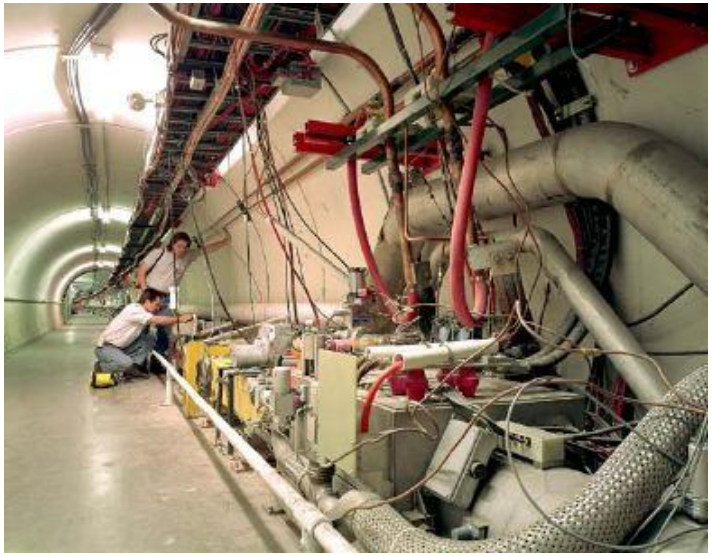
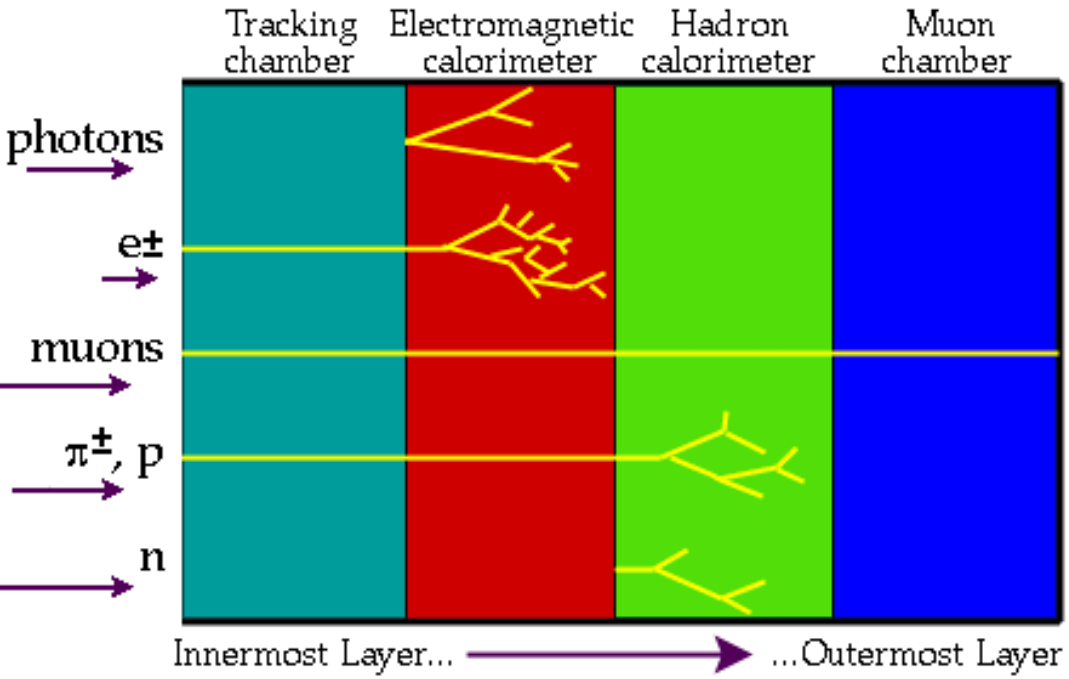
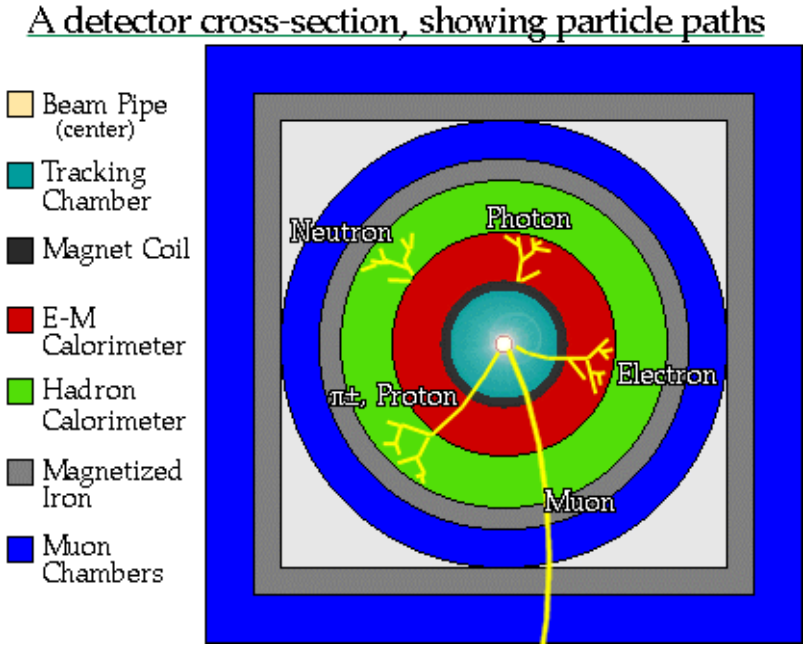
Tevatron

- Location: Fermilab (Batavia, IL)
  - accelerated particles: protons and anti-protons
  - beam energy: 1 TeV, beam current: 1 mA
  - the ring radius: 1 km
  - operation:1983-2011



Generic HEP detector

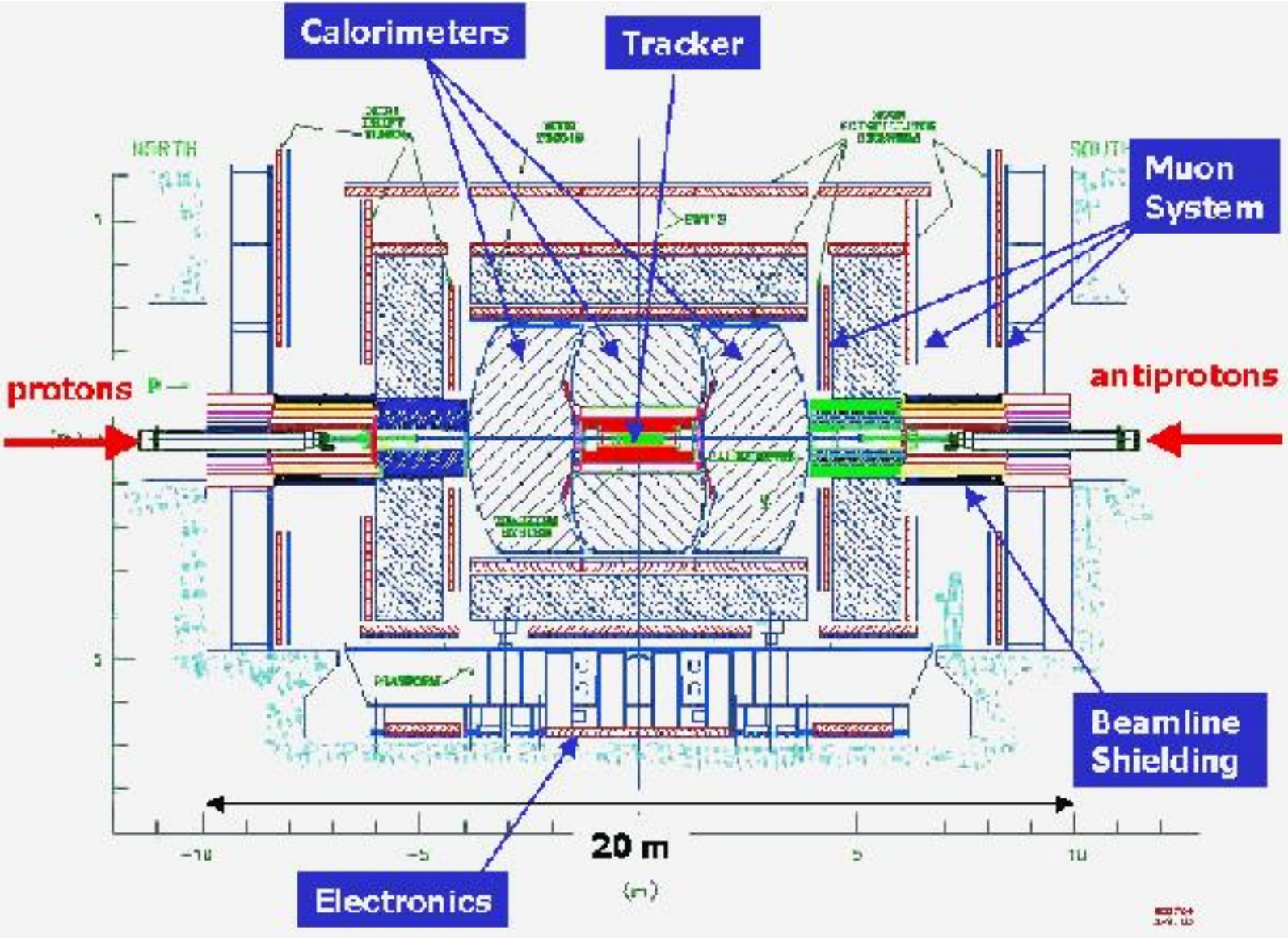




DØ detector at Fermilab

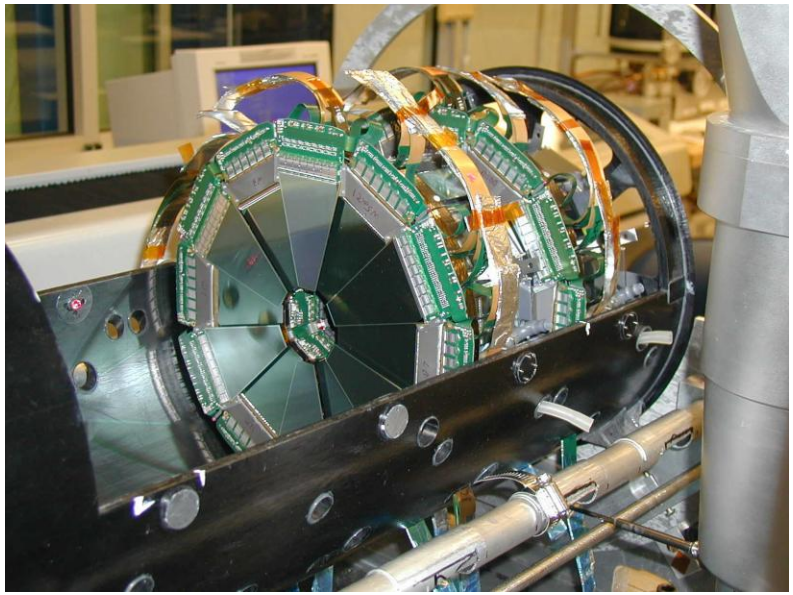
- DØ detector is one of two large multipurpose detectors at Fermilab (the other one is CDF)
  - name = one of six intersection points

DØ detector: components



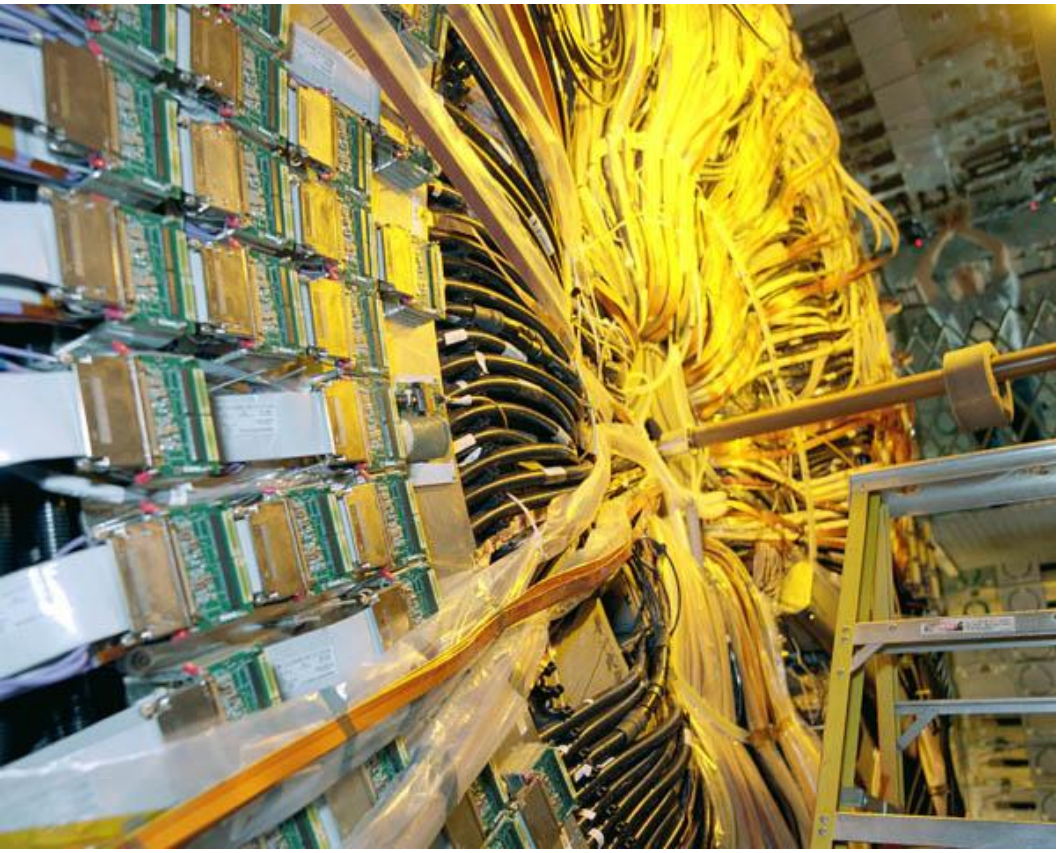
DØ: tracking system (1)

- Vertex detector: Silicon Microstrip Tracker
  - four layers of silicon detectors intercepted with twelve disks + (recent addition) Layer 0



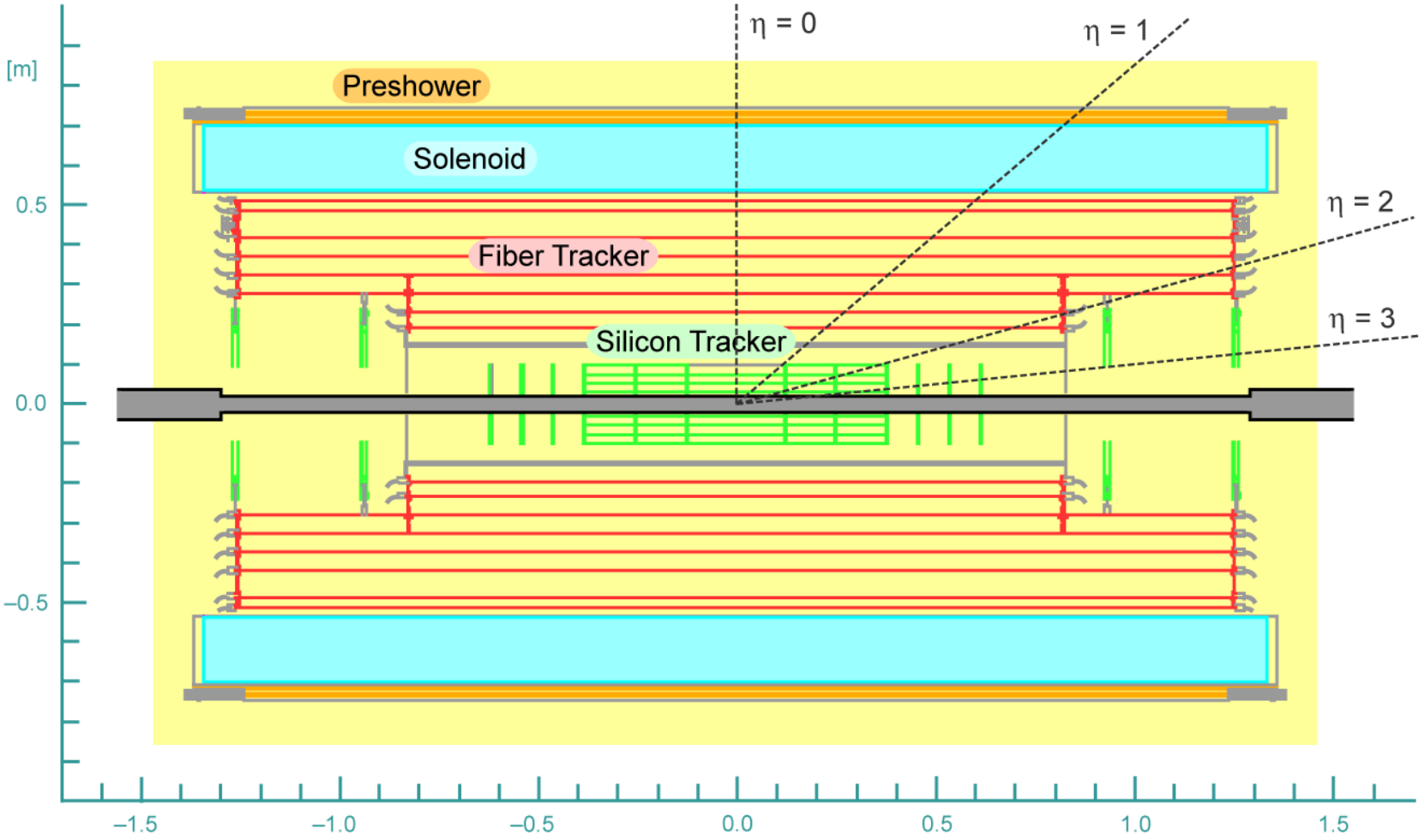
DØ: tracking system (2)

- Outer tracking detector: Central Fiber Tracker
  - sixteen double layers of scintillating fibers



DØ: tracking system (3)

- Very complicated structure

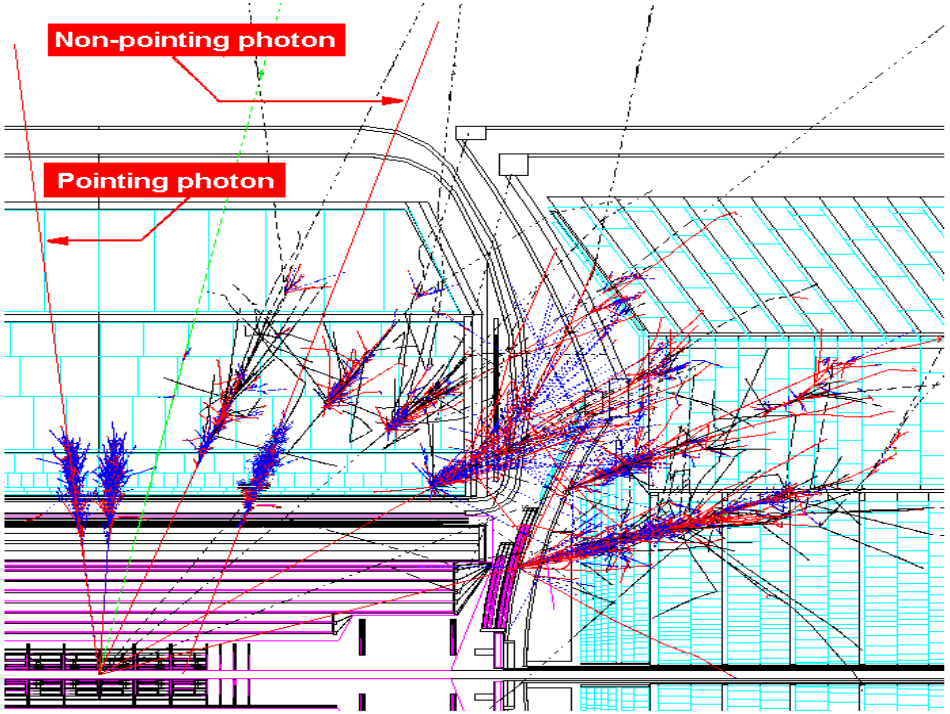


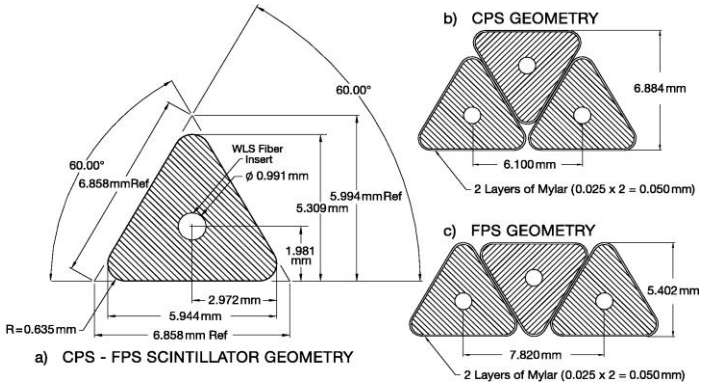
DØ: calorimeters (1)

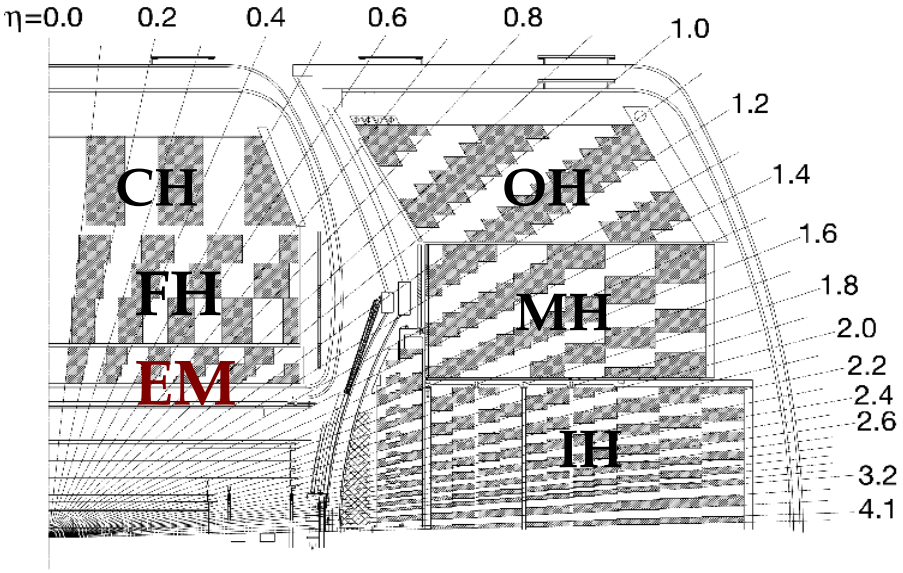
- Liquid argon / uranium calorimeter, consisting of central and two end calorimeters

DØ: calorimeters (2)

- Segmentation allows one to pinpoint the shower direction in 3d

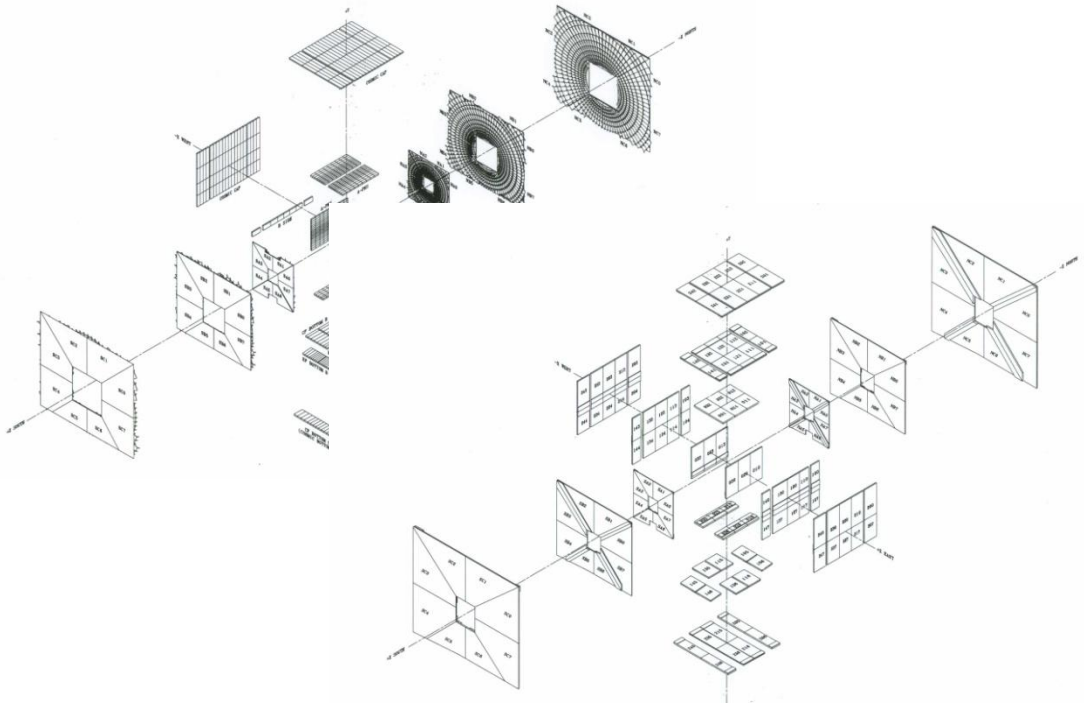






DØ: outer muon system

- The outermost part of the detector, surrounds the whole thing
  - Proportional Drift Tubes, Mini Drift Tubes
  - Central (Forward) muon SCintillators

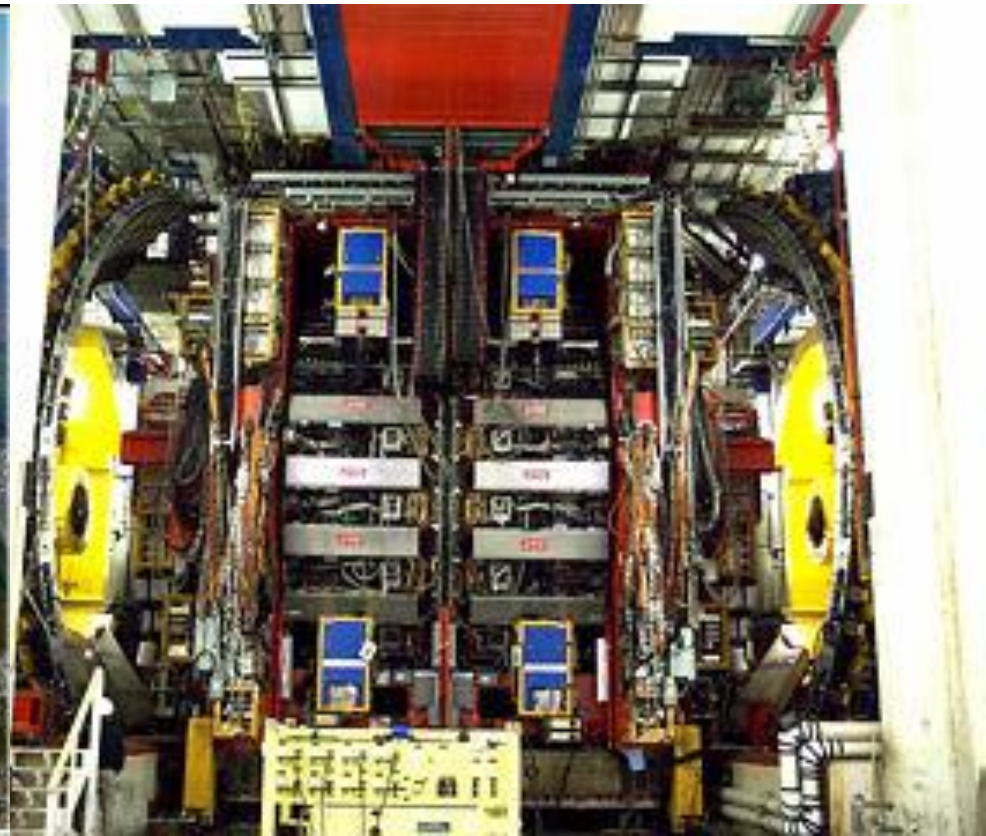


DØ: other elements

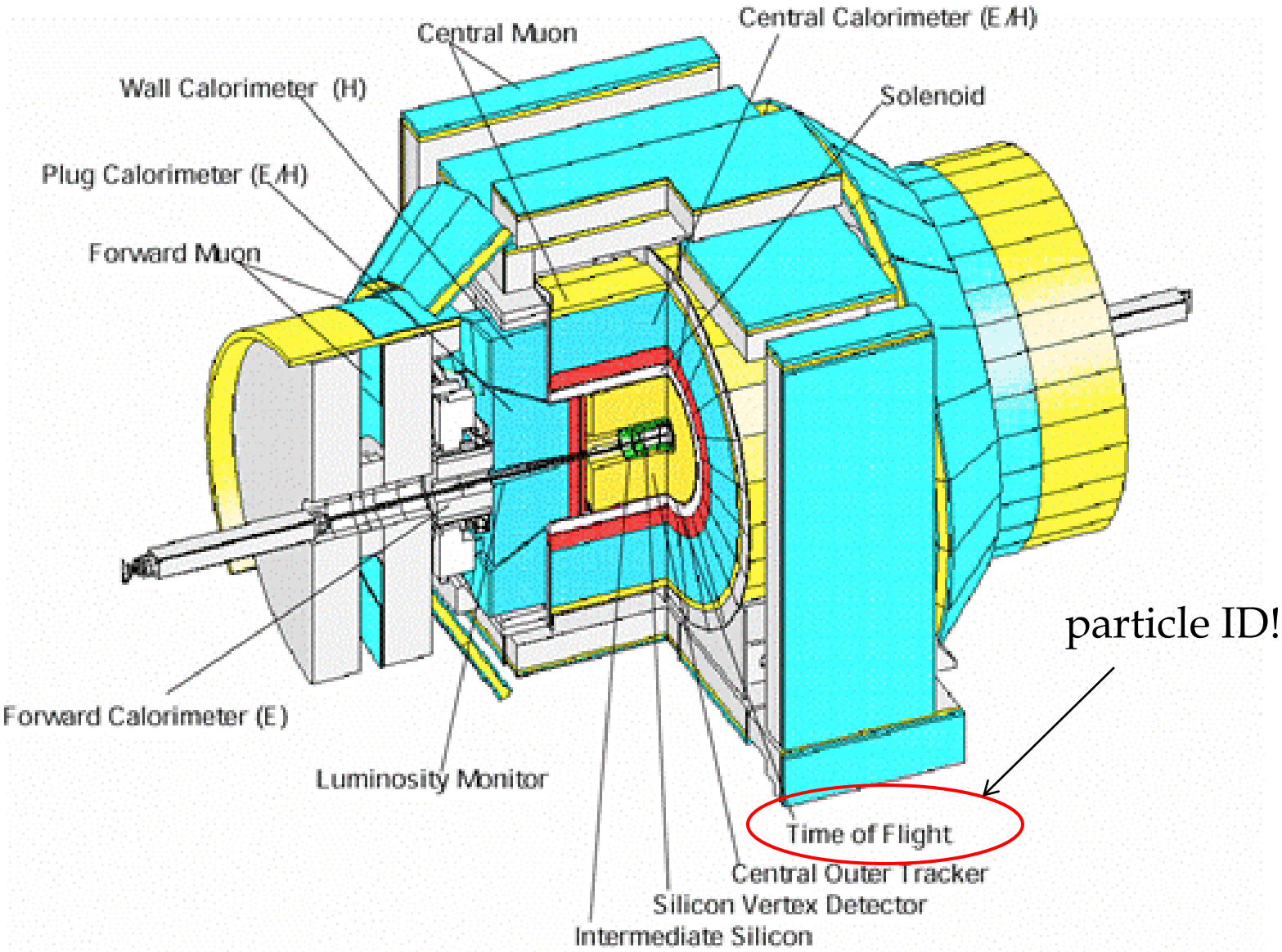
- Magnet: a central solenoid magnet (2 T) and outer toroid magnet
- Luminosity scintillating counters
- Central and forward preshower
- Forward proton detector (Roman pots)
- Data acquisition, trigger system, …

CDF detector at Fermilab

- CDF detector is another large multipurpose detectors at Fermilab (historically the first)
  - name = Collider Detector at Fermilab

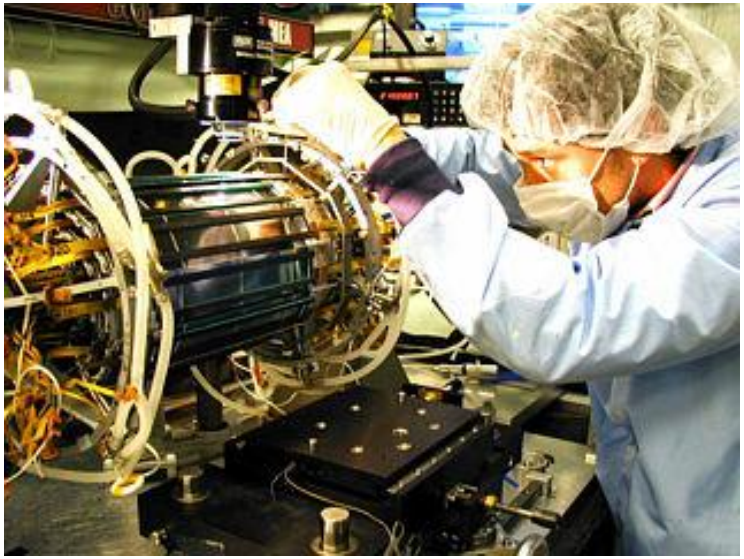


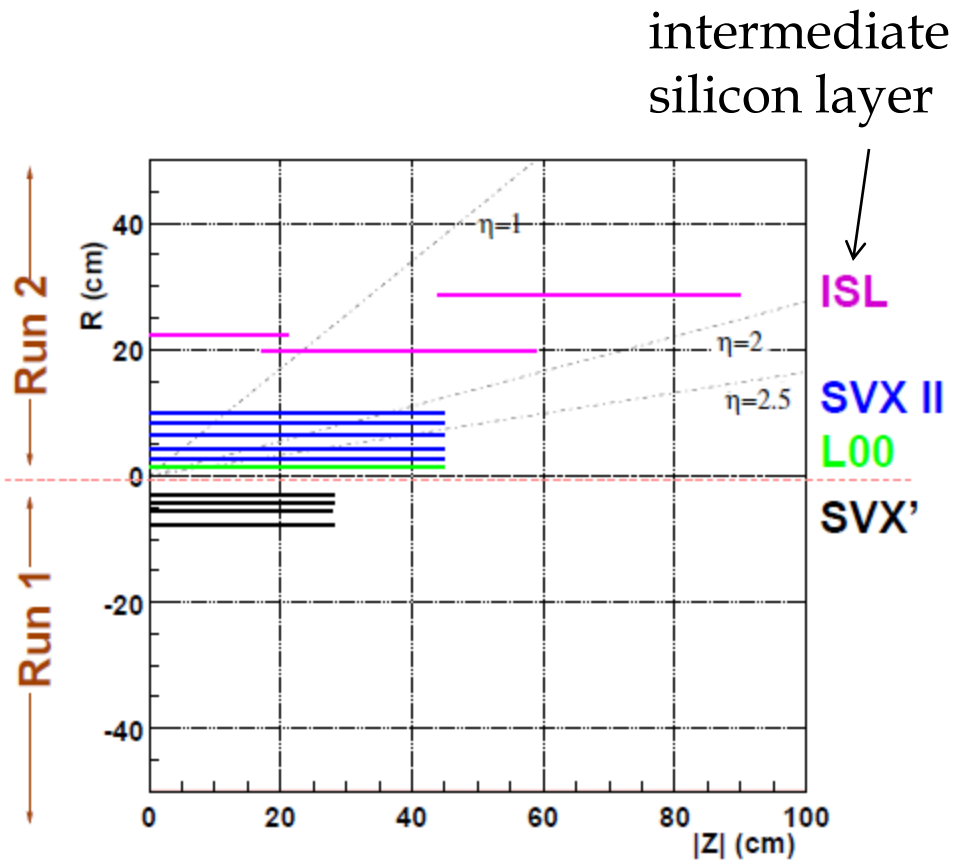
CDF detector: components

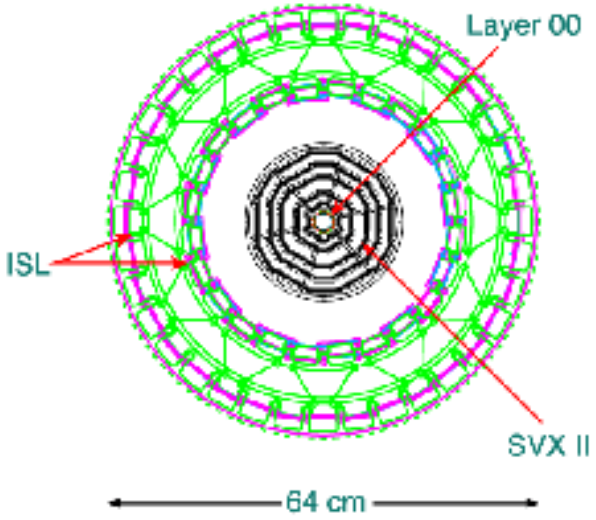


CDF vertex detector

- Vertex trigger!



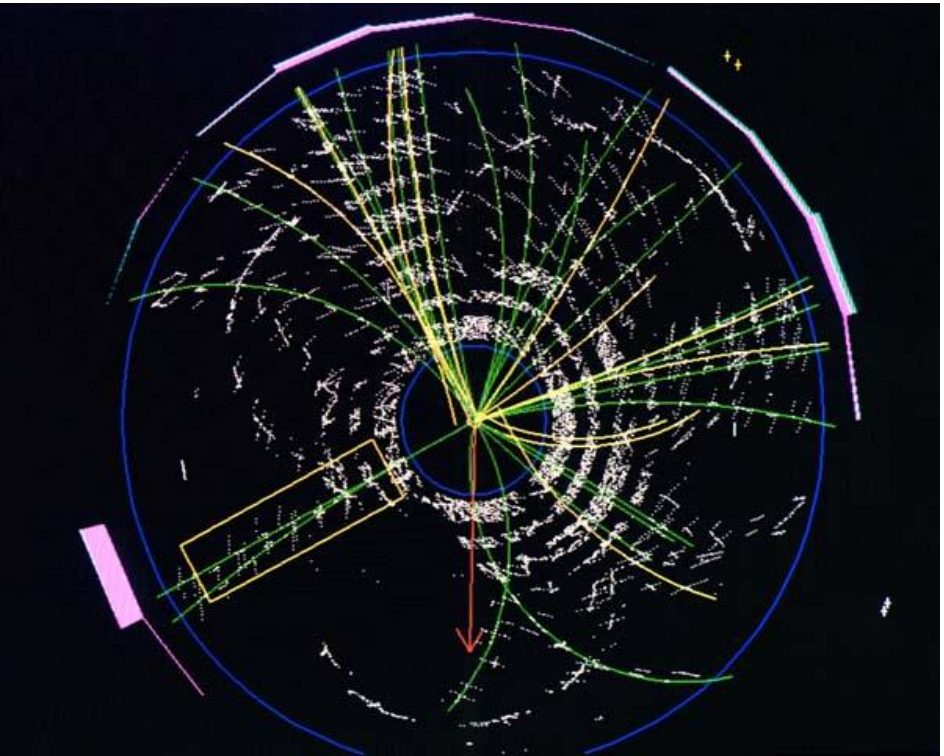




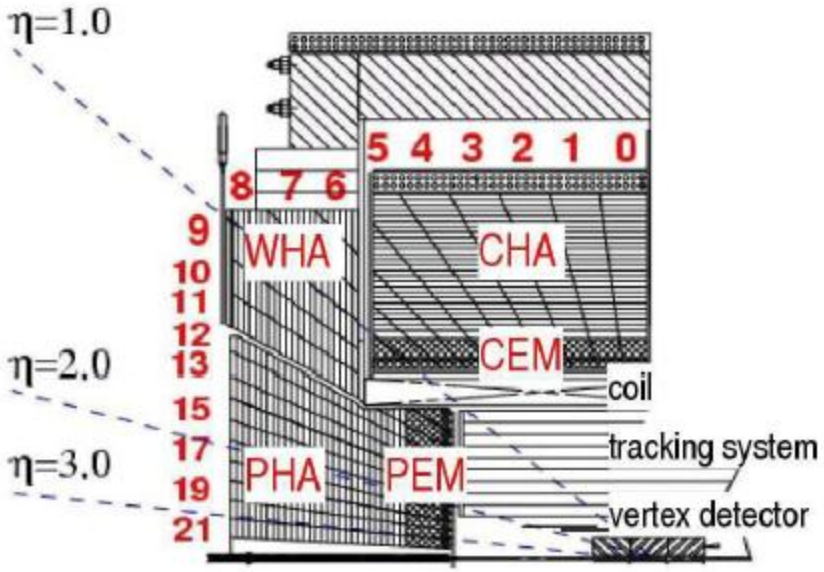
CDF: Central Outer Tracker

- Technology: multi wire proportional chamber
- Good pT resolution but limited to $|\eta|<1$

4+4 layers



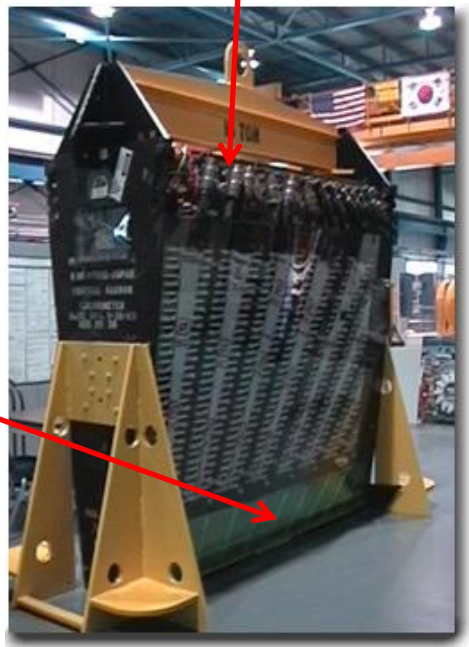
CDF: calorimeters



		Central	Plug
EM	thickness	19 X_0, 1λ	21 X_0, 1λ
	sample(Pb)	0.6 X_0	0.8 X_0
	sample(scint.)	5 mm	4.5 mm
	wavelength sh.	sheet	fiber
	resolution	$\frac{13.5\%}{\sqrt{E_T}} \oplus 2\%$	$\frac{14.5\%}{\sqrt{E}} \oplus 1\%$
HAD	thickness	4.5 λ	7 λ
	sample(Fe)	25-50 mm	50 mm
	sample(scint.)	10 mm	6 mm
	wavelength sh.	finger	fiber
	resolution	$\frac{50\%}{\sqrt{E_T}} \oplus 3\%$	$\frac{70\%}{\sqrt{E}} \oplus 4\%$

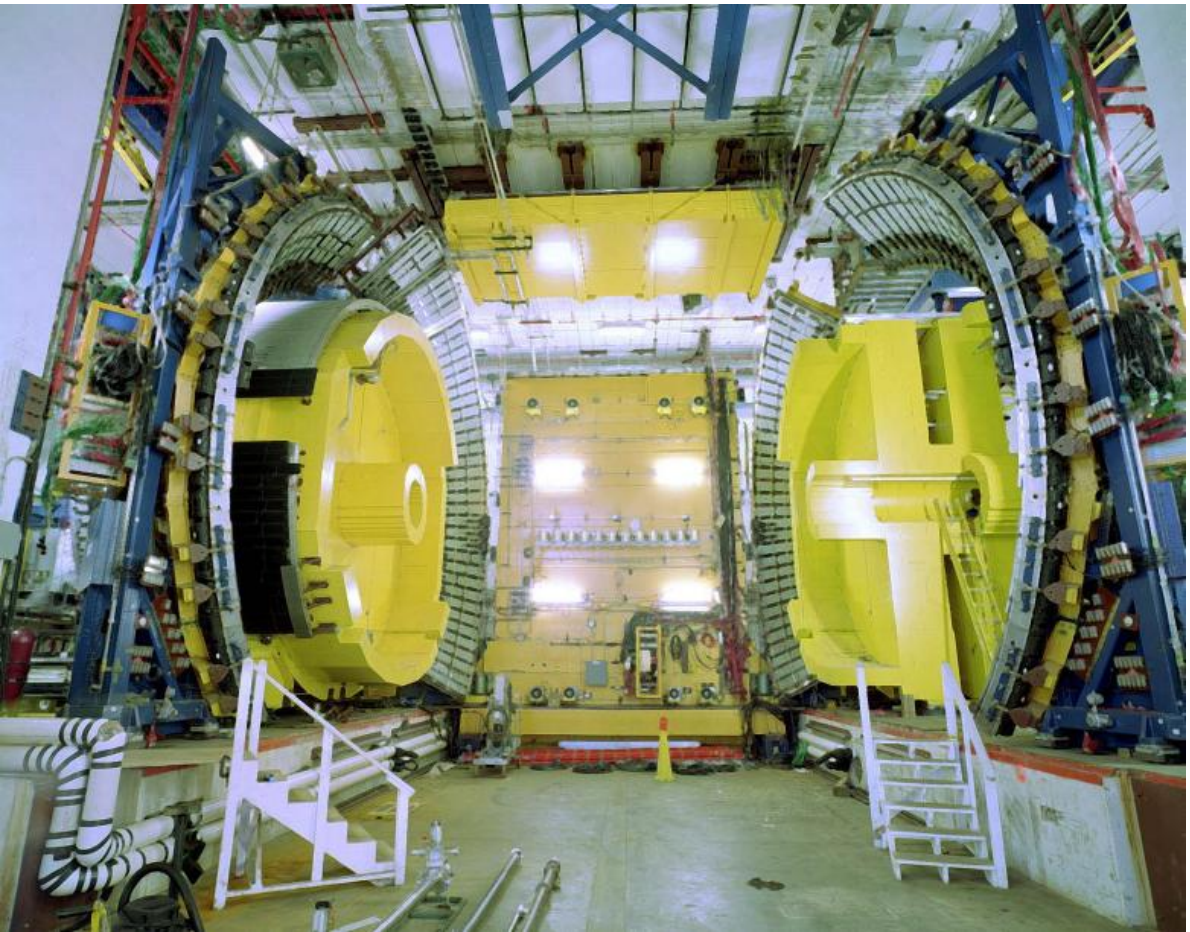
PMT

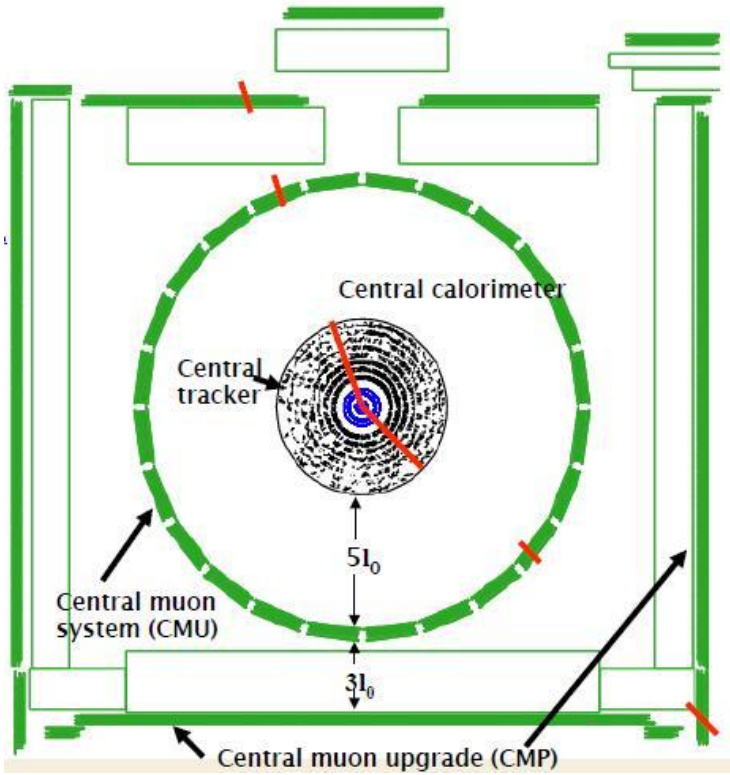
scintillator



CDF: outer muon system

- Technology: wire chambers
- Up to $|\eta|<1.5$ (worse than DØ)





These detectors are history

- Detector as a tourist destination?
  - Potential radiation safety issues for public access?
  - Uneven walking surfaces
  - Low clearances, narrow pathways
- Source of Museum pieces
  - 15th floor?
  - Lederman Center?
  - DØ Visitors area?
- Phototubes and scintillators
- VLPC readout system
  - VLPCS
  - Waveguides
  - AFEII readout boards
- Electronics and VRB readout crates
  - Much of this is rather specialized
  - Component recovery and disposition in the grey market?
- BiRa Model 4877 VME High Voltage Power Supplies
- NIM electronics and racks
- Power supplies
  - Weiner Power Supplies
  - Vicor power supply modules
- Electronics racks, heat exchangers, blowers
- Rack Monitors and 1553 slow controls system

from "Tevatron Detector Decommissioning"

- Infrastructure
  - Scopes, meters and other diagnostic tools
  - Tools, scaffolding, ladders, lift equipment, shelving
  - UPS
  - Power supply test stand
  - Vacuum pumps, leak detectors
  - Compressors and air dryers
  - Chillers
  - Liquid helium and liquid nitrogen dewars
  - Tube Trailers