

Fermilab Community Advisory Board November 18, 2021 meeting

Members attending: Chris Faber, Carrie Garstecki, Leah Goodman, Sydney Jordan, Denis Kania, Dean Kilburg, Crystal Porter, Ray Stachowiak, Alexandra Tsang

Fermilab/DOE personnel attending: Jacquie Bucher, Tracy Marc, Alison Markovitz, Kim Mazur, Chris Mossey, Becky Thompson, Rick Verhaagen

Welcome and Introductions

Rebecca Thompson

News from the Lab

Tracy Marc

Presentation and links to communication highlights are linked in the agenda.

Tracy answered questions about how the lab drives traffic to the website, with one example being the monthly Fermilab Frontiers newsletter that contains articles with links to provide continuity. Fermilab has a strong social media presence with Twitter being the main focus. It was noted CAB members could share on social media.

LBNF/DUNE Update

Chris Mossey

Presentation is linked in the agenda.

LBNF is the facility, DUNE the experiment and PIP-II the upgrade to the linear accelerator

Q – It seems that there are a lot of people on-site, how do you deal with things like air quality underground?

A – The excavation contractor has 120 people, contractor that provides construction support and inspections has another 30 people, our team is 25 people and there are another 30 that work for SURF and operate the shaft and do maintenance and repairs.

There are many complicated issues with air quality and a lot of time was spent working on understanding these issues, and designing the whole infrastructure for the need to provide sufficient ventilation. The work included modeling of how air gets drawn underground, flows through and exits so that air quality is safe, how it can support construction, and how it will support when detectors are operating and that the heat they generate must be removed. It is all about safety and no one is exposed to any hazard. There is a safety team that oversees the contractor that provides monitoring and management of the various parameters we are measuring to ensure that the workers are safe.

Q - As a young girl I was familiar with the Sudan mines and this is so much larger and complex.

A - It is a big effort and has taken a lot of work to have the foundation to do what we are doing now. It is exciting to be excavating these caverns.

One of the questions usually asked is as you are digging up 800,000 tons of rock in an old gold mine, is there any gold? The answer is no. This whole formation is called the poorman formation and they really did a lot of work, even 100 years ago, to understand where the gold was and they didn't find any in this area. We like it because it is solid rock and great for physics.

Q – Do I understand this right? This beam will be created in Batavia near Kirk Road and be sent underground through Planet Earth and there will be massive detectors, greatest conglomeration ever put together, to attempt to detect neutrinos.

A - That's correct. It is hard to detect neutrinos as they tend to pass through matter without interaction. If you created a wall made of lead, a light year thick (which is inconceivably thick!) and aimed a neutrino at it, there is a 50/50 chance it would just come out the other side without any interaction. That is why the detectors have to be so large and use liquid argon, which is very dense and has other favorable properties. We are also sending a tremendous number of neutrinos. We might get a dozen interactions a day and because interactions are so rare, statistics must be collected for years.

There are various neutrino experiments around the world but this one of the world's most ambitious experiments to detect neutrinos. The technology we're using can get super fine "photos" of what is going on in each interaction, and the size of the detectors and the intensity of the beam is much more than is happening elsewhere in the world.

Membership Discussion

Rebecca Thompson

The group discussed CAB membership and member recruitment. Based on CAB comments, Fermilab staff will put together a membership plan for the CAB.

Upcoming Events

Rebecca Thompson

Presentation is linked in the agenda.

What the lab should know

All

Denis Kania announced his resignation from CAB. The CAB and Fermilab learned so much from him and his passion for the lab and all its beauty is infectious. Denis has been a wonderful

and engaged CAB member and Fermilab EPE will definitely be asking him to be part of the Open House so he should expect that email!

Rick Verhaagen, Fermilab Site Office Manager, indicated that he appreciates all of the interest and work of the members of the CAB. The support of local community is really remarkable to him and he appreciates the relationship with the community. Thanks to Denis for the work he has done