



Santa Fe, New Mexico

April 2nd to 5th 2024





Welcome!

First Short-Baseline Experiment/Theory Workshop :

“Mini SBN-Theory workshop”

Took place fully virtually in December 2021, after the release of MicroBooNE's first results

<https://indico.ph.ed.ac.uk/event/107/>

Welcome everyone!

If this mini-workshop works well, we could do it more regularly

*Slide from Pedro opening talk



2nd Short-Baseline Experiment/Theory

- Reviewing status of the **short-baseline anomalies**, with a focus on new, non-standard (i.e non 3+1 oscillating sterile) approaches
- **Recent experimental results**, as well as discussions on modern **methods and techniques** capable of leveraging LArTPC capabilities
- Explore new, **broader BSM scenarios** that can be explored at short-baselines, complementary with wider experimental programs
- **Neutrino-nucleus interactions** physics that can be explored at short-baselines, in particular leveraging SBND's high-statistics

Organizing Committee

Bill Louis (local)

Mark Ross-Lonergan (local)

Pedro A. Machado

Ornella Palamara

Vishvas Pandey



2nd Short-Baseline Experiment/Theory

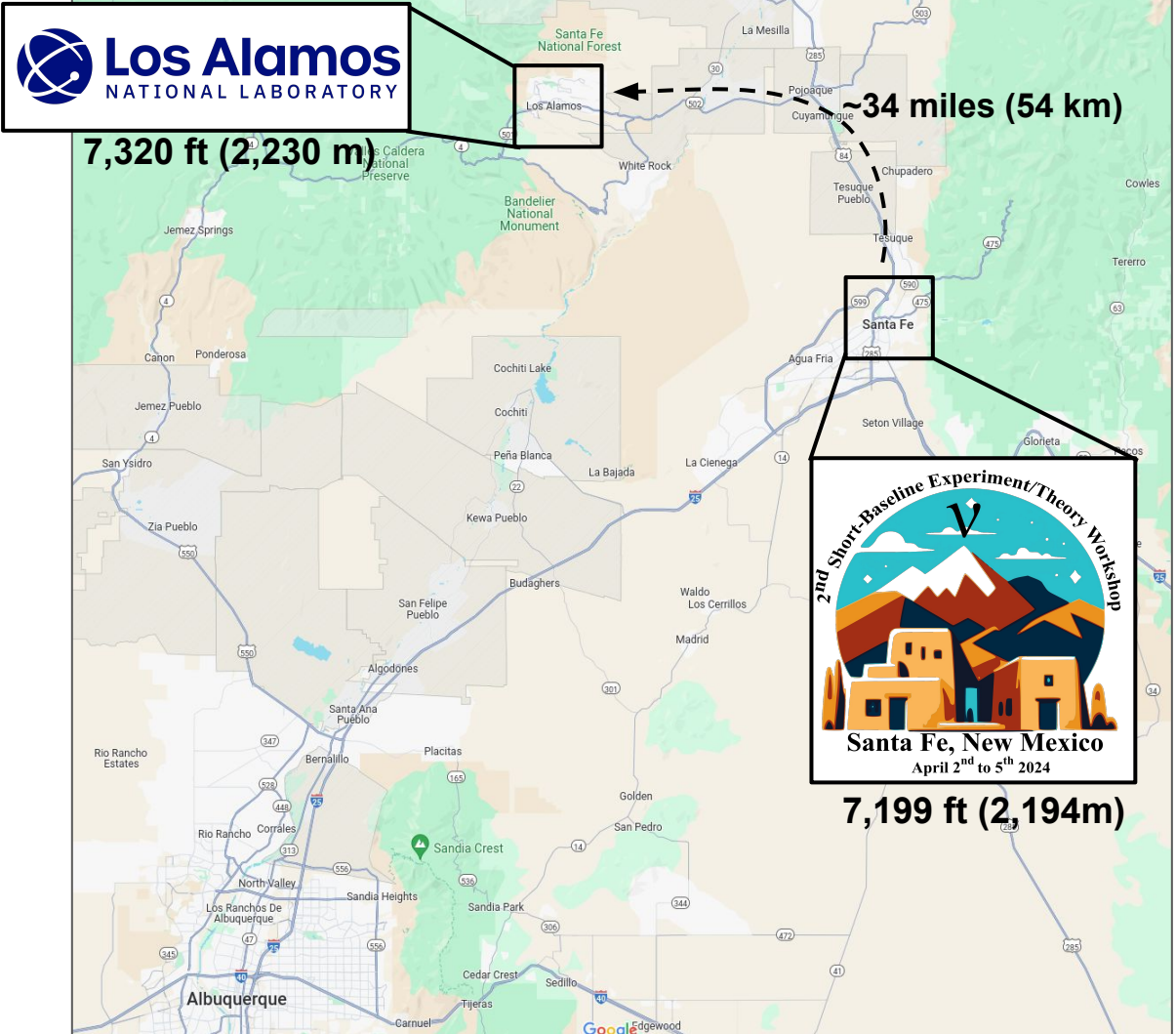
Aim is for a **friendly, informal** workshop that can connect **theory** \rightleftharpoons **experimental** short-baseline communities

Please (politely!) interrupt, ask questions and bring up any ideas, especially with your **theory/experimental** colleagues. No right or wrong questions!

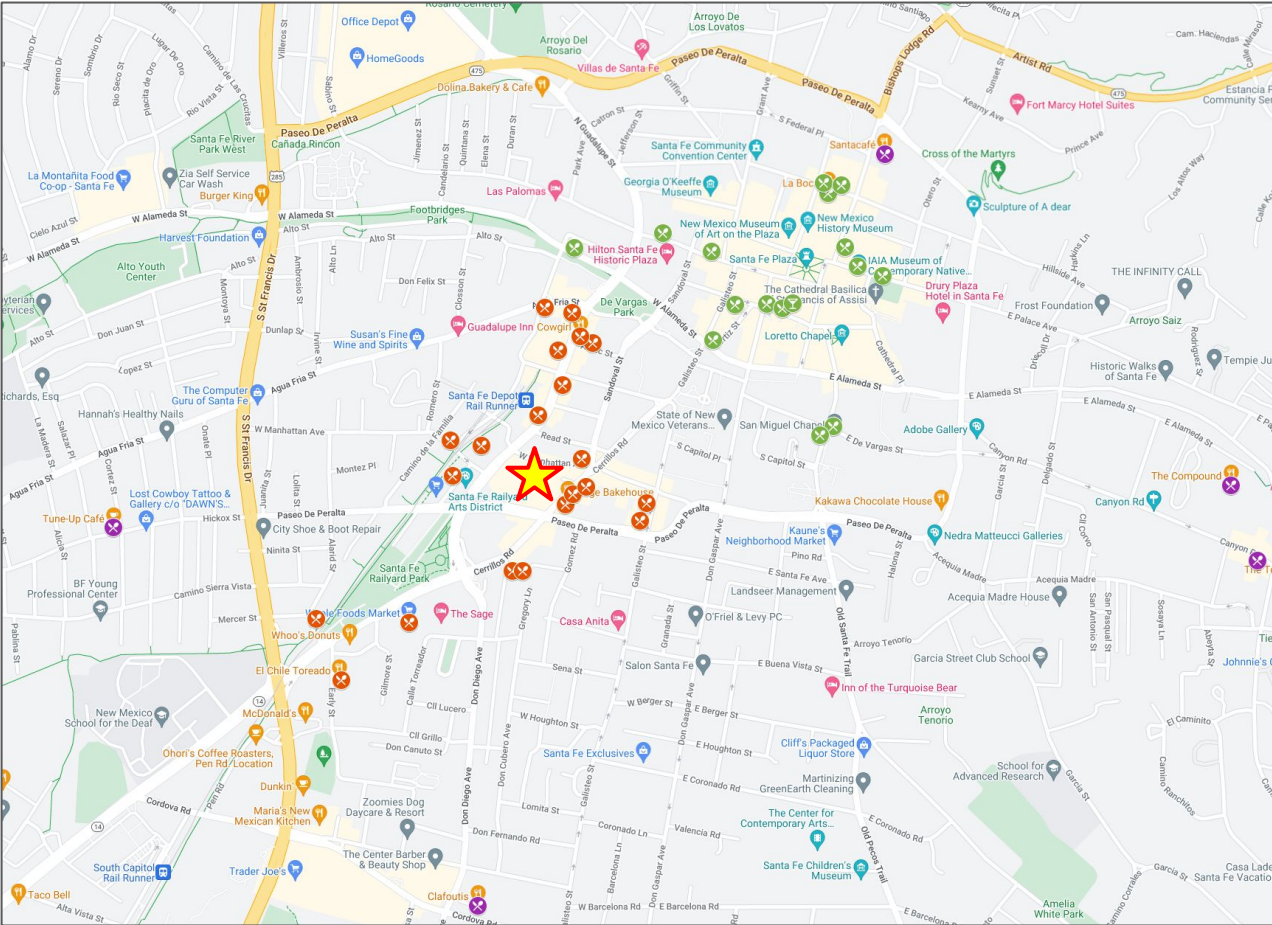
- If you have a **potential idea** for a search at short-baselines we want to sit down, see if it's feasible \rightarrow make it happen!
- If you are a student, or PI, looking for experimental **thesis analyses** topics at short-baseline experiments, we want you to leave this workshop with *options!*

We want to get the most, for all communities, out of our short-baseline program!

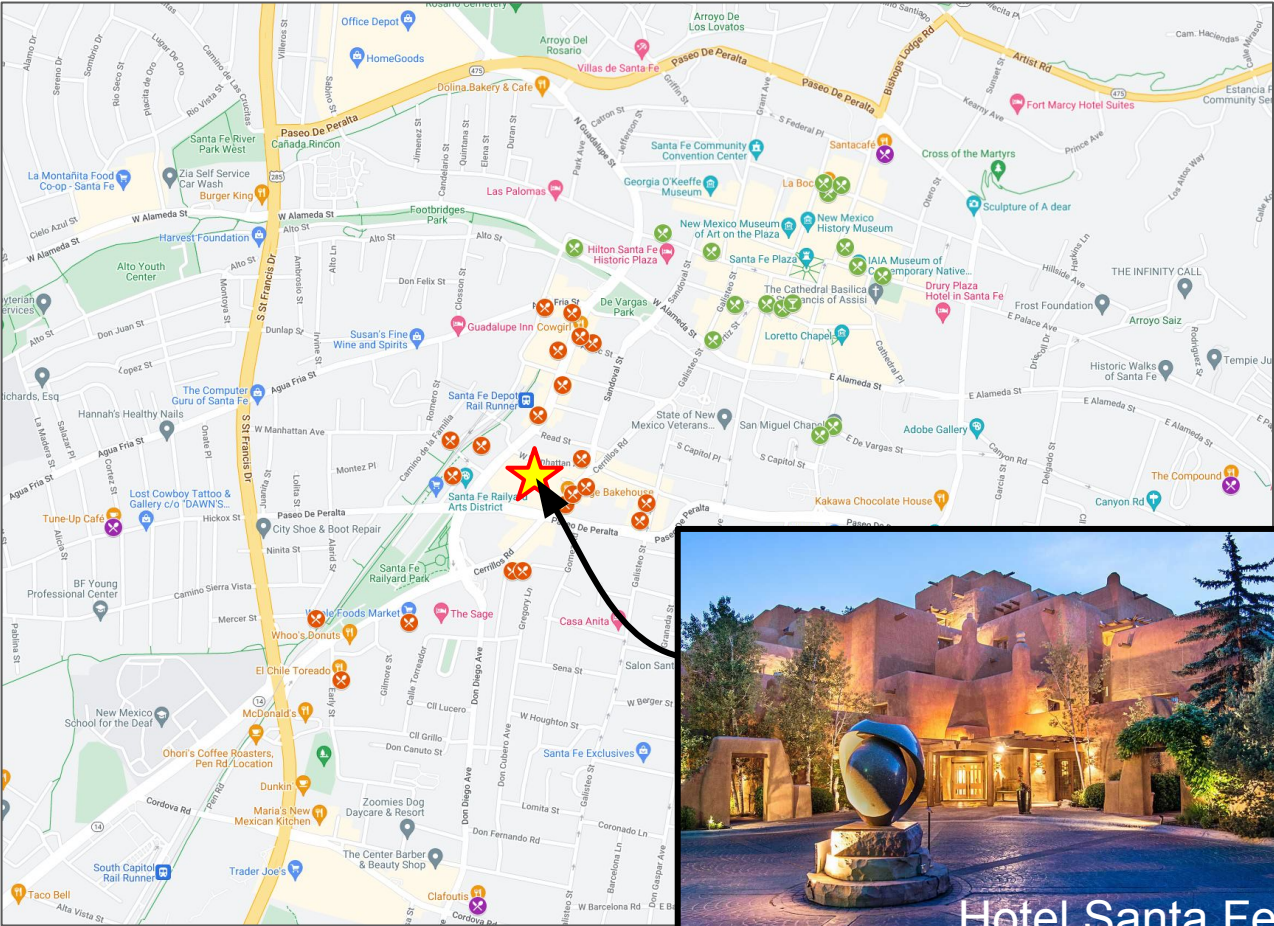
Local area



Local area



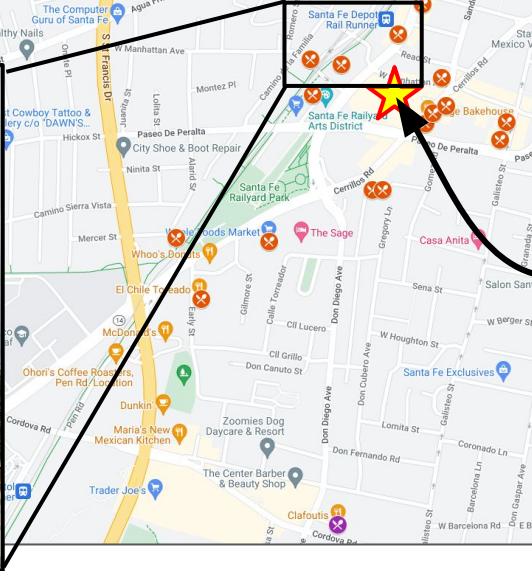
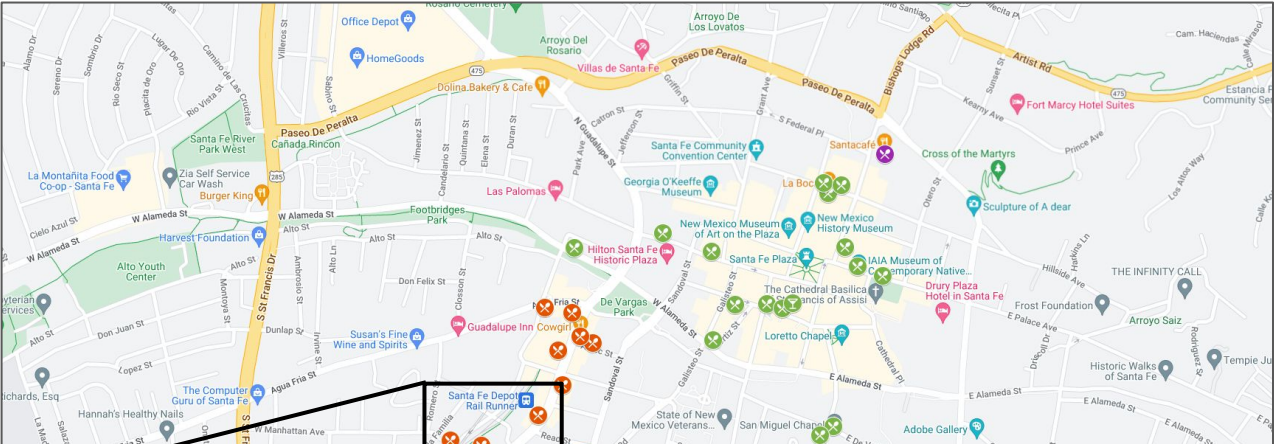
Local area



For those with cars, you are welcome to park in the hotel for duration of workshop

Hotel Santa Fe

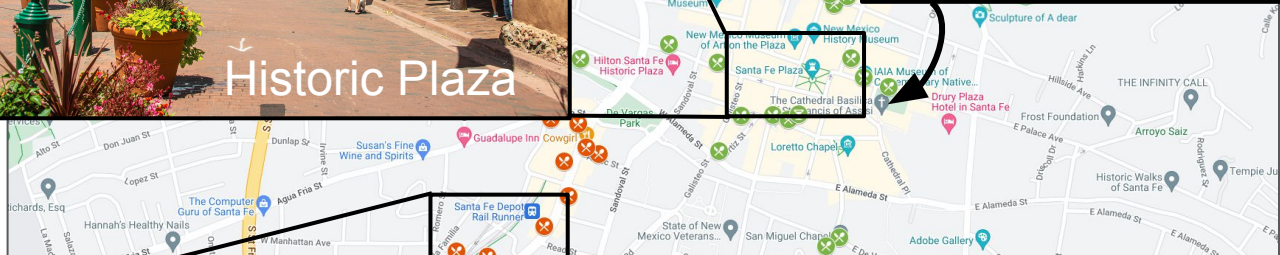
Local area



Local area



Historic Plaza



Hotel Santa Fe

Lunch/Dinners

Huge number of excellent restaurants, cafe and bars in Santa Fe

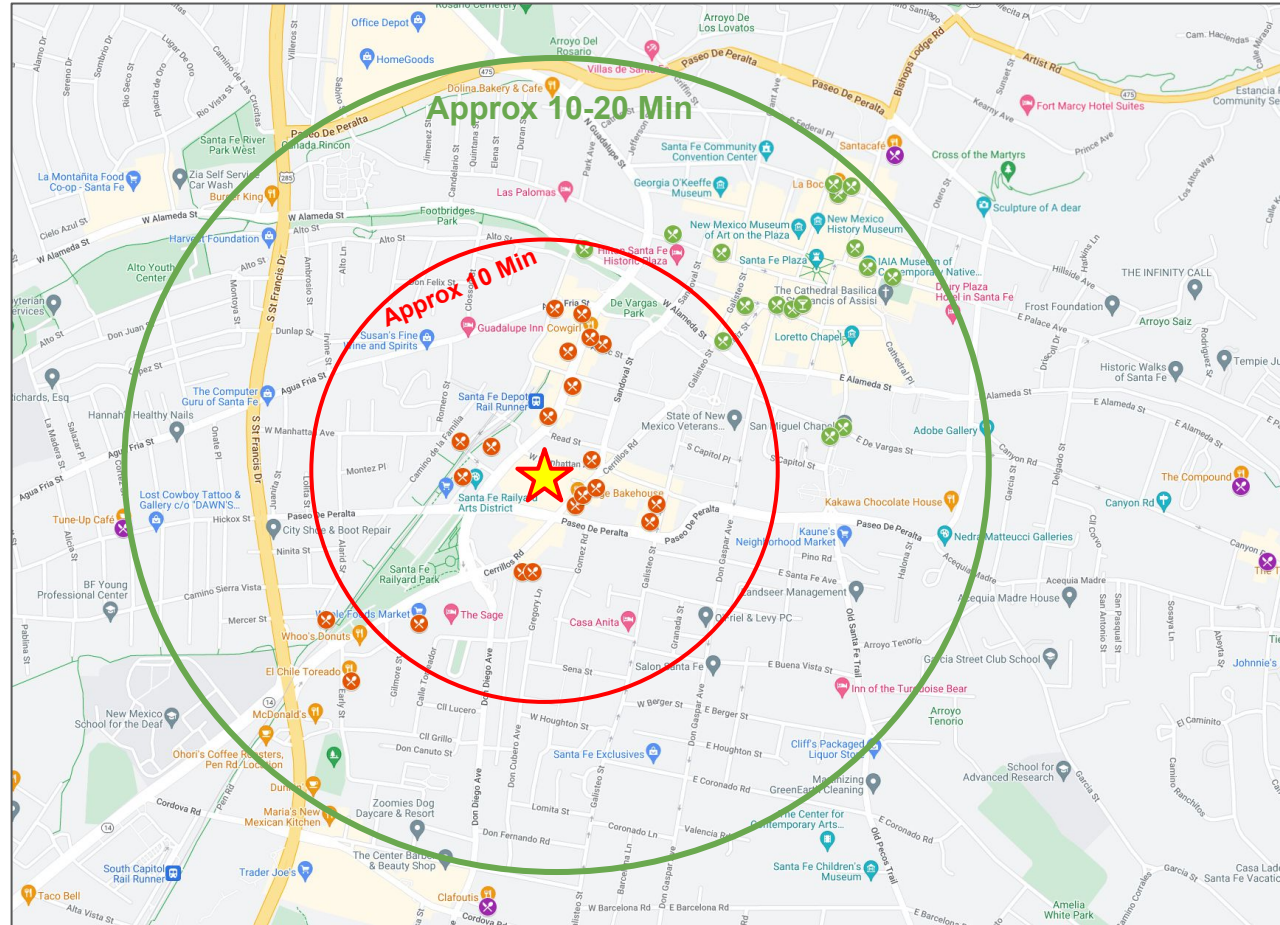
Link to Information:

<https://indico.nevis.columbia.edu/event/6/page/3-lunchdinner-suggestions>

Google Map of Suggestions:

<https://www.google.com/maps/d/viewer?mid=1s27w3lC1JvG-IUmlvEkqTudimvB3s&hl=en&usp=sharing>

Lunch breaks from **12:30 pm to 2pm** to allow ample time for wandering and discussion over lunch



Workshop Dinner, Thursday 4th @ 6:30pm



Santa Fe, New Mexico

April 2nd to 5th 2024



On Thursday 4th, 6:30pm we will be having a **workshop dinner** here at Hotel Santa Fe.

If you have dietary requirements and did not indicate them on the registration, or want to check/modify please let me know as soon as possible



Workshop Timetable

| | | |
|-------|--|---------------------------------------|
| 09:00 | Welcome Talk <i>Hotel Santa Fe, Santa Fe, NM</i> | Srinivas Iyer 09:00 - 09:15 |
| | General information <i>Hotel Santa Fe, Santa Fe, NM</i> | Mark Ross-Lonegan 09:15 - 09:30 |
| | IceCube Recent 3+1 results <i>Hotel Santa Fe, Santa Fe, NM</i> | Nick Kamp 09:30 - 10:00 |
| 10:00 | Coffee Break <i>Hotel Santa Fe, Santa Fe, NM</i> | 10:00 - 10:30 |
| | Thoughts on MiniBooNE <i>Hotel Santa Fe, Santa Fe, NM</i> | Richard Van de Water 10:30 - 11:00 |
| 11:00 | MicroBooNE Osc and LEE results <i>Hotel Santa Fe, Santa Fe, NM</i> | Eirin Yandel 11:00 - 11:30 |
| | Overview of global 3+1 scenario <i>Hotel Santa Fe, Santa Fe, NM</i> | Carlos Argüelles 11:30 - 12:00 |
| 12:00 | Beyond the standard model interaction generators <i>Hotel Santa Fe, Santa Fe, NM</i> | Will Jay 12:00 - 12:30 |
| 13:00 | Lunch Break | |
| 14:00 | <i>Hotel Santa Fe, Santa Fe, NM</i> | 12:30 - 14:30 |
| | A Bird's-Eye View of New Physics and the MiniBooNE Anomaly <i>Hotel Santa Fe, Santa Fe, NM</i> | Adrian Thompson 14:30 - 15:00 |
| 15:00 | EFT approach to neutrino-nucleus interactions <i>Hotel Santa Fe, Santa Fe, NM</i> | Zahra Tabrizi 15:00 - 15:30 |
| | Coffee Break <i>Hotel Santa Fe, Santa Fe, NM</i> | 15:30 - 16:00 |
| 16:00 | SBND cross-section measurements <i>Hotel Santa Fe, Santa Fe, NM</i> | Henry Lay 16:00 - 16:30 |
| | MicroBooNE Cross-Section results <i>Hotel Santa Fe, Santa Fe, NM</i> | Lee Hagaman 16:30 - 17:00 |
| 17:00 | Discussion Time | |
| 18:00 | <i>Hotel Santa Fe, Santa Fe, NM</i> | 17:00 - 18:00 |

Starts at 9am each day

Two Coffee breaks w/ snacks

Morning: 10:00am→10:30am

Afternoon: 3:30pm→4:00pm

Lunch from 12:30 to 2:00pm

**(Except today Tue 2nd until 2:30pm)*

Day ends with dedicated discussion session at 5:00pm
generally themed by proceeding talks

- *Tue: Cross-Sections*
- *Wed: BSM Physics*
- *Thu: LArTPC Technology*

Zoom details and talks



Workshop will be hosted on zoom

<https://fnal.zoom.us/j/99316433722?pwd=QnBxRFVOKzNhUnZ5bVpidHhMN3AvZz09>

Meeting ID: 993 1643 3722

Passcode: nu@santafe

Numeric Passcode: 6903885035

Hotel wifi should be available for all:

WifiName: HotelSF-FreeWifi

Password: amaya1501

- Speakers can use **this central laptop** to project and share slides or can **connect to zoom and share on their own personal laptop**
- If using central laptop, please **email me** (markrosslonergan@lanl.gov) **your slides** well before the start of your session!
 - Regardless, please email slides if you are happy for them to be included on indico website



Los Alamos
NATIONAL LABORATORY



U.S. DEPARTMENT OF
ENERGY

Office of Science

Huge thanks for all the support that allowed this workshop to take place