# APPEC Report

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Partikeldagarna

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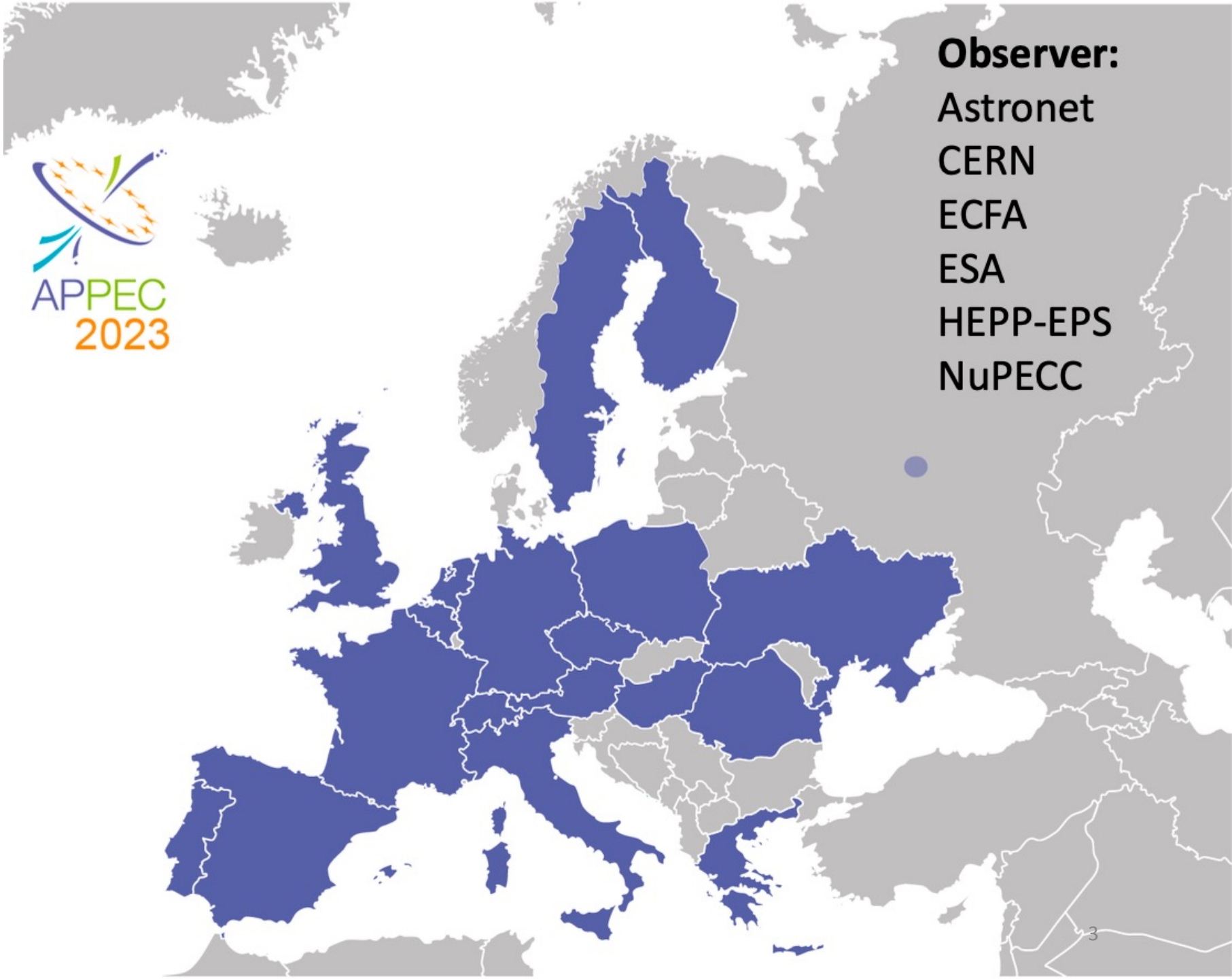
# What is APPEC?

## Astroparticle Physics European Consortium

APPEC brings together funding agencies, governmental institutions and institutes from European countries, responsible for coordinating and funding national research efforts in astroparticle physics.

- *What is Dark Matter?*
- *What is Dark Energy?*
- *What caused our Universe to become dominated by matter and not anti-matter?*
- *Can we probe deeper into the earliest phases of our Universe's existence?*
- *What are the properties of neutrinos?*
- *Can we identify the sources of high-energy neutrinos?*
- *What is the origin of cosmic rays?*
- *Do protons decay?*
- *What do gravitational waves tell us about General Relativity and cosmology?*
- *What will multi-messenger astronomy teach us?*

# Member Countries



# APPEC Consortium

CAMK: Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences, Poland
CEA: Commissariat à l'énergie atomique et aux énergies alternatives, France
CNRS: Centre National de la Recherche Scientifique, France
DESY: Deutsches Elektronen-Synchrotron, Germany
FRS-FNRS: Fonds de la Recherche Scientifique – FNRS, Belgium
FWO: Fonds Wetenschappelijk Onderzoek, Belgium
FCT: Fundação para a Ciência e a Tecnologia, Portugal
HIP: Helsinki Institute of Physics, Finland
IEAP-CTU: Institute of Experimental and Applied Physics, Czech Republic
IFIN-HH: Horia Hulubei National Institute of Physics & Nuclear Engineering, Romania
INFN: Istituto Nazionale di Fisica Nucleare, Italy
KIT: Karlsruher Institut für Technologie, Germany
LSC: Laboratorio Subterráneo de Canfranc, Spain
NASU: National Academy of Sciences of Ukraine, Ukraine
NOA: National Observatory of Athens, Greece
NWO: The Netherlands Organisation for Scientific Research, Netherlands
ÖAW: Austrian Academy of Sciences, Austria
SNF: Schweizerische Nationalfonds, Switzerland
STFC: Science & Technology Facilities Council, United Kingdom
VR: Vetenskapsrådet Swedish Research Council, Sweden
Wigner RCP: Wigner Research Center for Physics, Hungary
JINR: Joint Institute for Nuclear Research, Dubna, Russia (suspended)

# Structure

The organisational structure of APPEC consists of the following three bodies:

The General Assembly (GA) - the strategic and decision-making supervisory body.

* Andreas Haungs, KIT, chair
~ 25 members
* Sweden: Matthias Marklund, VR

The Joint Secretariat (JS) - the executive body chaired by the General Secretary.

* Katharina Henjes-Kunst, DESY, General Secretary
* Representatives from the six "functional centers": APC (France), DESY (Germany), INFN/EGO (Italy), Nikhef/NWO (Netherlands), KIT (Germany), Canfranc (Spain). (No Swedish member of JS)

The Scientific Advisory Committee (SAC) - the advisory body

# APPEC-SAC

# Scientific Advisory Committee

| | |
|---|---|
| Sijbrand de Jong (chair) | Cosmic Rays |
| Silvia Pascoli (vice chair) | Neutrino Properties |
| Laura Baudis | Dark Matter |
| Marica Branchesi | Gravitational Waves |
| Paula Chadwick | High Energy Photons |
| Karsten Danzmann | Gravitational Waves |
| Chad Finley | High Energy Neutrinos |
| Ken Ganga | Dark Energy |
| Maarten de Jong | High Energy Neutrinos |
| Ofer Lahav | Dark Energy |
| Manfred Lindner | Theory |
| Sotiris Loucatos | Cosmology CMB |
| Jocelyn Monroe | Dark Matter |
| Marco Pallavicini | Neutrino Properties |
| Sergey Troitsky | Theory |
| Licia Verde | Cosmology CMB |
| Christian Weinheimer | Neutrino Mass |

# European Astroparticle Physics Strategy Document 2017-2026

Apart from promoting cooperation and coordination, a crucial APPEC activity is to formulate, update and realise the European astroparticle physics strategy and roadmap process. The APPEC Scientific Advisory Committee (SAC) provided valuable contributions to the scientific part of the roadmap, followed by contributions from the agencies. In April 2016 the APPEC General Assembly, in close cooperation with the SAC, organised a very well-attended and animated two-day Town Meeting in Paris open to the entire astroparticle physics community. This provided the key ingredients that culminated in **the 21 recommendations presented in this strategy document, endorsed by the astroparticle community** – recommendations addressing, in addition to the scientific issues, crucial organisational aspects as well as important societal issues such as gender balance, education, public outreach and relations with industry. The APPEC General Assembly unanimously approved them at its meeting in Stockholm in November 2016. By acting coherently on these recommendations, Europe will be able to exploit fully the tantalising potential for new discoveries that is highlighted in the second part of this document.

# Midterm Update to Strategy Document

- Field developed rapidly just as strategy document completed
- Process to provide midterm update began by APPEC-SAC in 2020
- Public draft released in Fall 2021 for community feedback
- Review + feedback => lively Town Meeting in Berlin 2022 June 9-10
- SAC prepared Strategy Update Document for GA in Fall 2022
- Final document to be approved at GA meeting Warsaw June 28-29, 2023

APPEC

Midterm Strategy Recommendations for:

| | |
|---|---|
| SCIENCE | High-Energy Gamma Rays<br>High-Energy Neutrinos<br>High-Energy Cosmic Rays<br>Gravitational Waves<br>WIMP Dark Matter<br>Axions, ALPs and other non-WIMP Dark Matter<br>Neutrino Mass and Nature<br>Neutrino Mixing and Mass Ordering<br>Cosmic Microwave Background<br>Dark Energy<br>Multi-messenger Astroparticle Physics<br>Theory<br>Detector R&D<br>Computing and Data Policies |
| CONNECTING TO SOCIETY | Ecological Impact<br>Societal Impact<br>Open Science and Citizen Science |
| ORGANISATION | Human Talent Management<br>Central Infrastructures<br>European and Global Cooperation<br>Interdisciplinary Opportunities<br>Resources |