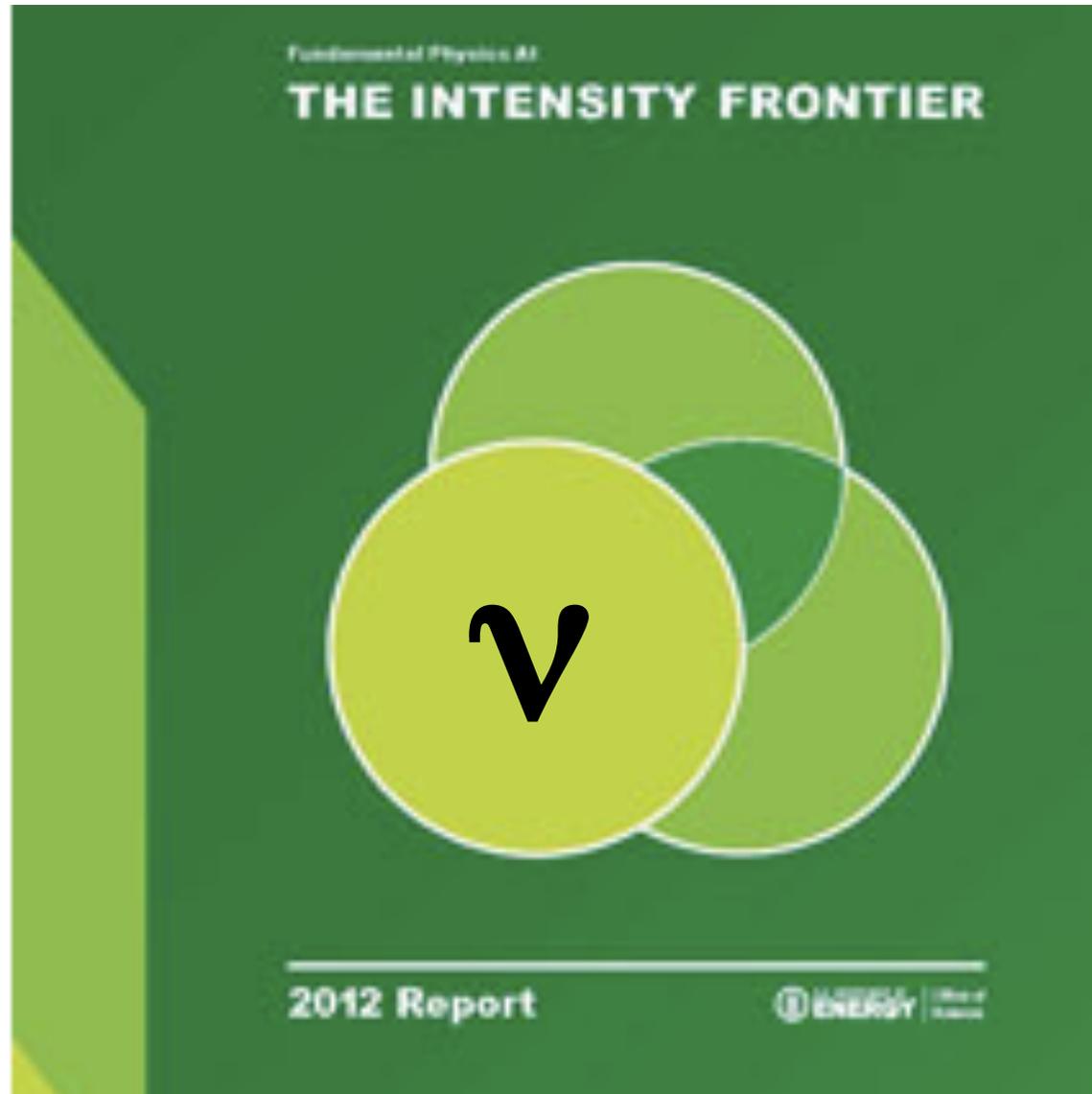
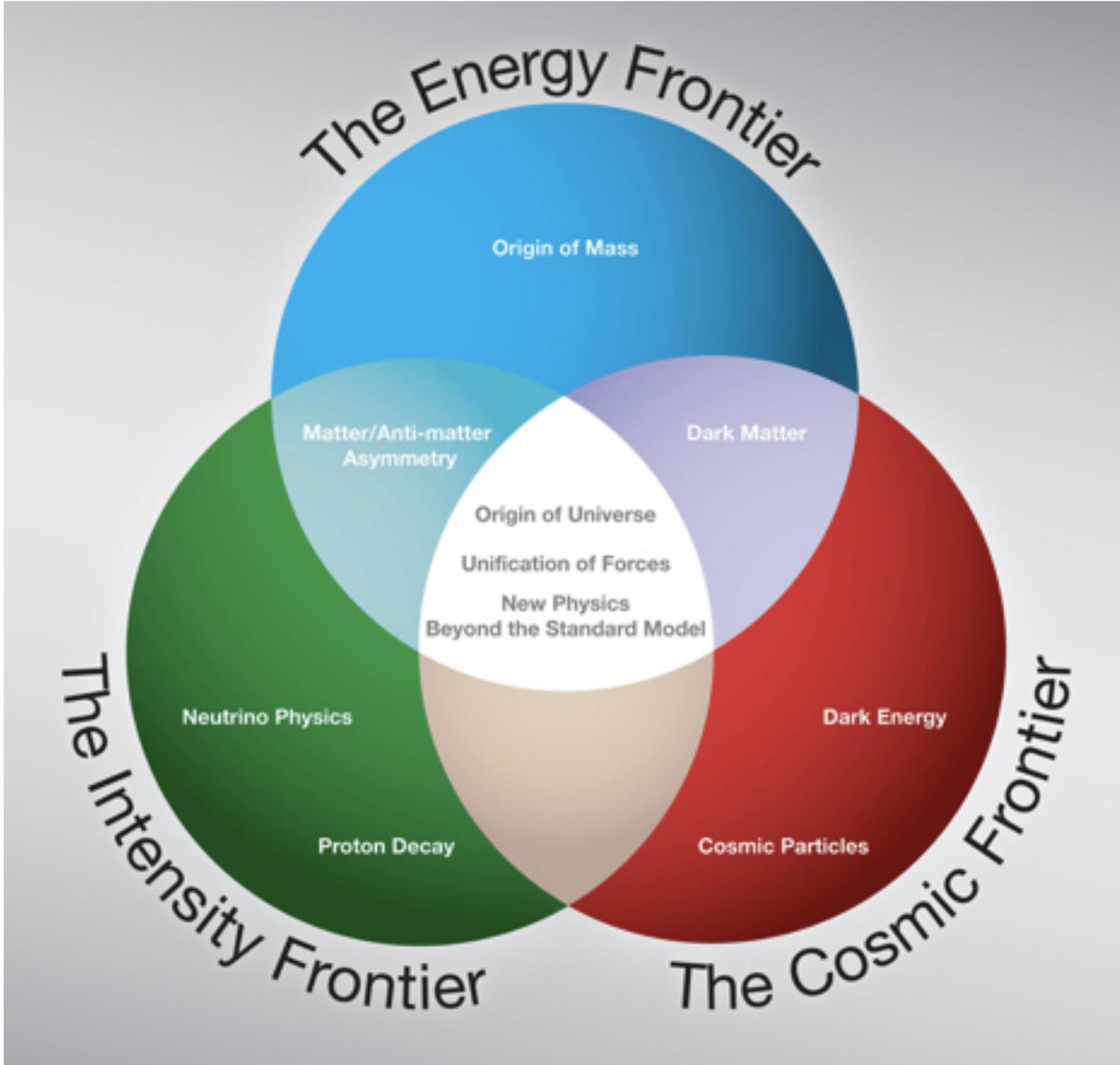


Intensity Frontier Neutrino Subgroup



André de Gouvêa, Kevin Pitts, Kate Scholberg, Sam Zeller

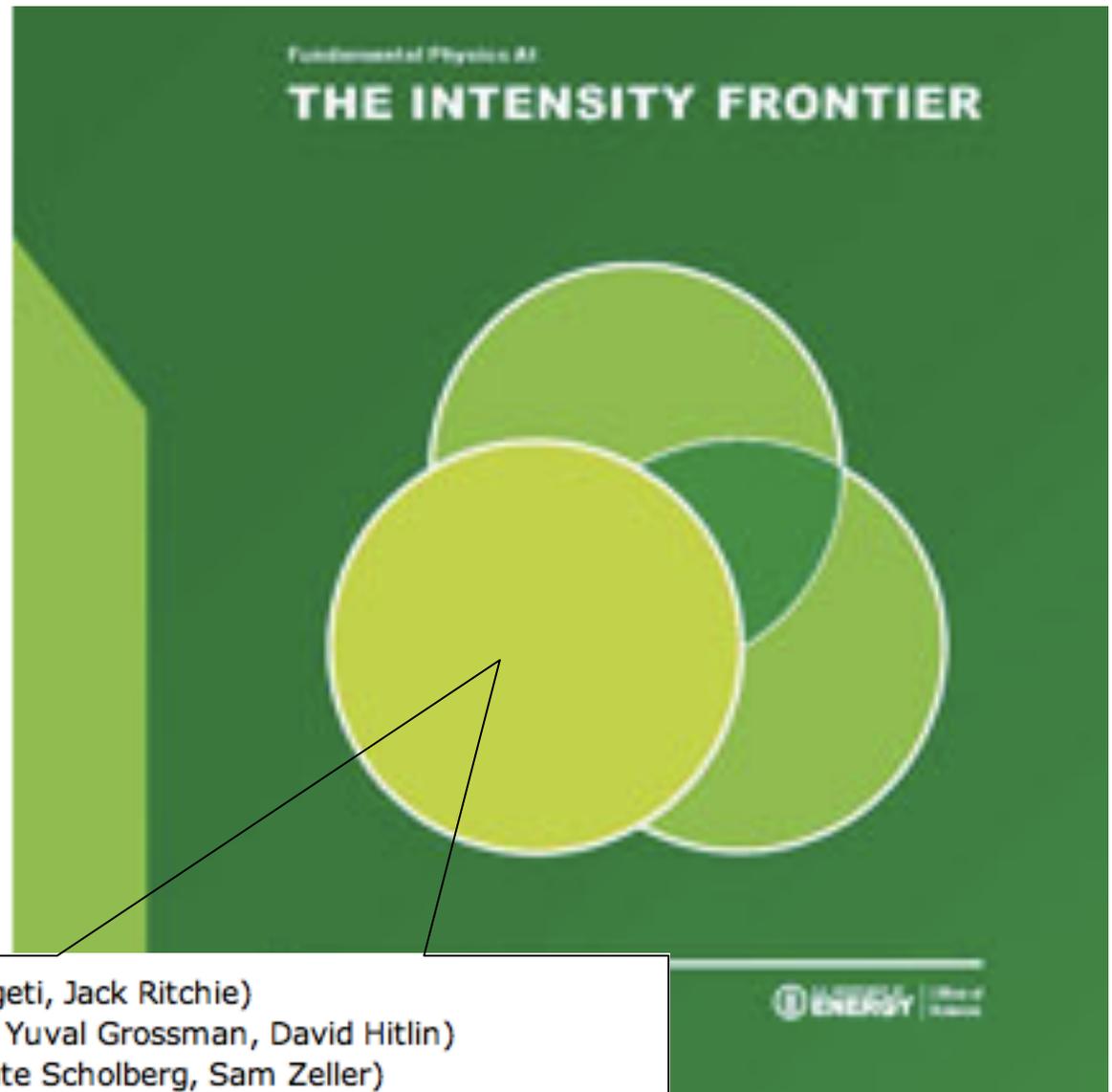
Cosmic Frontier Meeting, SLAC, March 2013



Intensity Frontier Subgroups

IF conveners: JoAnne Hewett,
Harry Weerts

- IF1: [Quark Flavor Physics](#) (Joel Butler, Zoltan Ligeti, Jack Ritchie)
- IF2: [Charged Lepton Processes](#) (Brendan Casey, Yuval Grossman, David Hitlin)
- IF3: [Neutrinos](#) (Andre deGouvea, Kevin Pitts, Kate Scholberg, Sam Zeller)
- IF4: [Baryon Number Violation](#) (K.S. Babu, Ed Kearns)
- IF5: [New Light, Weakly Coupled particles](#) (Rouven Essig, John Jaros, William Wester)
- IF6: [Nucleons, Nuclei and Atoms](#) (Krishna Kumar, Zheng-Tian Lu, Michael Ramsey-Musolf)





IF1: Quark Flavor Physics

IF2: Charged Leptons

IF3: Neutrinos

IF4: Baryon Number Violation

IF5: New Light, Weakly Coupled Particles

IF6: Nucleons, Nuclei and Atoms

Neutrino Subgroups

Nu1: Neutrino Oscillations and the Three-Flavor Paradigm

Nu2: The Nature of the Neutrino: Majorana vs. Dirac

Nu3: Absolute Neutrino Mass

Nu4: Neutrino Interactions

Nu5: Anomalies and New Physics

Nu6: Astrophysical and Cosmological Neutrinos

Nu7: Neutrinos and Society

Neutrino Subgroups

- **Nu1: Neutrino Oscillations and the Three-Flavor Paradigm**
subgroup conveners: Mary Bishai, Karsten Heeger, Patrick Huber
- **Nu2: The Nature of the Neutrino: Majorana vs. Dirac**
subgroup conveners: Steve Elliott, Lisa Kaufman
- **Nu3: Absolute Neutrino Mass**
subgroup conveners: Hamish Robertson, Ben Monreal
- **Nu4: Neutrino Interactions**
subgroup conveners: Jorge Morfin, Rex Tayloe
- **Nu5: Anomalies and New Physics**
subgroup conveners: Boris Kayser, Jon Link
- **Nu6: Astrophysical and Cosmological Neutrinos**
subgroup conveners: Kara Hoffman, Cecilia Lunardini, Nikolai Tolich
- **Nu7: Neutrinos and Society**
subgroup conveners: Jose Alonso, Adam Bernstein

Overlaps in physics & instrumentation

	Nu1: 3 flavor	Nu2: M vs D	Nu3: Abs. mass	Nu4: Xscns	Nu5: Anomal ies	Nu6: Astro/ cosmo	Nu7: Society
Nu1		☑	☑	☑	☑	☑	☑
Nu2	☑		☑		☑	☑	
Nu3	☑	☑			☑	☑	
Nu4	☑				☑	☑	☑
Nu5	☑	☑	☑	☑		☑	☑
Nu6	☑	☑	☑	☑	☑		
Nu7	☑			☑	☑		

CF overlaps with many neutrino topics!

**Astrophysical sources for ν oscillation, UHE ν 's, supernovae
 ν mass & families from cosmology, nucleosynthesis, large underground detectors,
 low background detectors... **neutrinos tell us about the sources & vice versa!****

Neutrino Subgroup Timeline & Deliverables for Snowmass

<http://www.snowmass2013.org/tiki-index.php?page=Neutrinos>

Output:

1. ~60-100 page writeup with section for each subgroup, written by subgroup conveners
(similar to 2012 IF document)
2. ~6-8 page summary in IF ~30 page document, written by neutrino conveners

83 one-page whitepapers received from community

Many opportunities for feedback from community:

- March 6: subgroup conveners will have draft outlines of their section of the neutrino working group document, informed by whitepapers
- March 6-7: [premeeting at SLAC](#), presentation of ideas and discussions
- March 31: first draft of neutrino working group document circulated to community for feedback
- April 1-24: first community comment period
- April 25-27: [Intensity Frontier Workshop at ANL](#), chance for feedback and discussion
- May 21: second draft of neutrino working group document circulated to community for feedback
- May 21-June 15: second community comment period
- July 1: third draft of document circulated to community for feedback

now

Neutrino Workshop Program: Wed & Thu

09:00	Plenary 1: Introduction; Snowmass Process and Agency Updates <i>Andre DeGouvea</i> Redwood A/B/C/D (Bldg 48, First Floor) RT 3840765 08:30 - 10:00			
10:00	Break Redwood Lobby, Kavli Lobby, Panofsky Lobby 10:00 - 10:30			
11:00	Plenary 2: Frontier Overviews <i>Sam Zeller</i> Redwood A/B/C/D (Bldg 48, First Floor) RT 3840765 10:30 - 12:00			
12:00	Lunch Harvest Cafe, etc. 12:00 - 13:00			
13:00	Parallel Session 1: Nu1: Introduction and Precision Measurements	Parallel Session 1: Nu6+Nu4: Cross Sections for Astrophysics	Parallel Session 1: Nu5: NSI and Sterile Neutrino Reviews Whitney (Bldg 40, Third Floor) RT 5785999	Parallel Session 1: Nu2: Neutrinoless Double Beta Decay Reviews Shasta (Bldg 40, Third Floor) RT 2608859
14:00	Break Redwood Lobby, Kavli Lobby, Panofsky Lobby 14:30 - 15:00			
15:00	Parallel Session 2: Nu1: Mass Hierarchy <i>Mary Bishai</i> Redwood C/D (Bldg 48, First Floor) RT 3840765	Parallel Session 2: Nu3: Absolute Neutrino Mass <i>Hamish Robe...</i> Whitney (Bldg 40, Third Floor) RT 5785999	Parallel Session 2: Nu7: Neutrinos and Society <i>Adam Bernst...</i> Shasta (Bldg 40, Third Floor) RT 2608859	Parallel Session 2: Nu6+CF: Astrophysical Neutrinos; same as CF6-A5 in CF meeting Madrone (Bldg 48, Second Floor) RT 1231322
16:00	Break			
17:00	Parallel Session 3: Nu1+Nu6: MH from Astrophysics; Underground Facilities Discussion			
18:00				

parallel talks will summarize whitepapers

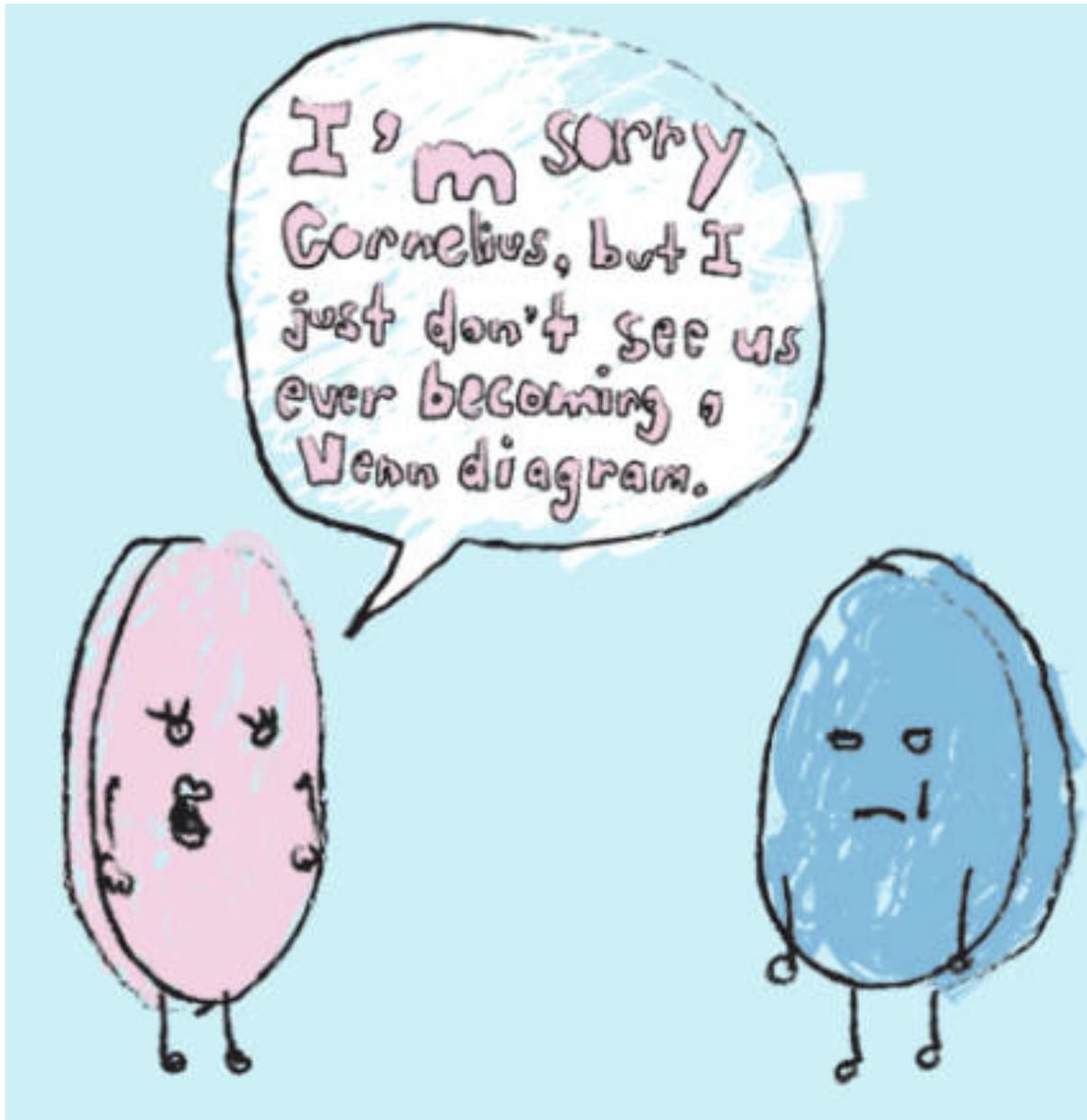
joint with CF

09:00	Parallel Session 4: Nu1: CP Violation and Massive Detectors <i>Redwood C/D (Bldg 48, First Floor) RT 3840765</i>	Parallel Session 4: Nu6+Nu5: Sterile Searches <i>Lassen (Bldg 40, Second Floor) RT 1785999</i>	Parallel Session 4: Nu4: Cross Sections <i>Jorge G. Mor...</i> <i>Shasta (Bldg 40, Third Floor) RT 5785999</i>	Parallel Session 4: Nu2: Neutrinoless Double Beta Decay Experiments <i>Whitney (Bldg 40, Third Floor) RT 2608859</i>
10:00	Break <i>Redwood Lobby, Kavli Lobby, Panofsky Lobby</i> 10:00 - 10:40			
11:00	Plenary Session 3: International and Broader Perspectives <i>Kate Scholberg</i> <i>Kavli Auditorium (Kavli First Floor) RT 3840765</i> 10:40 - 12:10			
12:00	Lunch (& conveners meeting) <i>Harvest Cafe, etc.</i> 12:10 - 13:10			
13:00	Parallel Session 5: Nu1+Nu4+Nu5: Decay-In-Flight Experiments, Cross Section-Related Issues <i>Rex Tayloe</i> <i>Kavli Auditorium (Kavli First Floor) RT 3840765</i>	Parallel Session 5: Nu6: Large Underground Detectors <i>Nikolai Tolich</i> <i>Cypress (Bldg 40, First Floor) RT 1785999</i>		
14:00	Break <i>Redwood Lobby, Kavli Lobby, Panofsky Lobby</i> 14:40 - 15:10			
15:00	Parallel Session 6: Nu1+Nu5+Nu7: New Experiments and Facilities	Parallel Session 6: Nu4: Cross Section Measurements <i>Cypress (Bldg 40, First Floor) RT 5785999</i>	Parallel Session 6: Young Snowmass <i>Jonathan Asa...</i> <i>Whitney (Bldg 40, Third Floor) RT 1785999</i>	Parallel Session 6: Nu2: Neutrinoless Double Beta Decay Discussion <i>Shasta (Bldg 40, Third Floor) RT 2608859</i>
16:00	Break <i>Redwood Lobby, Kavli Lobby, Panofsky Lobby</i> 16:40 - 17:00			

Please feel welcome to attend neutrino sessions, and give input at any point in the process

18:00

Let's avoid this...



Cross-talk between frontiers is essential!