Minutes

* Intro – C. Polly
  + Charge from SAC
    - <https://docs.google.com/document/d/1tiY3XKHgYOft-NUJO7zWuCVRrBQKg8BbkfixRmbgqXo/edit?usp=sharing>
  + Important dates
    - April 13 (6-8 PM CDT) – Town hall meeting at DPF, join from WH1W if you like (Kiburg)
    - May 1 prioritized list to report to SAC
    - June 14 interface to resources and All-Scientist retreat
    - Fall produce written report
    - Plan for Snowmass in ~2020
* REDTOP – Corrado Gatto
  + Eta factory proposal, multi-purpose detector with dozens of physics channels to explore
    - Can use DR or PIP-II
  + Proposal history
    - LOI to PAC in 2017 - science goals appreciated, but not recommended to proceed at that time
      * Director recommended waiting a couple of years
    - Jan 2018 presented at the CERN “Physics Beyond Colliders”
      * Feasibility at CERN 1/10th of flux and a larger impact on existing physics program as compared to FNAL
  + Collaboration
    - 8 countries, 23 institutions, 67 collaborators
  + Current activities
    - Event generator development
    - Simulation, digitization, reconstruction, and analysis
    - Detector optimization and sensitivities
    - Detector R&D
      * Adriano2 prototype in development at NIU
      * Optical TPC nobody working actively at moment
      * Fiber tracker copies LHCB design
  + Timeline
    - 2 yrs R&D + 1 yr detector construction once approved
    - 1 yr to add a SC cavity to the DR
  + Conclusion
    - Couple of years (or more) away due to program planning at CERN, short-term need is funding for detector R&D
    - Competition form LHCB, complimentary due to low energy
  + Questions
    - Conflict with Mu2e pushes this way out if we use the DR?
      * Only need an integrated year of POT
      * Construct elsewhere, install in summer shutdown
      * Need one more RF cavity
    - Is there space for one more?
    - Why DR decelerate instead of just going for PIP-II?
      * Will take much longer to mount
      * Can build in the AP50 hall
      * Target will be very different for PIP-II (tritium target preferred, politically challenging), current plan uses a solid target
    - Above or below the transition?
      * Have to go through transition
* Mu2e-II – Doug Glenzinski
  + Recent history
    - June 2018 – directorate initiated task force
    - July 2018 – Presented to FNAL PAC
      * Physics case is compelling, endorsed R&D
    - Aug 2018 – Northwestern workshop
    - Sep 2018 – Proposal to measure extinction performance of PIP-IIs beam chopper
    - Oct 2018 – Interfaced with the DPF ESG white paper
    - Dec 2019 – Submitted joint white paper on CLFV in muons with 4 collab spokes
    - Feb 2019 – Presented to DOE, OHEP OK with the R&D effort as long as not too larger and dovetails with Mu2e
    - Mar 2019 – Associate scientist hire in AD target group to help with Mu2e I/II target planning
  + Current priorities
    - Narrow window in FY19/20 where the extinction measurement can be completed before PIP2IT is scheduled for decommissioning
    - R&D for production target, engage new AD target group hire and/or RADIATE collaboration (worldwide group looking at targetry)
    - R&D for new PS conductor. Not yet clear the existing PS will work
    - Rethink where Mu2e-II should aim to be by the next P5 exercise, people saturated, Mu2e project schedule extends through 2022
  + Other CLFV – Bob Bernstein
    - 3 main muon channels, already doing 1...how can we add the other two?
      * Other two are stopped (but not captured 🡪 mu+)
      * Want steady beam due to accidental backgrounds, while Mu2e needs a pulsed source
    - Can we get the x100 needed for next gen experiments and to be competitive with PSI
      * PSI uses 1% of beam to get 10e8 muons/sec from a surface muon beam
    - Community on these 3 channels numbers about 600
    - FNAL advantages
      * Green field, not limited to be shoe-horned into available footprints
      * Use capture solenoid or lens to focus pi+ to get many more muons per proton compared to PSI
      * Slow muons down to 10 MeV/c..SCRF? Improved vertex
      * Possibly use PS from Mu2e, 30-40 MeV/c muons...see talk for ideas on how to convert to sending mu+ to expts instead of capturing mu-
        + Mu2e already produces a factor of 100 more muons/sec than PSI
        + HIMB plan at PSI would get a factor of 100, but future a little uncertain
        + Carol – Already have a design that could be used, optimized over PSI which has to prioritize their neutron program
  + Carol work for 400 MeV linac might also be good to include in report.
* Action items
  + Other topics for next meeting
    - Talk from Carol or John on muon production
    - Frozen spin EDMs
    - Check with Gordon on dark matter stuff
  + Schedule 2 more meetings in April to produce SAC deliverable
  + Produced prioritized list for May 1
  + See current priorities under the REDTOP and Mu2e-II sections above.
  + Other CLFV consult with Carol J. to understand work already done on muon production
  + Decide if Seaquest should also be included in our precision science planning.