KM3net and APPEC

Rome 17 Jan 2014

Stavros Katsanevas
APPEC Chairman, APC-Paris Diderot, IN2P3/CNRS

European programmatic context

- APPEC: a new SAC: mandate to produce a roadmap update "within constraints of agency budgets" by summer 2014.
- ESFRI: (new chair J. Womersley).
- The AEG advisory group to ESFRI judging projects on financial and managerial maturity ranked
  - CTA rank B ("might be able to achieve maturity by 2015, if substantial actions are implemented to address the bottlenecks and weaknesses") and
  - the full KM3NET rank C ("minimal chances of achieving maturity by 2015 for various reasons").
  - The ESFRI group re-examined KM3Net adding scientific criteria to the evaluation. ESFRI opinions are a determinant input to EU funding (central infrastructures, data access, legal entities etc). Update of the roadmap in 2016.
  - *Agreement with ESFRI chair that APPEC will present the findings of the new roadmap*
- European Union Horizon 2020 (H2020) .
- Large Research Infrastructures for ESFRI PP and Implementation ➔ CTA (Jan 2015)
  - CLUSTER (CTA,KM3Net) Sep 2014
  - ITN PhDs ? Sep 2014
  - Blue growth March 2014
- Also National Roadmaps e.g; Greek National Roadmap

APPEC

Summary of the roadmap statements of November 2011, specified in January 2013 as input to the European Strategy of Particle Physics

APPEC supports:

I. In the category of medium scale projects: the timely completion of the 2nd generation upgrades of gravitational wave antennas, as well as the upgrades/constructions towards ton-scale detectors for dark matter and double-beta neutrino mass experiments.

II. In the category of large-scale projects a high priority is given to the construction of the Cherenkov Telescope Array (CTA), and strong support for the first phase of KM3NeT, as well as R&D towards the definition of the next generation ground-based observatory for high energy cosmic rays.

III. Finally there needs to be coordination with other European/non-European organizations for the realization of billion-euro scale projects at the 2020 horizon, in particular a 50-500 kt scale low-energy neutrino astrophysics/proton-decay detector. Other projects on this cost scale are dark energy surveys on ground and in space, and in a longer perspective gravitational wave antennas with cosmological sensitivity on ground and in space.

ESFRI

statement in the minutes after the presentation by MdJ (not yet public)

KM3NET

- Presentation Maarten de Jong presents the project (slides enclosed).
- The presentation is accompanied by detailed documentation in response to the recommendations of the Assessment Experts Group and the Scientific Standing Committee.
- KM3NeT is a new Research Infrastructure cabled network of neutrino telescopes located in deep waters of Mediterranean Sea. Renewed interest due to recent IceCube results is reported.
- MdJ reports on the recent progress of the project: agreement that France, Italy and Greece host part of infrastructure.
- The timetable of the future steps is presented. The current plan is: implementation phase 1.5 for conformation and refinement of the neutrino signal reported in 2013 by IceCube.
- Resources Review Board supports ERIC for phase 1.5 start process when phase-1 is positively reviewed (i.e. before it is completed). Finally funding requests are well detailed. KM3NET -

ESFRI

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APPEC

Q&A

- Q: Dividing in three parts the volume does not reduce the effectiveness of the instrument?
- A: No. Detailed studies confirm this statement for the signals from high energy neutrinos
- Q: Have you evaluated the operational costs? A: They are not the major ones, but they are included in the budget (calculated for 10 years) and are about 5% of the capital construction cost
- Q: Is it an experiment or an observatory?
- A: Both. Open access, after phase 1.5.
- Q: Why the ERIC should be based in the Netherlands?
- A: Nl has experience in hosting ERICs and the headquarters do not need to coincide with the instrumentation sites.
- Q: What are the main barriers for future progresses?
- A: The progress is in our hand, and strongly depends on phase 1.5.
- Q: How are industries involved?
- A: PMT, strings, cables, deployment.

ESFRI

statement in the minutes after the presentation by MdJ (not yet public)

KM3NET - Discussion I

- The group recognizes important progresses from last year, and a serious and successful effort to address all recommendations of the Assessment Experts Group and the Scientific Standing Committee. A lot of work has been done to overcome the difficulties identified by the AEG.
- The technical question on the size of the telescope (single site or 2-3 sites) has been addressed with new calculations/simulations and it turns out that above a certain size threshold doubling in the same place or at a distance does not change the observation power, but in fact could be advantageous in the deployment phase as well as politically to get more countries directly involved. The water quality also seems so be of marginal effect on the sensitivity of the telescope.
- The recent observations of IceCube prompted new enthusiasm and the Phase 1.5 addresses a two-site (Fr, It) installation that will exceed the measuring power of IceCube. The current phase 1 is completely funded (31 M€ secured) and will complete the technical R&D.

ESFRI

statement in the minutes after the presentation by MdJ
(not yet public)

KM3NET - Discussion II

- A remarkable result of the phase 1 is the design of a telescope whose cost in for 60% in the "active part" (e.g. detectors) of the whole infrastructure, marking a big leap ahead with respect to the previous ANTARES demonstrator. A consequence of the new design is that the operational costs of Km3NET will be much cheaper then the general 10% rule, helping to address the long term sustainability issue.
- As soon as (2014-15) the phase 1 is finished the phase 1.5 will start achieving the implementation stage of the infrastructure.
- This implies funds at the level of 90M€ for which there is commitment from France, Italy and the Netherlands.
- Later the phase 2 will start that will make Km3NET the first neutrino telescope capable of studying individual cosmic sources.
- This will include the relevant contribution of Greece (with a third site) and about 55 M€ of structural funds.
- The SWG was pleased to hear about the big progress of this project and anticipates that with the anticipated new rules of the Roadmap it has 2 more years to get to the implementation phase.

H2020
Excellent science

- **INFRADEV-4-2014/2015 - CLUSTER OF ESFRI RESEARCH INFRASTRUCTURES (55 ME (up to 15ME each project), 02/09/2014)**
- For ESFRI projects, other world class research infrastructures, ERICs, e-infrastructures and Integrating Activity projects to coordinate common activities, to define harmonised policies for access to the infrastructures and data lifecycle (acquisition, access, deposit, sharing and re-use), to develop and deploy common underpinning technologies and services, and to implement common and efficient solutions on issues such as, for example, data sharing and provision, architecture of distributed infrastructures, distributed and virtual access management, and development of common critical physical and virtual. APPEC interest: Astrophysics Cosmology and Astroparticle Phyiscs cluster - E-ELT/SKA/CTA/KM3NET
- **MSCA Innovation Training Networks (ITN) (405 ME, 09/04/2014,of which 25 ME EID, 30 ME EJD), ESR up to 540 months, for a maximum 48 month duration)**
- Innovative Training Networks (ITN) (ESR, 3 to 36 months, No doctorate or <4 years research experience). "Triple i dimension": international, interdisciplinary and intersectoral mobility combined with an innovation-oriented mind-set. **APPEC interest: Multidisciplinarity in underground labs (very advanced with APPEC help) Multidisciplinarity in underwater physics ? Photodetection network (CTA,AUGER, KM3NEt)**

H2020
Societal challenges

Blue Growth BG-9-2014 Acoustic and Imaging technologies (82M, first stage 12/03/2014)

- Proposals should cover innovative technologies to improve the performance and the cost efficiency of underwater sensors and survey systems needed for acoustic detection, imaging or LiDAR, as well as the (fixed or mobile) platforms supporting them and signal and image processing to interpret raw data. Subsequent use of this information as part of an integrated framework of multi-modal data sources should also be considered.
- Proposals should bring together marine scientists, technology providers and end-users (including policy makers), with a view to support implementation of MSFD, characterisation of good environmental status or to enhance a sustainable European maritime economy.
- The Commission considers that proposals requesting a contribution from the EU in the range of EUR 4–6 million would allow this specific challenge to be addressed appropriately.

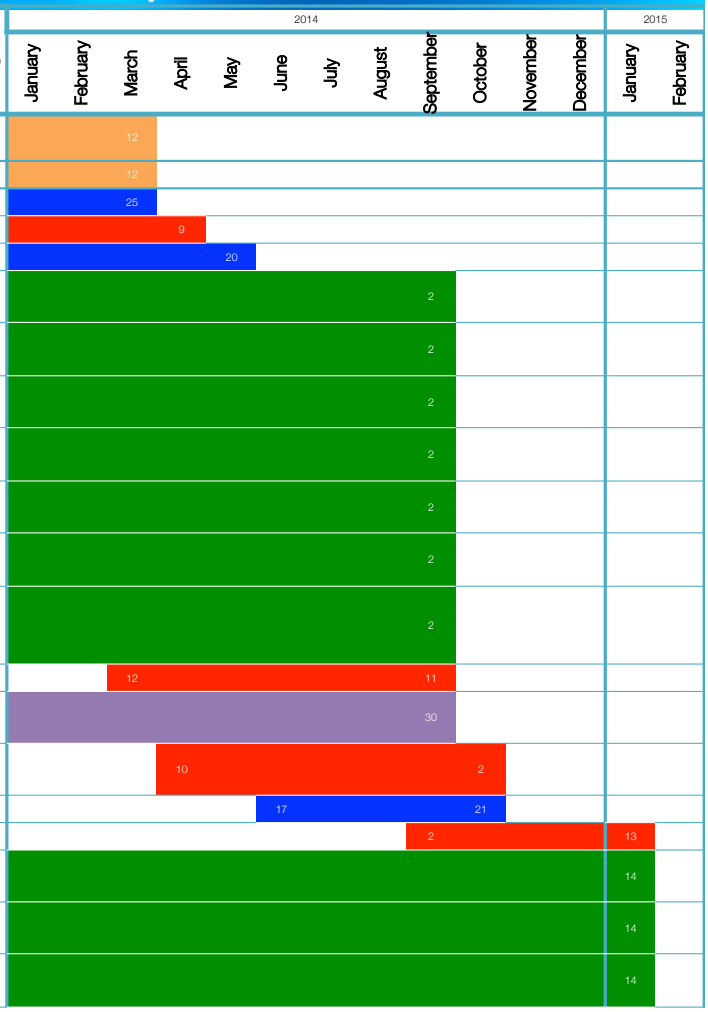
H2020 APPEC actions summary

- **APPEC will try to centrally propose:**
  - COFUND scheme
    - for Marie Curie (50% agencies -50% EU)
    - for R&D (ERANET+, 66% agencies -33% EU)
  - Coordination networks (for agencies):
    - International for large research infrastructures
    - Knowledge Transfer (+CERN,ESOASTRONET,…)
    - Outreach (+CERN,ESO,ASTRONET,…)
- **APPEC will help/supervise the coordination by the community for:**
  - One design study (dark matter)
  - ESFRI projects PP and Implementation
  - CLUSTER (with Astronet)
  - Integrating Activities (Underground labs, Gravitational Antennas,…)
  - e-infrastructures
- **APPEC will provide advice for individual initiatives:**
  - IT Networks, RISE
  - ERC
  - FET and LEIT

Astroparticle Physics European Consortium

APPEC

Pillar	Call	Topic Description	Topic Number	Budget (in M)
P3	S2	DELIVERING THE SUB-SEA TECHNOLOGIES FOR NEW SERVICES AT SEA	BG-6-2014	82
P3	S2	ACOUSTIC AND IMAGING TECHNOLOGIES	BG-9-2014	82
P1	ERC	STARTING GRANT	H2020-ERC-2014-StG	485
P1	MCSA	INNOVATIVE TRAINING NETWORKS (ITN)	H2020-2014-MSCA-ITN	405,18
P1	ERC	CONSOLIDATOR GRANT	H2020-ERC-2014-CoG	713
P1	RI	DESIGN STUDIES	H2020-INFRADEV-1-2014	15
P1	RI	CLUSTER OF RESEARCH INFRASTRUCTURES	H2020-INFRADEV-4-2014/2015	25
P1	RI	INTEGRATING ACTIVITIES	H2020-INFRAIA-2014-2015	140
P1	RI	MANAGING, PRESERVING AND COMPUTING WITH BIG RESEARCH DATA	H2020-EINFRA-2014-1	55
P1	RI	INNOVATION SUPPORT MEASURES	H2020-INFRASUPP-1–2014	2
P1	RI	INTERNATIONAL COOPERATION FOR RESEARCH INFRASTRUCTURES	H2020-INFRASUPP-6–2014	7
P1	RI	E-INFRASTRUCTURES POLICY DEVELOPMENT AND INTERNATIONAL COOPERATION	H2020-INFRASUPP-7–2014	5
P1	MCSA	INDIVIDUAL FELLOWSHIPS (IF)	H2020-2014-MSCA-IF	240,5
P1	FET	FET OPEN	H2020-FETOPEN1–2014/2015	77
P1	MCSA	COFUND	H2020-2014-MSCA-COFUND	80
P1	ERC	ADVANCED GRANT	H2020-ERC-2014-AdG	450
P1	MCSA	INNOVATIVE TRAINING NETWORKS (ITN)	H2020-2015-MSCA-ITN	370
P1	RI	PREPARATORY PHASE	H2020-INFRADEV-2-2015	14
P1	RI	IMPLEMENTATION OF ESFRI INFRASTRUCTURES	H2020-INFRADEV-3-2015	90
P1	RI	E-INFRASTRUCTURES FOR VIRTUAL RESEARCH ENVIRONMENTS (VRE)	H2020-EINFRA-2014-9	42



APPEC Actions in 2014 (relevant to KM3NEt)

- General H2020 preparation meeting
  - 27-28 February Paris
- Computing white paper and H2020
  - 14-15 April Bologna
- NEXT SAC meeting (KM3NET presentation will be solicited)
  - 24-25 April, Cracow
- Global Neutrino Oscillation meeting (ORCA?)
  - 23-24 June Paris
- Presentation of APPEC roadmap to ESFRI
  - fall 2014-early 2015
- We would also be very happy to organize an EMSO-KM3NET meeting for coordination in view of H2020, and with the industry, in the spirit of the Amsterdam meeting of 2012.

27 February 2014 - presentations

ROOM: Amphitheatre Gilles de Gennes		Call	Speaker
09:30	10:15	Design Study	Laura Baudis
10:15	11:00	CLUSTER	Lamanna/DeJong/Beghofer
11:00	11:30	coffee	
11:30	12:15	IA Underground	Ragazzi or Piquemal?
12:15	13:00	IA GWA	M. Punturo
13:00	14:00	lunch	
14:00	14:30	Computing	Tier1 responsible ?
14:30	15:00	Curie	ITN Ulabs S. Paling
15:00	15:30	COFUND-MSCA	P. Binetruy
15:30	16:00	COFUND-R&D	S.Katsanevas
16:00	16:30	coffee	
16:30	17:00	Innovation support	T. Berghoefer
17:00	17:30	International Research Infrastructure	S. Katsanevas
17:30	18:00	Outreach	A. Marsollier

28 february 2014 - working sessions

Room	Time	Call/Theme	Convener
Room 1	09:30-16:00	PP ESFRI / Implementation	W. Hoffman
Room 2	09:30-16:00	Design Study	Laura Baudis
Room 3	09:30-12:30	FET	Ramon Miquel
	13:30-16:30	COFUND-R&D	S.Katsanevas
Room 4	09:30-16:00	CLUSTER	Lamanna/DeJong/Beghofer
Room 5	09:30-16:00	Underground Labs	Ragazzi/Piquemal/Paling
Room 6	09:30-16:00	Gravitational waves	M. Punturo
Room 7	09:30-16:00	Computing (Big Data/VRE)	Tier1 responsible ?
Room 8	09:30-12:30	APPEC initiatives (International Cooperation)	S. Katsanevas
	13:30-16:30	APPEC initiatives (Innovation Support/Outre	T. Berghoefer/A. Marsollier