Convenor's Meeting Report:

Perspective from CPAD Leadership
&
Ideas for a first round of RDC Proposals

Mitch & Angelo

Points to keep in mind for the first round of RDC proposals.

There are 11 RDC topical groups → Considering the realities of 2024-25 funding

Fewer Proposals than RDC's are likely to be recommended for submission by CPAD in the first Comparative Review → Due by September 5, 2024.

Note that the September 5 **FOA** is **University Led**. Not ideal, but present reality.

Considering the size of our RDC Detector R&D instrumentation community we should look to propose:

- **Work Packages that CROSS RDC Topical lines.**
- **Multi-year investigations that span a period of brainstorming and foraging into the realm of possibilities with initial feasibility studies in Year 1-2 culminating in significant funded effort in year 3+**
- **A backbone of Regular meetings to showcase interest evolve ideas, results, search areas in an RD format similar to that of early stage CERN RD.**
- **Encourage wide participation without requiring commitment of unfunded human resource.**

Distilled Slides from Jonathan Asaadi's Report at the RDC Convenor's meeting

Feb 14, 2023

Good reasons to be enthusiastic about the direction we are heading

The particle physics community has identified the need for stronger coordination between the different groups carrying out detector R&D in the US. We strongly support the R&D Collaborations (RDCs) that are being established and will be stewarded by CPAD, the Coordinating Panel for Advanced Detectors, overseen by the APS/DPF. The RDCs are organized along specific technology directions or common challenges, and aim to define and follow roadmaps to achieve specific R&D goals. This coordination will help to achieve a more coherent detector instrumentation program in the US, and will help to avoid duplication while addressing common challenges. International collaboration is also crucial, especially in cases where we want to have technological leadership roles. Involvement in the newly established Detector R&D Groups at CERN is encouraged, as are contributions to the design and planning for the next generation of international or global projects. Targeted future collider detector R&D in particular, such as for Higgs factories or a muon collider, is covered in Section 6.5.

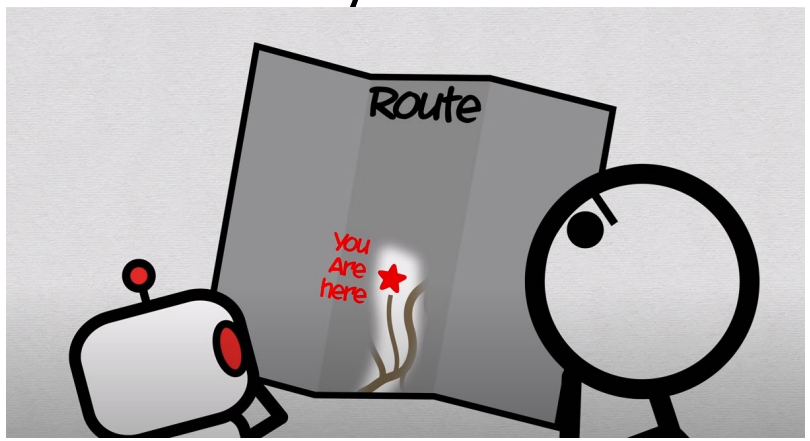
The RDC's are in the P5 report as is participation in the DRD's

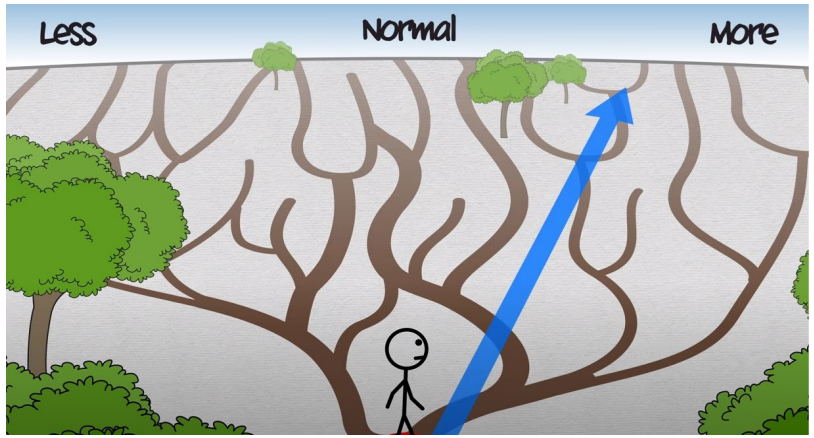
Area Recommendation 6: Increase the budget for generic Detector R&D by at least $20 million per year in 2023 dollars. This should be supplemented by additional funds for the collider R&D program.

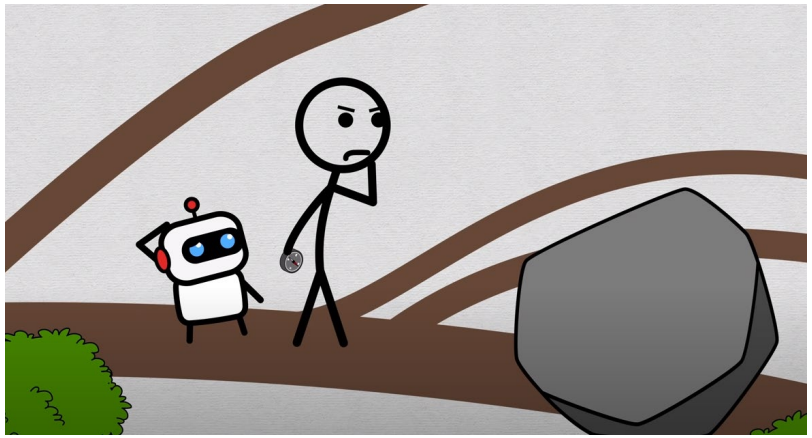
Area Recommendation 7: The detector R&D program should continue to leverage national initiatives such as QIS, microelectronics, and AI/ML.

Two central issues we need to help communicate

2. **The office of science will take "many months" to turn the P5 report into actionable strategy**
    a. From there it will take 2+ years to turn this into available budgets
        i. This is based on experience from the last P5 report released in 2014
    b. This could take longer if issues with favorable budgets don't come out the right way

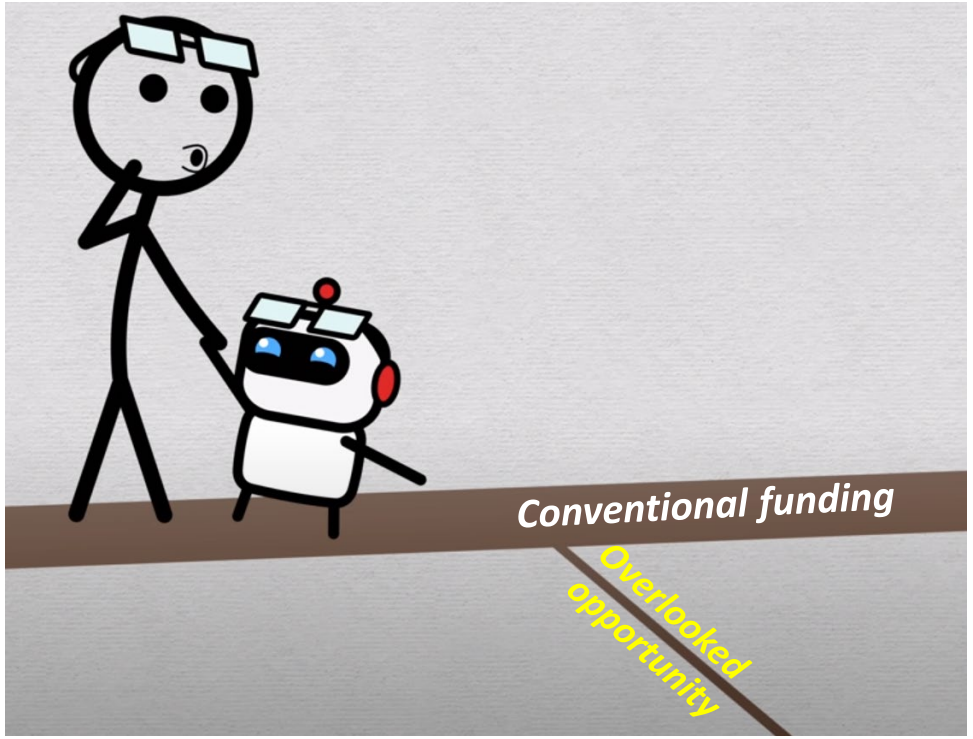






I think this means we have to be approaching the problem of forming RDC's, making work packages, and turning these into proposals adaptively and realistically recognizing that this will require us to pursue many different paths and there will be obstacles along the way

CPAD and the RDC coordinators are going to have to find a way to keep momentum in the community in the face of potentially disappointing budgets in the short run



- **This means looking for opportunities in all places for RDC projects**
  - SCGSR's to fund student
  - SBIR's to fund partnerships with businesses
  - Looking for reallocating funds from labs to jump start projects (KA25, LDRDs, Lab based fellowships, etc.)
- **It is also recognized that the current university comparative review is not the ideal vehicle for RDC-type proposals**
  - It will take time to develop a new funding mechanism
  - However, we can't wait before we do anything, instead we need to make the best of what we have and manage expectations

R&D Collaborations (RDC's)

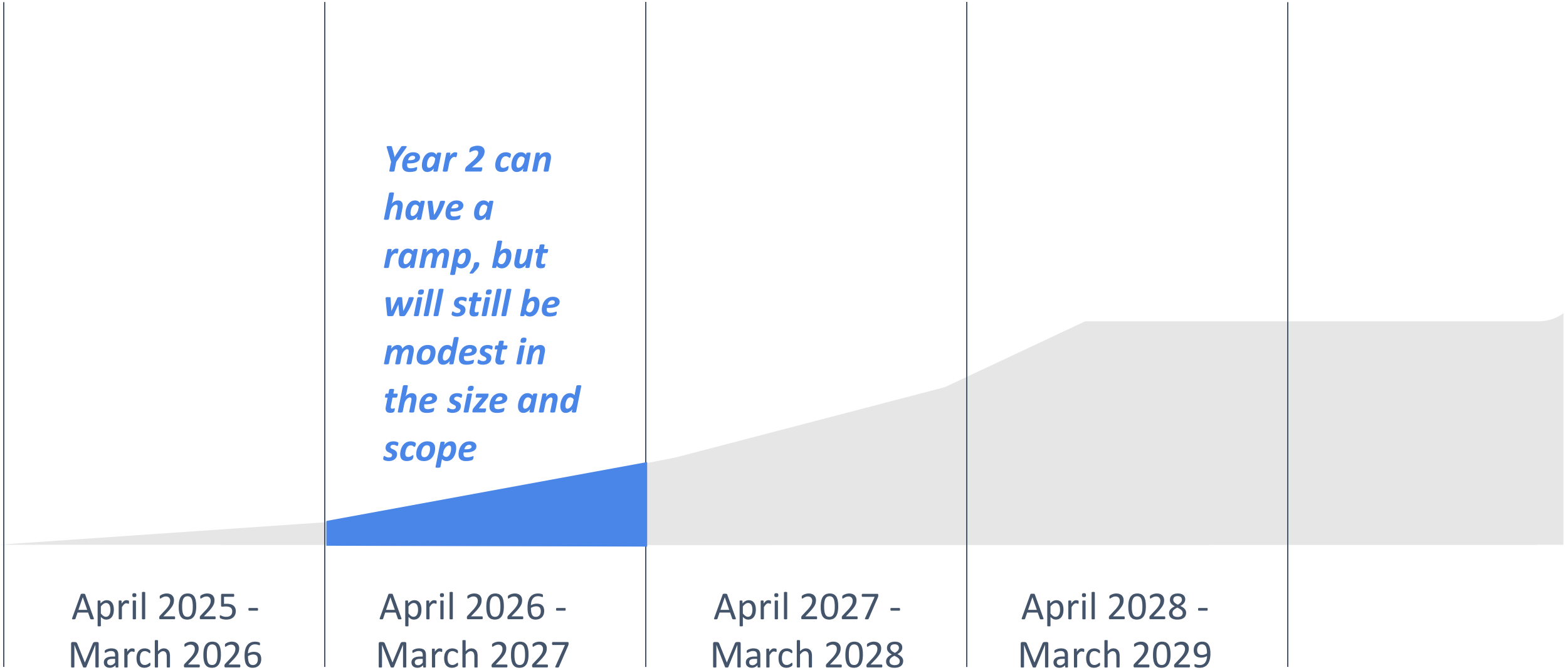
- **This could (should) be the first year where the CPAD based RDC's bring forward collaborative proposals targeting some set of R&D priorities**
  - These could be new collaborations which formed with the help of CPAD
  - These could be existing collaborations (potentially grown further through the help of CPAD)
  - These should be "blue-sky" and less project specific R&D
- **CPAD won't be the unit funding these proposals or selecting these proposals**
  - These proposals will go into the "regular" comparative review process and be selected through panel review
  - These could also be done by working with national labs / DOE to reallocate KA25 funds at the lab to help jump start them
- **In order to help manage expectations and fit into realistic budget scenarios we should limit ourselves to no more than 5 proposals**
  - With 11 RDC's, this means not every group will get to put one forward this round
  - **I think we should emphasize work packages which cross many RDC areas and are blue sky proposals which will benefit from additional coordination and support**
  - While we can have big ambitions, we will need to manage budget expectations
    - Proposals can be million dollar proposals over 3+ years, but will be VERY **small budgets in year 1 and 2**, with the potential to ramp in subsequent years.

Proposed Timeline for RDC Activities (reverse chronological order)

- **09/04/24:** Deadline for proposals to DOE (**before Sept. 5th 2024)**
  - See FOA here page 49
- **08/08/24:** CPAD Executive Committee and RDC coordinators put forward "≤5" (handful) collaborative proposals to be identified as "high priority" RDC proposals
  - These proposals will get letters of collaboration from CPAD and the RDCs identifying that this work has been earmarked as important to the community and will have support from CPAD in helping in the structure and execution of the collaboration
    - Would be helpful if these proposals also had clear synergy with ECFA DRDs
  - **This does not stop any group of PI's from continuing to submit to the DOE FOA,**
    - Hopefully this process enhances the selected proposals and helps them in their formation of new collaborations by identifying synergies, forming collaboration with the CERN based DRDs, identifying common resources, and avoiding duplication of work
    - Hopefully we work to help find other packages opportunities to jump start their work in the coming year (SCGSR, LDRDs, SBIR's, etc…)
- **07/24:** RDC coordinators bring short whitepapers to for each collaborative proposal (Virtual Town Hall) where we try to get a sense of what is being proposed
  - We will need to define what these white papers should have in them
  - This will give the coordinators and the CPAD EC time to
- **06/24:** Virtual check-in with RDCs to see how the formation of collaborations and preparations for the white paper is going.
  - One last opportunity to solicit calls for these proposals and help identify
- **04/24:** RDC Workshop to call to attention and highlight what CPAD is looking for in the RDC proposals
  - Will need time for parallel sessions to have people "workshop" their ideas

Unknown: Will there be a DOE PI meeting in 2024 and when will this be (might drive the schedule a little bit)

Funding ramps (note these are imaginary dates for the purpose of example only!!!!)



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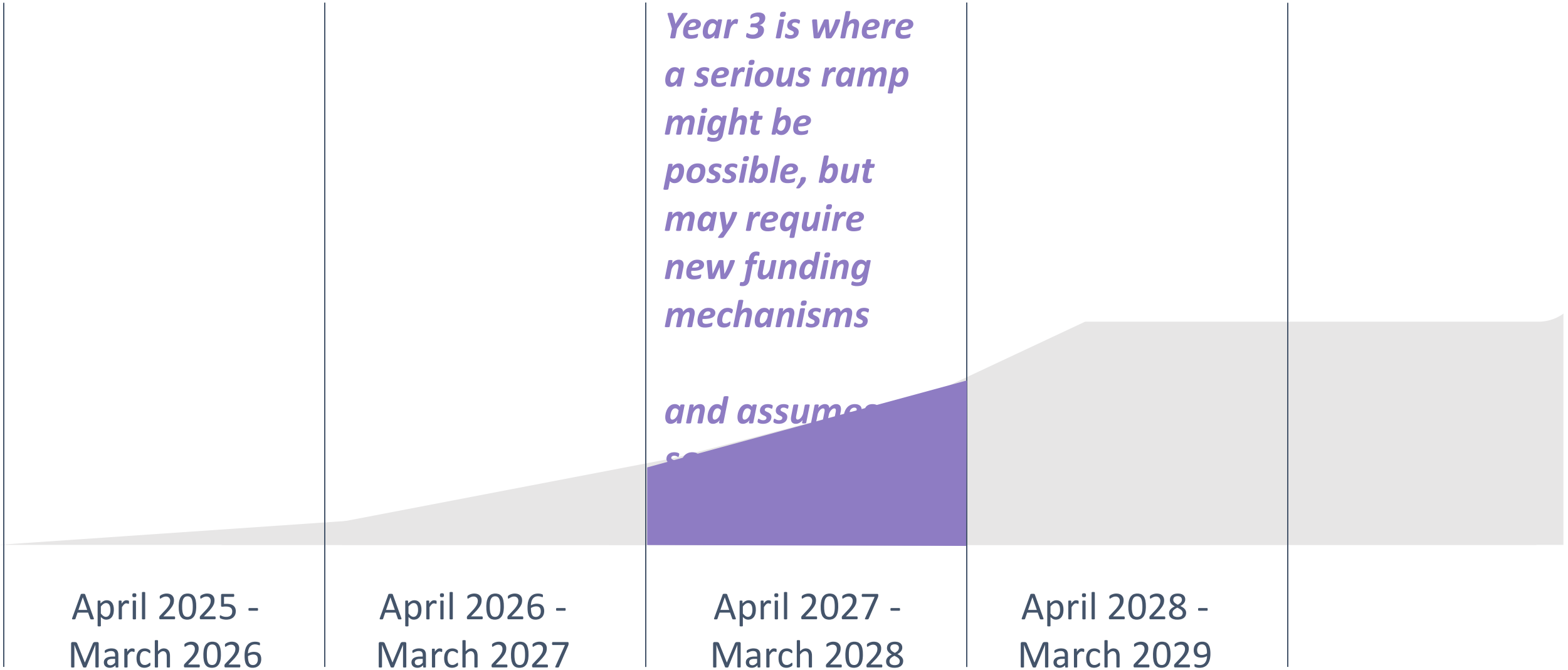

Conclusions

- **The US instrumentation community via CPAD is working to form collaborations to tackle the larger detector R&D challenges facing the HEP community**
- **It is my sincere hope that this can be done in collaboration and harmony with the CERN based DRDs**
  - Identifying key areas of overlap and looking for areas of opportunity will be a big part of this process
- **I hope the process can be done without a heavy hand, as the nature of this work is explorative, adaptive, and prone to failure (it wouldn't be R&D otherwise)**
  - Instead let us focus on bringing together the world experts to tackle some groundbreaking instrumentation. Let us bring together some of the cutting edge resources, processes, and collaborations to allow us to fulfill what only advances in instrumentation can do:

"Measure what is measurable, and make measurable what is not so"

We stand at a decade of HEP with immense ambition and challenge ahead of us to realize the next generation of facilities, detectors, sensors, and experiments which will light the way to the next major discoveries in physics

Some potential Take aways & Comment