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Welcome and Fermilab Context

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Science Strategy for the Future/Major Initiatives

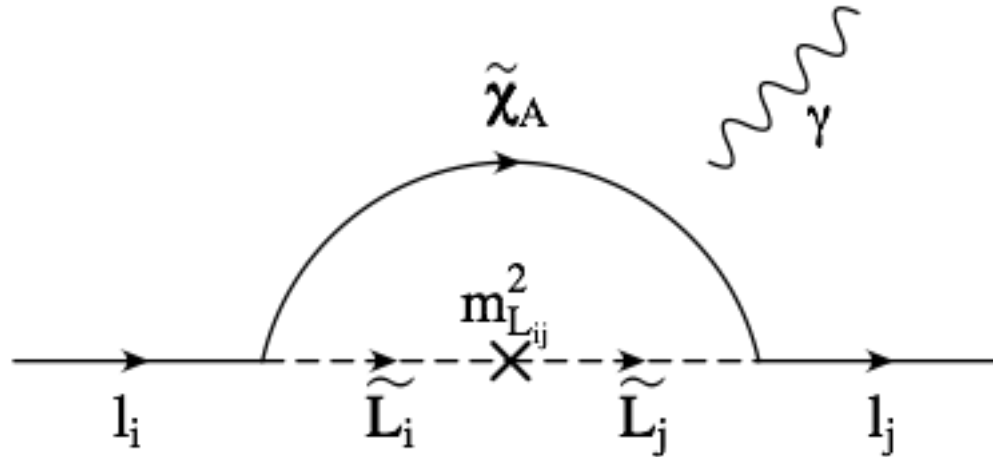
- Building a world-leading neutrino program
- Upgrading the accelerator complex to meet future needs
- Driving Large Hadron Collider research and upgrades
- Launching a muon physics program
- Advancing our understanding of dark energy, dark matter, and the cosmic microwave background
- Leveraging accelerator expertise and infrastructure for the benefit of science and society



Building for Discovery

Strategic Plan for U.S. Particle Physics in the Global Context

Fermilab Muon Program: muons as messengers of new physics



Some new heavy particles in the loop (e.g. sleptons, gauginos, heavy Majorana neutrinos) couple to charged leptons. Then:

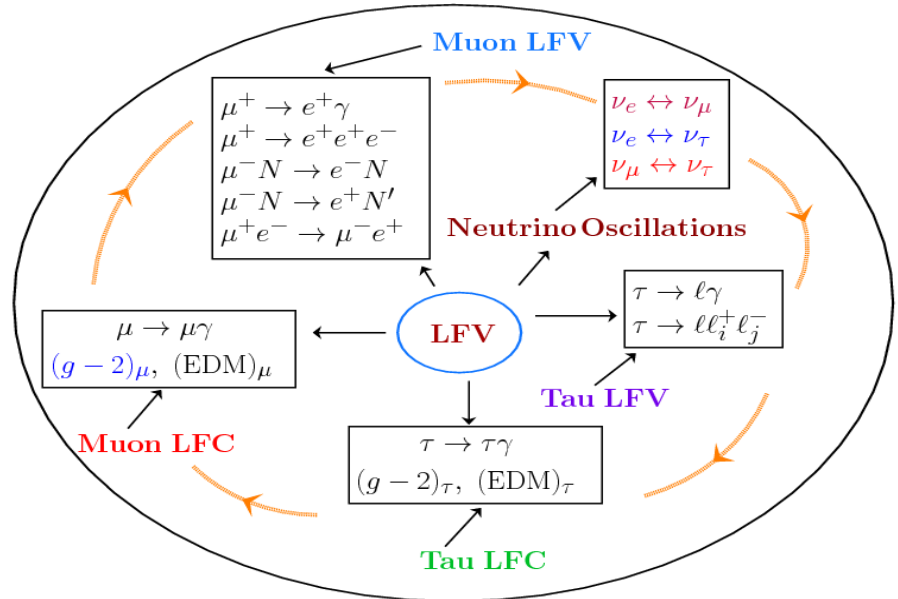
- The lepton flavor conserving, CP conserving part of this contributes to muon $g-2$
- The lepton flavor conserving, CP violating part creates an EDM
- The lepton flavor violating part induces mu to e conversion. Note that a heavy Majorana neutrino sector will induce this automatically

Mu2e expt give biggest jump in reach: 4 orders of magnitude! and richest potential program post-discovery: upgrades + new targets

The HEP community is excited about this physics: e.g. Snowmass 2013

Charged Leptons

Charged Lepton Physics



LFV= Lepton Flavor Violation
LFC= Lepton Flavor Conserving

- Charged Leptons easy to produce & detect \Rightarrow precise measurements
- SM rates negligible in some cases so new physics stands out
- Directly probe couplings of new particles to leptons
- Diverse set of independent measurements
- Probe scales of $>$ a few 10^3 TeV

Intensity Frontier summary at P5, Nov 2, 2013

P5 report 2008

Recommendation

The panel recommends pursuing the muon-to-electron conversion experiment, subject to approval by the Fermilab PAC, under all budget scenarios considered by the panel.



Recommendation 22: Complete the Mu2e and muon g-2 projects.

Building for Discovery

Strategic Plan for U.S. Particle Physics in the Global Context



Fermilab scientists are excited about this physics: report to P5, Nov. 2013

Gina Rameika for the

The Fermilab Science Priorities Working Group

Summary in Advance

- **We recommend the following elements as priorities for the U.S. Particle Physics Program**
 - U.S. High Energy Physics community continues to play a leading role in LHC operations and upgrades
 - **Fermilab hosts a world-class accelerator-based neutrino program**
 - The next generation rare process experiments will take place within this decade

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 F. Tz
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 J. Yz

AD - Accelerator Division
 C - Contractor
 CD - Computing Division
 CO - Co-Op
 DIR - Directorate
 PCPA - Fermilab Center for Particle Astrophysics
 G - Guest

GSR - Guest Scientist Retired
 JA - Joint Appointment
 LF - Lederman Fellow
 ND - Neutrino Division
 OC - On-Call
 PO - Project Office
 RA - Research Assoc.

RT - Retired
 SE - Scientist Emeritus
 TD - Technical Division
 T - Term
 WDRS - Workforce Development & Resources
 Section
 WF - Wilson Fellow

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 D. Glenzinski, Deputy Head

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 (M. A. Soha)
 T. Walton, RA

Fermilab Organization

Fermilab organizational changes strengthen our ability to support Mu2e

— Fermi Research Alliance, LLC

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Joe Lykken

Chief Operating Officer
Timothy Meyer

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C. Hogan, JA, FCPA

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M. Andrews, SSO
E. Johnson, Admin. Support
J. Saviano, Admin Support
S. Schuler, Admin Support
(A. Dave, PPD FFM)
(D. Randich, WDRS)

How will changes affect projects?

Oct 2 All-hands meeting

- The Chief Project Officer is accountable for the successful execution of our project portfolio in concert with successful operation of the scientific program
- The CPO will have authority from the Director to address issues and solve problems across divisions
- Projects themselves will be located within divisions
 - PIP-II: Accelerator Division
 - LARP, LCLS-II: Technical Division
 - CMS upgrades, Mu2e, Muon g-2, Cosmic Frontier: PPD
 - All neutrino projects: Neutrino Division
- To succeed on this slate of big projects will require increased **focus and flexibility** on how we direct our efforts and resources

Priorities

Oct 2 All-hands meeting

- We are “**one laboratory**”, so priorities transcend divisional boundaries
- Priority = importance x criticality
- Priorities change over time

A dynamic process requiring full engagement of senior management

Mu2e in Context

- Muon Program integrates three components:
 - Mu2e experiment (DOE O413 Project)
 - Muon g-2 experiment (DOE O413 Project),
 - the Muon Campus Program (Accelerator Improvement Projects and General Plant Projects, funded through Accelerator Operations funding)
- Interfaces actively managed using interface documents and milestones, and monthly PMG's and POG's.
- Campus program complete FY17
 - \$55M overall commitment, \$2.5M in last year (FY17)
 - 2 finish in FY15, 3 in FY16, 2 in FY17
 - Completion well before Mu2e
 - Being actively managed

Fermilab commitment

- Fermilab is fully committed to Mu2e, and has already made substantial investments in the Muon Program
- We have implemented organizational changes that strengthen our ability to ensure the success of Mu2e while simultaneously supporting other projects and operations:
 - Chief Project Officer and Office of Project Support Services
 - Promoting “One Lab” culture, focus and flexibility
 - Dynamic prioritization process with full engagement of senior management
- We are excited about this science and ready to move forward