

Snowmass BSM@ ν Workshop

Goals

- Highlight and advance opportunities for BSM searches at neutrino experiments in the context of the Snowmass community planning exercise
- The focus is on the activities of the NF03 topical group (Neutrinos and BSM) and the overlapping physics interests of NF01, NF02, NF03, RF06 and TFI I
- Provide status update, make progress, and finalize NF03 sub-topical group white papers, which will inform the NF03 final report

Organization

- Plenary sessions Thursday-Saturday focused on NF03 Sub-topical group reports, cross-frontier synergies and complementarity
- Parallel sessions (Friday) highlighting a variety of topics on neutrinos and BSM physics
- Working / Writing sessions on NF03 whitepapers to discuss remaining issues and work needed on the whitepapers, make progress on writing editing, craft executive summaries, ...

Thursday Program

Plenary

- NF03 Sub-topical group reports
- Discussion/Questions encouraged

Working/Writing Sessions

- **Note: Writing sessions will take place in breakout rooms within the plenary zoom room**

Breakout rooms

1. BSM with neutrino oscillations
2. Heavy neutral leptons
3. Baryon number violation
4. CEvNS
5. Cosmogenic Dark Matter and Exotic Particle Searches
6. Dark Sector Studies with Neutrino Beams

10:00	Welcome & Logistics	Brian Thomas Batell	10:00 - 10:05
	Workshop Overview	Jae Yu	10:05 - 10:25
	NF03 Subtopical Group Report 1 - BSM Searches with Neutrino Oscillations	Pilar Coloma	10:25 - 10:50
	NF03 Subtopical Group Report 2 - Heavy Neutral Leptons	Ian Shoemaker et al.	10:50 - 11:15
11:00	Break		11:15 - 11:35
	NF03 Subtopical Group Report 4 - CEvNS	Louis Strigari et al.	11:35 - 12:00
12:00	NF03 Subtopical Group Report 5 - Cosmogenic Dark Matter and Exotic Particle Searches	Yun-Tse Tsai et al.	12:00 - 12:25
	NF03 Subtopical Group Report 6 - Dark Sector Studies with Neutrino Beams	Brian Thomas Batell	12:25 - 12:50
	NF03 Subtopical Group Report 3 - Baryon Number Violation	Bhupal Dev et al.	12:50 - 13:15
13:00			

14:00	Working Group: Breakout for sub-topical group working sessions		
15:00			
16:00			
17:00	14:00 - 17:00		

Friday Program

Plenary

- Cross frontier overview
- Discussion

Parallel Sessions

Working/Writing Sessions

- **Note: Writing sessions will take place in breakout rooms within the plenary zoom room**

Writing Session Breakout rooms

1. BSM with neutrino oscillations
2. Heavy neutral leptons
3. Baryon number violation
4. CEvNS
5. Cosmogenic Dark Matter & Exotic Particle Searches
6. Dark Sector Studies with Neutrino Beams

10:00	NF01, NF02, RF06, TH11 and NF03 quick overview <i>Alexandre Sousa et al.</i>		
	10:00 - 10:50		
11:00	Discussion on covered topics and missing ones, prospects and strategy <i>Lisa Koerner</i>		
	10:50 - 11:25		
	Break 11:25 - 11:45		
	MicroBooNE's Low Energy Excess Search: First Results and Future Prospects	Tau Neutrino Identification at IceCube for Unitary Violation Tests <i>Dr Peter Denton</i>	Searches for Nonstandard Neutrino Oscillations at Nuclear Reactors <i>Jeffrey Berryman</i>
12:00	Searching for Beyond the Standard Model Physics with MicroBooNE <i>Ivan Lepetic</i>	BSM Oscillation Searches at the IceCube Neutrino Observatory <i>Grant Parker</i>	BSM Physics Potential of the PROSPECT-II Experiment <i>Pranava Teja</i>
	New Proton Beam Dump Experiments at Fermilab: PIP2-BD and SBN-BD <i>Jacob Zetlemoyer</i>	IceCube Sterile Neutrino Searches <i>Mr Benjamin Smithers</i>	Hidden Sector Searches With Low-Threshold Reactor-Based Neutrino Experiments
	Opportunity to study physics beyond standard neutrino oscillations at the upcoming accelerator based neutrino	Search for Quantum Gravity Using Astrophysical Neutrino Flavour with IceCube	Searching for Neutrinoless Double Beta Decay with Xenon-doped Liquid Argon TPCs
	BSM searches in LAr using MeV-scale reconstruction <i>Will Foreman</i>	Towards Probing the Diffuse Supernova Neutrino Background in All Flavors	Study of invisible neutrino decay at ESSnUSB <i>Dr Monojit Ghosh</i>
13:00	Decays of New-Physics Particles at the DUNE Near Detector(s) <i>Kevin James Kelly</i>	Model-Independent Search for sub-MeV Sterile Neutrinos with Superconducting Quantum Sensors	Improving CP Sensitivity with Muon Decay at Rest <i>Pedro Pasquini</i>

14:00	Working Group: Breakout for sub-topical group working sessions
15:00	
16:00	
17:00	

Saturday Program

Plenary

- Overview of nu-N interactions
- Summary and closing discussion

Working/Writing Sessions

- Further working group sessions depending on need / interest

10:00	Summary on nu-N Interactions Workshop in BSM@nu Context	Noemi Rocco et al.
		10:00 - 10:25
	Summary of the workshop	Prof. Jae Yu
		10:25 - 10:45
11:00	Closing discussions and further feedback from the community	Lisa Koerner et al.
		10:45 - 11:30
	Break	
		11:30 - 12:00
12:00	Working Group: Free form Breakout Sessions for subtopical white paper groups	
13:00		
14:00		
15:00	12:00 - 15:00	

Other Notes

- Zoom connection information for plenary/writing sessions and parallel sessions have been sent to all registered participants
- We will take a workshop photo at the end of the first session today (around 11:15am EST)
- Please remain professional, courteous, and welcoming to all participants, and follow the [Code of Conduct](#), available on indico page.

Acknowledgements and Thanks!

Program Committee

- Brian Batell, Pilar Coloma, Arnab Dasgupta, Peter Denton, André de Gouvêa, Lisa Koerner, Donna Naples, Mark Messier, Ian Shoemaker, Alex Sousa, Jaehoon Yu

Local Organizers

- Joni George, Gracie Gollinger, Donna Naples, Vittorio Paolone, Arnab Dasgupta, Keping Xie, Matt Low, Akshay Ghalsasi