (months 3–24);	6	UVEG	R	PU	24
D.6.2	Report on expert groups established, meetings held and agreements in preparation (month 24);	6	UVEG	R	PU	24
D.6.3	Report on implementation of sustainable cooperation with other science communities (month 36);	6	UVEG	R	PU	36
D.6.4	Report on legal framework, advertisement and selection procedures (month 18);	6	UVEG	R	PU	18
D.6.5	Establishing selection committee (month 18);	6	UVEG	R	PU	18
D.6.6	Report on pilot exchanges (month 30);	6	UVEG	R	PU	30
D.6.7	Report on the results with data of Phase 1 and sensitivity of Phase 2 for dark matter studies (month 36);	6	UVEG	R	PU	36

M.7	Establish cooperation of KM3NeT with other scientific communities	6	36	Successful deliverance of report focusing in sustainable cooperation with other scientific communities