

Minutes of the TIARA 18th Collaboration Council meeting

Remote, 25th of February 2021

GC participants:

Remote : Roy Aleksan (RA, CEA), Ralph Assmann representing Wim Leemans (RA, DESY), Jean-Luc Biarrotte (JLB, CNRS), Giovanni Bisoffi (GB, INFN), Philip Burrows (PB, STFC), Antoine Chance (AC, CEA), Tord Ekelof (TE, UU), Alessandro Gallo (AG, INFN), Terence Garvey (TG, PSI), Mike Lamont (ML, CERN), Tadeusz Lesiak (TL, IFJ-PAN), Piotr Malecki (PM, IFJ-PAN), Jose-Manuel Perez-Morales (JPM, CIEMAT), Peter McIntosh (PMI, STFC), Eugenio Nappi (EN, INFN), Jens Osterhoff (JO, DESY), Niels Pyka (NP, GSI), Leonid Rivkin (LR, PSI), Daniele Sertore (DS, INFN), Peter Spiller (PS, GSI), Toms Torims (TT, RTU), Pierre Vedrine (PV, CEA), Maurizio Vretenar (MV, CERN)

Invitees: Dave Newbold (DN, STFC), Sandro Rossi (SR, Fondazione CNAO), Svetlomidir Stavrev (SS, CERN)

Start Meeting: Welcome (E. Nappi)

EN welcomes the TCC and thanks all speakers.

Approval of agenda (All)

The agenda is approved.

Approval of the minutes of the 17th meeting on 21 October 2020 (all)

The minutes are approved.

General information (Roy Aleksan)

RTU is officially the 12th TIARA member. The addendum has been signed. Toms Torims is the representative of RTU. Two new projects are approved and will be presented: IFAST (total cost: 10.6 M€, EC 10 M€) and HITRIPlus (total cost: 9.2 M€ EC: 5 M€). RA shows the EC contribution, the number of running projects and the average amount of EC contribution per project (about 2 M€) along the years. RA lists the accelerator R&D projects: 22 projects for a total cost of 333 M€ (EC contribution of 123 M€). RA focuses on Horizon Europe with a dedicated presentation at this meeting. Situation is dramatically changing with clear uncertainties about the future organisation. Design studies are still foreseen with a deadline March 2024. Submitted projects to ESFRI roadmap (EuPRAXIA and HITRIPlus) have been selected. Next deadline is 2022 with a limited amount of 3 M€.

Transnational access is a targeted call. Fortunately accelerator community can apply jointly with two other communities (particle and nuclear physics) for a total budget of 30 M€ (15 M€ per community; the other community is geosphere). The schedule is very tight with a deadline on 23 September 2021. Nuclear physics has already prepared a proposal without consulting particle physics community. The call does not allow buying new equipment at high level but allows improving the service.

High-tech development for accelerator is foreseen with two deadlines: September 2021 (max budget/project: 15 M€, total of 30 M€) and 2nd call March 2022 (10 M€/project, total of 110 M€).

Accelerator R&D roadmap is under racks. This roadmap identifies key accelerator development and issues and is relevant. The last report was released in 2011 and is to update.

CERN Accelerator R&D for the next 5 years (Mike Lamont)

Mike Lamont is the new accelerator DG of CERN, replacing Frederick Bordry. ML reminds the ESPP update and the main orientation for R&D accelerator technology. ML lists the CERN's scientific priorities. ML comments the CERN's reaction to the ESPP outcome. ML goes through the future collider options: FCC, CLIC, and muon colliders. ML details the R&D programme for high field magnets, SRF for FCC, FCC-ee injector, CLIC X-band cavities, muon collider, and advanced accelerator technologies with AWAKE flagship project. ML explains the in-house applications of R&D and the collaborations with other institutes. ML lists the EU programme CERN participates in. CERN is also participating to medical accelerators. ML shows the CERN's actions in knowledge transfer, energy and environment.

ML shows the new organisation of ATS (Accelerator Technology Sector) at CERN. Systems is a new department. ML shows the organisation of HiLumi project. ML goes through the realisations of RF, collimations, power converters, cryogenics, vacuum, surface treatment, knowledge transfer, robotics, mechanical and materials engineering groups. ML concludes.

SRF R&D group is now well established for FCC-ee and is moving to establish the collaborative links. CERN is involved in the preparation of ILCPreLab in Japan with representatives in the key technologies. If ILCPreLab goes further, CERN will examine its participation again. A risk is to spread the resources with a too large number of projects. Putting priorities in the 5-year plan is a challenge. CERN will enter the construction phase with HL-LHC, which is a critical priority. There is a competition for the resources. The medium-term plan will care the managing of the human resources. The plan for HTS magnets is material development with KIT and pushing the basic technology to a prototyping of inserts. It is too early to plan building a full HTS magnets.

European Roadmap for Accelerator R&D (Dave Newbold, STFC)

DN explains the main objectives: to make the roadmap taking into account what is explicitly mentioned in the ESPP, including discussions about muon colliders, relying on the substantial technology R&D. Future facilities depends also on new technology. DN goes through the R&D roadmap. DN explains the 2 stages to reach a roadmap: the first one is driven by the LDG (Laboratory Directors Group) with a formal process mirroring the style of ESPPU and roadmap approval by CERN council, and the second one by the community: proposals for activities by the accelerator R&D networks/community, agreement and engagement with funding agencies, continuation of work,... DN reminds the content of the LDG mandate. DN lists the requirements for the roadmap. DN shows the roadmap process and its organisation. There are 5 panels for accelerator R&D: high-field magnets, high gradient acceleration, high-gradient RF, muons, and ERL. DN explains the role of the LDG, of the panel and what is not in the scope. DN shows the status, key questions, and panel schedule for each of the 5 panels. DN explains what role TIARA can play.

The full list of the expert panel will be public in a couple of weeks on the website. Accelerator R&D Roadmap is for particle physics. Detector R&D process is done with ECFA. The accelerator process co-operates with them. There is no process for the computing topic. Main role of TIARA is to implement projects. Setting priorities and receiving priorities from outside is also one of TIARA roles. RA sees small problems in the timeline. With conclusions in December and a deadline for Horizon Europe early 2022, the timeline is tight to launch new projects. TIARA needs to have a close connection to roadmap process and to receive some inputs. Several funding agencies are also waiting for the conclusions. Budget for accelerator projects is 100s M€: we should work on lobbying on EC to get demonstrators/pilots...

Horizon Europe (Svetlomid Stavrev)

SS lists the main features of the research infrastructure programme. SS goes through the 5 destinations and relevant actions:

- 1. Developing, consolidating and optimising European RIs landscape, maintaining global leadership.**
 - Preparatory phase of new ESFRI RI projects (total of 35 M€, 1.5-3 M€ per project). Deadline is 13 January 2022. This call is suitable for FCC in future work programmes provided that it is in ESFRI roadmap.
 - Consolidation of the RI landscape - Individual support for ESFRI projects (total of 7.5 M€, 1-1.5 M€ per project). Deadline is 13 January 2022. This call is suitable for FCC in future work programmes provided that it is in ESFRI roadmap.
 - RI concept development (new name of design studies, total of 30 M€ for 10 projects). Deadline is 24 March 2022. This call is to develop new concepts and suitable for new accelerator-based RIs such as a new muon collider.
- 2. Enabling an operational, open and FAIR EOSC ecosystem.** It is not relevant for accelerator
- 3. RI services to support health research, accelerate the green and digital transformation, and advance frontier knowledge.** SS explains the main features. Support for transnational access is within. It is a top-down initiative with a multi-annual priority setting (MAPS) with challenge-driven and curiosity-driven topics. SS lists the identified topics for the 1st MAPS. One topic is particle and nuclear physics including three communities (particle, nuclear and detectors). A joint proposal must be done, which is a challenge. The relevant call is RIs service advancing frontier knowledge. Deadline is 23 Sep 2021 (budget: 30 M€, contribution per project: 7-15 M€). This call is suitable for support to accelerator test facilities, such as the ones currently funded in ARIES. It is better to have institutes which have the 3 parts (nuclear, particle and detector parts) like CERN or INFN to lead the common proposal.
- 4. R&D for the next generation of scientific instrumentation, tools and methods.** Deadline is 24 Mar 2022 (total of 120 M€, 5-10 M€ per project). This call is suitable for focused accelerator R&D relevant for the ESPP like high-field magnets. The proposal should be relevant for more than one facility. Large infrastructures are supported by laboratories.
- 5. Network connectivity in Research and Education – Enabling collaboration without boundaries.** This destination is not relevant for TIARA activities.

Design studies (up to 3 M€) will be maintained. Integrated activities are no longer available and replaced by dedicated funding for transnational activities (up to 15 M€) and development of scientific instrumentation (up to 10 M€). There is not more ambitious follow-up of the Innovation Pilot launched in the last H2020 WP (I.FAST). Intensive lobbying efforts are needed to convince the EC to provide programme-based funding as a Pilot Action in the second half of Horizon Europe.

A risk is double funding by overlapping with I.FAST. Objective of R&D line should be different. Four actions of TIARA are discussed:

- Design studies (DS). TIARA needs to identify what to support like muon colliders. RA suggests to invite Daniel Schulte at the next meeting to discuss how to go to a design study. The ESS nu-SB community would like to go to a second design study. That is possible if the second DS is fully orthogonal to the first one. TE explains the second DS will focus on NuStorm application, civil engineering and safety. The content of this DS can be discussed at a next meeting.
- For preparatory phase, despite an expected feedback from ESFRI committee in June 2021, both projects should prepare to apply to the preparatory phase because the timeline is short.

- TNA. Nuclear community and detector community are to be contacted. To have a contact person for accelerator community is urgent. Any suggestion is more than welcome. Nuclear physics has a contact person. RA asks to have the outcome of the meeting with nuclear physics.
- Destination 4 of Horizon Europe (R&D for the next generation of scientific instrumentation, tools and methods). A coordinator is requested: in the mid-time we could consult I.FAST community to know if there is some project to push forward to this call. I.FAST will concentrate the ARIES community: to select some projects from the community. MV finds this process dangerous: consultation process may be long and useless. A successor programme for IFAST is possible but in 4 years. We should not miss the opportunity of the call on RI. Several technologies can be developed in this programme. A proposal is to make several applications. It should be transverse R&D and not dedicated to one facility. This call covers a lot of topics: if too many applications are submitted, all of them may fail. A strategy is to identify priority topics in IFAST or in current design studies and then to analyse which call suits to which topic. RA will contact the coordinators of the expert panel of accelerator R&D to know if they have identified some R&D programmes but the call is limited to particle physics. As the chairman of high-field magnet panel, PV thinks that the call is a good opportunity for funding. PV agrees to be contacted to set-up a project.

Status projects in preparation

ARIES -> IFAST (M. Vretenar)

MV lists the main items of the ARIES amendment. MV shows the new approved ARIES timeline, the budget the status of deliverables after amendment. MV focuses on the annual meeting in Lisbon on 20-22 April: the meeting should be postponed in September. MV gives the news on I.FAST. SigmaPhi has left the consortium. The draft CA was sent to all partners. So far there are only some legal issues with Thales. The start of the new project is 1 May 2021. Kick-off meeting will take place on May 4-6 or June 8-10 depending on the pandemics and vaccination status. MV shows the accelerator test facilities in new TNA programme. CERN prefers concentrating effort on CLEAR rather than continuing X-Box. For the new call, we can aim 5 M€. 2-3 M€ would be a good start. MV will contact other facilities.

HitriPlus (S. Rossi)

SR explains the motivation: only 13 carbon ions centres in the world. HitriPlus groups 22 institutes in 14 European countries. SR shows the organisation of the project with 13 WPs. The grant agreement is under signature. The project will start on 1st April for 4 years with a kick-off meeting on 13 April. Pre-general assembly meeting in on 19 March. A key issue is the TNA of the facility for the research and clinical community. Synergy between both worlds is crucial. SR is confident in the success.

RA asks for the links to the website and to participate to this meeting.

Process for the selection of the TIARA coordinator

RA leaves the meeting. EN reminds the role of the TIARA coordinator. RA is in the second term until July: only one TIARA meeting leaves before the end of his term. All members will be asked to propose candidates. EN proposes to start thinking possible candidates and to discuss in September/October in Frascati to choose the new coordinator. In this aim, the mandate of RA would be extended by 6 months, which is reasonable with the current circumstances. All TIARA members agree with this proposal. RA joins the meeting again and accepts to extend his mandate for a maximum of 1 year. RA would prefer however that the extension duration is as short as possible.

AOB (all)

RA will send a doodle for a virtual meeting end June/early July. RA will contact the representatives of TIARA: the chair is elected for 2 years to be renewed once. EN is ready to finish his term.

TT proposes to show the status of HERTIS.

Other suggestion is to invite each chair of the R&D panels for a short status report of 10 minutes. The timeline seems too tight and to schedule this report at the October meeting is preferred.

There are 2 possible design studies proposals: ESSnuSB and muon collider. RA will contact Daniel Schulte to have his feeling.

The projects EuPRAXIA and HITRIPlus and their application to ESFRI roadmap will be discussed at the next meeting.

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