



APPEC GA meeting 2022
18th/19th 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

Andreas Haungs, GA Chair

- Agenda of the GA adopted
- Minutes from the last GA approved
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Update GA Membership – Andreas Haungs

- CNRS (France): Vincent Poireau replaces Berrie Giebels
- Ukraine is a new member of APPEC
- Denmark joining APPEC – the discussions are still ongoing
- UK – Justin O'Byrne substitutes Grahame Blair

Presentation by the Austrian Academy of Sciences on their AP activities – Josef Pradler

- Institutions with related physics faculties: University of Vienna, Institute of High Energy Physics, University of Innsbruck, University of Graz
- Funding landscape: Austrian Science Fund FWF, Austrian Research Promotion Agency (FFG), ERC, Federal Ministry Republic of Austria Education, Science and Research
- Science: Dark Matter and neutrino groups – TU Wien & HEPHY Austrian Academy of Sciences
- Members: Jochen Schieck, Florian Reindl, Josef Pradler, Suchita Kulkarni, Glenn van den Ven et al.
- Experiments: CRESST and COSINUS at LNGS, NUCLEUS at Chooz, Theory groups at HEPHY and University of Graz, Observation and Simulation group at University of Vienna
- Upcoming event: XVIII International Conference on Topics in Astroparticle and Underground Physics 2023, 28.08 – 01.09.2023 University of Vienna

Foundation of the ET collaboration – Jo van den Brand for Einstein Telescope

- GWIC (Gravitational Wave International Committee): its mission is to 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>
- Projects: DECIGO, ET, Cosmic Explorer, EPTA, GEO 600, KAGRA, LIGO, LISA community, NANOGrav, OzGrav/PPTA, Virgo, GW Theory Community
- Affiliated members: GWIC is Working Group 11 of IUPAP, International Society of General Relativity & Gravitation is an Affiliated Commission (AC2) of IUPAP, IAU Commission D1
- Scientific highlights with recent results from LVK were presented, for details please see the presentation slides at

https://indico.cern.ch/event/1171120/contributions/4956980/attachments/2482619/4262149/20220718_APPEC_v1.pdf

- Einstein Telescope appeared on the ESFRI Roadmap June 30, 2021, see <http://www.et-gw.eu/>
- Funds: preparatory funds available in some countries (IT, NL...), EU INFRA-DEV proposal approved (3.45 M€ grant)
- Site candidates: studies ongoing in Sardinia in Italy, BE-DE-NL border region, and Saxony in Germany
- Governance in evolution; Current instances: Board of Governmental Representatives, Coordinators – Bentvelsen/Zoccoli, Board of Scientific Representatives, ET Directorate - Ferroni/van den Brand, ET Collaboration – Punturo/Lück
- ETIC – Einstein Telescope Infrastructure Consortium: Next Generation EU investment proposed of 100 M€ focused on ET enabling technology and Sardinian site candidature support
- Einstein Telescope in Euregio Meuse-Rhine (EMR)- Einstein Telescope approved by Dutch National Growth Fund on April 14, 2022. Development funds of M€ 42 available to prepare bid book, while M€ 870 will be available in case EMR region hosts ET
- ETpathfinder - ETpathfinder is a new R&D infrastructure for testing innovative concepts and technologies for future gravitational wave observatories. Open for everyone interested to join. See Issues of importance to APPEC GA: <http://www.etpathfinder.eu>

Next steps: Issues of importance to APPEC GA

- LIGO-Virgo-KAGRA : IGWN as an initiative to bring more structure to the LVK Consortium: joint running, computing; OpenLV(K)EM meetings to align with the astronomy community in preparation for O4; Impact and opportunities: 2G versus 3G
- Close interaction between various stakeholders is needed: Facilitating international collaboration and exchange visits of scientists involved in ET, LVK and CE; Give advice on how to communicate at all relevant levels of the relevant government (White Papers, one-pagers, information cards, presentations...); Einstein Telescope: regular communication via Board of Governmental Representatives (BGR)
- Gravitational-wave research is growing rapidly: Upgrades of 2G facilities and preparation for 3G observatories; Fast increase in event rate expected
- Resources and priority should also grow to allow our community to handle these challenges effectively and to serve a broad community

APPEC Roadmap evaluation: next steps – Sijbrand de Jong

Research:

- High-energy gamma rays CTA top, next ASTROGAM over AMEGO, SWGO over LHAASO
- High-energy neutrinos KM3Net top, also IceCube-Gen2, no priority to P-ONE
- High-energy cosmic rays AugerPrime top, also support TAx4, prepare next-gen
- Gravitational waves Embrace ET, balance with Virgo, support LISA
- Dark matter Follow DDMD report, push for 1-2 exps in Europe, synergy with other topics, think of direction sensitivity
- Neutrino properties Follow Onbb report, worry about isotope procurement, KATRIN top, realise ORCA soon, solar and geo neutrinos ?
- Cosmic microwave background strongly support LiteBIRD, join 4th gen ground-based exps
- Dark energy must-have HW contribution to ground based, Support Euclid
- Multi-probe astroparticle physics Distinguish multi-messenger from multi-probe, standardisation of alerts and data-exchange (who funds?) APPEC should identify time-lines for exps

Community

- Ecological impact awareness, monitoring, mitigation/compensation- APPEC's role in standardization
- Societal impact Education, culture, regional development, industry, science for peace
- Open/citizen science Findable, Accessible, Interoperable, (Re)Usable, laymen's help vs outreach, Citizens help in analysis?
- Human talent management APP as community, Diversity Equity & Inclusion, career perspective, education
- Central infrastructures need to coordinate/streamline/collaborate really felt - synergy evident
 - Develop a transnational access agreement
 - Establish a collaboration network agreement
 - Deep Underground Laboratory Integrated Activity (DULIA) as
 - EU central structure (?)

Next steps:

- Now - September SAC prepares a draft strategy update
- A questionnaire has been sent to the experiment spokes and lab directors for update of the costs and timeline of the experiments
- Fall 2022 GA endorses the updates strategy (*or not*)

JENA Activities – Andreas Haungs

- JENA Symposium was held on May 3-6 in Madrid, and contained a recommendation for the funding agencies session;
<https://indico.cern.ch/event/1040535/timetable/#20220503.detailed>
- 6 approved EoIs, APPEC has representatives in 5 of them. A possible 7th, but needs more preparation

Next steps:

- All EoIs will be discussed in September: <https://www.nupecc.org/jenaa/>
- A coordination is needed for computing. The idea is to organize a dedicated workshop early 2023.

APPEC and ASTROGAM – Andreas Haungs

- A gamma-ray satellite concept, proposed for the ESA Medium-Class Mission Opportunity Call.
- A letter of support was requested, a draft circulated among the GA members

Next steps: a letter of support from APPEC has been sent to the ASTROGAM PI

NuPECC Long Range Plan – Andreas Haungs

- NuPECC has launched the process to create a new Long Range Plan (LRP) for nuclear physics in Europe

Next steps: aim to publish the document in 2024

Astronet Roadmap – Colin Vincent / Andreas Haungs

- New feedback from community possible until the end of August

Next steps: in September, circulate the final input, publication by the end of 2022.

Snowmass process – Andreas Haungs

- Berrie Giebels (IN2P3) will continue to report

Presentation by the Ukraine representative in APPEC – APP in Ukraine, main results over the last 5 years - Fedor Danevich (Institute of Nuclear Research of the National Academy of Sciences of Ukraine)

- Study of particle properties using astronomical data - Main astronomical observatory of the National Academy of Sciences of Ukraine: Dynamical mechanisms of accretion in galactic nuclei (for detailed information, see presentation slides)
- Study of particle properties using astronomical big data - Main astronomical observatory NAS of Ukraine, The Department for Extragalactic Astronomy and Astroinformatics
- Ukraine joined the CTA Consortium in 2015
- Participation in LISA, THESEUS, ATHENA
- Restrictions on the parameters of dark-matter-candidate particles from astrophysical and cosmological observations - Bogolyubov Institute for Theoretical Physics of NAS Ukraine (Kyiv, Ukraine)
- Gravity theory, dark matter, extension of the Standard Model - Astronomical Observatory of the Odessa I.I. Mechnikov National University
- Dark matter and dark energy on astrophysical and cosmological scales - Astronomical Observatory of the Ivan Franko National University of Lviv
- Several Ukrainian institutions and universities are members of the EuCAPT consortium
- Participation in the Hyper-Kamiokande and DUNE - Department of Nuclear Physics, Taras Shevchenko National University of Kyiv
- Borexino: neutrino from the Sun, geoneutrino, etc- Institute for Nuclear Research of the National Academy of Sciences of Ukraine
- Double β , rare α and β decay, effects beyond the Standard Model- Institute for Nuclear Research of NAS Ukraine
- Deep purification of metals for low counting experiments- Kharkiv Institute of Physics and Technology of NASU (in cooperation with INR NASU)
- Development of low-background scintillators- Institute of scintillation materials NAS Ukraine (in cooperation with INR NASU, Taras Shevchenko National University of Kyiv)
- Neutrinos from astrophysical sources - INR, KIPT, ISMA (NAS Ukraine)
- CUPID: search for $0\nu 2\beta$ decay of 100Mo with a sensitivity $\langle m\nu \rangle \sim 0.01$ eV- Institute for Nuclear Research of NAS Ukraine
- CUPID-Mo- Institute for Nuclear Research of NAS Ukraine

Outlook: There are several groups in Ukraine working effectively in different experimental and theoretical activities of astroparticle physics. Participation in the APPEC will be definitely the very suitable and reliable basis for Ukrainian scientists to participate in the research in the field in Europe

News from Horizon Europe, INFRA SERV 2023 – Antoine Kouchner

- *The call summary:* Will be found in the Horizon Europe – Work Programme 2023-2024 for Research Infrastructures
- Id: HORIZON-INFRA-2023-SERV-01-02
- Call scope: providing trans-national access on site or remote and/or virtual access to integrated and customized RI services for curiosity-driven research
- Scientific domain: "Astronomy and Astroparticle physics"
- Budget: up to 14.5 million euros
- Deadline for submission: 15 March 2023 (to be confirmed by the official release of the 2023-2024 WP)

- *Astroparticle/Astronomy discussions*: Focus on the overarching topic "Time domain, multi-messenger follow-up" is proposed. One of the objectives could be the implementation of a (virtual/conceptual) European Center for Multi-messenger Astrophysics. This will include the high-energy domain (X-rays & gamma rays, cosmic rays, neutrinos), Gravitational Waves, optical and radio bands for follow-up. There is a need for further discussions on what else to include to keep a unified proposal (eg. CCSNe ?)
- *Projects and partners (in progress)*: Opticon RadioNet Pilot, AHEAD2020, ESCAPE...

Next steps: A meeting of some experts in the time domain will be organized on the 30th of August; A Multi-messenger workshop will be held on October 10-12 in Florence, as follow-up of the APPEC MMA Workshop in Paris (Jan 22), locally organized by Stavros Katsanevas. The last day will be dedicated to the proposal.

Report by the General Secretary – Katharina Henjes-Kunst

APPEC – The Joint Secretariat: The joint Secretariat is the ApPEC executive body. Its main functions are distributed over a limited number of 'functional centres' hosted in different Participating Institutions.

- - FC APC (Julie Epas, Antoine Kouchner)
 - FC KIT (Katrin Link)
 - FC DESY (Christian Stegmann, KHK)
 - FC INFN (Aldo Ianni, Marco Pallavicini) + EGO (Stavros Katsanevas)
 - FC Gran Sasso (Carlos Peña Garay)
 - FC CEA (Sylvie Leray)
 - FC NWO (*Job de Kleuver – SAC*)
 - EUCapt?
- It holds about 6 JS meetings/ year, and has many working groups: JENA Symposium, APPEC TechForum, Horizon Europe working group (resulted in the HORIZON INFRA-2023-SERV-01-02), APPEC Town Meeting, APPEC MoU

Next steps: Total Work and financial report 2022 to be published by the end of the year. Work Plan for 2023 has to be ready for the GA in November/ December 2022. Send ideas and topics to Katharina.

APPEC Tech Forum – September 20-21 – speakers invited, still waiting from some answers; communication sent to APPEC GA

Next steps: increase the involvement of ECFA and NuPECC (invited speakers, communication)

Low-latency alerts and data analysis for Multi-messenger Astrophysics Workshop – report of contributions available here:

https://indico.cern.ch/event/1171120/contributions/4956989/attachments/2482010/4261075/MMA130122_contributions_report.pdf

HORIZON-INFRA-2023-SERV-01-02

- Result of lobbying
- First discussion with ASTRONET took place
 - 22nd of December – Call opening
 - 23rd of March – call closed (*date to be confirmed with the official release of the 2023-2024 WP*)

Coordination of the Underground Labs – Aldo Ianni

- EU underground facilities: LSC, LNGS, LSM, Boulby, CLAB, LSBB
- A network for ULs is proposed:
 - EU ULs network
 - Foster coordination to support R&Ds and future projects
 - Perform an overview of existing and planned facilities to support research
 - Define the possibility to use facilities in different labs
 - Future sharing of operations practices and work load
 - identify common interests
 - Establish a Transnational Access Agreement with contact experts to lead communication with Collaborations
 - Create a bank of screened materials for future use
 - Ensure continuation of know-how and expertise of personnel and others
- A Workshop on EU Underground Laboratories, organized by EU ULs and APPEC was held on 28-29 April 2022 in Gran Sasso: Contributions from: LNGS, LSC, LSM, Boulby, LSBB, CLAB, HADES, UL, Romania, ChETEC-INFRA Germany, UL Poland
- Summary of round table discussion: The Directors/Representatives of the European Underground Laboratories participating in the meeting agreed on initiating regular Lab Director's meetings, inclusive to other Underground Laboratories, to evaluate the current situation and plans on common services and activities and to identify future actions of common interest.
- APOGEIA – a proposal submitted to HORIZON-INFRA-TECH April 2022 and coordinated by Stavros Katsanevas. EU ULs have participated with a common effort in a specific Work Package named «Underground technologies»; Although it didn't get funded, APOGEIA is a step stone to foster collaborations between ULs.
- APPEC Town meeting and ULs: APPEC Town meeting in Berlin June 10th, 2022 for «Inventory of Central infrastructures». Main focus: science and technology in underground laboratories. Questions from organizers: What are the models for closer cooperation for European underground labs and RI? What issues can best be solved by European underground labs jointly?

Next steps:

1. COST Action 2022: EU ULs and interested Institutions are working on submitting a COST Action proposal by Oct 2022 (14 participants) to foster networking on cutting edge science and technology in underground laboratories.
2. Suggested recommendations requested to APPEC
 - Include in the roadmap the co-operation between ULs as a key parameter to facilitate the path to the next generation experiments
 - Facilitate the use of small labs for proof-of-principle projects
 - optimization of underground space and facilities use
 - Ensure the continuation of existing personnel expertise in specific technical topics
 - Facilitate a possible EU ULs central coordination to better support a scientific program and work load for next generation experiments; face increasing manpower and funding needs
 - Coordinate strategy for future developments
 - Investments optimization

APPEC MoU – Katharina Henjes-Kunst

- was established in 2012
- Different opinions on extension, Spanish legal situation
- Other parts of the MoU are “not up to date”, Functional Centers/Tasks

Next steps: The MoU has been sent to the GA for feedback, a working group will compile a draft by the end of August to be validated by the GA.