

Welcome to Colorado State University!



Logistics

- ▶ Breakfast provided all three days
- ▶ Lunch provided [here](#) today and tomorrow
- ▶ Workshop dinner: Rio Grande Mexican Restaurant in downtown Fort Collins
- ▶ Need a lift somewhere? Ask me!
- ▶ More information:

<https://indico.cern.ch/event/1274349/page/29673-local-information>

Path to Dark Sector Discoveries

- ▶ What we want: maximize the physics reach of neutrino experiments by expanding into non-oscillation physics
- ▶ Dark sectors are a great target:
 - ▶ Near detectors: high intensity beam
 - ▶ Far detectors: large volume detectors
- ▶ See recent Snowmass whitepaper: [arXiv:2207.06898](https://arxiv.org/abs/2207.06898)
- ▶ Goal: What developments do we need to achieve a **broad** program of dark sector searches at current and upcoming experiments?

Necessary Developments

- ▶ Streamlined pipeline for event generation
(see PITT PACC Nu Tools workshop)
- ▶ Robust fast simulation and/or parameterized response
- ▶ Reconstruction for “exotic” topologies
- ▶ Simulation and storage across many models/benchmarks
- ▶ Accurate modeling of backgrounds
- ▶ Separation of signals from backgrounds
(kinematics, timing)
- ▶ Triggering of exotic topologies
- ▶ Preserve data for future new ideas

Looking Forward

- ▶ Focus on FNAL-based experiments: many new opportunities with TPC reconstruction
- ▶ Diverse set of participants across theory and experiment
- ▶ Understand status of dark sector searches on the theory and experiment side
- ▶ Understand status of FNAL facilities toward goals
- ▶ Foster discussions across different research interests
- ▶ Write document outlining some of our goals and findings, with a plan for going forward (Wednesday)

Thank you!

- ▶ Scientific organizers: Brian Batell, Michael Mooney, Ornella Palamara, Alex Sousa, Yun-Tse Tsai, Jaehoon Yu
- ▶ Local organizer: Biswajit Padhi
- ▶ Administrative Help: Christie Chapman
- ▶ Colorado State University and the Lori Student Center
- ▶ All of you!

Welcome to Colorado State University!
Let's have a great workshop!