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Astroparticle Physics European Consortium

# General Assembly Meeting (4/2022)

6+7 December 2022

report from GA chair



# Stavros Katsanevas



\* 1953 in Athens

† 27 November 2022

- Deputy director IN2P3
- Director APC, Paris
- Director EGO, Pisa
- Founding father of coordinated Astroparticle Physics in Europe
- Leader of ASPERA
- Driver and Inspirer of APPEC last 15 years
- Particular attention to interdisciplinary science and art & science

We will miss him as friend and colleague

Let us commemorate Stavros and whoever wants to can say a few thoughts!

# Minutes GA 3/2022 (Vienna, 18/19 July 2022)



APPEC GA meeting 2022  
18<sup>th</sup>/19<sup>th</sup> of July 2022, Vienna  
<https://indico.cern.ch/event/1171120/>

Attendees: Jo van den Brand, Fedor Danevich, Julie Epas, Andreas Haungs, Katharina Henjes-Kunst, Katri Huïtu, Aldo Ianni, Sijbrand de Jong, Stavros Katsanevas, Ulrich Katz, Job de Kleuver, Antoine Kouchner, Péter Lévai, Katrin Link, Ramon Miquel (EPS-HEPP), Justin O'Byrne, Josef Pradler, Mario Joao Pimenta, Leszek Roszkowski, Jochen Schieck, Christian Stegmann, Ivan Stekl, Colin Vincent (ASTRONET), Krijn de Vries, Xin Wu

<https://indico.cern.ch/event/1171120/>

Minutes: [APPEC GA 18072022 minutes.pdf](#)

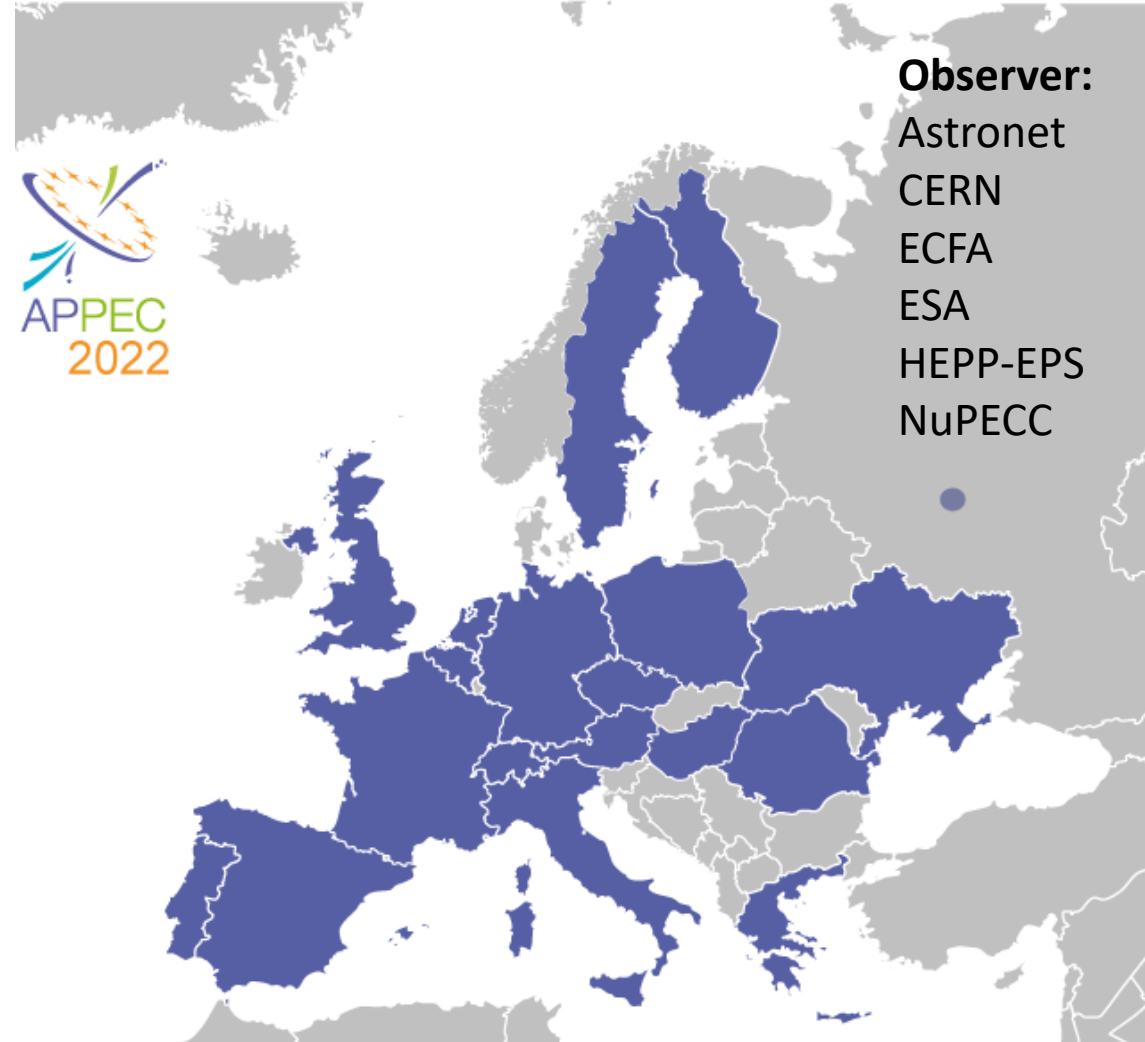
# APPEC 2022



[www.appec.org](http://www.appec.org)

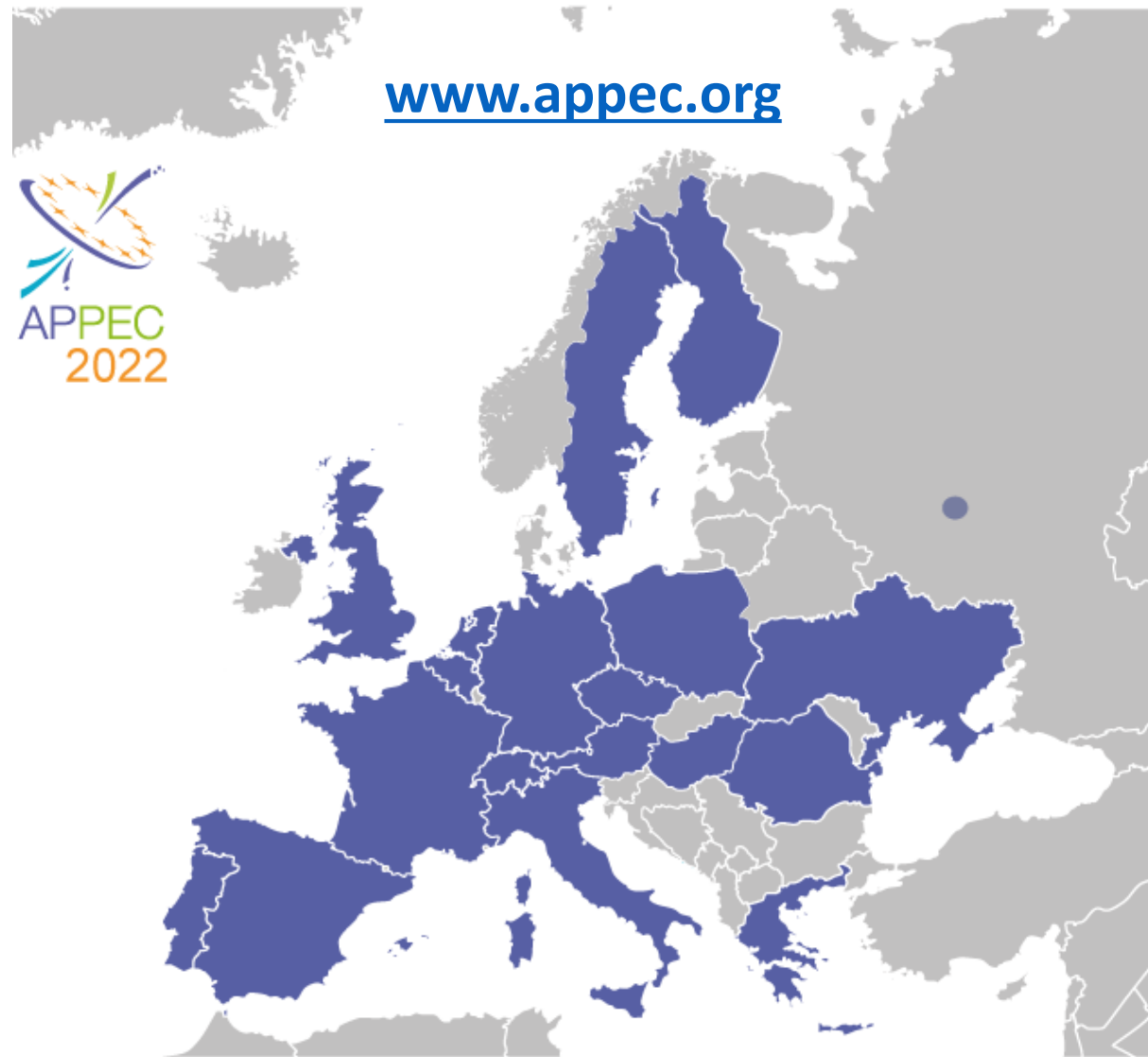
**AstroParticle Physics European Consortium** - an international coordinating structure, founded in 2012

- Based on a **MoU** and financial Agreement with DESY (host of the APPEC Common Fund) by all partners
- a budget of c. 70k€/year
- 3 bodies:
  - General Assembly with Observers
  - Scientific Advisory Committee;
  - Joint Secretary
- 18 (+1 suspended) member countries with 22 funding agencies
  - in 2022 new Austria and Ukraine
  - Russia (Dubna) suspended since March 2022
  - In 2022 HEPP-EPS as new Observer in the GA



# Activities 2022

- 4 General Assembly Meetings (2 in hybrid format)
- Joint Secretary: many meetings, newsletters, etc.
- Scientific Advisory Committee
- Roadmap Evaluation
- Town Meeting
- Underground-, Multimessenger- workshops
- Snowmass Process
- ECFA R&D Detector Roadmap
- ASTRONET Roadmap
- Horizon Europe
- ESCAPE
- EuCAPT
- JENA Activities
- Coordination Underground Labs
- APPEC Tech Forum
- IYBSSD



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[www.appec.org](http://www.appec.org)





# Town Meeting

<https://indico.desy.de/event/25372/>



- ➔ An inspiring, lively and colourful event with a lot of debates and exchange!
- ➔ important input to the Roadmap update (see tomorrow)
- ➔ One of largest request: intensify cooperation with Astronomy (see ACME)



# APPEC Flagship Research Infrastructures

This is not a closed, but dynamic list...

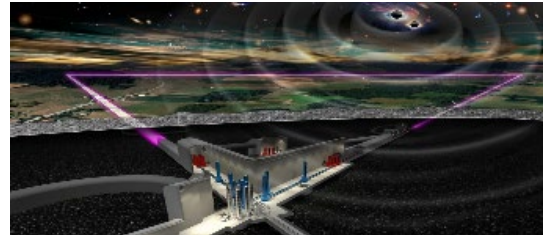


[construction KM3NeT 2020-2026; IceCube-Gen2]



ESFRI

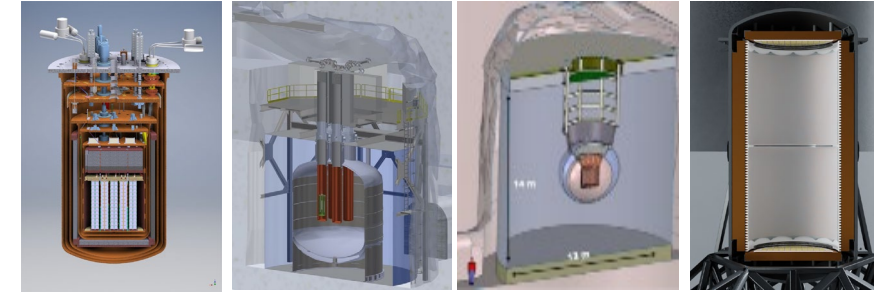
HE Neutrinos



ESFRI

[construction Einstein Telescope 2026- ]

Gravitational Waves



[construction LEGEND-1000 / nEXO 2023- ; ... ]

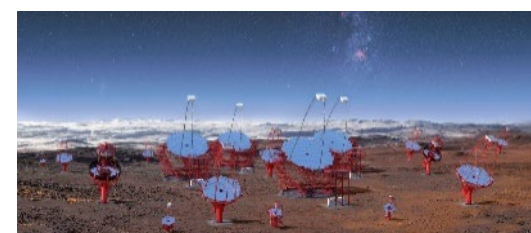
Neutrino Properties

[construction AugerPrime 2019-2023]



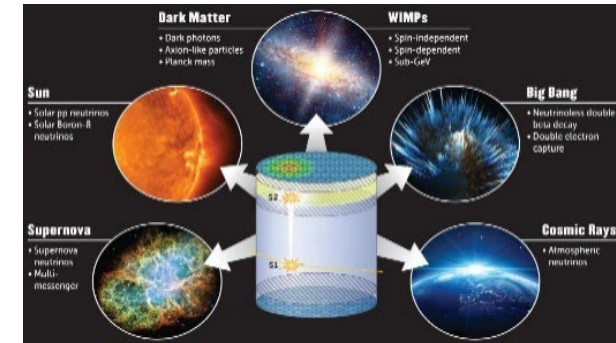
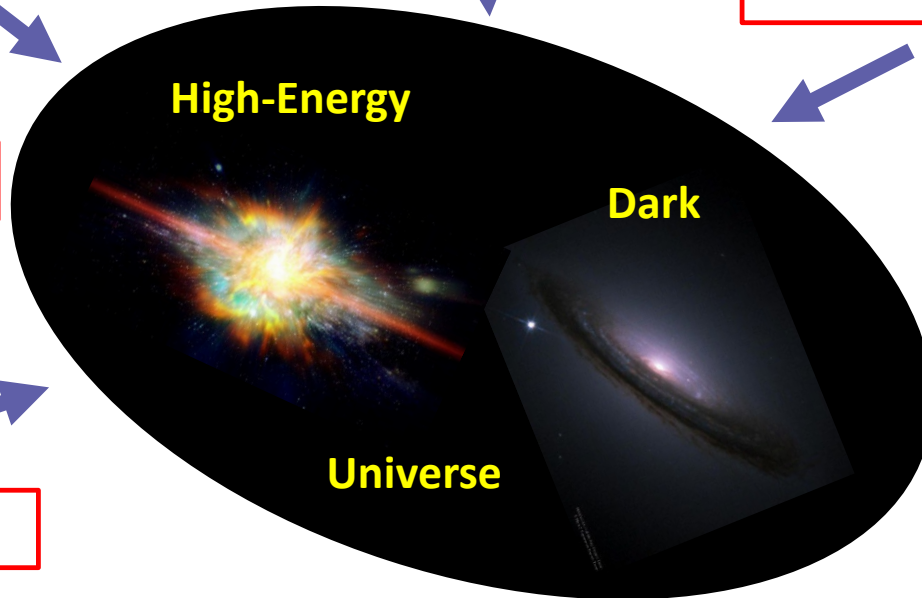
HE Cosmic Rays

[construction CTA 2021- ]



ESFRI

HE Gamma Rays



[construction DARWIN 2024- ; XLZD, ARGO, ... ]

Dark Matter

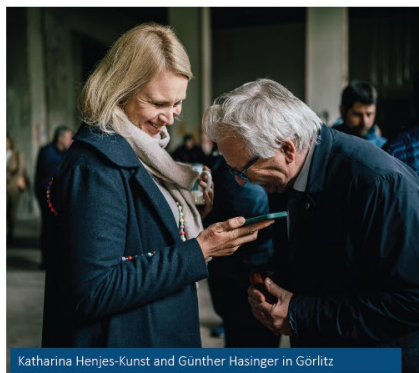


# DZA (German Center for Astrophysics)



- The DZA is a joint initiative of German astronomy and astroparticle physics with the idea of creating a national and also international hub of astrophysics.
- The "Deutsches Zentrum für Astrophysik - Forschung. Technologie. Digitalisierung. (DZA)" has been selected to be realised in the national "Wissen schafft Perspektiven für die Region" programme for Saxonia, Germany.
- Elaboration of the structure of the centre in next 6 months => 3 years ramp-up => 10 years funding by 170 Mio€/y
- Further test drills and geological / seismic investigations to determine suitability of granite for LSL & ET
- First hires (5 profs, 60 staff and support) 2023

29. September 2022



Katharina Henjes-Kunst and Günther Hasinger in Görnitz



Michèle Heurs and Christian Stegmann in Cunnewitz

[www.deutscheszentrumastrophysik.de](http://www.deutscheszentrumastrophysik.de)

## DZA concept : the challenges of astrophysics today



### Astronomy

Square Kilometre Array  
Observatory (SKAO)  
  
Einstein Telescope  
(Low Seismic Lab)



### Instruments

Developments for future  
astronomical experiments  
  
Strong participation of  
Saxon industry



### Data Intensive Computing

Processing huge amounts  
of astrophysics data from  
all over the world  
  
Innovative AI based and  
Smart Green Computing

Interlocking of pillars → unique synergies

## The role of the DZA in the Einstein Telescope

### THREE POSSIBILITIES:

#### 1. No ET

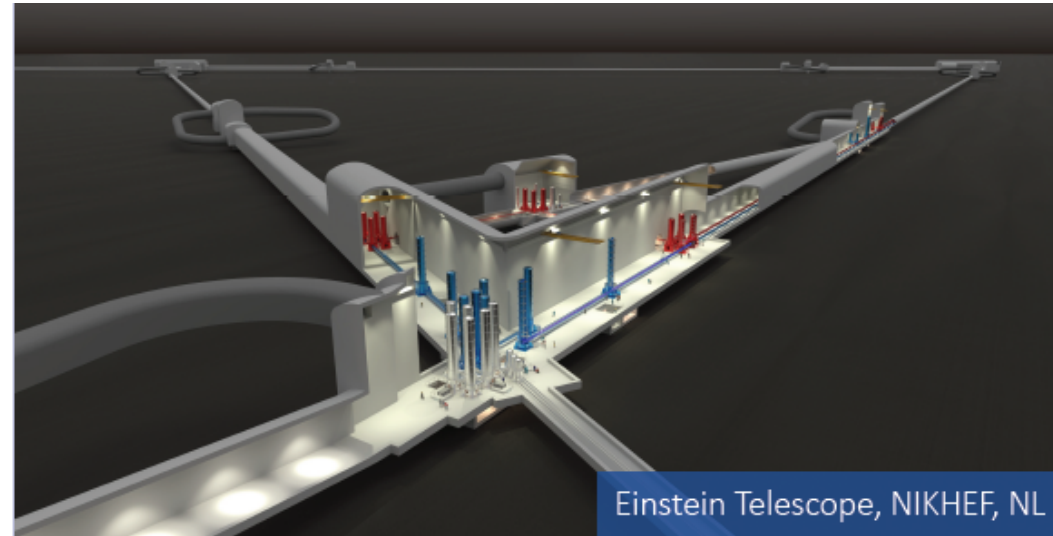
The DZA will participate in other international projects with the Low Seismic Lab (e.g. Cosmic Explorer, Advanced LIGO etc.).

#### 2. ET in Sardinia or The Netherlands

With the Low Seismic Lab, the DZA will make essential contributions to the reduction of seismic noise, among other things.

#### 3. ET in Lusatia

A potentially excellent scientific solution. Strengthening the lighthouse character for the region. Political support for financing is necessary.



Einstein Telescope, NIKHEF, NL

### A EUROPEAN PROJECT

- Construction costs:
  - First phase 1.2 B€
  - Full scope 1.7 B€
- Construction time: 8 years
- Lifetime: 50 years
- Site decision: 2025

# JENA Seminar 2022



- 2<sup>nd</sup> JENA Symposium: 3-6 May 2022 in Madrid, Spain  
<https://indico.cern.ch/e/JENAS2022>
  - Balanced Program over Nuclear Physics, Particle Physics, Astroparticle Physics, focussing on synergies
  - Discussion on the JENA Eols (next slide)
  - Special Session with invited Funding Agencies
  - There is a need for a European Workshop on (federated) **Computing** → foreseen for spring 2023
- APPEC nomination for expert members in organization committee; Proposal: Stefano Bagnasco (Torino) ; Gonzalo Merino (PIC)
- Next JENAS in 2.5-3 years
    - Better preparation of the FA session
    - Taking into account the feedback of JENAS 2022

**JENAS-2022**  
2nd Joint ECFA-NuPECC-APPEC Seminar  
Exploring synergies between Particle, Astroparticle and Nuclear Physics  
May 3-6, 2022  
Madrid, Spain

**TOPICS:**  
- Physics highlights  
- Future projects and overall strategies  
- Detector technologies  
- Computing and software  
- Diversity and recognition  
- Education and Outreach  
- Transfer of knowledge

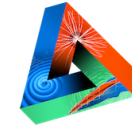
**JENAS 2022 Committee**  
**ECFA:** Karl Jakobs (Univ. Freiburg)  
Patricia Conde Mullo (LIP, Lisboa)  
Jorge D'Honnin (NIK, Brno)  
**APPEC:** Andreas Haungs (KIT, Karlsruhe)  
Rutharina Riegler-Kraut (DESY, Hamburg)  
Teresa Montaruli (Univ. Geneva)  
**NuPECC:** Marek Lewinowicz (GAMM, Bonn)  
Eberhard Widmann (OIM, Wien)  
Gabriela-Elisabeth Körner (NuPECC)

**Local Committee**  
María José García Berge (ICM, Madrid)  
Antonio Baeriswiler (EIR, Strassburg)  
Carlos Peña Ganyú (ISC, Cantabria)  
Joaquín Gómez-Camacho (DMA, Sevilla)  
Celia Martínez-Rivero (IFCA, Santander)  
Luis Mario Fraile (ICM, Madrid)

ECFA European Committee for Accelerator and Nuclear Physics | NuPECC | APPEC







## Expression of Interests (Eol)

1. Dark Matter - iDMEu (<https://indico.cern.ch/event/869195/overview>)
2. Gravitational Waves for fundamental physics (<https://agenda.infn.it/event/22947/overview>)
3. Machine-Learning Optimized Design of Experiments - MODE (<https://mode-collaboration.github.io/#home>)
4. Nuclear Physics at the LHC (<https://indico.ph.tum.de/event/4492/>)
5. EDM - Search of Charged-Particle Electric Dipole Moments (<https://indico.ph.tum.de/event/4482/>)
6. Synergies of EIC with LHC - EIC; kick-off happened in June 2022 (<https://indico.ph.tum.de/event/7004/>)

APPEC Eol representatives in 1., 2., 3., 4., 6.

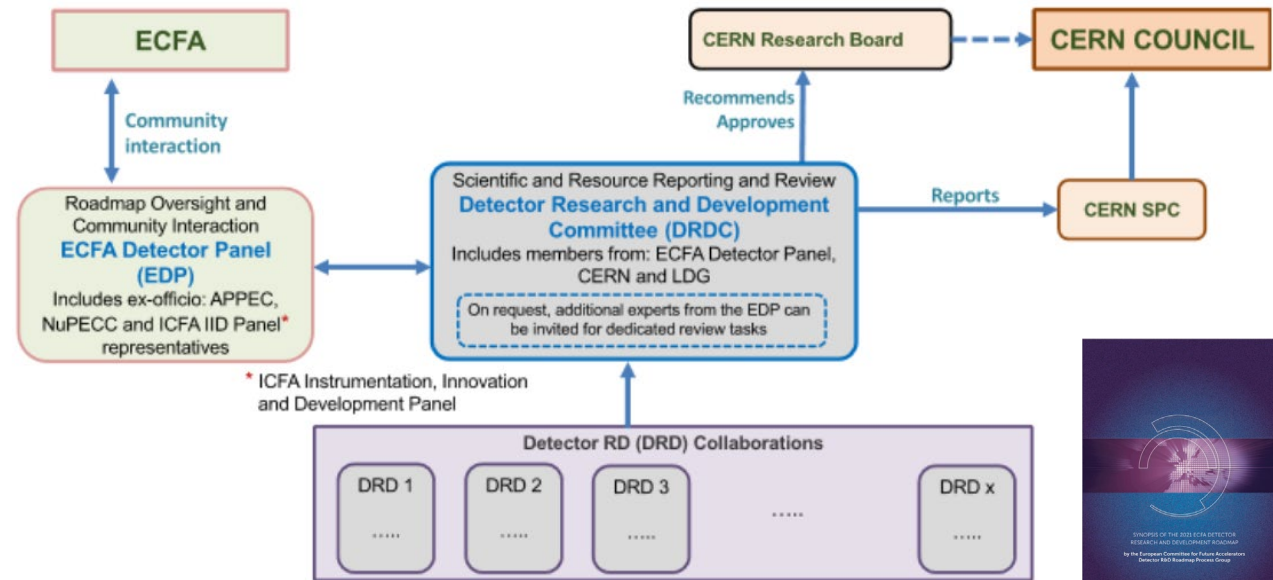
- **Very good presentations at JENAS (all are validated as community overarching networks)**
- **ENA chairs will discuss with all Eol leads separately the status, plans, requests and schedule for 2023 in mid January**

# Implementation of ECFA R&D Detector Roadmap

The roadmap as well as documentation of full process is available at: [ECFA Detector R&D!](#)



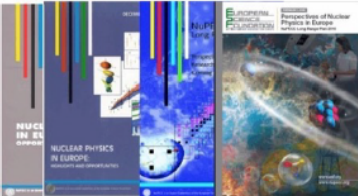
- Implementation by a Governance Structure and mainly by “Detector R&D Collaborations”
- DRD’s are thematically organized
- Open für synergetic activities with neighboring fields  
→ opportunity also for Astroparticle Physics groups
- DRDC & the ECFA Detector Panel (EDP) oversees the scope, R&D goals, and milestones as described in the Roadmap (EDP exists, hosted at DESY).  
→ **APPEC nomination of one seat in EDP (Proposal: Aldo Ianni)**



# NuPECC Long Range Plans


**NuPECC Towards NuPECC Long Range Plan 2024** SCIENCE CONNECT YOUR PARTNER IN SCIENCE

1991 1997 2004 2010



- The LRP identifies opportunities and priorities for the nuclear science in Europe
- The LRP provides national funding agencies, **ESFRI** and European Commission with a framework for coordinated advances in nuclear science in Europe

Assessment of Implementation of the NuPECC Long Range Plan 2017  
February 2022



Contributors: H. Abele, N. Alahari, W. Barth, D. Bemmerer, K. Blaum, F. Bossi A. Braeco, M. Chiossi, A. Deng, M. Dozer, S. Freeman, M. Gładziński, F. Gélis, H. Goulet, M. Grieco, M. Harakeh, M. Hon, G. Imbriani, E. Khan, K. Kirch, W. Kortem, A. Laird, J. P. Lansberg, D. Lunney, F. Maas, G. Martinez-Pinedo, S. Masciocchi, A. Mengoni, O. Navillat-Cuncic, D. Rifuggiato, P. Rossi, E. Scarparin, J. Simpson, H. Schmieden, O. Schneider, N. Severijns, Th. Stöhrker, J. Stroth, H. Ströher, U. Thoma, S. Ulmer, C. A. Ur, Ch. Weinheimer, U. Wiedner, H. Wittig

**NuPECC LRP 2017** **February 2022** **NuPECC LRP 2024**

<http://www.nupecc.org/lrp2016/Documents/lrp2017.pdf> [http://nupecc.org/2017\\_LRP\\_Assessment\\_of\\_Implementation\\_final.pdf](http://nupecc.org/2017_LRP_Assessment_of_Implementation_final.pdf) **Launched in May 2022**

Marek Lewitowicz 3

- Dedicated steering committee established (APPEC chair is member of the SC)
- May 2022: Call for inputs from the community [explicitly: also exploring synergies with the particle physics and astroparticle physics communities]. Deadline October 2022
- ➔ More than 120 inputs from community (also several from APP community)
- January 2023 – February 2023: Kick-off meetings of thematic WGs
- November 2023 - January 2024: Layout and editing of the LRP Draft, then community feedback
- May 2024: Town Meeting - presentation and feedback from the community
- November/December 2024: LRP presentation in Brussels



# ASTRONET Roadmap

<https://www.astronet-eu.org/>



© Colin Vincent

## • ASTRONET Roadmap

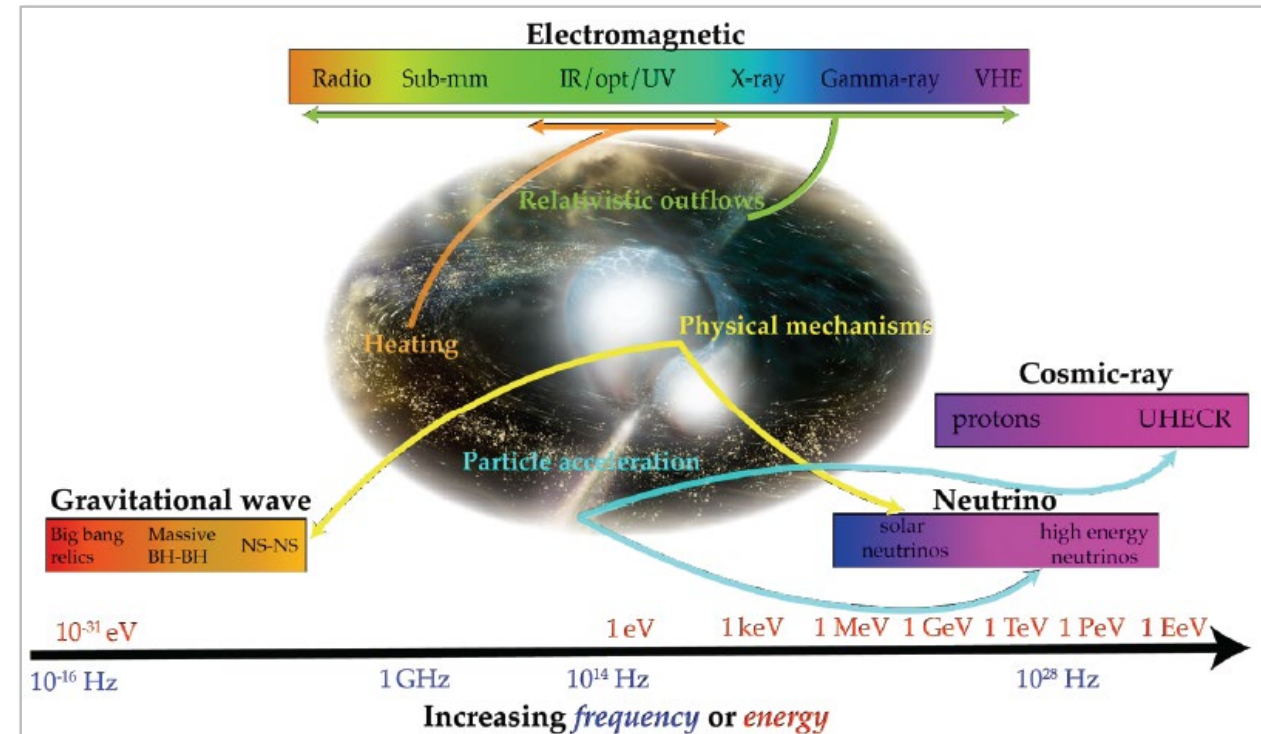
- Feedback to the first section drafts led to a new Panel: Extreme Astrophysics; APPEC contact: Paula Chadwick, Antoine Kouchner

## • Panels / Working Groups (reports available)

- Roadmap preliminary Executive summary
- Origin and evolution of the Universe
- Formation and evolution of Galaxies
- Formation and evolution of Stars
- Formation and evolution of Planetary Systems
- Understanding the Solar System and conditions for Life
- Computing - big data, high performance computing
- Societal aspects
- **Extreme Astrophysics: [Draft report](#)**

## • Executive Summary

- Draft exists and is at Astronet Board and external advisory team
- **Production and pre-print end of January 2023; then distribution**
- Options for a particular launch event under discussion



# SNOWMASS Process



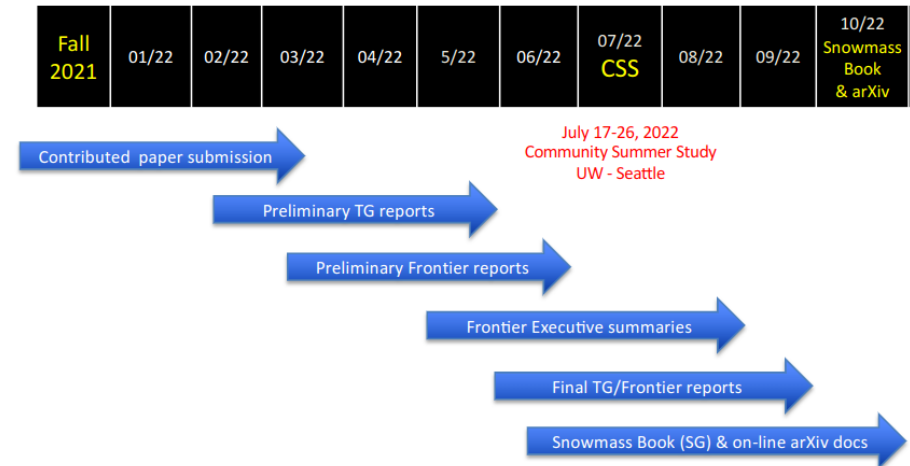
<https://indico.fnal.gov/event/22303/>  
<https://snowmass21.org/>

- September 2022: „Frontier“ reports on arxiv....

The Snowmass Community Study has 10 frontiers addressing different aspects of the field. They are:

- Energy Frontier,
- Neutrino Physics Frontier,
- Rare Processes and Precision Measurements Frontier,
- Cosmic Frontier [arxiv.2203.08297](https://arxiv.org/abs/2203.08297)
- Theory Frontier,
- Accelerator Frontier,
- Instrumentation Frontier,
- Computational Frontier,
- Underground Facilities,
- Community Engagement [arxiv.2209.09067](https://arxiv.org/abs/2209.09067)

## Snowmass Timelines



- **March 15: Contributed papers (a.k.a. White Papers)**
- May 31: Preliminary Topical Group Reports
- June 30: Preliminary Frontier Reports
- **July 17 – 26: Converge on reports for all the frontiers and produce executive summaries representing the views of their communities and providing the basic input needed for P5**
- September: draft Executive Summary and Report Summary
- October- November: Snowmass Book finalized and ready for submission

→ Not sure about new timeline of „Book“

→ the P5 recommendations will be due in the second half of 2023

→ Berrie Giebels (representative of APPEC in the Snowmass process) will report

# IYBSSD2022

<https://www.iybssd2022.org/en/home/>



- APPEC is partner (10k€)
- several flagship events
  - Opening Ceremony: July, 8, 2022; UNESCO Paris
  - Closing ceremony, CERN, Geneva - October 6<sup>th</sup>, 2023 at CERN new building
  - Asia: Rencontre de Vietnam (Tran van Tanh) Sept 2022
  - Europe: Belgrad: September 20-22 2022: [worldacademy.org/world-conference](http://worldacademy.org/world-conference)
  - Latin-America: Honduras, everything unclear as new government expected, Argentina involved
  - Afrika: Cape Town 6-9 December 2022 , world science forum (every 4 years: 2018 Budapest, 2014 Jordan): <https://worldscienceforum.org/>
- Still possibility to propose relevant activities for calendar
  - APPEC has not done much, chance for visibility at closing event?

## IYBSSD2022 leadership



- **The International Year of Basic Sciences for Sustainable Development 2022** will put the spotlight on the links between the basic sciences and the Sustainable Development Goals. It will be a key moment of mobilization to convince economic and political leaders, as well as the general public, of their importance.



# ESA M7 Mission Opportunity



<https://www.cosmos.esa.int/M7>

- **ESA hat call for M7 mission (launch expected 2030/2031)**
  - APPEC has written support letter for ASTROGAM Gamma-ray satellite concept with unprecedented energy coverage (100 keV – 3 GeV)
  - ET Collaboration wrote support letter for THESEUS multi-instrument mission for transient astronomy, with focus on Gamma Ray Bursts
- **Decision on November, 8 2022**
  - ASTROGAM rejected
  - At its November meeting, the ESA Science Programme Committee (SPC, Paul McNamara) has been informed that the following missions have been selected for further study for the M7 mission opportunity:
    - CALICO (materials at Ceres),
    - HAYDN (asteroseismology),
    - M-MATISSE (Mars studies),
    - Plasma Observatory (near-Earth plasma), and
    - THESEUS.

# Outlook 2023

- General Assembly Meetings: again 2 longer + ~2 shorter
- MoU and new SAC, GA chair and JS chair elections
- Roadmap Update and public event
- JENAA Activities and Astronomy Connections
- APPEC Tech Forum
- Horizon Europe: ACME et al.
- Underground Facilities
- ESCAPE future
- Implementation of Roadmaps
- Governance Working Group
- Newsletter, Webpage, ..
- European Early Career Initiative
- Attracting more APPEC member countries
- ....

2023

The roadmap is the nucleus of our activities



....and probably many more items in 2022!



# 2023



**LISTENING TO NEW  
COSMIC MESSENGERS**

These posters are another  
legacy of Stavros