



APPEC GA meeting 2023
28 & 29th of June 2023, AstroCeNT Warsaw and online
<https://indico.cern.ch/event/1295199/>

Attendees: Stan Bentvelsen, Jo van der Brandt, Giacomo Bruno, Fedor Danevich, Job de Kleuver, Julie Epas, Andreas Haungs, Katharina Henjes-Kunst, Katri Huitu, Sijbrand de Jong, Uli Katz, Antoine Kouchner, Sylvie Leray, Péter József Lévai, Katrin Link, Ramon Miguel, Carlos Peña Garay, Mario Joao Pimenta, Vincent Poireau, Leszek Roszkowski, Alexandra Saftoiu, Ivan Stekl, Colin Vincent, Krijn de Vries, Xin Wu

And Wojciech Dzedzic, Deputy Director of International Cooperation of Ministry of Science and Education, Poland

Welcome by GA Chair (Andreas Haungs)

- Agenda of the GA adopted
- Minutes from the last GA approved: comment from Sijbrand: the last big discussions on the mid-term review took place on the 4th of May

Welcome words of the host – Leszek Roszkowski, head of AstroCeNT

Report from GA Chair

1. **In memory Stavros Katsanevas** – a symposium was held on June 1st at APC Laboratory, Paris: <https://indico.in2p3.fr/event/29126>
2. **JENA Computing Workshop** – event held in Bologna, on 12-14 June 2023 <https://agenda.infn.it/event/34738/> covering computing, HPC vs. HTC, software, data management, open data, sustainability, following the need identified at JENA 2022
Five working groups were constituted:
 - HPC integration in the HTC federated Infrastructures
 - Software and Heterogeneous Architectures
 - Federate Data Management, Virtual Research, Environments and FAIR/Open Data
 - Machine Learning and Artificial Intelligence
 - Training, Dissemination, Education.

APPEC representatives for expert members in organization committee and working group are Stefano Bagnasco (Torino) and Gonzalo Merino (PIC)

Next steps:

- Searching for participation in the working groups from Astroparticle Physics
- Contact ESCAPE for working group on FAIR/Open Data
- Building the WGs with dedicated meetings
- Preparing the topic for JENAS 2025

3. ESCAPE

- A H2020 funded project: The European Science Cluster of Astronomy & Particle Physics ESFRI, ended in January 2023.
- APPEC (chair) is member of the External Advisory Board: a report with recommendations and a support letter for future activities were prepared for the end of the project
- Recently , all of the 5 EOSC Science Clusters have put in place long term structures

through MoU or Collaboration Agreement plus H2020 and potential Horizon Europe funded actions.

- From 1st Feb 2023 ESCAPE is an Open Collaboration : Collaboration will be a community with common interests and synergies (see kick-off meeting: <https://indico.in2p3.fr/event/30249/>)

Next steps (to be discussed):

- Cooperation between JENA computing WG and ESCAPE?
- Broader APPEC participation on the Open Collaboration?

4. JENA Activities

- Current Expressions of Interest (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>)
 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/>
- Very good presentations at JENAS (all are validated as community overarching networks)

Next steps:

- At JENA Computing Workshop idea of new Eol: machine learning as analysis tool (Sascha Caron, NIKHEF)
- APPEC Eol representatives in 1., 2., 3., 4., 6. -- do we need reconsidering these persons?

5. HECAP Sustainability Initiative

- Document from Sep. 2022 <https://sustainable-hecap.github.io>
- Publication on arXiv on 5/6/2023 <https://arxiv.org/abs/2306.02837>
- Contacted the editors via given email address: hep-sustainability@protonmail.com (Peter Millington, UKRI). They would acknowledge contribution from
- APPEC, but difficulties with timeline
- A presentation at the JENA Computing Workshop from one of the authors

Next steps:

- Should we and how further interact with the initiative? And how we should organize that?

6. **APIF** - <https://kipac.stanford.edu/astroparticle-physics-international-forum-apif>
 - APIF was established by the Organization for Economic Co operation and Development's Global Science Forum, which is a committee of senior science policy officials of OECD member and observer countries. The Global Science Forum was acting on one of the final recommendations of its Working Group on Astroparticle Physics, whose report is available here: kipac.stanford.edu/sites/default/files/inline-files/47598026.pdf
 - After some discussions and dedicated IUPAP/C4 discussion, Andreas got an email from Roger Blandford informing about the dissolution of APIF. The APIF colleagues could contribute to APPEC in an extensive way

Next steps: How to continue at this point?

7. **ACME** – Astrophysics Centre for Multimessenger studies in Europe a Horizon Europe INFRA SERV proposal
 - Topic: better access of users to RI services to advance frontier knowledge , activities to improve and harmonize the access, and training for scientists.
 - Consortium: 41 partners, 15 countries, >30 research infrastructures
 - Currently on the reserve list for funding, waiting for decision in December

8. **IYBSSD2022** - <https://www.iybssd2022.org/en/home/>

- APPEC is partner – 10 k€

Next step: APPEC has a chance for visibility at the closing event, on Dec 15

9. **NuPECC Long Range Plans**

- Dedicated steering committee established (APPEC chair is member of the SC)
- 10 Thematic working groups established
- Early 2023: Meetings of thematic WGs, see <https://indico.ph.tum.de/category/61>

Next steps:

- 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

10. **ECFA**

Implementation of ECFA R&D Detector Roadmap

- End 2022 : Detector R&D Roadmap Task Forces organised community meetings to establish the scope and scale of the community wishing to participate in the corresponding new DRD activities
- Early 2023: DRDC mandate and composition defined by CERN management
- EDP mandate plus membership updated: APPEC nomination of one seat in EDP: Aldo Ianni
- Summer 2023: DRD proposals based on the detector roadmap and community interest in participation with light weight organisational structures and work plan for R&D programme to start in 2024
- Autumn 2023: Review of proposals leading to recommendations for formal establishment of the DRD collaborations

Next steps:

- End 2023 : Discussion of approval by the CERN Research Board
- 2024 : New structures operational, ramp up of resources throughout 2024-2025
- Many meetings happend for all the coming DRDs, see <https://indico.cern.ch/category/12772>

11. **Other news**

- 29/6/2023 19:30 CEST: embargo lifting: IceCube neutrinos from the Milky Way <https://indico-sfb1491.epp.physik.tu-dortmund.de/event/5>
- 29/6/2023: <https://nanograv.org/news/2023> Announcement of the Pulsar Timing Arrays community

Global Gravitational Wave Activities (GWIC) – Jo van den Brand

- GWIC mission: facilitate international collaboration and cooperation in the construction, operation and use of the major gravitational wave detection facilities world-wide. See <https://gwic.ligo.org>

Affiliated members:

- GWIC is Working Group 11 of IUPAP
- International Society of General Relativity and Gravitation –ISGRG is an Affiliated Commission (AC2) of IUPAP
- IAU (International Astronomical Union) Commission D1
- Amaldi 2023 - Premier biannual international conference on gravitational wave science and gravitational wave detection. Virtual world-wide conference using Zoom from July 17th to 21st, 2023
- LIGO-Virgo-KAGRA collaboration started run O4 on May 24th, 2023 - The Virgo Collaboration and KAGRA have decided to postpone the entry in the next observing run (O4), in order to continue the detector commissioning activities and further increase their sensitivity

For detectors and observatories current status and updates, see presentation slides at <https://indico.cern.ch/event/1295199/>

Discussion points:

Einstein Telescope and Cosmic Explorer

- Close interaction between various stakeholders is needed
- Proposal to Gravitational Wave Agencies Correspondents (GWAC): See <https://www.nsf.gov/mps/phy/gwac.jsp>
- Facilitate a global workshop/conference having the aim to coordinate the actions of the future 3G observatories
- Funding opportunities for coordinating specific 3G actions, like R&D on specific items of global interest (vacuum, infrastructures, ...)

The road from 2G to 3G observatories

LIGO-Virgo-KAGRA-LIGOIndia

- Community faces challenges in meeting requirements for future observation runs: O4, ...
- A# and Virgo Next: when are proposals expected?
- Impact and opportunities: 2G versus 3G
- What is the timeline (final configuration) for LIGO-India?

Cosmic Explorer and Einstein Telescope

- Timeline for funding CE?
- Status of configuration study of ET?
- What is status of OzGrav's NEMO?

Gravitational-wave research is growing rapidly

- Upgrades of 2G facilities and preparation for 3G observatories
- Fast increase in event rate expected
- Missing FTEs in computing domain: LVK should develop a coherent plan

Multi-messenger Astronomy

- Involve relevant communities
- Ensure timely development of instruments for EM follow-up

Astro 2020 Decadal

- Exploring the cosmos in the multi-messenger and time domains is a key scientific priority for the coming decade, with new capabilities for discovery on the horizon with the Rubin Observatory, Roman, LIGO, Virgo, and KAGRA, and IceCube

APPEC

- Update of Roadmap

Astronet Roadmap 2022 -2035

–Improvements in neutrino and cosmic-ray capabilities will greatly enhance possibilities in multi-messenger Astronomy

NASA –NSF meeting

- –TDAMM meeting in the fall. Both the present and future GW observatories will profit from a robust program of space and ground-based photon and particle observatories

Voyage 2050

- Long-term planning of the ESA science programme
- –See <https://www.cosmos.esa.int/documents/1866264/1866292/Voyage2050-Senior-Committee-report-public.pdf/e2b2631e-5348-5d2d-60c1-437225981b6b?t=1623427287109>
- –Recommendation: ESA should develop a Large mission capable of deploying new instrumental techniques such as gravitational wave detectors or precision microwave spectrometers to explore the early Universe (say $z > 8$)

ASTRONET activities, Roadmap and ACME – Colin Vincent

Download roadmap at https://www.astronet-eu.org/?page_id=521

Summary of recommendations:

- New ground-based facilities: ELT + 1st gen instruments; SKA-1; CTA; EST; Wide-field/High multiplex spectrograph
- Upgrades and new instruments: ALMA; VLT (BlueMuse, High contrast/High angular res); ELT 2nd gen instruments
- Space-based facilities: Athena + LISA; Exomars (re-examine European strategy for Mars exploration)
- Laboratory astrophysics: Data on atoms, molecules, solids + investigations of meteorites and space samples
- Technology developments toward: radio-astronomy; space FIR space; ELT-PCS; UV-to-IR space telescope; optical/IR interferometry
- Computing, data, theory: science-ready data products and analysis tools; data infrastructure; professional skills base; collaborative, open and synergistic view of the computing ecosystem
- Sustainability, accessibility: carbon-neutrality, climate science, diversity/inclusion, dark and radio-quiet skies
- Education, training, society: training programmes, transferable skills, career paths for instrumentation, computing and data science, public engagement, big science, big data, AI, R&D, equal/respectful engagement with communities

Future beyond 2035: Set-up pan-European working groups for:

- Defining roadmap towards ELT-PCS
- Launching detailed design study for SKA-2
- Defining European participation in CMB-S4
- Defining roadmap towards European CMB space mission
- Defining European contribution to HWO
- Defining European contribution to NASA far-IR space mission

Next steps:

- ASTRONET Board starting to consider the recommendations, but also to continue to promote awareness of the report in media, community and to policy-makers
- Already had links to APPEC, Europlanet, ORP, ESCAPE, AHEAD etc.
- Now working on improving links to ESFRI, EC: coordinated submissions to ESFRI Landscape Analysis with APPEC
- Engaged with process to develop ACME EC bid (including transnational access) across astroparticle and astrophysics, starting to engage with INFRA-Tech bids, ESCAPE2

- Highlighting recommendations not directly for ASTRONET to those more able to take them forward
- Considering infrastructure recommendations
- For some, endorsement is sufficient –current ESA programme, ELT, Rubin etc.
- For others need to consider how best to encourage, facilitate and engage:
- ESA /NASA future programmes –both science and exploration, and linkage with ground-based capabilities
- Astroparticle facilities –CTA, ET etc. How best to work with APPEC to support these
- Planetary capabilities –how to take discussion forward with community and representatives, how to ensure joined up approach to potential funders / policy makers
- EC opportunities –ACME plus plus.

APPEC MoU discussions – Katharina Henjes-Kunst

- In the last feedback round a draft with formal changes by KIT was received. After discussions between DESY and KIT legal departments these formal changes have to be considered. Therefore feedback round with all legal departments have to be done before the MoU can be signed.

Next steps:

- Send the final draft to all APPEC partners for feedback
- Send out final MoU signature pages to all partners

Day 2: Celebratory Event: Astroparticle Physics in Poland

Talks: slides can be downloaded at <https://indico.cern.ch/event/1295199/#b-515805-celebratory-event-ast>

1. Welcome and introduction to APPEC – Andreas Haungs
2. Astroparticle Physics in Poland – Leszek Roszkowski
3. Ministry of Education and Science - Wojciech Dzedzic
4. Copernican Academy - Leszek Roszkowski
5. The German Center for Astrophysics (DZA) in Lusatia – Christian Stegmann
6. Open/panel discussion – all speakers

Roadmap Update – Sijbrand de Jong

- Endorsed by the GA: <https://www.appec.org/roadmap>

Next steps: Presentation in Brussels on Dec 7th: <https://indico.cern.ch/event/1342120/>

EuCAPT – Gianfranco Bertone

Selected highlights:

- Community-wide White Paper “Opportunities and Challenges for TheoreticalAstroparticle Physics in the Next Decade” (arXiv:2110.10074) 135 authors, 400 endorsers
- Community building: Website, Monthly Newsletter, Mailing list (1655 colleagues), Code repository HEP + Astro + Cosmo
- Funded first exchange program in 2022: 4 collaboration meetings at CERN, 13 individual visits to other EuCAPT institutions
- Events organised: 3 Annual Symposia, 6 Workshops, 15 Colloquia, This year: EuCAPT BIP Erasmus+ School
- Looking for a new director: After ~5 years, Gianfranco will step down as director in Jan 2024

Next steps:

- New director elected: Silvia Pascoli
- Francesca Calore is the new chair of the EuCAPT council.

Strategic development of European Underground Laboratories – Aldo Ianni, Carlos Peña Garay

Currently working members in Underground Labs:

- LNGS, Ezio Previtali and Aldo Ianni (also in APPEC JS)
- LSC, Carlos Peña Garay (also in APPEC GA and JS)
- LSM, Jules Gascon; LSBB, Ignacio Lázaro
- Boulby, Sean Paling
- CallioLab, Julia Puputti
- VIRGO, Massimo Carpinelli

Goals:

- establish a robust cooperation and coordination in key services
- establish a European trans-national (TA) access policy
- coordinate existing facilities to support research by a Virtual Coordination Office
- coordinate ULs strategy for future investments

Actions:

- 1st common Workshop at LNGS in 2022
- Joint participation in EU calls (APOGEIA, ...)
- NEW. Joint proposal submitted to 2023 COST Action
- NEW. Coordinated activities by ULs worldwide
- Frontiers: Science and Technology in ULs
- Dedicated Session to ULs coordination in TAUP 2023 meeting.
- NEW. Establish TA and Research Coordination agreements between Laboratories. First step by LNGS and LSC.

Bilateral agreements:

- Agreement between LSC and LNGS: 1) Research Collaboration on low radioactivity services to match larger DM and 2b experiments and 2) Transnational Access to LNGS and LSC staff and collaboration members
- UJ (Poland) & LSC (Spain) cooperation

Requests to APPEC:

1. Prioritize the European Underground Laboratories coordination (research in services and transnational access) within the APPEC strategy.
2. Active support from APPEC within the consortium and with EU Institutions. Prepare and present a dedicated portfolio on the EULs coordination project.
3. APPEC prioritization of this initiative in EU calls which may financially support this coordination:
 - ULs activities are 100% supported by its host country
 - Goals could not be reached unless significant EU support is obtained.

Report by the General Secretary – Katharina Henjes-Kunst

APPEC Topics in 2023:

1. APPEC Common Fund
 - Still ongoing , really important that payments are made with the reference

2. APPEC Census
 - Finalised for the Midterm Review
3. MoU
4. JENA Computing workshop

Next steps:

SAC:

- half of the SAC has to be replaced now , the other half by the end of next year
- This has to be done by the national GA representatives
- SAC will be composited by scientific domain
- Suggestion to the GA by national representatives until 15th of October ready for decision in the Brussels GA in December

APPEC Next meeting 2023

- JS meeting after summerbreak (end of September during RI week during Spanish presidency) – Zoom
- 7-8 December : GA in Brussels with Midterm Presentation to officials:
<https://indico.cern.ch/event/1342120/>