

Goal of the workshop

- ❖ To define an **international roadmap towards colliders based on advanced accelerator concepts**, including intermediate milestones, and to discuss the needs for international coordination.
- ❖ <https://indico.cern.ch/event/569406/overview>



Defining an international roadmap (preliminary one)

- ❖ Merging existing roadmaps and workshop discussions
- ❖ Finalize the work initiated at the workshop (WG, workshop committee)



Output of the workshop

- ❖ Synthesis published within the next 3 months
 - ❖ Advanced Linear Collider roadmap proposal
 - ❖ Other title suggestions
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- ❖ More detailed/technical document for ESR, end of 2018: organisation to prepare it?

Do we need other workshops? How frequently?



- ❖ Discussion sessions at conferences (IPAC, EAAC)
- ❖ 1 beginning 2018
- ❖ 1 every two years?



HOW to set-up an ICALC?

- ❖ International Collaboration for Advanced Linear Collider
- ❖ Identify a group of researchers from different parts of the world motivated to work part of their time on collider design
- ❖ involvement of conventional accelerator labs
- ❖ With what type of funding?

From the US Strategy

- The significant cost of R&D facilities strongly influences the roadmap for advanced accelerator R&D.
- •Makes difficult (expensive) pursuit of multiple approaches in parallel.
- •Drives early (too early?) down-selection of approaches.
- •Cost strongly influenced the ARD Subpanel, which was charged to meet specific budget scenarios.
- •**An international AARD program, with some level of international coordination, is more capable of mounting the future facilities needed to explore multiple promising approaches.**
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Personal vision for PWA in Europe

Objectives

PWA should become a technology corner stone of AS&T

- *PWA should build a strong, united and coordinated community of developers and users*
 - *PWA should carefully agree and define for which application present technical knowledge and technology is most appropriate and set realistic timescales*
 - i.e. PWA should be careful of NOT “over selling machines” that are still “dreams”: credibility is very important*
 - *PWA should demonstrate that one can use this technology for user dedicated facilities, i.e. a full accelerator system should be operated reliably for users*
- ⇒ *An attractive, yet realistic, roadmap and strategy for accelerators (regularly updated) should be elaborated*
- ⇒ *and should be input and/or integrate national and input to international roadmaps*
- ⇒ *At least one user oriented facility using PWA should be constructed in Europe in the 2020's (should be the showcase of PWA in Europe)*
- ⇒ *A Design Study for an Energy Frontier Accelerator should be launched in the early 2020's*

Personal vision for PWA in Europe

Objectives (cont'd)



PWA community should augment the R&D in a coordinated way and use the available and planned EC instruments

- ***A European PWA R&D roadmap and strategy using the infrastructures in Europe,
i.e. What R&D should be done, who does it and where...***
- ***PWA should be visible at the EC level, not only for getting some funds, but also to gain credibility***
- ***PWA should use the EC tools as lever arms for getting additional national funding,***

Personal vision for PWA in Europe (cont'd)

How to achieve the above objectives

Continue and Amplify collaborative R&D

Why : *to get full system multistage reference simulation code(s)*

to bring the technology to higher TRL

to build up a large community with common R&D objectives

Who : *All communities interested in PWA technologies, including labs, universities and industry*

How : *through **ARIES and future TIARA coordinated initiatives***

Reinforce the coordination with a larger integration of European partners

Why : *to increase visibility and community weight in Europe*

to provide access to existing R&D infrastructures

Who : *All communities interested in PWA technologies, in particular relevant infrastructure owners*

How : *through **ARIES (EuroNNAc and PBT)***

*through **Education and Training** activities dedicated to PWA*

Personal vision for PWA in Europe (cont'd)

Roadmap and Strategy of PWA with clear priorities before 2019

- Why:**
- to provide a high visibility of PWA in Europe
 - to show coordinated, united and mature community to the decision makers
 - to have PWA strategy partially included in other roadmap/strategy (e.g. PP, Light Source, Laser...)
- Who:**
- All communities interested in PWA technologies, including at government levels
- How:**
- through EuroNNAc and dedicated workshops (e.g. EAAC2017...)
(**Why not setting up a strategy preparatory group as for PP?**)
 - by being active and participating to national roadmaps

Personal vision for PWA in Europe (cont'd)

Be ready to propose the construction of a user oriented accelerator in Europe in 2018-2019 with credible site(s)

Why : to demonstrate the usability and appropriateness of PWA to provide a clear option for States and decision makers to be included in Roadmap such as ESFRI, PP, Light Sources... to be included in H2020 calls of Preparatory Phases

Who : All partners interested in constructing a user-oriented facility including at government levels

How : through EuPRAXIA, **the success of which is mandatory**

Engage in the preparation of a HE frontier DS proposal

Why : to (possibly) be included in Roadmap such as ESFRI, PP, Light Sources... to be included in H2020 calls of DS in 2019

Who : All partners interested in studying a user-oriented energy frontier facility, including at government levels

How : Set up a **Task Force**, Down selecting technologies for a proposal!

Summary and Conclusion

The U.S. R&D roadmap for Advanced Accelerator Concepts is driven by the science priorities set by the U.S. particle physics strategic plan.

Focuses on achieving a multi-TeV e^+e^- collider
at affordable cost,
with a TDR in the 2040 timeframe.

- The roadmap has several possible routes to the same destination.
 - We do not know which route will lead most directly or most quickly.
 - We do know that all routes are long and arduous.
 - In practice, we do not (yet) know how strong is the scientific motivation for our technical solution.
- Exploring all possible routes makes sense, provided all can be advanced at a technically limited pace.
 - Otherwise one needs to pick a favored route to explore more fully.
 - Because of the need for sophisticated (expensive) test facilities, being technically limited while pursuing all three options is unlikely.
- The arena of Advanced Accelerator Concepts is ripe for international collaboration and cooperation.
 - If we venture forward collaboratively to explore the range of possible solutions to the challenge of a multi-TeV e^+e^- collider, then we will all be winners when the goal is achieved and discovery science ensues.



Do we need dedicated facilities?

- ❖ Do existing facilities correspond to our needs?

Strategy for funding AARD for collider applications?



❖ involvement of conventional labs