

Mu2e-II Workshop (x) Introduction

Frank Porter
September 15, 2021
DocDB-nnnnn

This meeting will be recorded

Mu2e-II workshops

Recent past workshops

For all workshops, see the Mu2e-II calendar at:

https://mu2eii-internal-wiki.fnal.gov/wiki/Main_Page#Calendar

Workshop dates	Links to recordings
Wednesday, October 28 https://indico.fnal.gov/event/45937/	https://caltech.zoom.us/rec/share/zCGxa2uJwAKwONXm7pyiqrrLPJvixTaNHkY2cxHRDjtmkWOYqraV8D9ynUMATk.JNeSkLhSj4-Hfcof
Wednesday, December 9 https://indico.fnal.gov/event/46433/	https://caltech.zoom.us/rec/share/xXVV4YURBMeRsnFOGLQsGAPv-FJ466HNnTGze3VeiAoooyUcRSU7cP16QBwlvNPv.XvSqSC_JVmuSKVA9
Wednesday, March 3, 2021 https://indico.fnal.gov/event/47787/	https://caltech.zoom.us/rec/share/po6RL9ZZL27yeF8sjUZ9Wk9xcBw-wqm-TYgRmSNjn6yUYBE5mnb5Myza-ez2k3tFV.deUj8dQcDWOVSqAU
Wednesday, April 28, 2021 https://indico.fnal.gov/event/48516/	https://caltech.zoom.us/rec/share/NM_b0LyWSJopNa_YAu9LXmfjJ05XrCmjXkmfwCoqj9VtBqVFKeA0N4pouLDKGMz.1f96W6EOVkyUsnT4
Wednesday, July 21, 2021 https://indico.fnal.gov/event/49360/	https://caltech.zoom.us/rec/share/Lm8mhRjuLVcAVvyvWYmIWUNaLu-WlwRSB-uGvxncQBz0TAHTUWKHiipsi7LMwUt.F8VaPWZ49mhfLB9w

Mu2e-II collaboration/author list

- Please respond (to fcp@caltech.edu)
 - Philosophy is people need to sign on
 - So please send me an email if you haven't already
 - Also, please check that I got your information right!
- I will make sure anyone on the list is also on the Mu2e-II email list
 - That is: mu2eii@listserv.fnal.gov
 - The email list is a superset of the collaboration list
- Collaboration/author list is available from the internal Mu2e-II wiki page
 - https://mu2eii-internal-wiki.fnal.gov/wiki/Main_Page#Mu2e-II_Collaboration_and_Author_list
- Also directly accessible with link
 - <https://caltech.app.box.com/file/793439425745?s=gkidbcqykvhrmfnl85rfct3z6ybhftqb>

Mu2e-II collaboration/author list, page 1

Name	Email	Institution	Address	Name on author list
Daniel Ambrose	ambr0028@unm.edu	University of Minnesota	Minneapolis, Minnesota 55455, USA	D. Ambrose
A. Artikov	akram@jinr.ru	Joint Institute for Nuclear Research	Dubna, Russia 141980	A. Artikov
N. Atanov	atanov@jinr.ru	Joint Institute for Nuclear Research	Dubna, Russia 141980	N. Atanov
Richard Bonventre	rbonventre@lbl.gov	Lawrence Berkeley National Laboratory	Berkeley, California 94720, USA	R. Bonventre
Leo Borrel	lborrel@caltech.edu	California Institute of Technology	Pasadena, CA 91125	L. Borrel
David Norvil Brown	david.brown@louisville.edu	University of Louisville	Louisville, Kentucky 40292, USA	D. N. Brown
Myron Campbell	myron@umich.edu	University of Michigan	Ann Arbor, Michigan 48109, USA	M. Campbell
Brendan Casey	bck.casey@gmail.com	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	B.C.K. Casey
Raymond L. Culbertson	rlc@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	R. Culbertson
Mary Anne Cummings	macc@fnal.gov	Muons Inc.	Batavia, Illinois 60510, USA	M. A. C. Cummings
Yu.I. Davydov	davydov@jinr.ru	Joint Institute for Nuclear Research	Dubna, Russia 141980	Yu.I. Davydov
Sergei Denisov	sergey.denisov@ihep.ru	NRC Kurchatov Institute, IHEP	142281, Protvino, Moscow region, Russia	S. Denisov
Simone Donati	simone.donati@gmail.com	Università di Pisa; INFN Sezione di Pisa	I-56127 Pisa, Italy	S. Donati
(Edmond) Craig Dukes	ecd3m@virginia.edu	University of Virginia, Charlottesville	Virginia 22904, USA	E. C. Dukes
Bertrand Echenard	echenard@caltech.edu	California Institute of Technology	Pasadena, CA 91125	B. Echenard
Valery Evdokimov	valery.evdokimov@ihep.ru	NRC Kurchatov Institute, IHEP	142281, Protvino, Moscow region, Russia	V. Evdokimov
Andrei Gaponenko	gandr@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	A. Gaponenko
Antonio Gioiosa	antonio.gioiosa@df.unipi.it	Università di Pisa; INFN Sezione di Pisa	I-56127 Pisa, Italy	A. Gioiosa
Simona Giovannella	simona.giovannella@inf.infn.it	Laboratori Nazionali di Frascati dell'INFN	I-00044 Frascati, Italy	S. Giovannella
Valerio Giusti	valerio.giusti@unipi.it	Università di Pisa; INFN Sezione di Pisa	I-56127 Pisa, Italy	V. Giusti
V. Glagolev	vlglagolev@jinr.ru	Joint Institute for Nuclear Research	Dubna, Russia 141980	V. Glagolev
Hank Glass	glass@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	H. D. Glass
Douglas A Glenzinski	douglasg@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	D. A. Glenzinski
Lisa Goodenough	goodenou@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	L. Goodenough
Robert Craig Group	rcg@p@virginia.edu	University of Virginia, Charlottesville	Virginia 22904, USA	R. G. Group
Julian Heeck	heck@virginia.edu	University of Virginia, Charlottesville	Virginia 22904, USA	J. Heeck
Michael Hedges	hedges7@purdue.edu	Purdue University	West Lafayette, Indiana, 47907, USA	M. T. Hedges
Ken Heller	heller@umn.edu	University of Minnesota	Minneapolis, Minnesota 55455, USA	K. Heller

Mu2e-II collaboration/author list, page 2

Name	Email	Institution	Address	Name on author list
David Hitlin	hitlin@caltech.edu	California Institute of Technology	Pasadena, CA 91125	D. G. Hitlin
(James) A. Hocker	hocker@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	A. Hocker
(Timothy) Matthew Jones	jones105@purdue.edu	Purdue University	West Lafayette, Indiana, 47907, USA	M. Jones
Cole Kampa	colekampa2024@u.northwestern.edu	Northwestern University	Evanston, Illinois 60208, USA	C. Kampa
Vadim Kashikhin	vadim@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	V. Kashikhin
Yury Kolomensky	ygkolomensky@lbl.gov	University of California, Lawrence Berkeley National Laboratory	Berkeley, California 94720, USA	Yu. G. Kolomensky
Alexander Kozelov	alexander.kozelov@gmail.com	NRC Kurchatov Institute, IHEP	142281, Protvino, Moscow region, Russia	A. Kozelov
Robert K. Kutschke	kutschke@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	R. K. Kutschke
Mark Lancaster	mark.lancaster@manchester.ac.uk	University of Manchester	Manchester, M13 9PL, UK	M. Lancaster
Kevin Lynch	klynch@york.cuny.edu	York College and the Graduate Center, The City University of New York	New York, New York 11451, USA	K. Lynch
Michael MacKenzie	michaelmackenzie@u.northwestern.edu	Northwestern University	Evanston, Illinois 60208, USA	M. MacKenzie
Matteo Martini	Matteo.Martini@Inf.infn.it	Laboratori Nazionali di Frascati dell'INFN, I-00044 Frascati, Italy; Universit'a degli Studi Guglielmo Marconi, 00193, Rome, Italy		M. Martini
Sophie Middleton	smidd@caltech.edu	California Institute of Technology	Pasadena, CA 91125	S. Middleton
James Miller	miller@buphy.bu.edu	Boston University	Boston, Massachusetts 02215	J. P. Miller
Stefano Miscetti	stefano.miscetti@Inf.infn.it	Laboratori Nazionali di Frascati dell'INFN	I-00044 Frascati, Italy	S. Miscetti
Stefan E. Mueller	Stefan.Mueller@hzdr.de	Helmholtz-Zentrum Dresden-Rossendorf	Dresden 01328, Germany	S. E. Mueller
Alexey Popov	popov_al@ihep.ru	NRC Kurchatov Institute, IHEP	142281, Protvino, Moscow region, Russia	A. Popov
James L. Popp	jpopp@york.cuny.edu	York College and the Graduate Center, The City University of New York	New York, New York 11451, USA	J. L. Popp
Frank C. Porter	fcp@caltech.edu	California Institute of Technology	Pasadena, CA 91125	F. C. Porter
Vitaly Pronskikh	vpronskikh@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	V. S. Pronskikh
Dave Pushka	pushka@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	D. Pushka
Reuven Rachamin	r.rachamin@hzdr.de	Helmholtz-Zentrum Dresden-Rossendorf	Dresden 01328, Germany	R. Rachamin
Gregory Rakness	grakness@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	G. Rakness
Robert Szafron	rszafron@bnl.gov	Brookhaven National Laboratory	Upton, N.Y., 11973, USA	R. Szafron
Giovanni Tassielli	giovanni.tassielli@le.infn.it	INFN Sezione di Lecce	Lecce I-73100, Italy	G. F. Tassielli
Igor A. Vasilyev	igor.vasilyev@cern.ch	NRC Kurchatov Institute, IHEP	142281, Protvino, Moscow region, Russia	I. A. Vasilyev
I.I. Vasilyev	ivasilyev@jinr.ru	Joint Institute for Nuclear Research	141980 Dubna, Moscow region, Russia	I.I. Vasilyev
Mete Yucel	myucel@fnal.gov	Fermi National Accelerator Laboratory	Batavia, Illinois 60510, USA	M. Yucel
Anna Maria Zanetti	annamaria.zanetti@ts.infn.it	INFN Sezione di Trieste	I-34127 Trieste, Italy	A. M. Zanetti

Mu2e-II Working Groups

Email convenors if you wish to participate
Anyone can subscribe to email lists

Accelerator

mu2e-ii-accelerator@fnal.gov

Karie Badgley, Convenor, FNAL

David Neuffer, Convenor, FNAL

Eric Prebys, Convenor, UCD

Mary Anne Cummings, Muons, Inc.

Keegan Harrig, UCD

Andrei Gaponenko, FNAL

Vadim Kashikhin, FNAL

Kevin Lynch, CUNY

James Popp, CUNY

Diktys Stratakis, FNAL

- Accelerator meetings every other Thursday, 1PM CT. Next meeting September 23, 2021 (TBC)
- TBD, 2021 (10-12 CT): AF2/AF5/AF7/RP/NP target workshop (contact: Eric Prebys)
<https://indico.fnal.gov/event/46752/>

Radiation simulation and mitigation

mu2eii-radiation@fnal.gov

Michael MacKenzie, Convenor, Northwestern

Stefan Mueller, Convenor, HZDR

Vitaly Pronskikh, Convenor, FNAL

Anna Ferrari, Reuven Rachamin, HZDR

Vadim Kashikhin, FNAL

James Popp, CUNY

David Pushka, FNAL

Yuri Oksuzian – CRV

Sophie Middleton – Sensitivity

Giani Pezzullo - TDAQ

Theory

mu2eii-theory@fnal.gov

Lorenzo Calibbi, Convenor, Nankai U

Julian Heeck, Convenor, UVa

Robert Szafron, BNL

Yuichi Uesaka, Kyushu Sangyo University

Tracker

mu2eii-tracker@fnal.gov

Daniel Ambrose, Convenor, UMinn

Giovanni Tassielli, Convenor, INFN Lecce

David Brown, LBNL

Brendan Casey, FNAL

Manolis Kargiantoulakis, FNAL

James Popp, CUNY

Mete Yucel, FNAL

Tracker meetings every two weeks on Tuesdays 12AM CT

Next meeting September 28, 2021 (TBC)

Calorimeter

mu2eii-calorimeter@listserv.fnal.gov

David Hitlin, Convenor, Caltech

Luca Morescalchi, Convenor, INFN Pisa

Ivano Sarra, Convenor, LNF

Leo Borrell, Bertrand Echenard, Dexu Lin, Sophie Middleton,
James Oyang, Frank Porter, Liyuan Zhang, Renyuan Zhu, Caltech

Eleonora Diociaiuti, Raffaella Donghia, Simona Giovannella,
Fabio Happacher, Stefano Miscetti, LNF

Stefano Di Falco, Simone Donati, Antonio Gioiosa, Elena
Pedreschi, Franco Spinella, INFN Pisa

Cosmic Ray Veto

mu2eii-crv@listserv.fnal.gov

Craig Dukes, Convenor, Uva

Yuri Oksuzian, Convenor, ANL

Karen Byrum, Simon Corrodi, Peter Winter, Lei Xia, ANL

Raymond Culbertson, Gary Drake, Anna Pla-Dalmau, Greg Rakness, FNAL

Akram Artikov, Yuri Davydov, JINR, Dubna

Timothy Bolton, Glenn Horton-Smith, Yurii Maravin, Kres Neely, KSU

Gerald Blazey, Kurt Francis, Sergey Uzunyan, Vishnu Zutshi, NIU

Merrill Jenkins, U South Alabama

Steven Boi, Ralf Ehrlich, Stephen Goadhouse, Craig Group, UVa

Trigger/DAQ

mu2eii-tdaq@listserv.fnal.gov

Antonio Gioiosa, Convenor, INFN Pisa

Gianantonio Pezzullo, Convenor, Yale

Richard Bonventre, LBNL

Rebecca Chislett, UCL, [Tracker](#)

Raffaella Donghia, LNF

Bertrand Echenard, Caltech

Ryan Rivera, FNAL

Roberto Soletti, LBNL

Franco Spinella, INFN Pisa – [Calorimeter](#)

Craig Dukes, UVa – [CRV](#)

Jinyuan Wu, FNAL

Sensitivity estimates

mu2e-ii-sensitivity@listserv.fnal.gov

Lisa Goodenough, Convenor, FNAL

Sophie Middleton, Convenor, Caltech

Yuri Oksuzian, Convenor, ANL

Rebecca Chislett, UCL

Michael Hedges, Purdue

Cole Kampa, Northwestern

Manolis Kargiantoulakis, FNAL

Michael MacKenzie, Northwestern

Mu2e-II Parameters

“Complete” parameter list on public Wiki:

https://mu2eiwiki.fnal.gov/wiki/Learn_about_Mu2e-II

Recent modification to follow Mu2e assumptions, 3rd year (DocDB-26289, “Mu2e staging options”)
 Note that this implies 1.5×10^7 s/yr for CE data
 Hence 4 years for total run time of 6×10^7 s

Wiki has been updated
 Also need to update PIP-II parameters to reflect current understanding (accelerator talk)

Parameter	Value	Units	Value	Units
Accelerator beam	40	week/yr	2.4×10^7	s/yr
Accelerator up time	90	%	2.2×10^7	s/yr
Calibration, background studies, other special runs	30	% of delivered beam	6.5×10^6	s/yr
Mu2e efficiency	100	%		
CE data	70	% of delivered beam	1.5×10^7	s/yr

Snowmass 22 Schedule

Rare Processes & Precision Measurements Frontier

<https://snowmass21.org/rare/start>

In January 2021 the Rare Processes and Precision Measurements Frontier paused activities until the end of August

- At the end of August, resume activities again with a schedule to be determined
- No events posted in September or October yet (nor for CLFV)
- Plan to postpone Frontier meeting by one year to around May 2022

Mu2e-II Snowmass Schedule

March 15, 2022 deadline for submission of Mu2e-II contribution to arXiv

That is, we need to be done in six months!

- Our submission will serve as the input to the Topical Group Convenors
 - Their deadline for preliminary reports is May 31, 2022
- Mu2e-II aim for a “good first draft: by February 1, 2022

Outline and framework on Overleaf (read link):

<https://www.overleaf.com/read/mrbgttkmfgvq>

(let me know if you need edit link)

Mu2e-II talks – Material for Speakers

- Have added a “Materials for Speakers” section to the public Mu2e-II Wiki https://mu2eiiwiki.fnal.gov/wiki/Material_for_speakers
- Resource of “Blessed” material
- Please use while preparing Mu2e-II talks
 - Work in progress
 - Suggestions for additional material
 - Corrections
 - Removal of obsolete material

Mu2e-II Communication Links

- Public wiki page: <https://mu2eiiwiki.fnal.gov>
 - Please email Lisa or Frank if you wish to have write access
- Private wiki page:
https://mu2eii-internal-wiki.fnal.gov/wiki/Main_Page
 - SSO log-on
 - May need to contact Lisa or Frank to request access
 - This page has the Mu2e-II calendar with links to zoom, indico, etc.
- Mu2e-II mailing list: mu2eii@listserv.fnal.gov
- Mu2e-II Slack channel link:
 - <https://Caltech-tka1525.slack.com>

Mu2e-II Calendar

- On main page of **private** Wiki
https://mu2eii-internal-wiki.fnal.gov/wiki/Main_Page

- Let me know if something is missing, or feel free to edit yourself

September 2021

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3 NuFact practice talk	4
5	6	7	8 NuFACT talk	9	10	11
12	13	14 Tracker	15 Mu2e- II workshop	16	17	18
19	20	21	22	23 Accelerator (TBC)	24	25
26	27	28 Tracker (TBC)	29	30		

9/15/2021

Clicking on date provides details of events for that day

Main Page/2021-09-15

Contents []

- Mu2e-II Snowmass22 Workshop (x)
 - DocDB entry
 - Indico page with agenda and talks
 - Zoom link
 - Meeting recording

Mu2e-II Snowmass22 Workshop (x) [\[edit\]](#)

Wednesday, September 15, 2021, 10AM to 2PM CT

We will use this meeting to discuss the plan for completing our contribution to the Snowmass process.

DocDB entry [\[edit\]](#)

<https://mu2e-docdb.fnal.gov/cgi-bin/sso/DisplayMeeting?conferenceid=11655>

Indico page with agenda and talks [\[edit\]](#)

<https://indico.fnal.gov/event/50719/>

Zoom link [\[edit\]](#)

Frank C. Porter is inviting you to a scheduled Zoom meeting.

Topic: Mu2e-II Snowmass22 workshop (x) Time: Sep 15, 2021 10:00 AM Central Time (US and Canada)

Join Zoom Meeting <https://caltech.zoom.us/j/86897022670>

Emphasis of this Mu2e-II Workshop

Reports on planning for white paper

- What needs to happen?
 - What is already decided?
 - What do we need to decide?
 - Should have a plausible path to success
 - What can be longer term R&D?
 - Alternatives
- How is it going to happen?
- What do you need from other working groups?
- Detailed outlines by working groups

Contributed Paper – Proposed Top Level Outline

- Author list in same format as LOI (Current author list has not been updated yet)
- Figures in-line with text
- Default section, figure, equation, citation referencing
- Resist temptation to overdo private macros

If you aren't a TeX person, give me your ASCII (or Word) files and I'll translate into Overleaf.

- I. Overview
- II. Theory
- III. Accelerator and beam line
- IV. Production target and environment
- V. Solenoids
- VI. Radiation
- VII. Tracking
- VIII. Calorimetry
- IX. Cosmic ray veto
- X. Trigger and Data Acquisition
- XI. Physics sensitivity
- References

Is this a suitable organization?

- All at end, with BibTeX
- Citations to be identified with first author last name and year, e.g., deGouvea2013
- Include article titles

September 15, 2021 Mu2e-II workshop agenda

Indico timetable at: <https://indico.fnal.gov/event/50719/>

When (CT)	Who	What
10:00-10:20	Frank Porter	Introduction
10:20-10:45	Daniel/Gianfranco	Tracker
10:45-11:10	David/Luca/Ivano	Calorimeter
11:10-11:35	Antonio/Giani	TDAQ
11:35-12:00	Craig/Yuri	Cosmic ray veto
12:00-12:20	All	Break
12:20-12:45	Michael/Stefan/Vitaly	Radiation studies
12:45-13:10	Karie/David/Eric	Accelerator
13:10-13:35	Lisa/Sophie/Yuri	Sensitivity
13:35-14:00	Lorenzo/Julian	Theory
14:00	All	End

Additional Material

Mu2e-II talks

- If you plan to submit an abstract or give a Mu2e-II talk, or are invited to give such a talk, please
 - Email [Kevin Lynch](#) and [Frank Porter](#)
 - If you have an invitation, please email us even if you do not wish to accept – we may be able to suggest someone else
- Fermilab requirements – writeups
 - Acknowledgment should usually include:
 - This document was prepared by members of the Mu2e-II Collaboration using the resources of the Fermi National Accelerator Laboratory (Fermilab), a U.S. Department of Energy, Office of Science, HEP User Facility. Fermilab is managed by Fermi Research Alliance, LLC (FRA), acting under Contract No. DE-AC02-07CH11359.
 - Fermilab preprint number
 - <https://mu2e-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=4083>
- With byline, include:
 - “For the Mu2e-II Collaboration”
 - Optionally as applicable; “For the <appropriate group name> working group of the Mu2e-II Collaboration”

Thinking about “when”

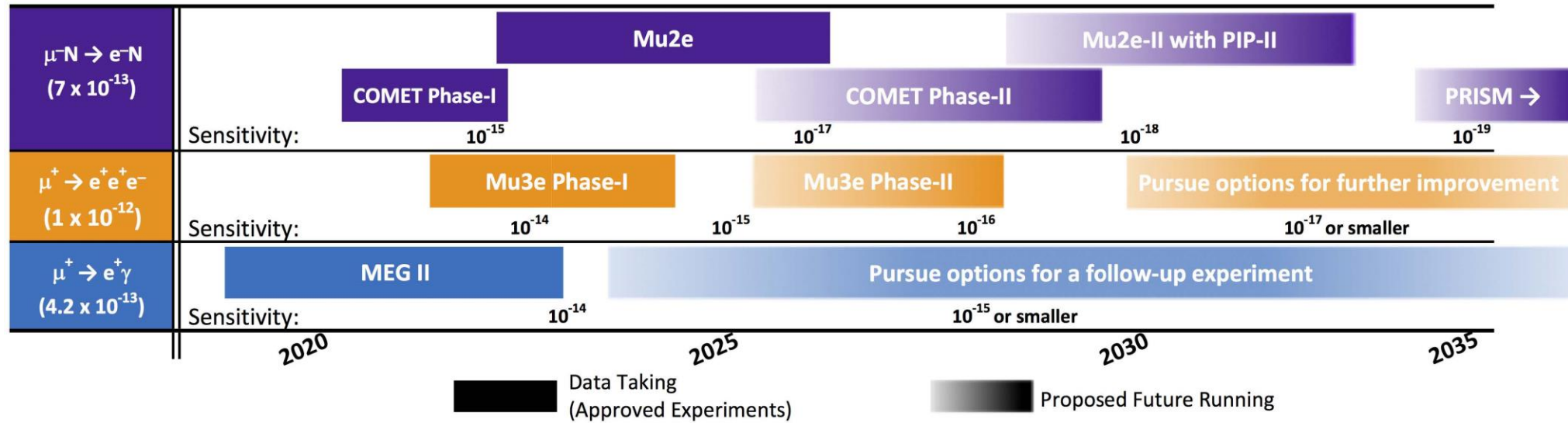
If Mu2e runs until end of 2030, when does Mu2e-II run?

- Mu2e experience useful to have in designing Mu2e-II
- Significant construction could happen in parallel with Mu2e run, long shutdown
- Major installation cannot begin until Mu2e is complete
 - Except perhaps portions of beamline from PIP-II
- Sticky question: When/how can work happen in PS area?
 - Residual radiation

Thinking about “when”

View from 2020 European Strategy Physics input on CLFV

<https://arxiv.org/pdf/1812.06540.pdf>

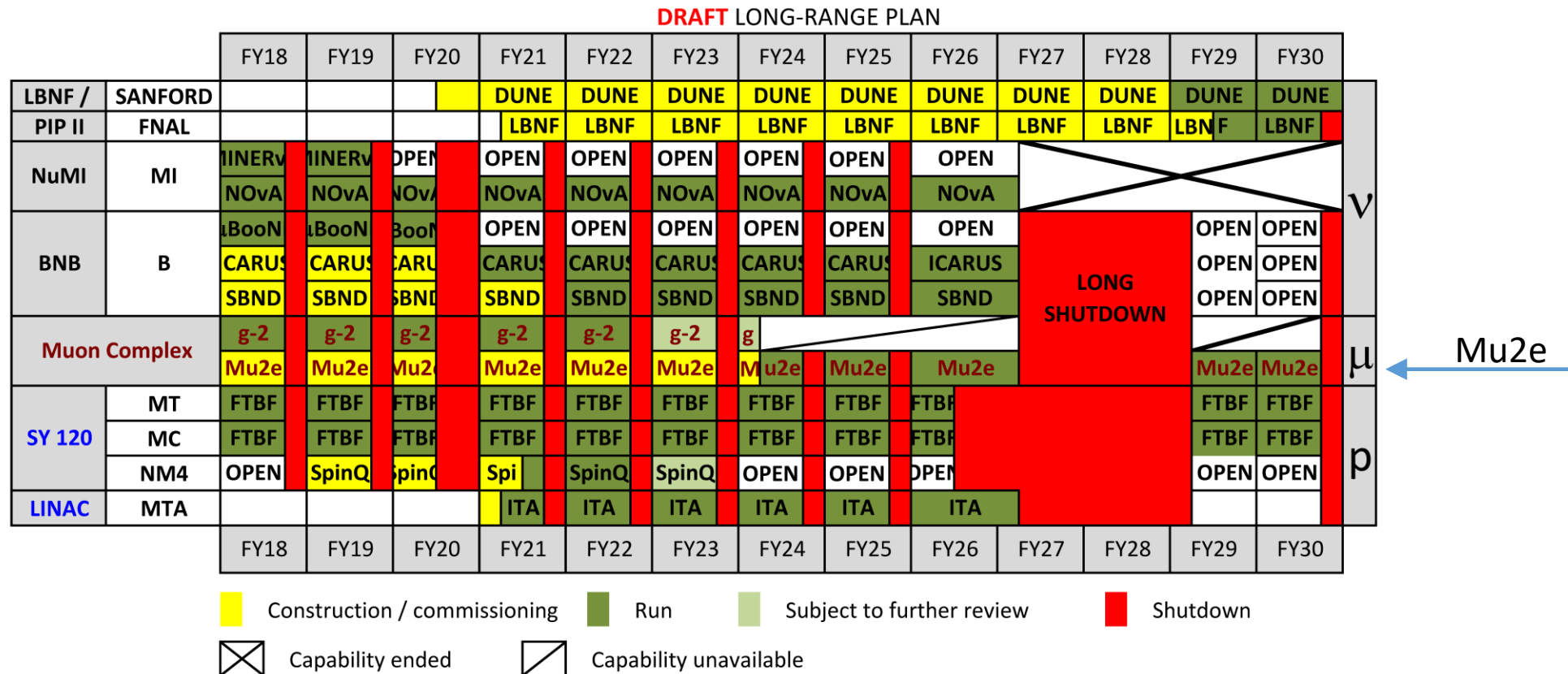


- Nice overview, but already wrong when it appeared (not only for Mu2e)
- Latest Mu2e is “Project Complete” April 2024 (R.Ray, DocDB-38699)

Thinking about “when”

FNAL draft long-range plan (Jan 2021, excluding accompanying notes)

<https://ppp-docdb.fnal.gov/cgi-bin/sso/RetrieveFile?docid=724&filename=10yr-PLAN-Current.pdf>



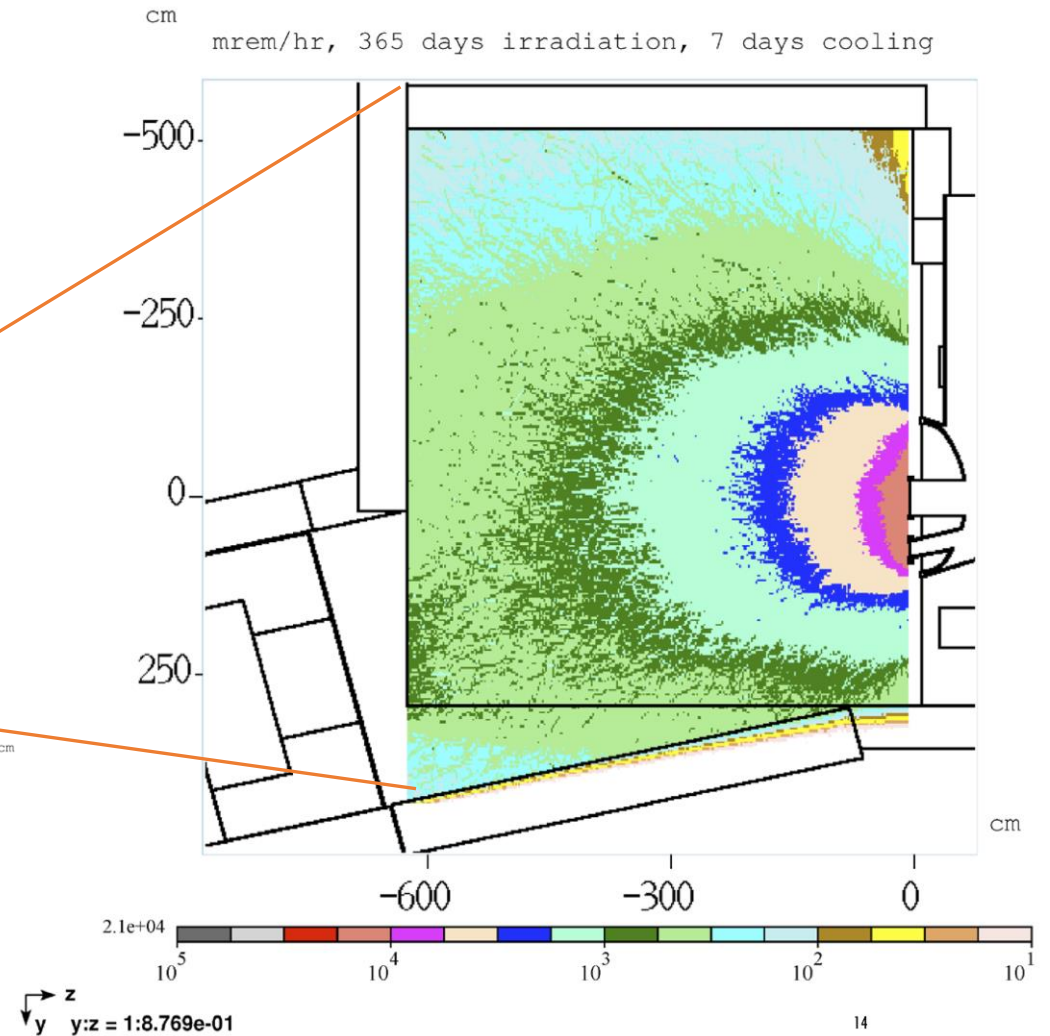
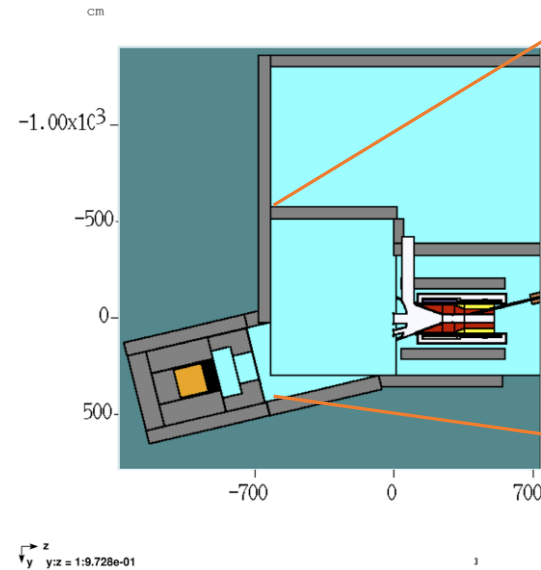
Shows Mu2e running until end of FY30

Shows PIP-II operation beginning mid FY29 (PIP-II CD4 December 2028)

Thinking about “when”

Residual dose at production solenoid

- 365 days irradiation
- 8 GeV
- 8 kW
- **after 1 week cooldown**
- mid-plane of PS



DocDB-5629 (Leveling)

See also:

<https://www.sciencedirect.com/science/article/abs/pii/S0168900217309415> (FermiCORD paper)

Hottest point in this region: 21 rem/hr

Mu2e-II Working Groups

Mu2e-II working groups	Convenors
Theory mu2eii-theory@fnal.gov	Lorenzo Calibbi Julian Heeck
Accelerator (including PS, production target, extinction) mu2e-ii-accelerator@fnal.gov	Karie Badgley David Neuffer Eric Prebys
Radiation mitigation (includes radiation simulation) mu2eii-radiation@fnal.gov	Michael MacKenzie Stefan Mueller Vitaly Pronskikh
Tracker mu2eii-tracker@fnal.gov	Daniel Ambrose Giovanni Tassielli
Calorimeter (and STM?) mu2eii-calorimeter@listserv.fnal.gov	David Hitlin Luca Morescalchi Ivano Sarra
CRV mu2eii-crv@listserv.fnal.gov	Craig Dukes Yuri Oksuzian
Sensitivity estimate (includes simulation, stopping target) mu2e-ii-sensitivity@listserv.fnal.gov	Lisa Goodenough Sophie Middleton Yuri Oksuzian
Trigger and DAQ mu2eii-tdaq@listserv.fnal.gov	Antonio Gioiosa Giani Pezzullo

Muon stops

Quantity	Mu2e	Mu2e-II (nominal)	Units
Stopped μ /POT	1.5×10^{-3} (37571)*	8.9×10^{-5} (37571)	
Beam kinetic energy	8000	800	MeV
Beam power	8	100	kW
POT (3 yr)	3.6×10^{20} (12014)	4.5×10^{22}	
Stopped μ	5.4×10^{17}	4.0×10^{18}	
SES	3.7×10^{-17} (12014)*		

numbers in () are DocDB references

POT = Protons On Target
SES = Single Event Sensitivity

$$\text{POT} = 3 \text{ yr} \times 1.92 \times 10^7 \text{ (s/yr)} \times \text{power(W)} / E_{\text{beam(J)}}$$

*DocDB 7464 says 0.00187 stopped mu/POT (corresponds to SES 3×10^{-17});
SES here is scaled from this using 0.0015 stopped mu/POT

$$\text{Stopped mu(Mu2e-II)} / \text{Stopped mu(Mu2e)} = 40 / 5.4 = 7.4$$

Muon stops

This means that for a SES of 10x better than Mu2e, or $SES = 3.7 \times 10^{-18}$, the beam power should be 135 kW

In other words,

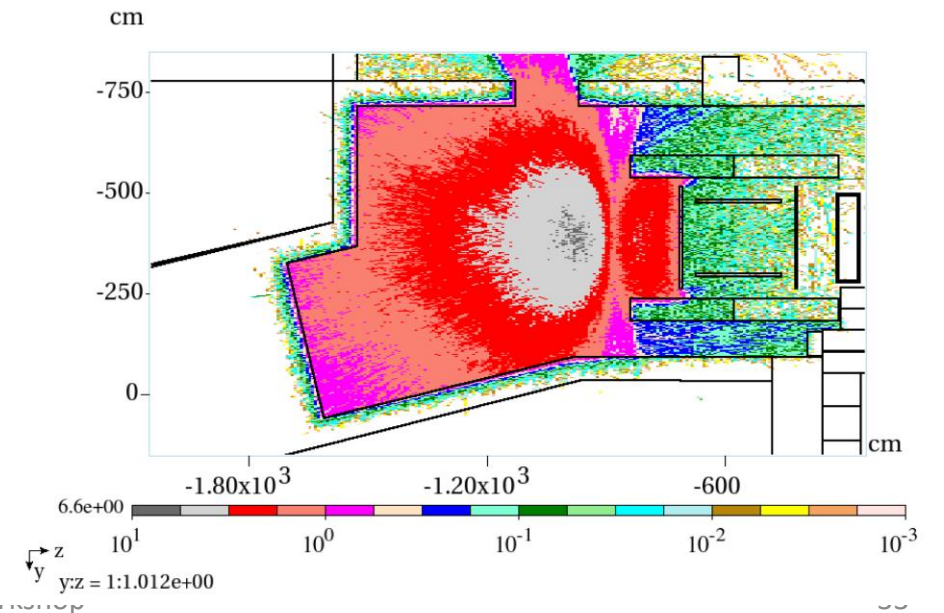
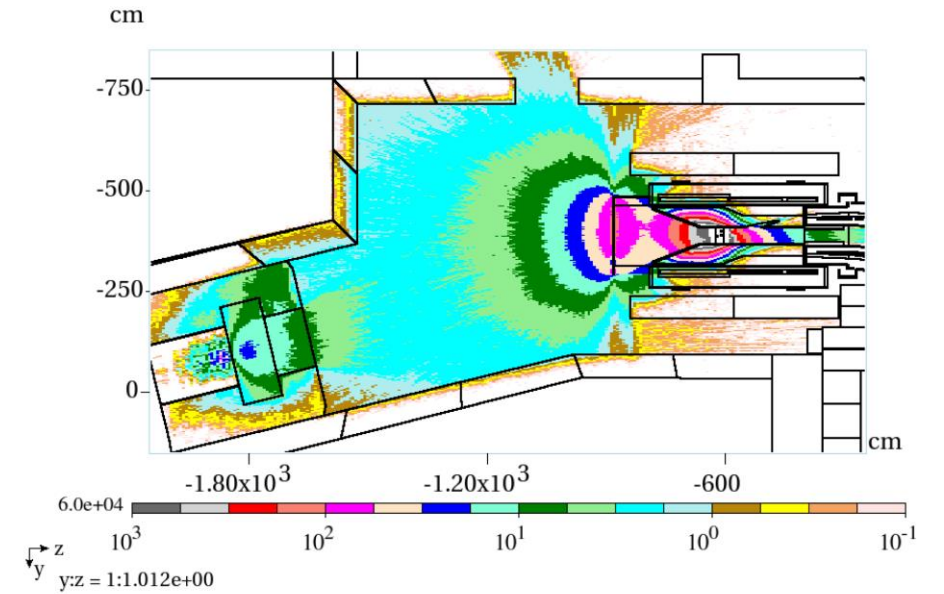
$$SES(\text{Mu2e-II}) = 5 \times 10^{-18} \times \frac{100 \text{ kW}}{P}$$

(We assume the efficiency to observe a conversion electron is the same in Mu2e-II as in Mu2e)

Comment: These are early results and will change!

Thinking about “when”

<https://www.sciencedirect.com/science/article/abs/pii/S0168900217309415>



Snowmass 22 Planning – “covid pause”

January Snowmass newsletter:

[https://indico.fnal.gov/event/47394/attachments/139229/175180/Snowmass Newsletter Jan.2021.pdf](https://indico.fnal.gov/event/47394/attachments/139229/175180/Snowmass_Newsletter_Jan.2021.pdf)

<https://snowmass21.org/announcements>

- **High-level activities on hold until the end of June 2021**
 - Includes Frontier-level and Topical Group-level workshops, All-conveners meetings, Advisory Group meetings and Newsletters.
- **Other Topical Group and cross-frontier activities paused or reduced to a significantly lower level, proceeding only as necessary to ensure:**
 - scientific continuity
 - meet essential programmatic needs
 - maintain collaborative work with other units and communities
- No critical decisions will be made during the hiatus
- No individuals obligated to participate in these activities
- **Individual, collaborative and self-organized work can continue at the discretion of the individuals involved**

Snowmass 22 - Endgame Schedule

- **White Paper submission to arXiv: no later than March 15, 2022**
 - Late submissions and updates unlikely to be incorporated in the working group reports
- Preliminary reports by the Topical Groups due: no later than May 31, 2022
- Preliminary reports by the Frontiers due: no later than June 30, 2022
- Snowmass Community Summer Study (CSS): July 2022 at UW-Seattle
- Final reports by Frontiers due: no later than September 30, 2022
- Snowmass Book and on-line archive documents due: October 31, 2022

Contributed Paper – Proposed Top Level Outline

- I. Overview
 - II. Theory
 - III. Accelerator and beam line
 - IV. Production target and environment
 - V. Solenoids
 - VI. Radiation
 - VII. Tracking
 - VIII. Calorimetry
 - IX. Cosmic ray veto
 - X. Trigger and Data Acquisition
 - XI. Physics sensitivity
- References

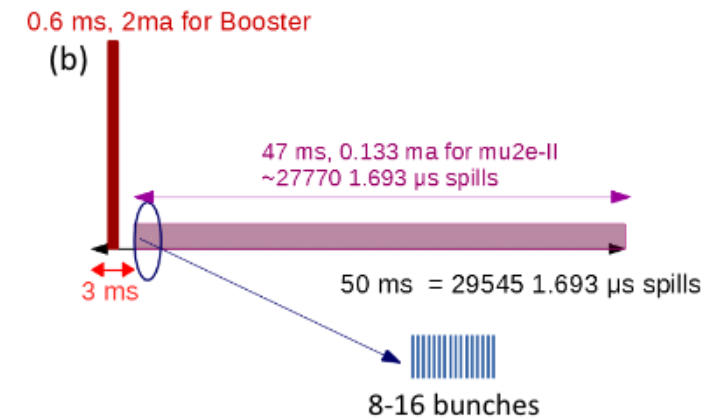
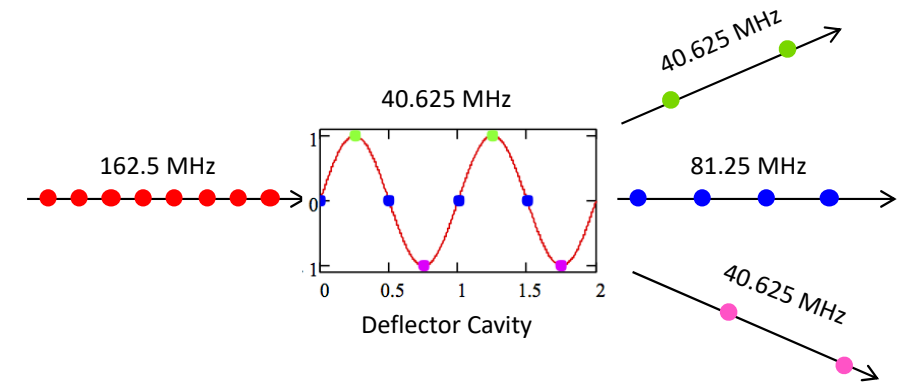
Proposed Mu2e-II beam nomenclature

- Follow accelerator group usage
- Beam delivery is different than Mu2e

Quantity	Name
Beam in one PIP-II RF bucket (162.5 MHz)	Bunch
PIP-II pulse (20 Hz/0.55 ms)	Pulse (but see below)*
Mu2e-II repetition (e.g., 1693 ns)	Spill (also pulse, but see above)**
Set of bunches in one spill (e.g., 8)	Burst (also pulse, but see above)**

*One PIP-II pulse is about 27770 Mu2e-II spills; suggest saying “PIP-II pulse” to avoid confusion.

**“Pulse” may be used when distinction is not important



Eric Prebys

<https://indico.fnal.gov/event/44997/>

David Neuffer, DocDB 33896

Mu2e-II Snowmass21 Committee

Name	Institution	Email
Dan Ambrose	U Minn	ambrose0028@gmail.com
Rebecca Chislett	UC London	rebecca.chislett@ucl.ac.uk
Lisa Goodenough	FNAL	goodenou@fnal.gov
Julian Heeck	U Virginia	julian.heeck@gmail.com
David Neuffer	FNAL	neuffer@fnal.gov
Yuri Oksuzian	ANL	yoksuzian@anl.gov
Frank Porter (chair)	Caltech	fcp@caltech.edu
Giovanni Tassielli	INFN-Lecce	giovani.tassielli@le.infn.it
Robert Bernstein (ex officio)	FNAL	rhbob@fnal.gov
Jim Miller (ex officio)	Boston U	miller@bu.edu