

Status of the Tevatron and Expected Future Performances

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Around Fermilab

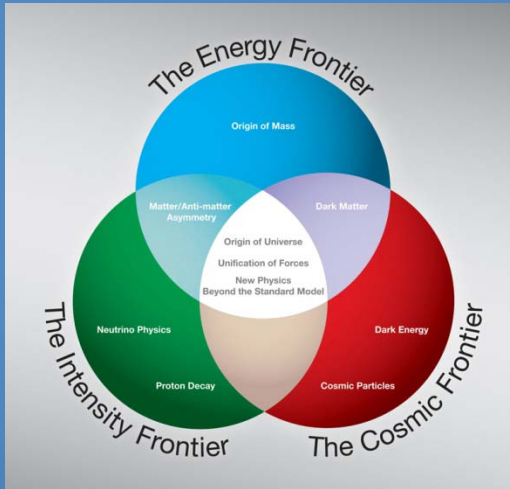
~65 km from Chicago



Fermilab

at

the Three Frontiers



Energy & Intensity Frontiers
(Accelerator Based Experiments)
for this presentation

Planning Strategy

Flexible to adopt changes:
both physics landscape and
status and schedule for new projects in the world

What I am presenting today is the present plan under discussion.

Tour of Accelerator Complex at Fermilab

Cockroft-Walton



Linac



Booster



Main Injector (Recycler)



Tevatron



Antiproton

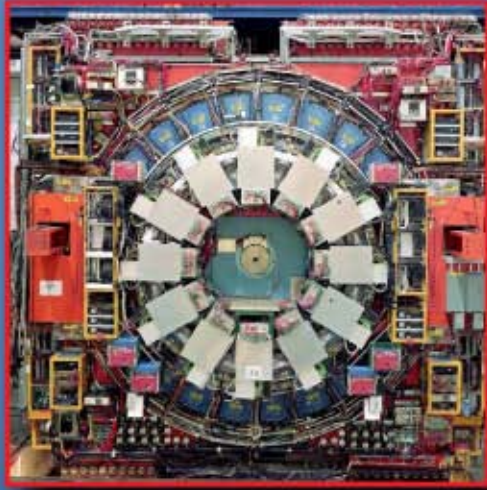
Production &
Accumulation

Storage Ring
(Recycler)



Tevatron

CDF and DZero



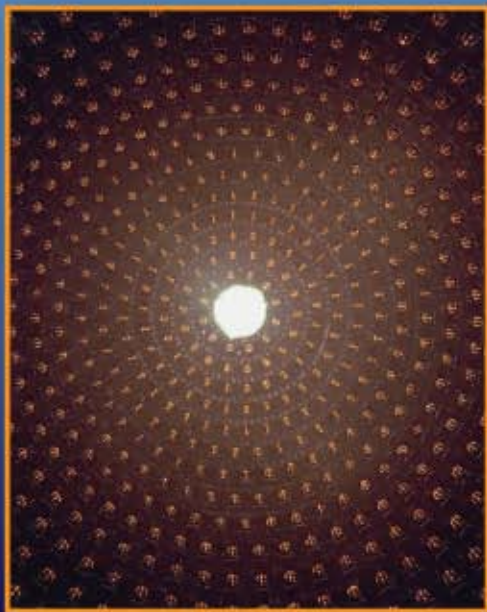
ν 's from Main Injector

- MINOS (on-axis)
- MINERvA
- ArgoNeuT (LAr)

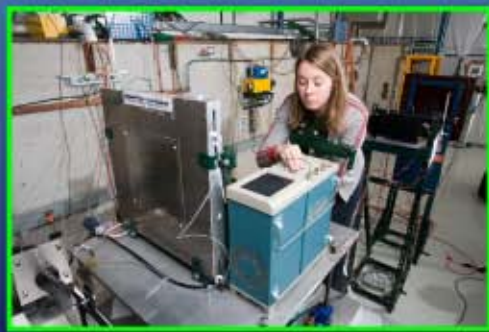


ν 's from Booster

MiniBooNE
(SciBooNE)



Testbeam for Detector Development



Test Facility for Accelerator Development

Super Conducting RF
Technology



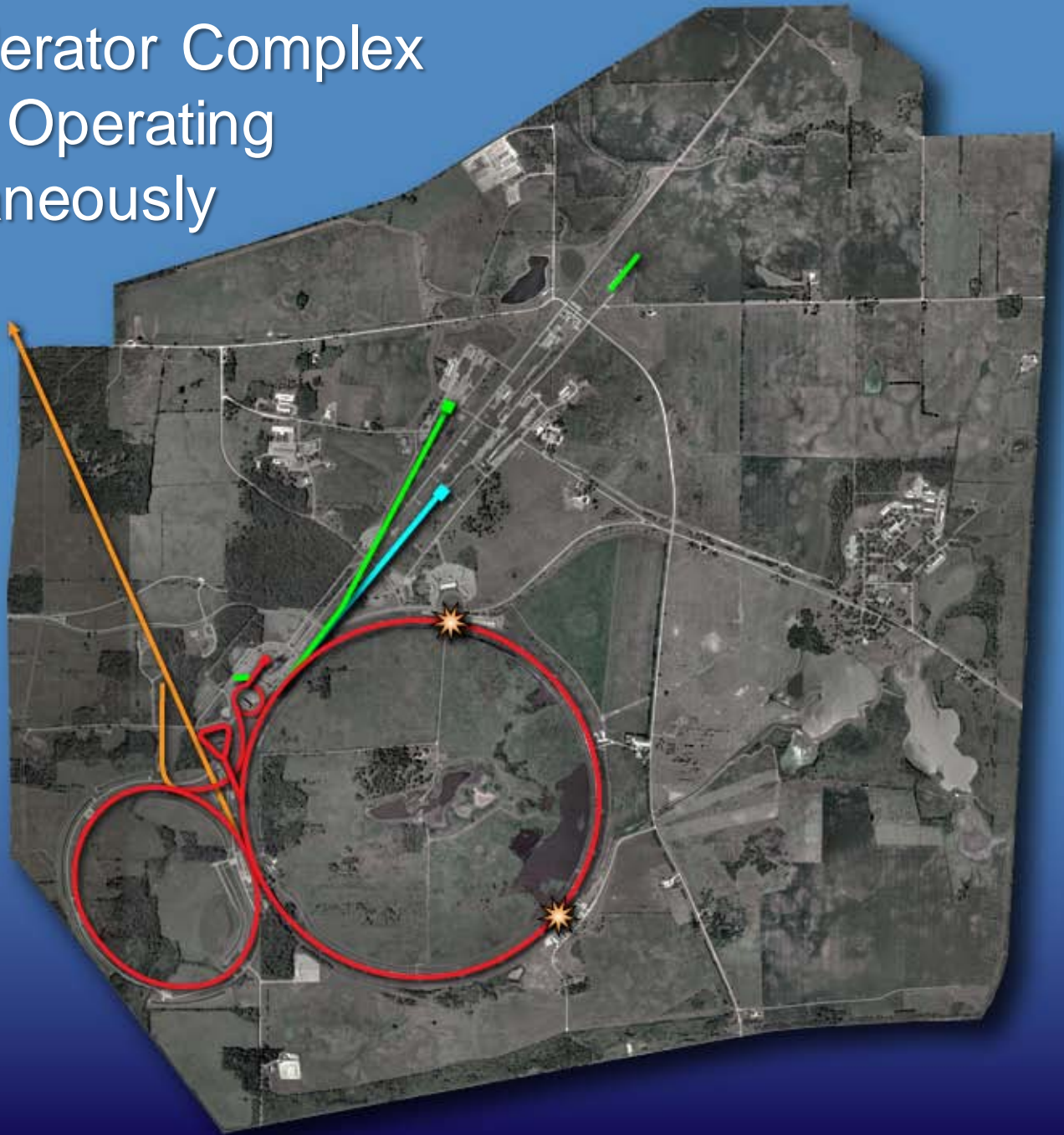
Test Facility for Muon Cooling (MuCOOL)



SeaQuest



Fermilab Accelerator Complex Currently Operating Simultaneously



LHC (Construction/Commissioning/Operations/Physics/Upgrades)

Accelerators

Detectors/Computing

Operations/Physics



LHC IR quadrupoles

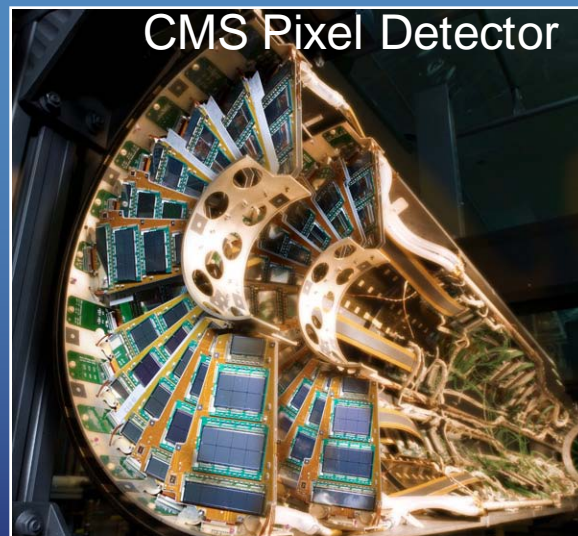


CMS Calorimeter
Muon Chamber
Silicon Tracker



Remote Operations Center

LHC upgrade
3.4m Nb3Sn prototype



CMS Pixel Detector

LHC Physics Center
CMS Tier-1 Computing Center
US CMS Host Laboratory



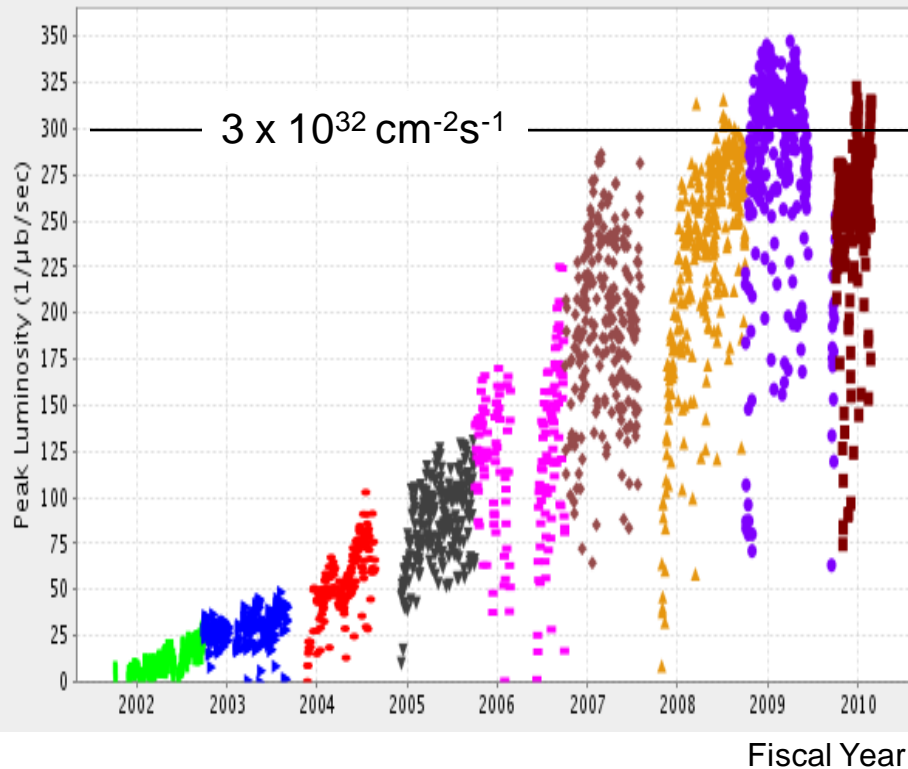
German vs. US+UK

Final: Italy+France+Spain
vs. rest of the world

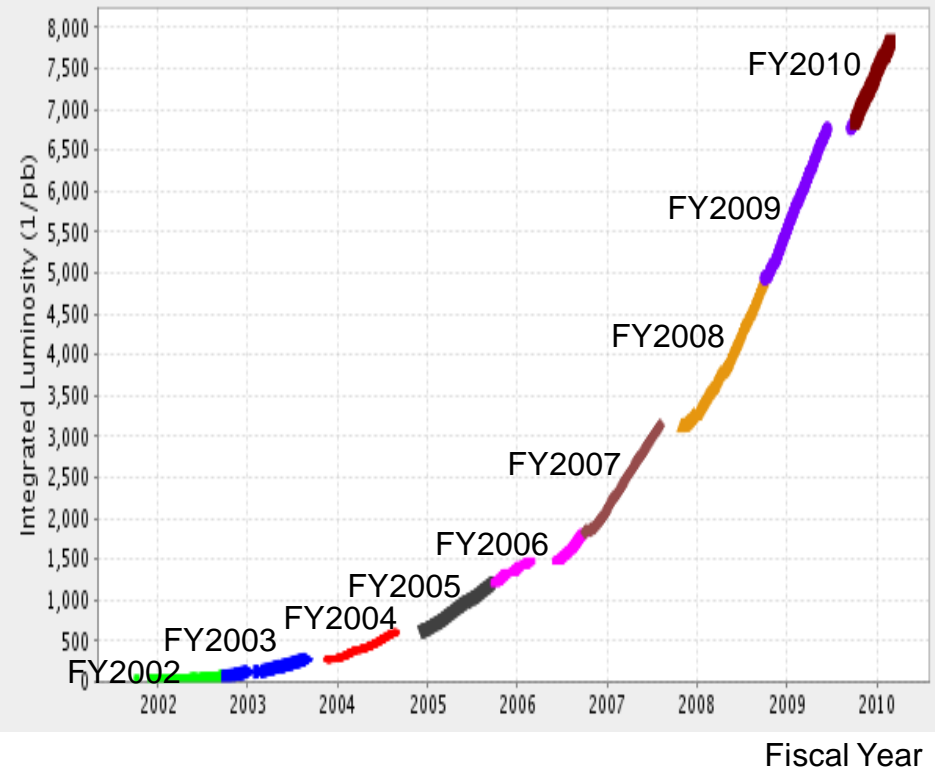
CERN-Fermilab Summer School Since 2006

Tevatron Performance so far (Run II since 2002)

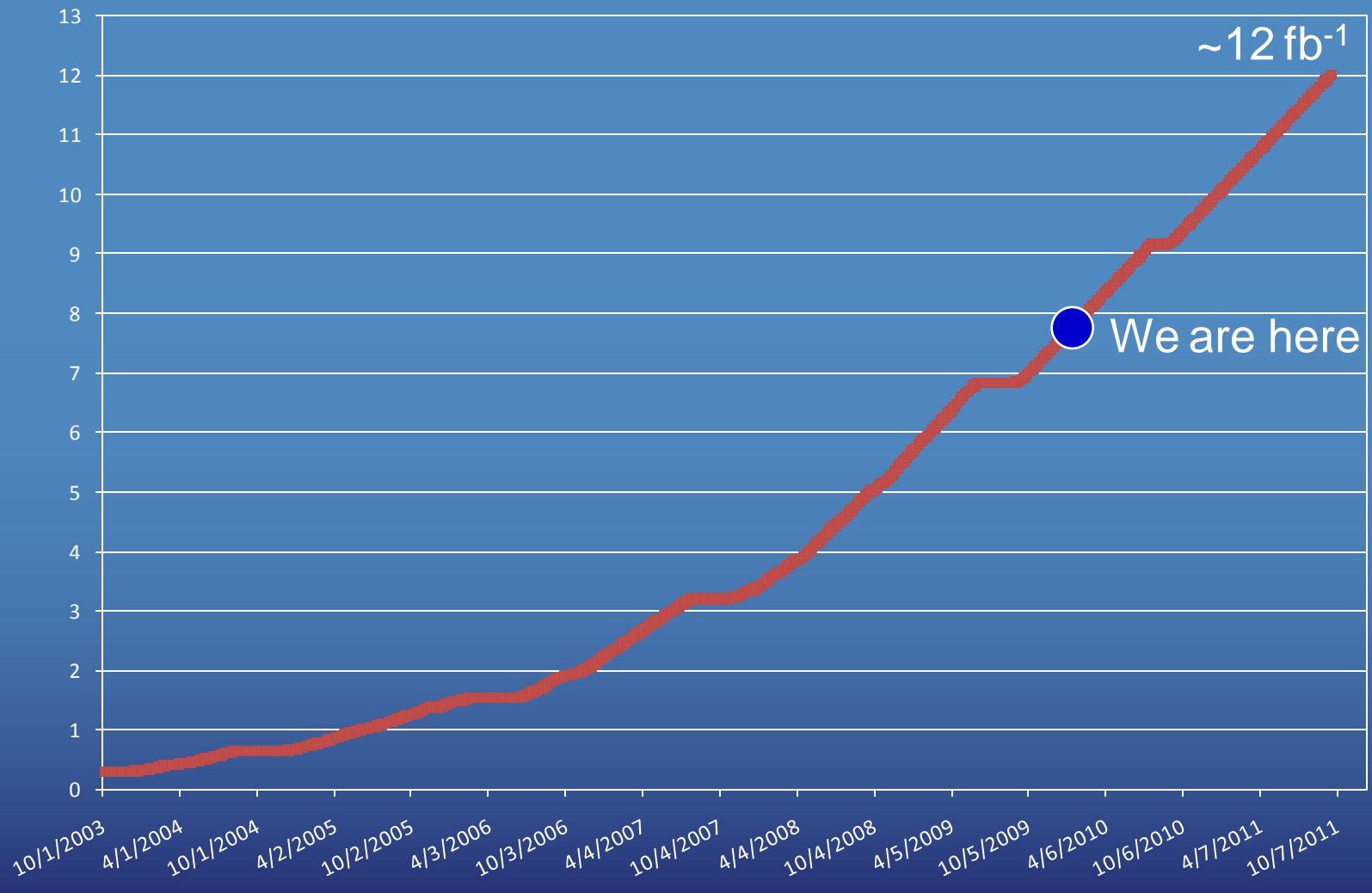
Peak Luminosity



Total Integrated Luminosity (7.8 fb⁻¹ /expt.)



Tevatron Expected Performances through FY2011 (Sept. 2011)



Accelerator Shutdown
March 2012 – February 2013
to upgrade neutrino beam from Main Injector
(250 kW → 700 kW)

NOvA Detector Construction & Installation
Plan: MicroBooNE Detector Construction & Installation

Neutrinos

NOvA (off-axis)

MINERvA

MicroBooNE (LAr)



Neutrinos

NOvA (off-axis)

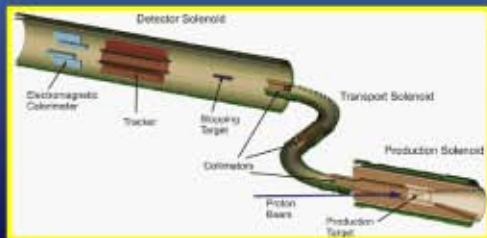
MINERvA

MicroBooNE (LAr)

Muons

Mu2e

(DOE 1st stage approval)



Neutrinos

LBNE(to DUSEL)
(DOE 1st stage approval)

Muons

Mu2e

(DOE 1st stage approval)



700 kW
1300 km



Project X

Neutrino physics
Muon physics
Kaon physics
Nuclear physics
“simultaneously”



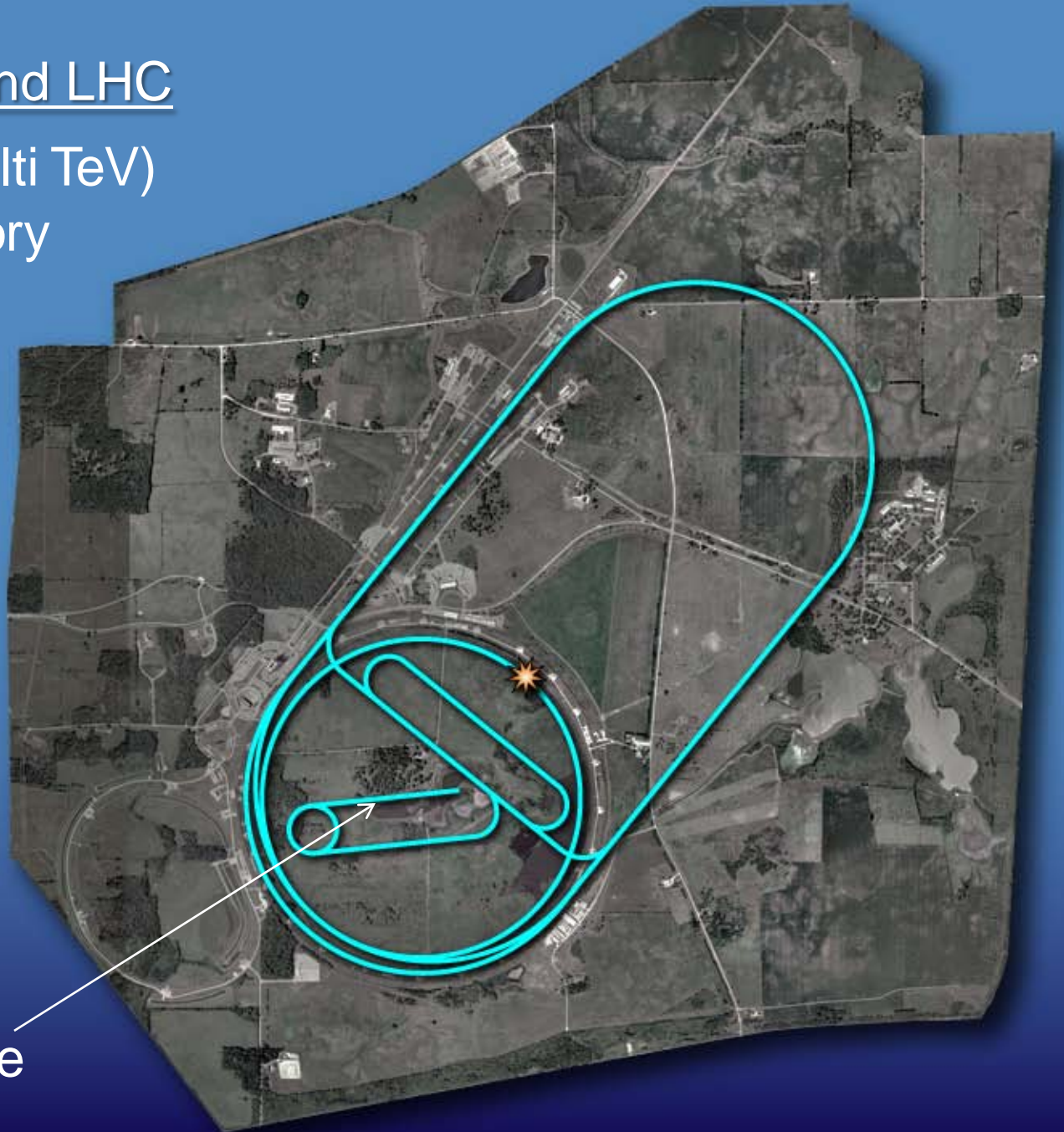
Beyond Project X and LHC

ILC ($< \sim 1$ TeV)



Beyond Project X and LHC

Muon Collider (multi TeV)
Neutrino Factory



Project X upgrade

Project X

- Would be a fantastic machine at the intensity frontier for neutrino, kaon, muon, nuclear physics, ...
- Would develop and exercise the technologies to position the US to host a global facility at the energy frontier (or contribute to one elsewhere)
 - ILC and muon collider