APPEC

Astroparticle Physics European Consortium

# Congratulations To NuPECC

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# Astroparticle Physics

…is a branch of fundamental science embedded in environment and society!

## *Understanding*

### the Extreme Universe

- Multi-Messenger observations of cataclysmic events

### the Dark Universe

- Exploring the nature of Dark Matter and Dark Energy

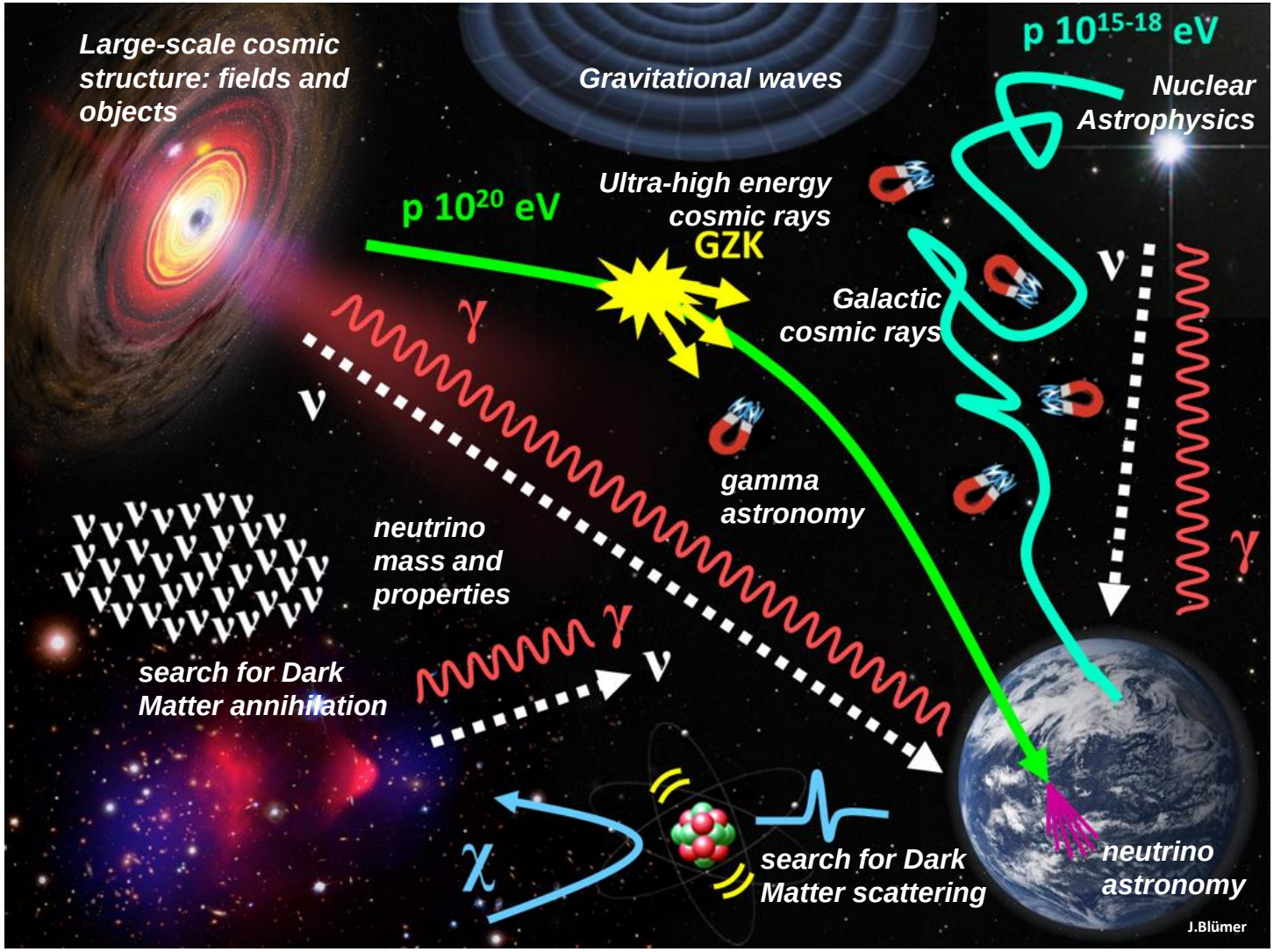
### the Mysterious Neutrinos

- Measuring their properties und unveil their role in the universe

### the Early Universe

- Learning about the Big Bang, e.g. from CMB

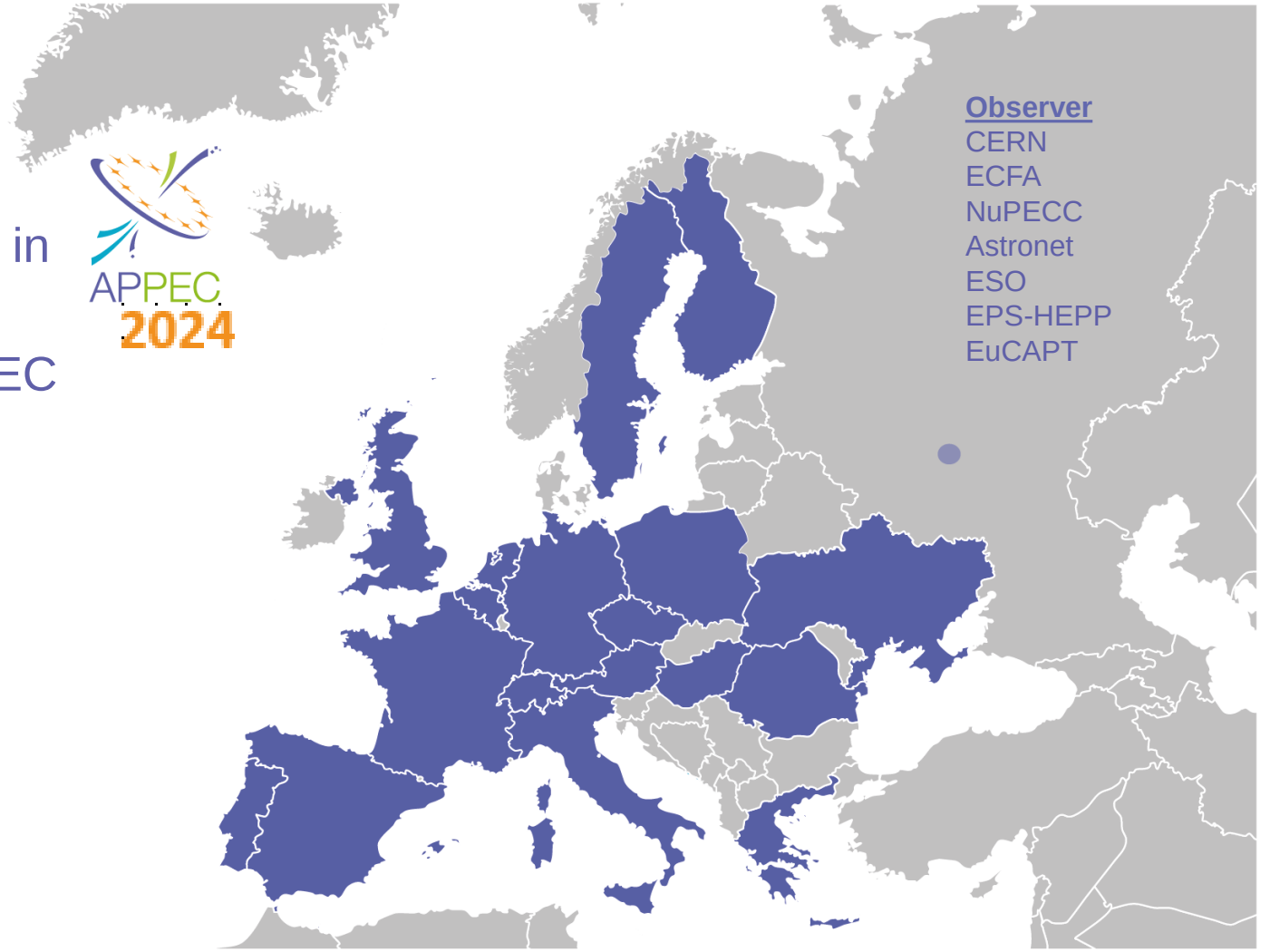
- Large-scale research facilities
- Interplay of theory with experiment
- Synergies with neighboring fields
- Connecting with society



www.appec.org

# AstroParticle Physics European Consortium

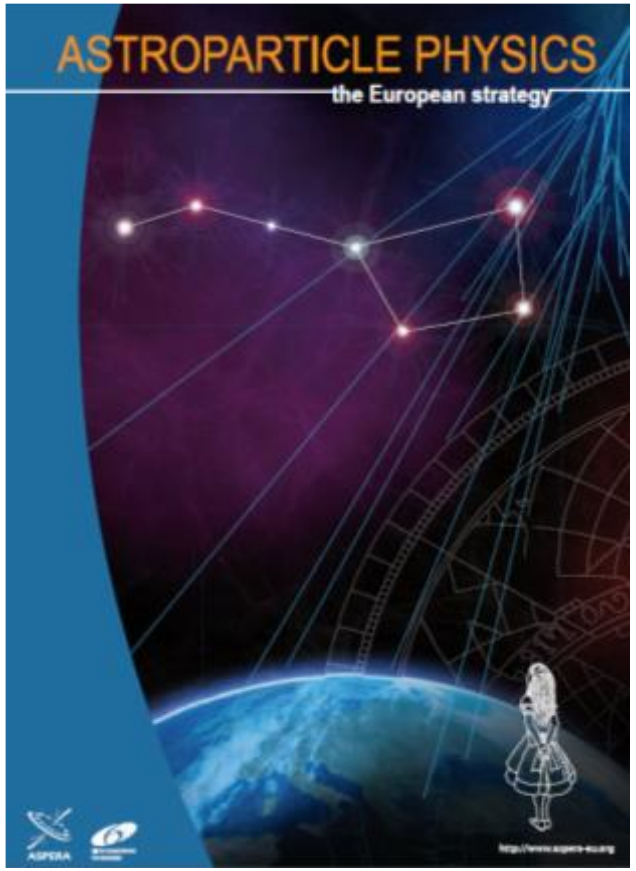
- an international coordinating structure, founded in 2012
- Based on MoUs by all partners and an APPEC Common Fund with c. 70k€/year
- 18 (+1 suspended) member countries with 22 funding agencies
  - In discussion with Denmark and Norway
- 3 bodies:
  - General Assembly with Observers
  - Scientific Advisory Committee;
  - Joint Secretary



# APPEC Roadmaps

https://www.appec.org/roadmap

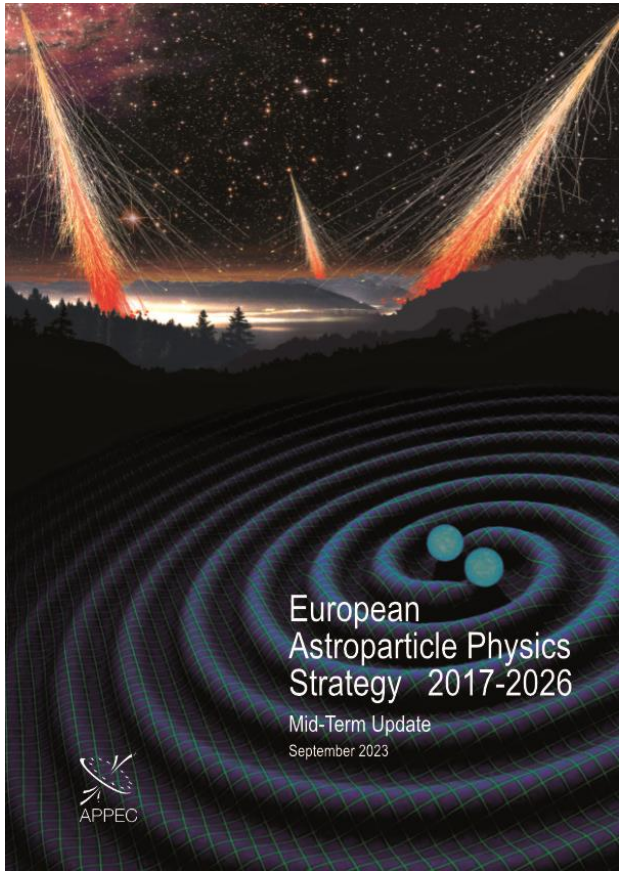
## 2008




## 2011


## 2017


## 2023



# APPEC Roadmap 2023

**RoadmapUpdate.pdf**

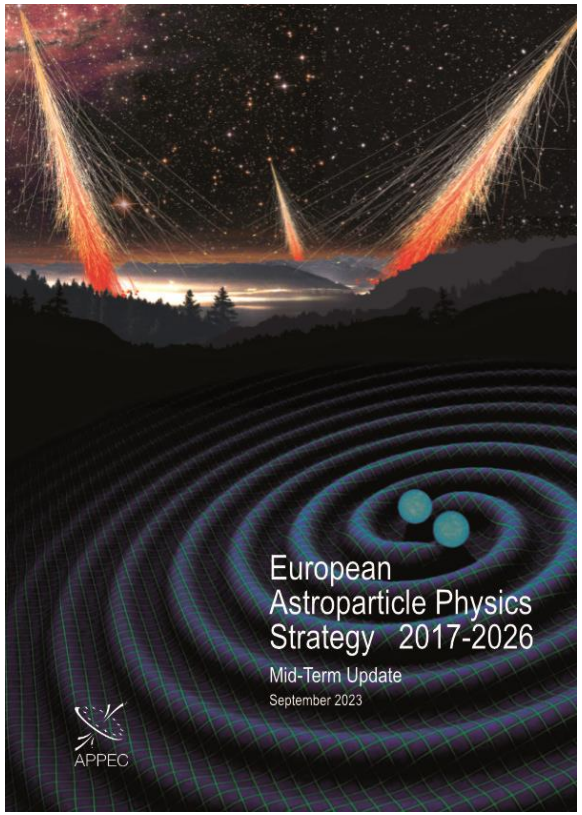
## Content (recommendations):

- High-energy gamma rays
- High-energy neutrinos
- High-energy cosmic rays
- Gravitational waves
- WIMP Dark Matter
- Non-WIMP Dark Matter
- Neutrino mass and nature
- Neutrino mixing and mass ordering
- Cosmic Microwave Background
- Dark Energy
- Multi-messenger astroparticle physics
- Astroparticle theory
- Detector R&D
- Computing and data policies
- Ecological Impact
- Societal Impact
- Open Science and Citizen Science
- Human Talent Management
- Central Infrastructures
- European and Global Cooperation
- Interdisciplinary Opportunities

JENAA
Joint ECFA-NuPECC-APPEC Activities

Horizon Europe
THE NEXT EU RESEARCH & INNOVATION PROGRAMME (2021–2027)

ACME
Astrophysics Centre for Multi-messenger studies in Europe




Astronet

EuCAPT

OPEN SCIENCE

Findable Accessible Interoperable Reusable

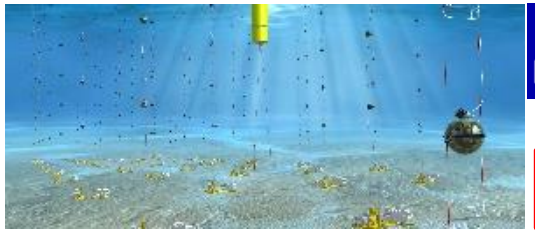
United Nations SUSTAINABLE DEVELOPMENT GOALS

# APPEC Flagship Research Infrastructures

This is not a closed, but dynamic list…

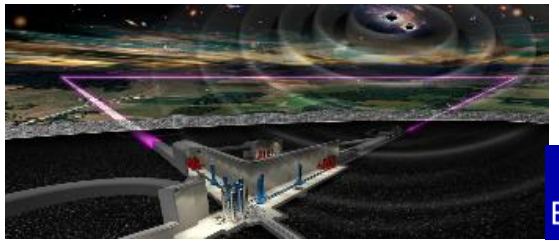
*ESFRI=European Strategy Forum on Research Infrastructures*

[construction KM3NeT 2020-2026; IceCube-Gen2]



ESFRI

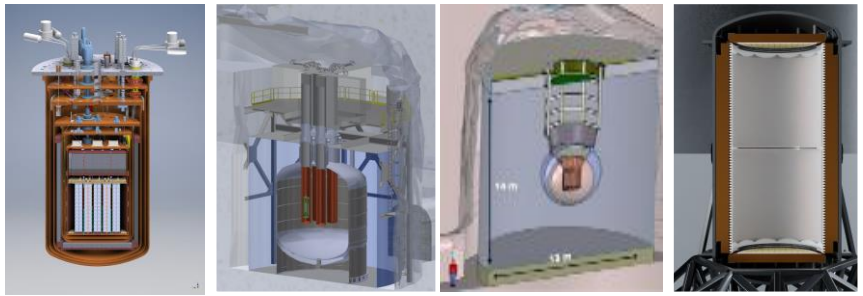
**HE Neutrinos**



ESFRI

[construction Einstein Telescope 2026- ]

**Gravitational Waves**

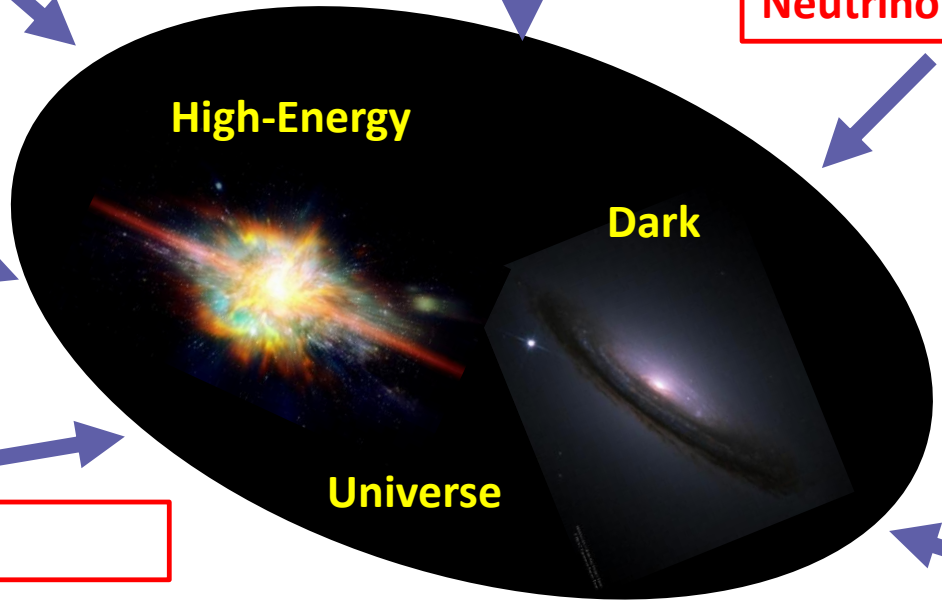


[construction LEGEND-1000 / nEXO 2023- ; … ]

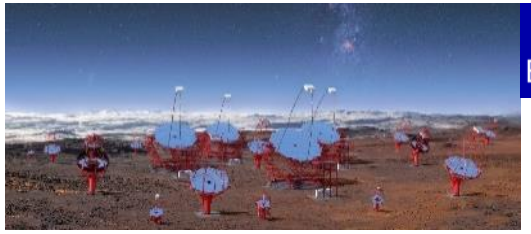
[construction AugerPrime 2019-2023]

**HE Cosmic Rays**

**Neutrino Properties**

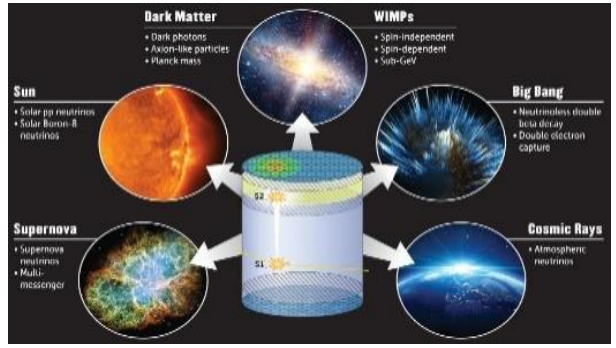



[construction CTA 2021- ]



ESFRI

**HE Gamma Rays**




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

**Dark Matter**

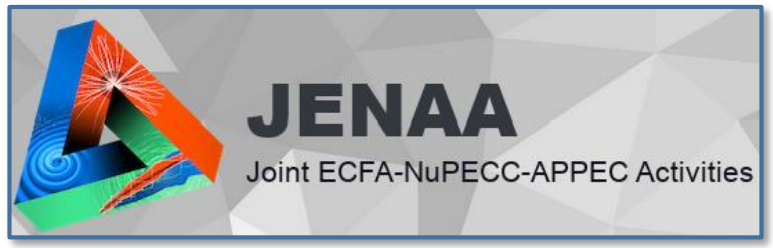
# Synergies

➔ Joint efforts are present in our daily work….

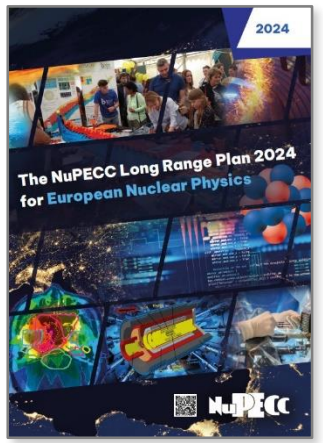
- …in scientific topics
  - e.g., neutrinos, dark matter
- …in research infrastructures
  - e.g., future Einstein Telescope
- …in funding programs
  - EUROLABS, ACME (Horizon EU Infra-Serv programs)
- …in societal and organizational matters
  - e.g., for federated computing, open & citizen science
  - next JENA Symposium: 8–11 Apr 2025 at RAL, UK

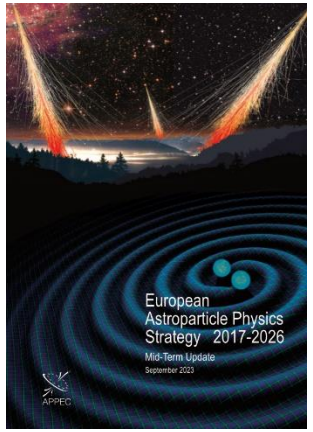




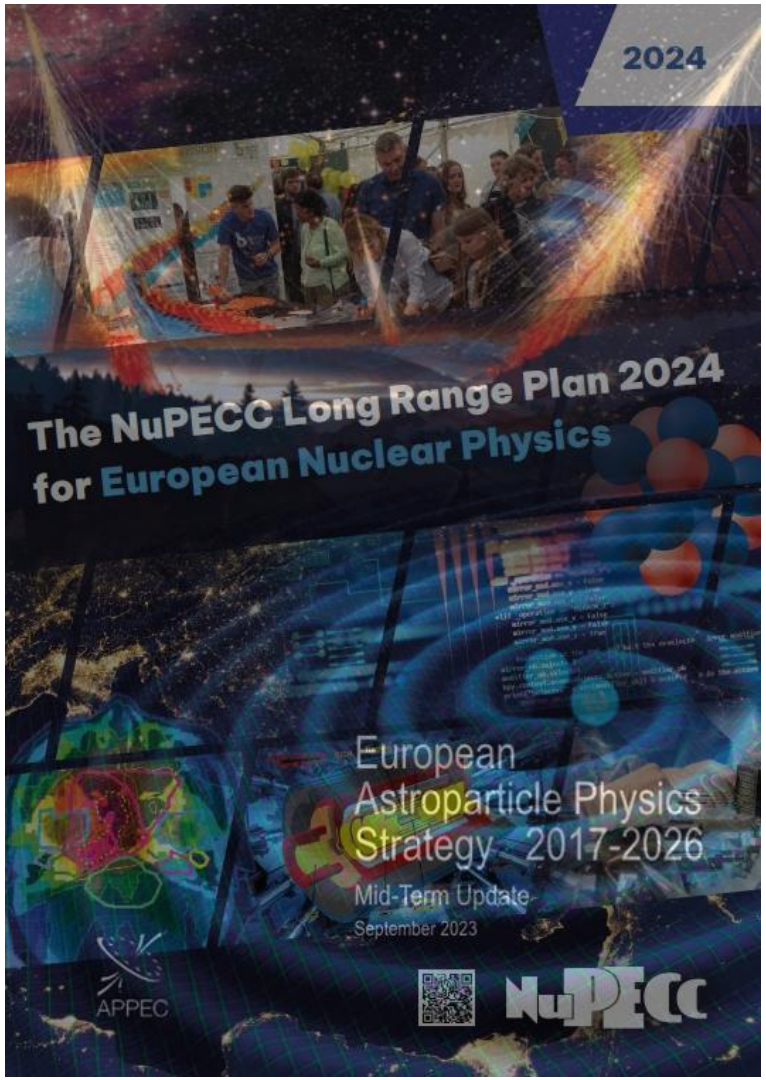


# Let‘s shape the next decade together…




by chatGPT




**APPEC* congratulates NuPECC on this next big step into the future of nuclear physics in particular and fundamental physics in general!**

*A big **thank you** to the community and the Funding Agencies in supporting APPEC


# Thank You