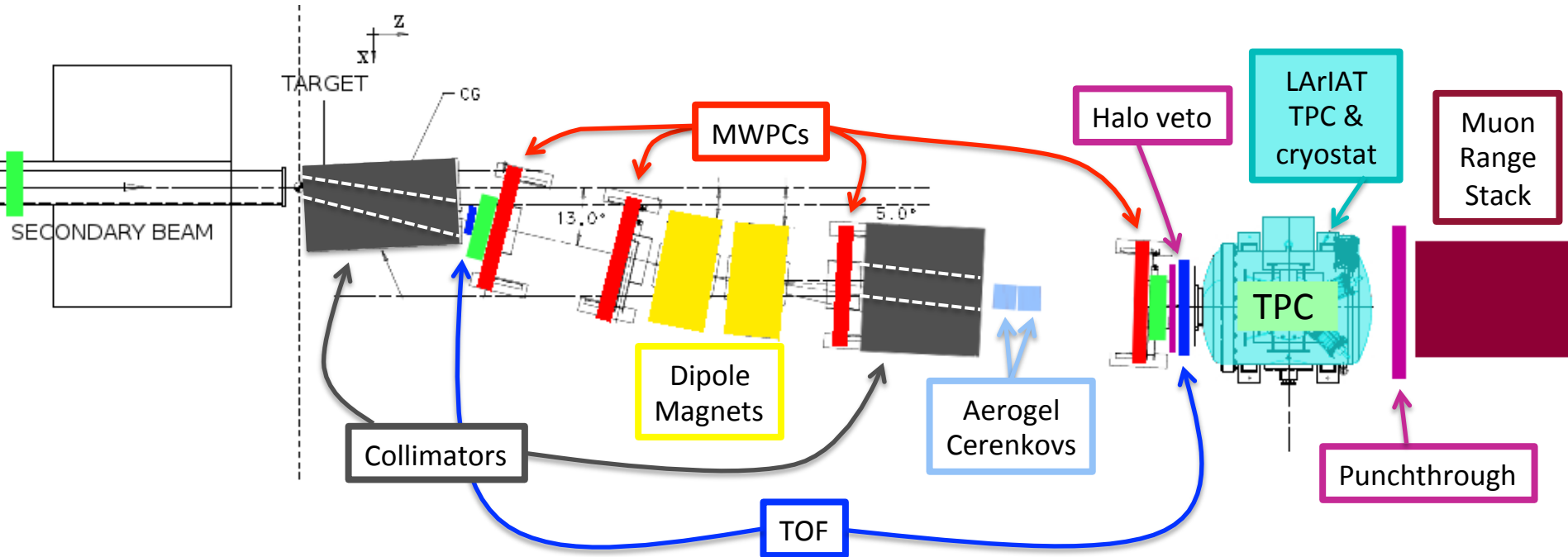


# Plans for LArIAT Run-III & High-pressure GArTPC

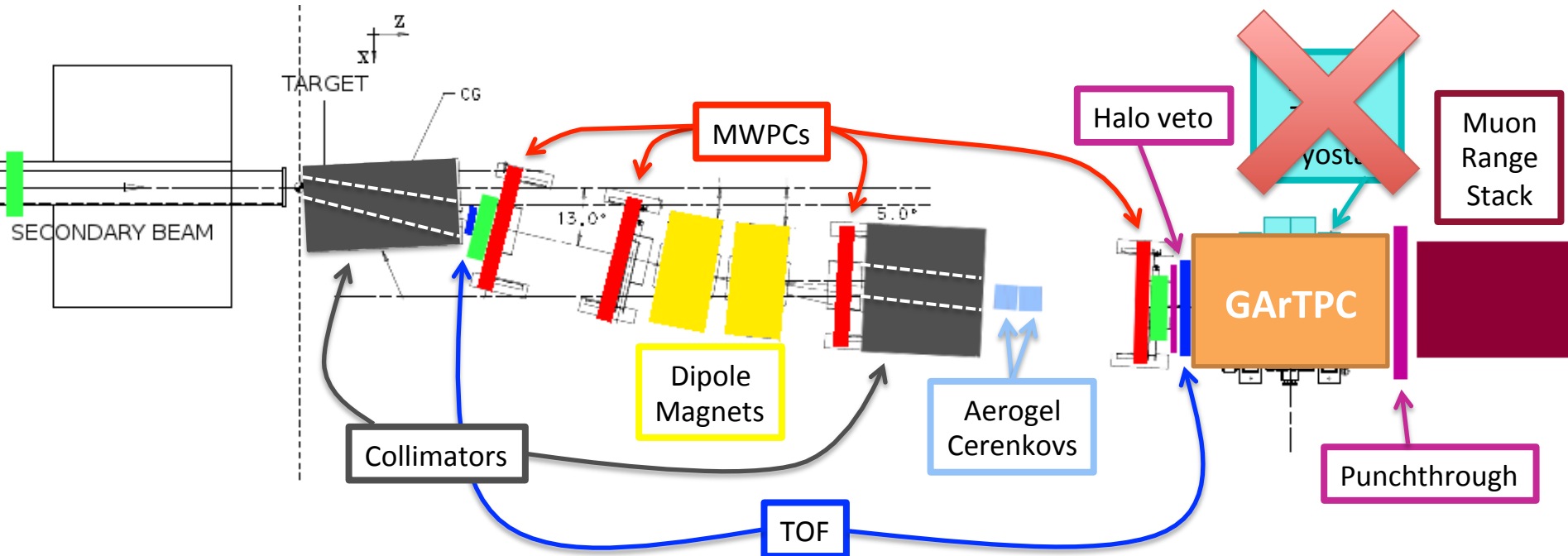
Jen Raaf

Sept. 27, 2016

# FTBF MCenter Layout



# FTBF MCenter Layout



- Replace LArIAT TPC & cryostat with GARtPC in pressure vessel, leave all other beam components in place

# Observations from LArIAT Run-II

- LAr filter becomes saturated, and must be regenerated every ~5-6 weeks
  - ~1.5 weeks downtime for regeneration
- Opening cryostat front flanges: 1 full week
  - 2-3 full days to clear space in front of cryostat (done by LArIAT collaborators)
  - 1/2 day to open inner and outer flanges (techs)
  - 1/2 day to replace flanges (techs)
  - 2-3 days to replace beamline elements in front of cryostat (LArIAT collaborators)

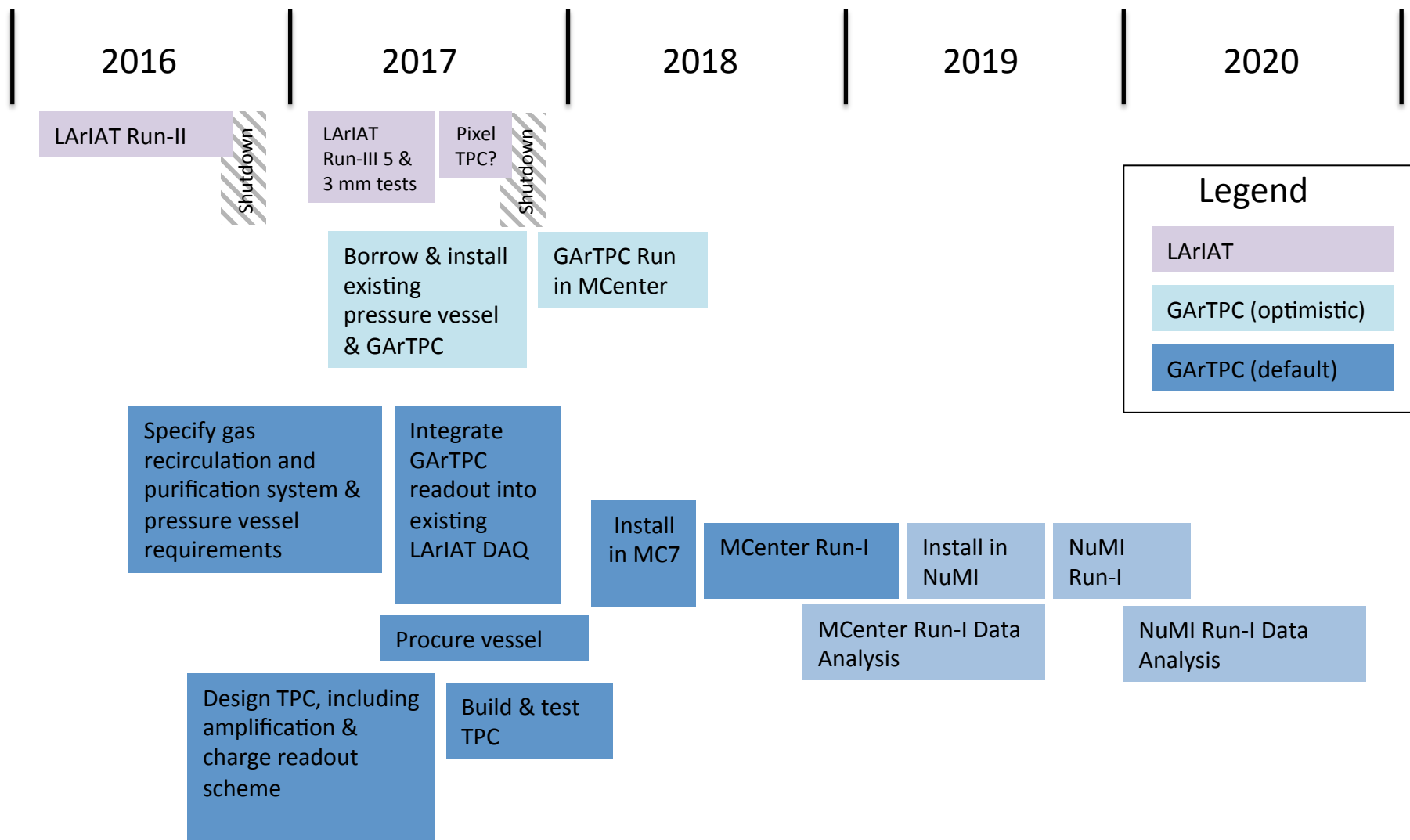
# LArIAT Run-III (tentative)

- **Oct 1 – Jan 31**: Prep for Run-III (MCenter activities only)
  - **2-3 days**: Move some beamline elements (downstream collimator, cosmic stands, downstream TOF & halo veto)
  - **~1 day**: Open front flange (requires techs & fork truck)
  - **~2 weeks**: Refurbish TPC (change to 5 mm wire pitch)
  - **~2 days**: Reinstall TPC, close front flange
  - **2-3 days**: Replace beamline elements
- **Feb 1 – ~Mar 10**: 5mm wire pitch data-collection
- **~Mar 10 – Apr 1**
  - Filter regeneration + TPC modification (same steps above)
- **~Apr 1 – May 15**: 3mm wire pitch data-collection
- **May 15 – June 1**: Filter regeneration & swap TPC
- **June 1 – shutdown (July?)**:
  - Possibly: new pixel-readout TPC from Bern

# GArTPC Optimistic Plan

- Possibly can borrow existing pressure vessel from BNL and existing GArTPC (NEXT-DEMO) from Dave Nygren
- Would have shorter timeline to enable collection of GArTPC data before DUNE Near Detector CD-1 Review
- Details not yet worked out (this possibility only came to light in the past week)

# Timeline as a whole (roughly)



# Spares



# GArTPC 5 Year Plan/Timeline (default)

## Year 1

- Develop specifications for gas purification and recirculation system and pressure vessel, request for bids, vessel procurement
- Layout of purification/recirc system within MCenter test beam enclosure, and within NOvA ND hall in NuMI underground
- Design of TPC amplification and charge readout scheme

## Year 2

- Finalize TPC design, acquire materials, assemble detector
- Integrate GArTPC readout with existing LArIAT DAQ
- Install pressure vessel and purification system in MCenter

## Year 3

- Complete detector assembly, test with cosmics
- Operation in MCenter tertiary beam
- Begin analysis of charged particle beam data
- Plan for detector move to NuMI neutrino beam

## Year 4

- Continued analysis of test beam data
- Move detector and associated systems to NuMI beamline

## Year 5

- Operation in NuMI neutrino beam
- Analysis of test beam data and neutrino beam data