

APPEC Report

APPEC Consortium

M

N

A

TI



APPEC 2018

RIA (Ireland)

STFC (UK)

FOM (NL)

FRS-FNRS, FWO (Belgium)

CEA, CNRS (France)

SNSF (Switzerland)

LSC (Spain)

FCT (Portugal)

OSI (Finland)

VR (Sweden)

DESY, KIT (Germany)

JINR (Dubna, Russia)

NCN (Poland)

IEAP-CTU (CZ)

INFN (Italy)

IFIN-HH (Romania)

CSF (Croatia)

NOA (Greece)

Observers: CERN, ECFA, ESO, NCN, CSF

Launch of the Roadmap event

<https://indico.nikhef.nl/event/767/>

- Plenary session: A. Masiero (APPEC Chair), RJ Smits, G. Rossi, J.van den Brand, Cordova (NSF) , E. Elsen (CERN), Ivison (ESO)

About APPEC: [Strategic objectives](#)

- Coordination of European Astroparticle Physics
- Develop and update long term strategies (roadmap)
- Express collective views on APP in international fora

[Implementation objectives](#)

- Coordination between existing/developing national activities
- Convergence of future large scale projects/facilities
- Organisational advice for implementation of large facilities
- Launch common calls funded by a (virtual) common pot

Job de Kleuver

Public Roadmap (2017-2020:

<http://www.appec.org/wp-content/uploads/2017/08/APPEC-Strategy-Book-Proof-23-Nov-2.pdf>

<http://www.appec.org/roadmap>



European Astroparticle
Physics Strategy
APPEC 2017-2026

Scientific issues – 13×

- *Large-scale: CTA, ν -telescopes, Auger, GW*
- *Medium-scale: Dark Matter, ν -mass, $0\nu\beta\beta$*
- ***+PP:** ν -mixing; **+ASTRO:** Dark Energy & CMB*
- *Base: theory, R&D, computing
deep-underground laboratories*

Organisational issues – 5×

- *European Commission*
- *European collaboration/coordination*
- *Global collaboration/coordination*
- *Particle physics & Astronomy*
- *Inter-disciplinary opportunities*

Societal issues – 3×

- *Gender balance*
- *Education & Outreach*
- *Industry*

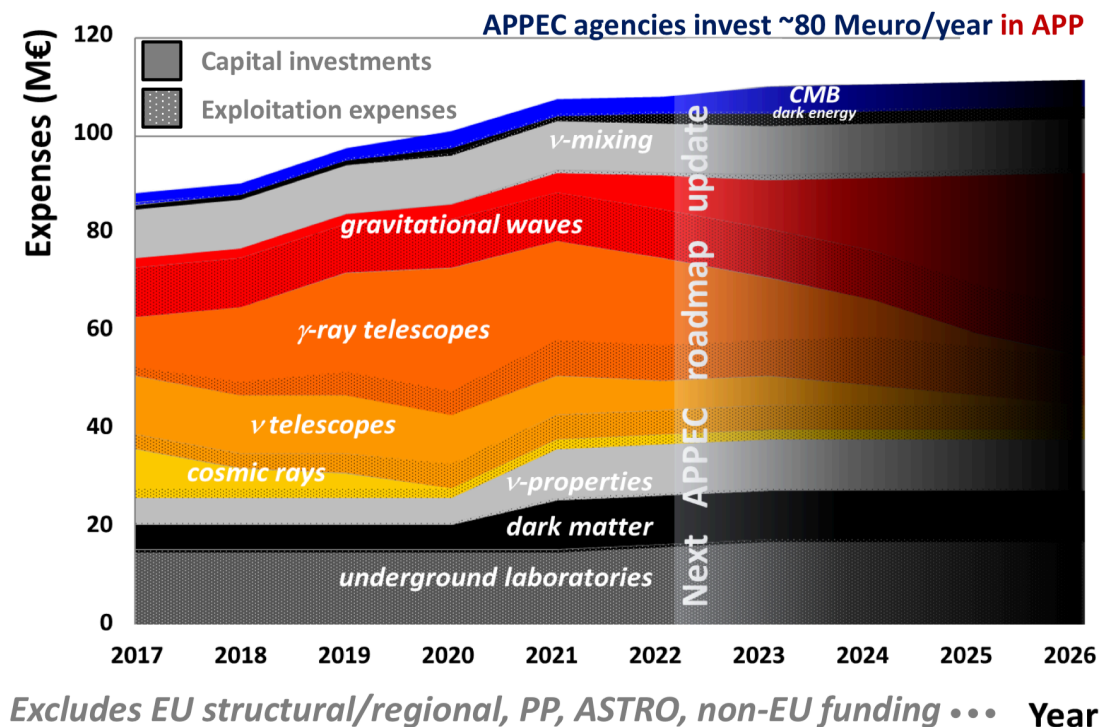
Resource aware roadmap in an Int. contest



The durability of large RI is addressed by ESFRI:



www.esfri.eu



Other highlights from the launch meeting:

– ESFRI ROADMAP 2018 UPDATE PROCESS STARTED (G. ROSSI'S TALK)

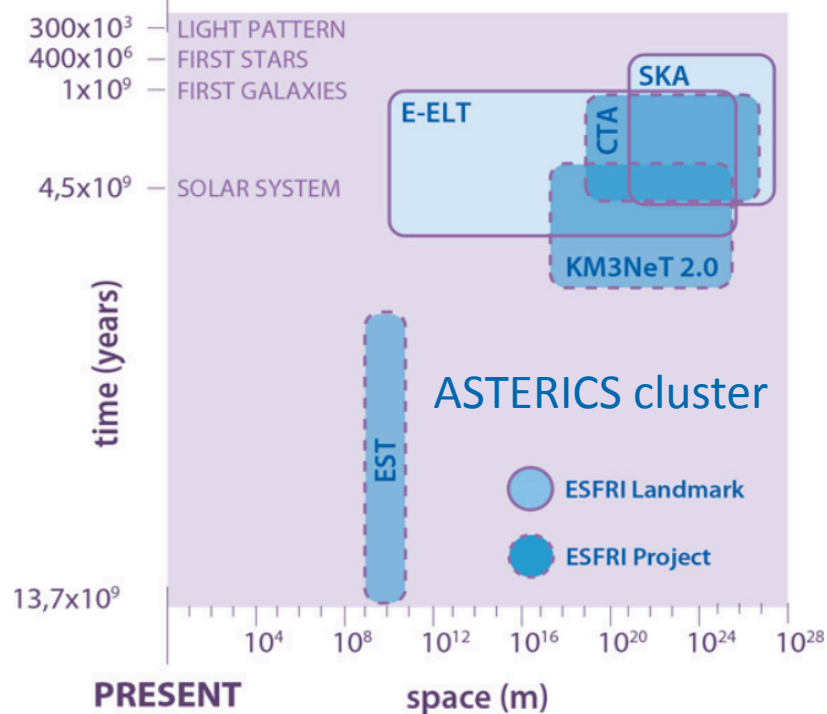
21 Projects

29 Landmarks

ESFRI Landscape for Astronomy and Astroparticle

Figure 1B: space and time domain of investigation of the ESFRI Projects and Landmarks in Astronomy and Astroparticle Physics

BIG BANG

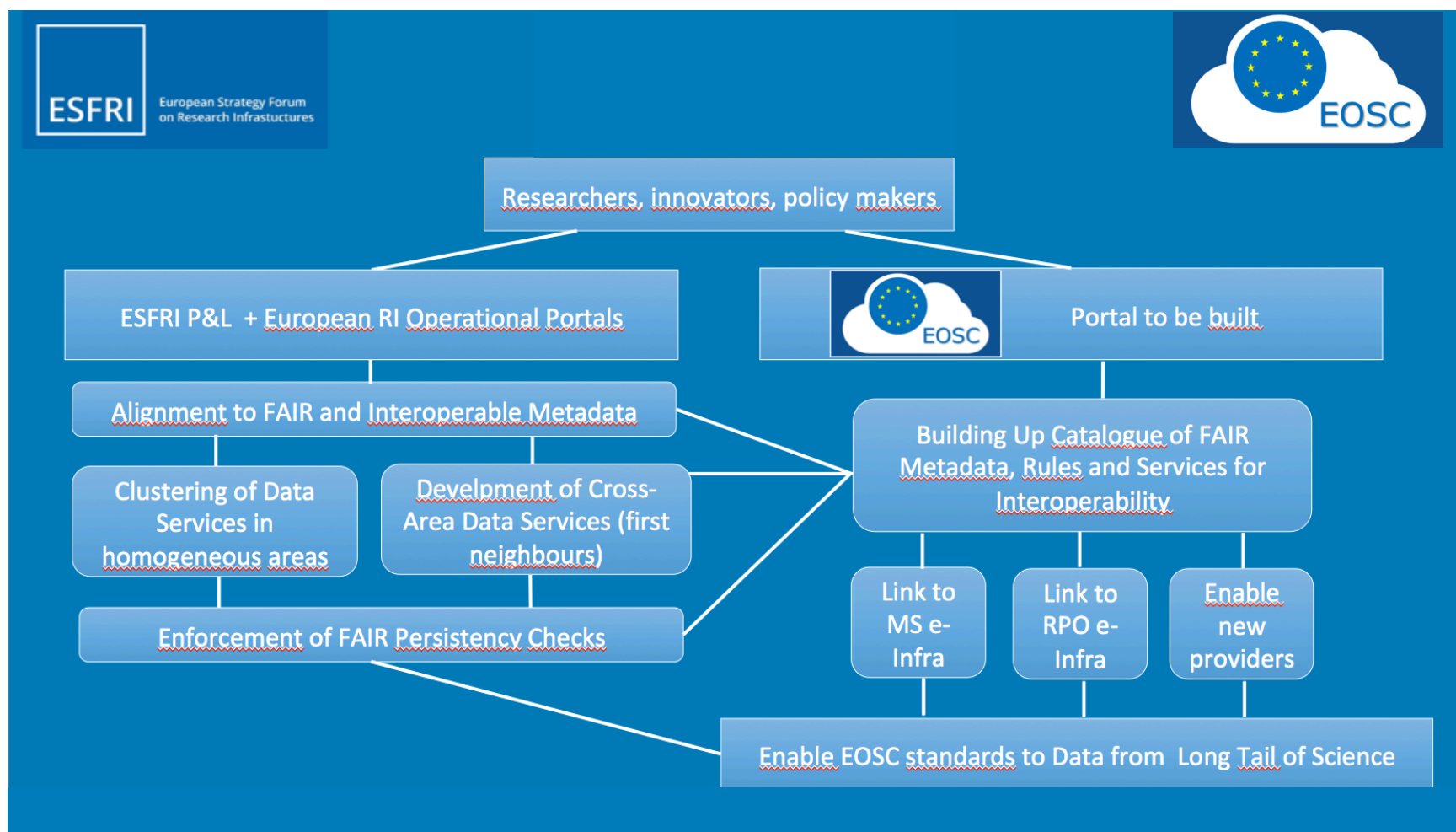


EOSC - EU Open Science Cloud

<https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud>

EOSC should adopt a subsidiarity & participatory principle, should not deligitimate RI's, should fill th gaps of unstructured areas, should be interdisciplinary and interoperable.

Position of ESFRI on EOSC: ESFRI is more than a "stakeholder" of the EOSC as it represents the effort of the Landmarks and Projects in developing Open Science objectives and namely Open Data policies that amount to ca 15% average of the overall financial effort in RIs. Therefore ESFRI is the Strategy Hub of Founders also for a large share of the EOSC-building actions.



View of SNF (FA Cordova)

- the era of Multi-messenger Astrophysics (during the meeting a common call for instruments for MMA and a dedicated Roadmap were proposed to APPEC)



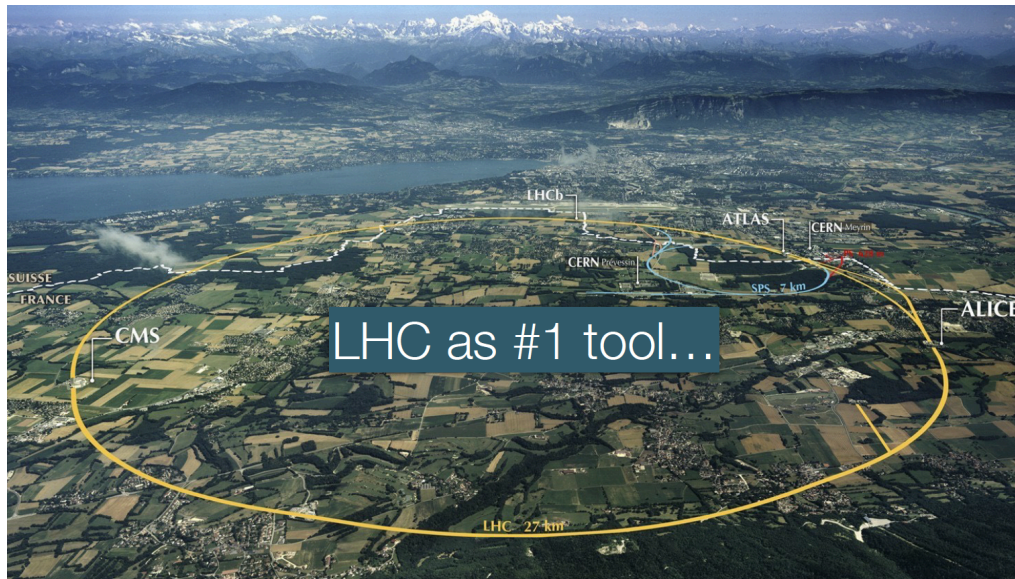
- The challenge: data exchange and common platforms



CERN view

E. Elsen

Preparing the European Strategy Particle Physics Update (2020)

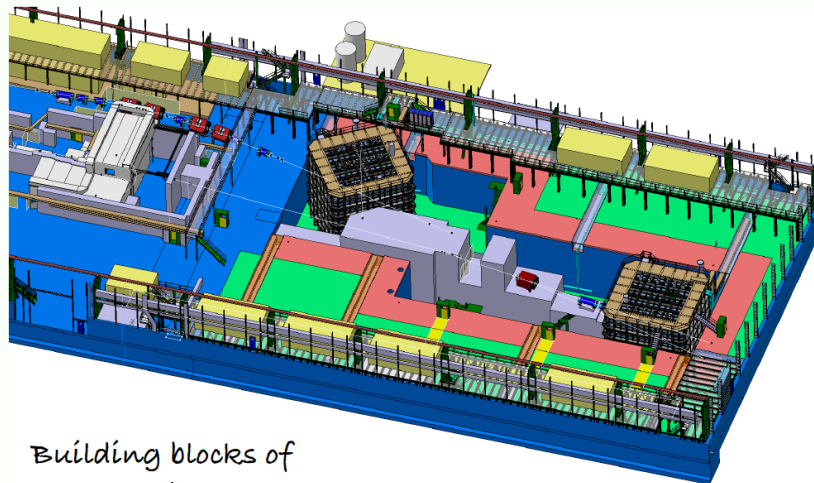


But CERN also establishes formal contacts with neighbouring fields through REC (18 mentioned in APPEC roadmap/28) and Nu Platform. Now also cryo support for DarkSide because DM is key science for CERN.

Number	Experiment	First Recognized	valid until
RE 1	AMS	1997	31-DEC-2019
RE 2b	Pamela	1999	31-DEC-2018
RE 3	Auger	1998	31-DEC-2018
RE 6	Antares	1999	31-DEC-2019
RE 7	Fermi /former	2000	31-DEC-2018
RE 8	LISA-PF	2000	31-DEC-2018
RE 10	IceCube	2005	31-DEC-2018
RE 11	MICE	2005	31-DEC-2018
RE 12	MEG	2005	31-DEC-2018
RE 13	T2K	2006	31-DEC-2018
RE 14	Katrin	2007	31-DEC-2019
RE 17	Magic	2008	31-DEC-2017
RE 18	ArDM	2008	31-DEC-2017
RE 19	CREAM	2010	31-DEC-2018
RE 20	Belle II	2011	31-DEC-2019
RE 21	CBM	2011	31-DEC-2019
RE 22	Panda	2011	31-DEC-2019
RE 23	CTA-PP	2011	31-DEC-2017
RE 25	CALET	2012	31-DEC-2017
RE 26	Borexino	2012	31-DEC-2017
RE 27	NEXT	2013	31-DEC-2018
RE 28	Advanced Vero	2013	31-DEC-2018
RE 29	DAMPE	2014	31-DEC-2019
RE 30	KM3NeT Phase 1	2014	31-DEC-2019
RE 31	Euclid	2015	31-DEC-2018
RE 33	LIGO	2016	31-DEC-2018
RE 34	JUNO	2017	31-DEC-2019
RE 35	SNO+	2017	31-DEC-2019

Neutrino Platform at CERN

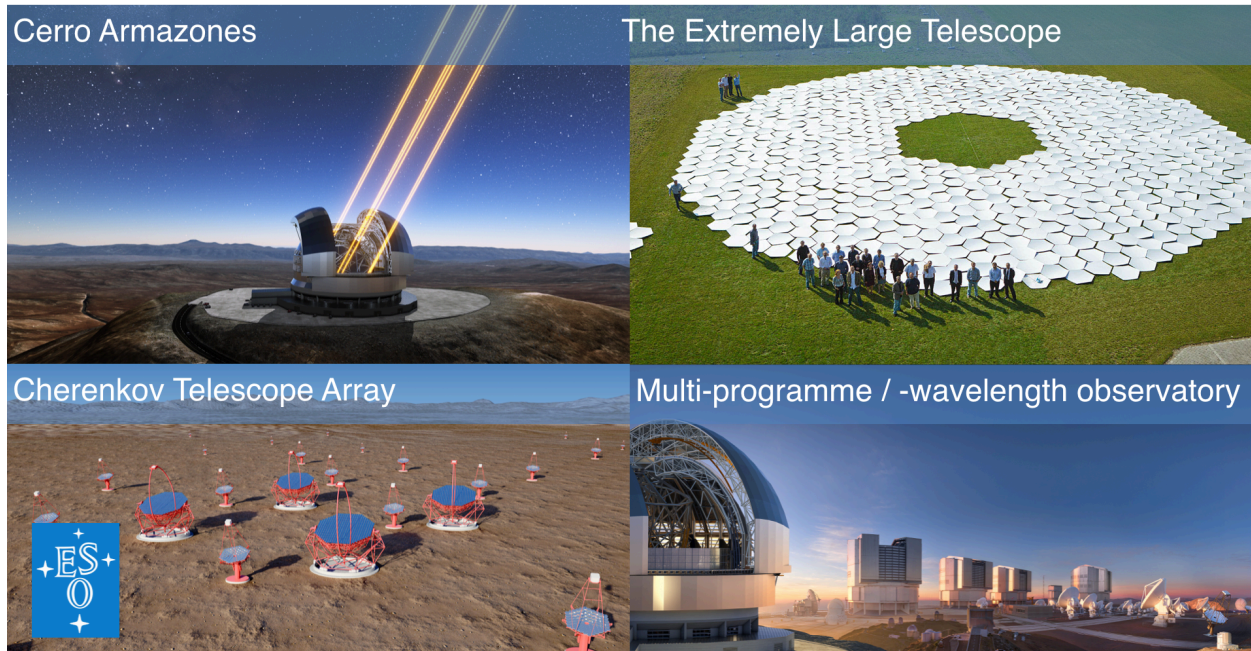
To develop experimental techniques, e.g.
protoDUNE
– single phase LArTPC
– double phase LArTPC



Building blocks of
DUNE detector

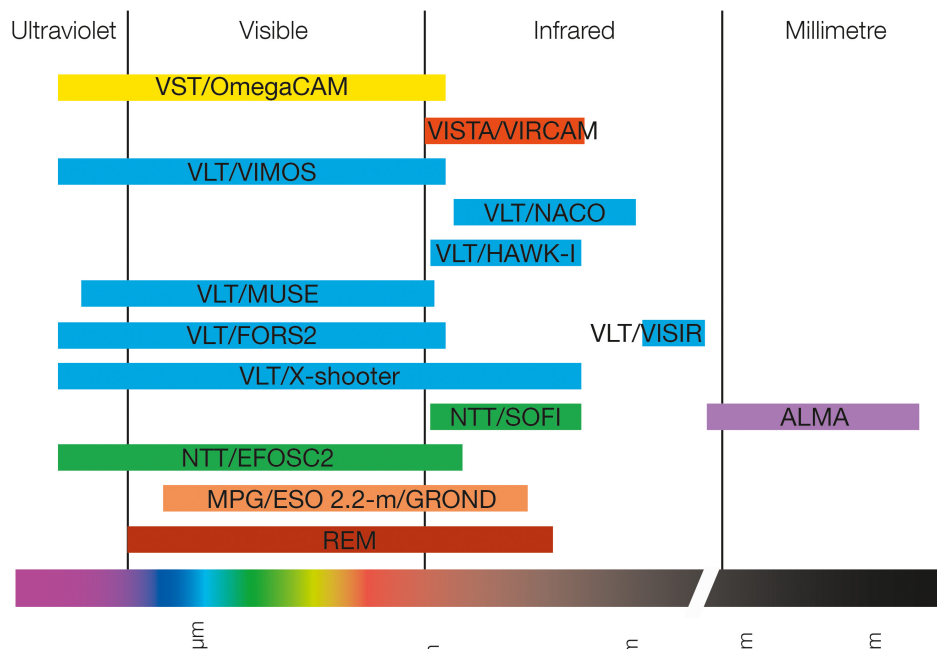
ESO view

European Southern Observatory – in the 2020s



- GWs, neutrinos, gamma rays: posing profound new science questions
- Can be answered only alongside observations of conventional EM radiation
- ***Genuine synergies in multi-messenger era***

Role of ESO for 1st GW event



More than 5,000 scientific images and spectra.

More than 115h of observations.

14 instruments

7 telescopes

Recent news:

- APPEC established a Committee of experts on R&D for next generation ton-scale neutrino-less double beta decay detector to join the analogous committee formed by DOE: A. Giuliani (CNRS/IN3P3, SAC member), E. Previtali (INFN, CUORE), JL Gomez Cadenas (IFIC, NEXT), S. Schoenert (TUM, GERDA, LEGEND), K. Schaeffner (COSINUS, CUPID, CRESST)
- APPEC launched a call for the Astroparticle Physics Theory Centre: in addition to CERN, Univ. Pierre et Marie Curie and Paris Sorbonne, also the Pascal Institute at Paris-Saclay where order of 60 researchers will be invited for several weeks to months of thematic programs.