Neutrino Division for the Users

Steve Brice I Deputy Head of Neutrino Division

Fermilab Users Meeting

16 June 2016

Neutrino Division Mission Statement

- Host a world-leading program of neutrino experiments
  - Operate the current program : NOvA, MicroBooNE, Minerva, MINOS+, LArIAT, ANNIE
  - Coordinate and execute a new international program of short and long-baseline neutrino experiments

- Provide support to the neutrino user community to participate in all aspects of this program
  - Ranges from technical expertise in design, project management, operations, etc. to arranging office and meeting spaces

The Next Few Years

- MINOS+ ends in FY16
- protoDUNE installation at CERN starts in FY17
- ICARUS and SBND join MicroBooNE to form SBN and start operations in FY18
- Start of DUNE detector installation in FY21
- This changing landscape requires careful management

Current Neutrino Division Org Chart

NEUTRINO DIVISION

Last Updated:
June 13, 2016

Neutrino Division Office
R. Rameika, Head
S. Brice, Deputy
E. Johnson, Admin Support
J. Saviano, Admin Support
S. Schuler, Admin Support
(M. Anderson, FFM)
(A. DeJong, Fin Support)
(D. Randich, WDRS)
(A. Aparicio, DSO)

DUNE Project
E. James, Ldr.
(M. Dixon)
(M. Hronek)
F. Cavanna, GS
C.K. Jung (JA)
J. Macier

Technical Support Department
R. Plunkett, Head
(M. Dixon)

LAr Detector Engineering Group
B. Norris, Ldr.
M. Delaney
M. Dinnon
R. Doubnik
M. Geynisman
M.J. Kim
F. Schwartz
A. Stefanik
J. Tillman
M. Zuckerbrot

Operations Support Group
M. Stancari, Ldr.
W. Badgett
L. Bagby
H. Ferguson
S. Hahn
B. Johnson
B. Lee
G. Savage
D. Torretta
J. Zalesak

Neutrino Physics Department
G. Zeller, Head
N. Mondal, GS

Beam
A. Marchionni, Ldr.
(E. Johnson)
P. Lebrun
B. Lundberg
Z. Pavlovic

DUNE Science
A. Hahn, Ldr.
(M. Dixon)
T. Alion, GS
C. Escobar, GS
T. Junk
T. Yang

MicroBooNE
B. Baller, Ldr.
(J. Saviano)
B. Carls, RA
H. Greenlee
S. Lockwitz, RA
A. Schukraft, RA
M. Soderberg (JA)
M. Toups

NOvA
P. Shanahan, Ldr.
(E. Johnson)
G. Brunetti, RA
J. Cooper
A. Himmel, WF
K. Matera, RA
E. Niner, RA
J. Paley
K. Sachdev, RA, LF
L. Suter, WF
R. Tesarek

Minerva
D. Harris, Ldr.
(J. Saviano)
L. Bellantoni
M. Betancourt, RA
M. Kiveni, RA
J. Morfin

SBN
P. Wilson, Ldr.
(E. Johnson)
R. Castillo Fernandez, RA
A. Fava, WF
C. James
R. Krull - C
T. Miao
O. Palamara, GS

Detector R&D
B. Rebel, Ldr.
(J. Saviano)
R. Acciarri, RA
P. Kryczynski, IF
S. Pordes
J. Raaf

GSR
D. Bogert
D. Jensen
H. Jostlein
W. Smart
R. Stefanski

Division Office and Management

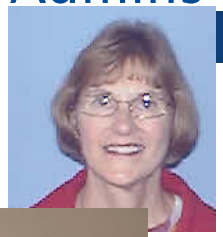
Head,
Gina Rameika

Deputy Head,
Steve Brice

Tech. Supt.
Dept Head
Rob Plunkett

Physics
Dept Head,
Sam Zeller

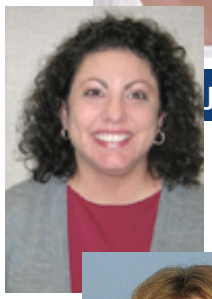
Admins



Marilyn Dixon

Maxine Hronek

Etta Johnson



Julie Saviano

Steph Schuler

NEUTRINO DIVISION

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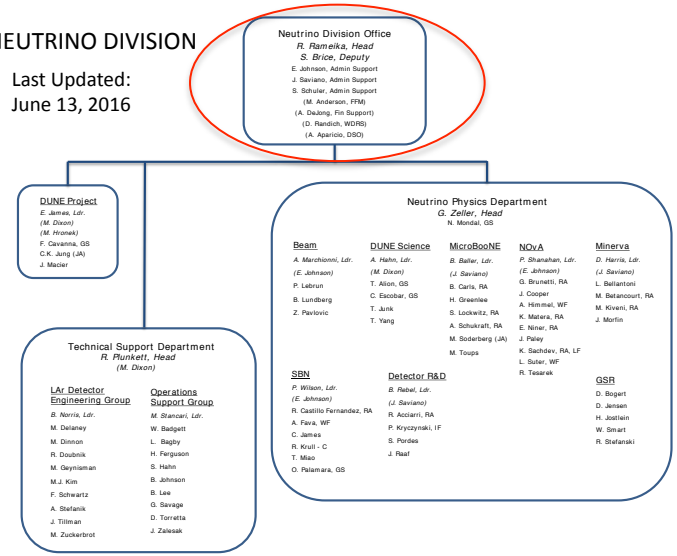
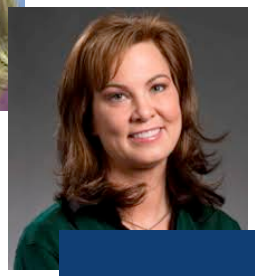


Safety,
Angela Aparicio

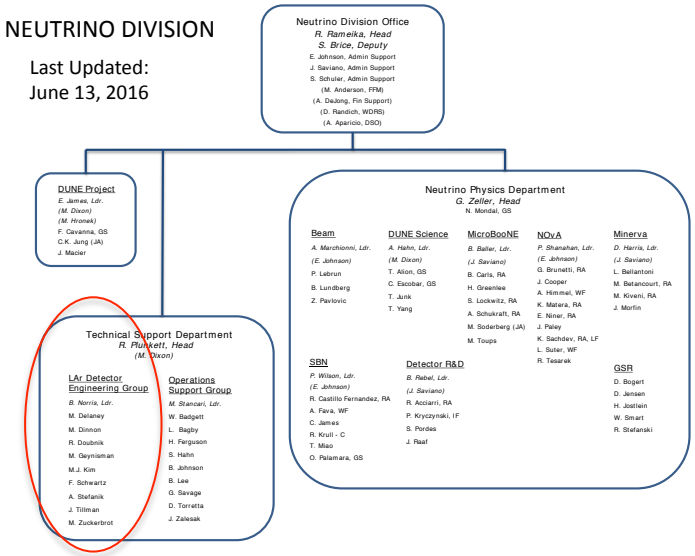
Financial,
Molly Anderson



HR
Deanne Randich

Fermilab

Liquid Argon Engineering Group



- Liquid Argon Engineering group has doubled in size over the last 18 months
- More expansion needed to handle the many calls on this group
  - Operating MicroBooNE
  - Operating and upgrading LArIAT
  - Installing and operating 35 ton
  - Designing SBND (with CERN)
  - Operating ICARUS
  - Assisting with LBNF cryo
  - …

Operations Support Group

- Current Operations Support Group expertise
  - DAQ (3 FTE), Electrical (1 FTE), General ops (4 FTE), Control room (1 FTE)

NEUTRINO DIVISION

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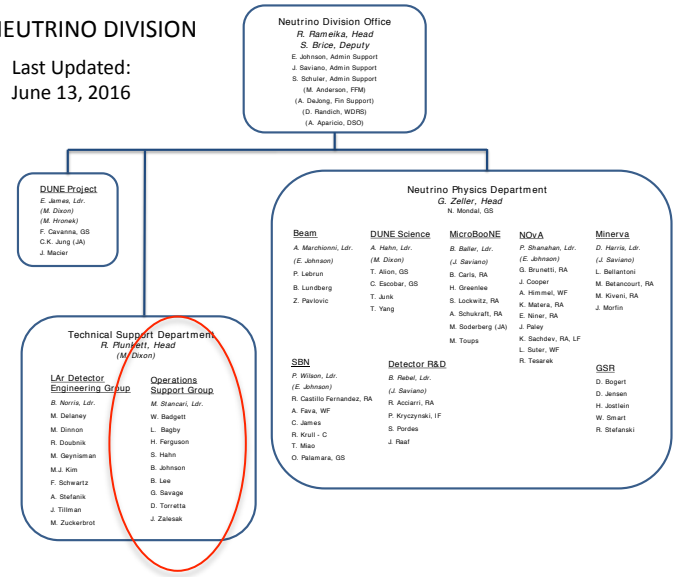
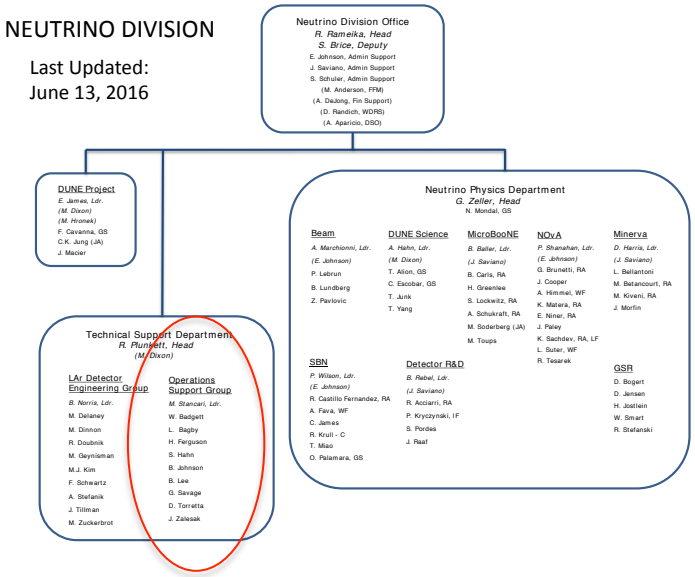


- Many calls on our operations staff
  - Operating onsite experiments
  - Involved in ICARUS and SBND design and construction
  - Involved in protoDUNE design and construction
  - Assisting at SNOLAB and SURF

Fermilab

Technician Support

- Currently we have a single technician devoted to neutrino work
  - We make use of technicians from Particle Physics Division



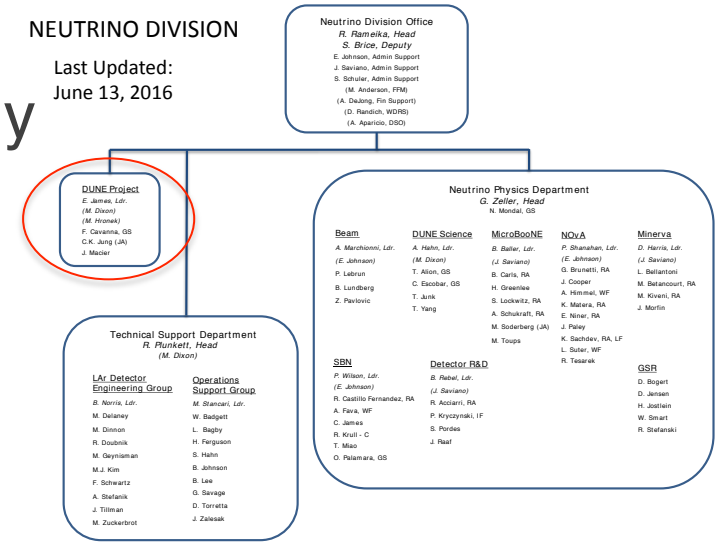
- We are growing a technician group
  - Use the VetTechs program to hire ~4-5 junior technicians over the next couple of years (see next slide)

The VetTechs Program

- We are partnering with a local community college
  - College of DuPage
- Offer summer technician internships to Military Veteran students
  - Automotive, HVAC, and electro-mechanical courses
- Have 4 interns lined up this summer
- Military Veterans come with relevant experience and attitude
- Hope to use this program to hire 4-5 technicians into Neutrino Division over the next couple of years
- VetTechs program is being piloted by Neutrino Division with the intent that it become a labwide program.

DUNE Project

- The DUNE Project lives within the division, but is staffed internationally
- Current focus - protoDUNE design, installation, and operations
- There is also significant DUNE commitment from the ND physics department



Eric James

Chang Kee Jung

Maxine Hronek

Jolie Macier

Flavio Cavanna

SBN Program

Cat James

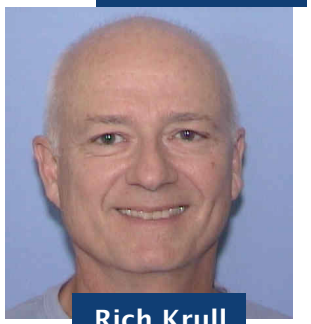
Ornella Palamara

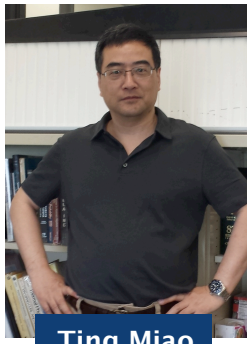
Angela Fava

Peter Wilson

Anne Schukraft

Raquel Castillo Fernandez


Rich Krull


Ting Miao

NEUTRINO DIVISION

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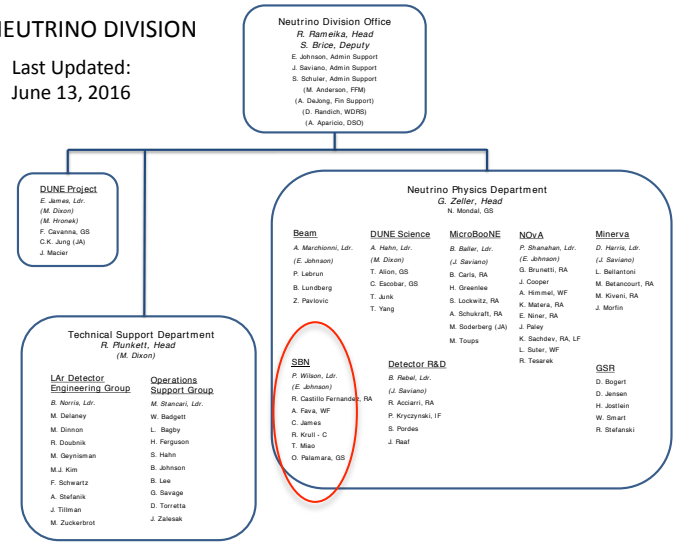


SBN Program

Design and build SBND

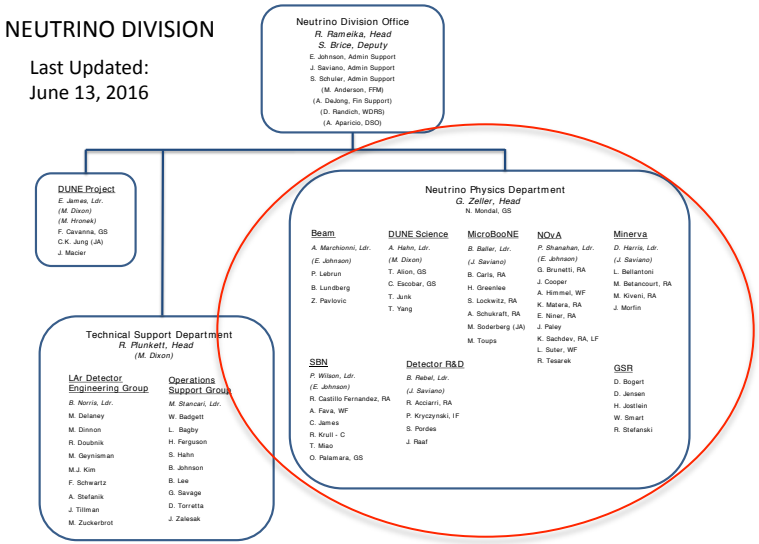
Refurbish and install ICARUS

(MicroBooNE already running)

Neutrino Division Physics Dept

- Department Head – Sam Zeller

- All scientists in the department help to facilitate the research of the community
  - Project management
  - Fermilab management
  - Designing and building detectors
  - Operating detectors
  - Working with visiting faculty, postdocs, and students
  - Collaboration management



- 10 postdocs
- 13 junior scientists (below Sci 2)
- 16 senior scientists (Sci 2&3)
- 4 guest scientists

- Aim to increase postdocs and decrease senior scientists a little over the next few years

Neutrino Division in Future

- The division will grow to meet the challenges of future efforts
  - protoDUNE
  - SBND
  - ICARUS
  - DUNE
- Most growth in engineering and operations support

- The DUNE effort will come to dominate the division and within a few years it will probably become the DUNE Division

- Since the creation of the division we have maintained a steady and persistent drive to improve it's diversity

  - Have made real gains in gender diversity - 51 men & 25 women

  - Much improvement still needed in our ethnic and racial diversity

Wilson Hall 13th Floor Renovation

- In recent years the expansion of neutrinos at the lab has outstripped the availability of office space
- Starting in September the 13th floor of Wilson Hall will be completely remodeled
  - Will house LBNF Project, DUNE Project and collaboration management and Neutrino Division management
- This frees up space elsewhere
  - Whole of 12th floor for current experiment users
  - Half of 10th floor for neutrino engineering and operations support
- Hope to complete by summer 2017

- WH 13th floor slab to slab refurb.
- Use of modular reconfigurable offices and collaboration areas
- Plan to continue floor by floor and part of future HEP GPP plan

From Tim Meyers's talk yesterday

Fermilab

Intensity Frontier Fellowships

- Fellowships for 6 – 12 month visits to Fermilab
- Work on Intensity Frontier project
- Very competitive

Application Info

Applications must include a curriculum vitae, and a selected publication list. In addition we request a two-page proposal describing the major contribution that will be made to the Intensity Frontier during the Fellowship, current compensation, and requested dates of support. Applicants holding postdoctoral positions should supply two letters of reference.

Further queries should be sent to: send email

Past and Current Fellows

Related Links

Fermilab Neutrino Division
Fermilab Particle Physics Division
NOvA Experiment
Mu2e Experiment
Muon g-2 Experiment
LBNF/DUNE
MINOS+ Experiment
MINERvA Experiment
MicroBooNE Experiment

All Fellowships & Awards

Intensity Frontier Fellowship Program

Award Year 2015

Antoine Chapelain
Institution: Cornell University
Research Project:

Robert Cooper
Institution: Indiana University
Research Project: **Developing the Booster neutrino beam for low-energy neutrinos and the MiniBooNE dark matter search**

Daniel Cronin-Hennessy
Institution: University of Minnesota
Research Project:

Sowjanya Gollapinni
Institution: Kansas State University
Research Project: **Low-energy neutrino cross section measurement in argon and cosmogenic background studies at MicroBooNE**

Christopher Grant
Institution: University of California at Davis
Research Project:

Or Hen
Institution: Massachusetts Institute of Technology
Research Project: **Neutrino-Nucleus Interactions and Multi-nucleon Effects**

Jonathan Insler
Institution: Louisiana State University
Resarch Project: **Liquid-argon 35-ton prototype**

David Kawall
Institution: University of Massachusetts-Amherst
Resarch Project: **A precision measurement of the anomalous magnetic moment of the muon**

Alysia Marino
Institution: University of Colorado
Research Project: **Beamline Monitors for LBNF**

Nicola McConkey
Institution: University of Sheffield
Research Project: **SBND TPC Development and Construction**

Alexander Mikhailichenko
Institution: Cornell University
Research Project:

Michael Mooney
Institution: Brookhaven National Laboratory
Research Project:

Ryan Nichol
Institution: University College London

Mayly Sanchez
Institution: Iowa State University

2 of 5

Research Project:**Intensity Frontier Fellowship on MINOS, NOvA and DUNE**

Research Project:

Ivano Sarra
Institution: INFN Laboratori Nazionali di Frascati
Research Project: **Mu2e electromagnetic calorimeter and EMC photo-sensors and electronics**

Erik Swanson
Institution: University of Washington
Research Project: **Mapping the NMR field in the Muon g-2 ring**

Jennifer Thomas
Institution: University College London
Research Project:

Yun-Tse Tsai
Institution: SLAC
Research Project: **DAQ developments to enable the study of non-beam physics in MicroBooNE and LBNF**

Taritree Wongjirad
Institution: MIT
Research Project: **R&D on light collection systems in liquid-argon time projection chambers**

Award Year 2014

Luis Alvarez Ruso
Institution: University of Valencia, Spain
Research Project: **Cross section theoretical studies for neutrino experiments in the few-GeV region**

Matthew Bass
Institution: Oxford University
Research Project: **MicroBooNE experiment calibration trigger**

Andrew Blake
Institution: Cambridge University
Research Project: **Intensity Frontier Fellowship on MINOS+, MicroBooNE and LBNE**

Marjorie Corcoran
Institution: Rice University
Research Project: **A prototype straw tube tracker for the Mu2e experiment**

Craig Dukes
Institution: University of Virginia
Research Project: **The Mu2e cosmic-ray veto and exotic physics with the NOvA detctors**

Laura Fields
Institution: Northwestern University
Research Project: **Neutrino interaction cross sections at MINERvA and beam simulations for the Long-Baseline Neutrino Experiment**

Rajesh Gandhi
Institution: Harish-Chandra Research Institute, India
Resarch Project: **Physics and sensitivity studies for the LBNE near detector**

Ornella Palamara
Institution: Yale University and Gran Sasso Laboratory, Italy
Research Project:**Testing neutrino anomalies with LArTPCs**

Alexey Petrov
Institution: Wayne State University
Research Project: **Studies of fundamental physics with leptons and quarks**

Robert Szafron
Institution: University of Alberta
Research Project: **Radiative corrections to muon-electron conversion and muon decay in orbit**

Xilin Zhang
Institution: Ohio University
Research Project: **Neutral-current induced pion and photon productions off nucleons**

Award Year 2013

Flavio Cavanna
Institution: Yale University and University of L'Aquila, Italy
Research Project: **Liquid argon at the Fermilab intensity frontier**

Ed Kearns
Institution: Boston University
Research Project: **Development of liquid-argon time projection chambers for the intensity frontier**

Breese Quinn
Institution: University of Mississippi
Research Project: **Beamline instrumentation for Muon g-2 and ORKA**

Alexandre Sousa
Institution: University of Cincinnati
Research Project: **Sterile neutrino searches in the MINOS+ and NOvA long-baseline experiments**

Thomas Strauss
Institution: University of Bern, Switzerland
Research Project: **MicroBooNE and R&D towards future liquid-argon experiments**

Patricia Vahle
Institution: College of William and Mary
Research Project: **Neutrino oscillations with long-baseline neutrino experiments at Fermilab**

- 36 awards since 2013
- Awarded by committee chosen from the community
- Administered by Rob Plunkett and Jen Raaf in Neutrino Division but run by the community for the community
- http://www.fnal.gov/pub/forphysicists/fellowships/intensity_frontier/

Neutrino Physics Center

http://npc.fnal.gov/

- In 2016 we have started the Neutrino Physics Center (NPC)
  - Loosely modelled after the LHC Physics Center (LPC)

Debbie Harris

Bonnie Fleming

Stephen Parke

- Three leaders
  - Fermilab experimentalist
  - Non-Fermilab experimentalist
  - Theorist
- International Advisory Committee
  - Luis Alvarez Ruso, IFIC
  - Ed Blucher, University of Chicago
  - Scott Dodelson, Fermilab
  - Antonio Ereditato, Bern University
  - Georgia Karagiorgi, University of Manchester
  - Steve Manly, University of Rochester
  - Takasumi Maruyama, KEK
  - Silva Pascoli, Durham University
  - Mayly Sanchez, Iowa State University
  - Robert Shrock, Stony Brook University
  - Patricia Vahle, College of William and Mary
  - Ellizabeth Worcester, Brookhaven
  - Renata Zukanovich Funchal, Sao Paulo University

Neutrino Physics Center http://npc.fnal.gov/

- Have initiated an NPC Fellowship Program
  - 32 awards made this year
  - Short (1 to few week) visits to Fermilab
  - Student focus (unlike IF fellowships)

- Run the Fermilab Neutrino Seminar Series
  - Very popular – creating a problem finding large enough venues
  - http://neutrino.fnal.gov/events/seminar_series/

- Run the Neutrino Summer Lecture Series
  - Starting soon
  - http://neutrino.fnal.gov/events/summer_lecture_series/index.html

Neutrino Physics Center http://npc.fnal.gov/

- Oversee the International Neutrino Summer School (INSS)
  - 2 week school on all aspects of neutrino physics
  - 60 to 100 participants
  - Will be at Fermilab in odd numbered years
  - Away from Fermilab in even numbered years

- Host workshops
  - March 18-20, 2016: Frontiers of Scintillator Technology (FroST 2016) Workshop
  - January 20-21, 2016: Detector R&D Workshop
  - July 21-25, 2015: Neutrino Theory and Phenomenology Workshop
  - Many more to come

Summary

- A lot of exciting things are happening in neutrinos at Fermilab
- Neutrino Division has a world class team in projects, operations, and research
- Neutrino Division exists to facilitate the work of the international neutrino community