



Steve Brice

Fermilab

Sustainable HEP Workshop

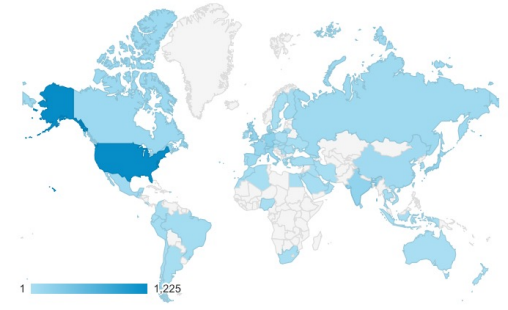
28-30 June, 2021

A Little About this Conference Series

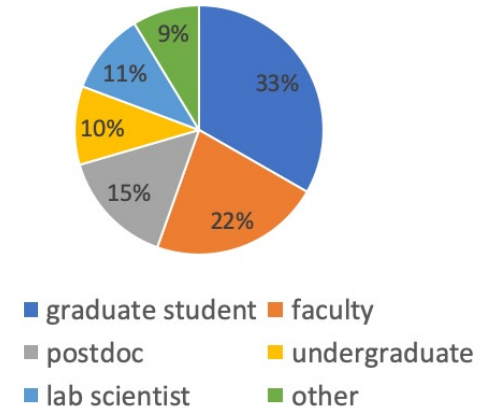
- The Neutrino conference is the largest in neutrino physics. It is an international conference. Typically ~600-900 people attend.
- Conference has been hosted around the world every other year since 1972.
- Neutrino 2020 was planned to be held in downtown Chicago, but in March 2020 we had to re-plan it in 3 months as an entirely online conference due to COVID-19.
 - Co-Chairs: Steve Brice (FNAL), Marvin Marshak (University of Minnesota), Sam Zeller (FNAL)
 - Team included 11 people on the LOC + 5 session chairs + excellent support from Fermilab

Year	Location	Conference Link
2024	Milano, Italy	
2022	Seoul, South Korea	https://sites.google.com/wizmic.com/nu2022
2020	Chicago, USA	http://nu2020.fnal.gov
2018	Heidelberg, Germany	http://www.mpi-hd.mpg.de/nu2018/
2016	London, UK	http://neutrino2016.iopconfs.org
2014	Boston, USA	http://neutrino2014.bu.edu
2012	Kyoto, Japan	http://neu2012.kek.jp
2010	Athens, Greece	http://indico.cern.ch/event/73981/overview
2008	Christchurch, New Zealand	http://www.slac.stanford.edu/econf/C0805263
2006	Santa Fe, USA	http://ss.fnal.gov/conf/C0606131
2004	Paris, France	http://ss.fnal.gov/conf/C0406141
2002	Munich, Germany	http://www.mpi-hd.mpg.de/nu2002/
2000	Sudbury, Canada	http://nu2000.sno.laurentian.ca
1998	Takayama, Japan	http://www-sk.icrr.u-tokyo.ac.jp/nu98/
1996	Helsinki, Finland	
1994	Eilat, Israel	
1992	Granada, Spain	
1990	Geneva, Switzerland	
1988	Boston, USA	
1986	Sendai, Japan	
1984	Dortmund, West Germany	
1982	Balaton, Hungary	
1981	Wailea, USA	
1980	Erice, Italy	
1979	Bergen, Norway	
1978	Lafayette, USA	
1977	Eilbrus, USSR	
1976	Aachen, West Germany	
1975	Balaton, Hungary	
1974	Philadelphia, USA	
1972	Balaton, Hungary	

- Many records set by this conference:
 - 4,350 registrants from 67 countries
 - participation from all 7 continents (including the South Pole)
 - ~60% of attendees were students and postdocs
 - 5,800 YouTube views of posters
 - 23,078 communications on Slack
 - 62,000 visits to our website to view recorded talks
- Neutrino 2020 had a far reach & allowed people to attend who might otherwise have been unable



participants connected from 67 countries



The Conference Itself



- Neutrino 2020 was held as an entirely online conference June 22 - July 2, 2020.
- Format included several components:
 - **Plenary talks** (Monday-Thursday, 4 days/week for 2 weeks, 1/2 days, 7:00-11:30 CDT)
 - broadcast via **ZOOM webinar** with Q&A
 - **Poster sessions**
 - both via a **web portal** and VR
 - **Virtual Reality (VR) platform**
 - **Slack** for conference interactions
 - **Advertised talks in real time on Twitter**
 - **Physics Slam** for public outreach

conference website: <http://nu2020.fnal.gov>

NEUTRINO 2020

Addressing Neutrino-Oscillation Physics

$$P_{\nu_\mu \rightarrow \nu_e}(E, L) \sim \sin^2 2\theta \sin^2 \left(\frac{\Delta m^2 L}{4E} \right) \rightarrow \Phi_e(E, L) / \Phi_\mu(E, 0)$$

Detectors measure the neutrino interaction rate:

$$N_e(E_{\text{rec}}, L) \propto \sum_i \Phi_e(E, L) \sigma_i(E) M_{\text{rec}}(E, E_{\text{rec}}) dE$$

Reconstructed ν energy Cross Section Smearing matrix

A quantitative knowledge of $\sigma(E)$ and $f_{\text{th}}(E)$ is crucial to precisely extract ν oscillation parameters

Speaker: Noemi Rocco, Argonne National Laboratory and Fermilab
Title: Historical Review and Future Program for neutrino cross section measurements and calculations
Session: Neutrino Interactions: 1
Date: June 23, 2020

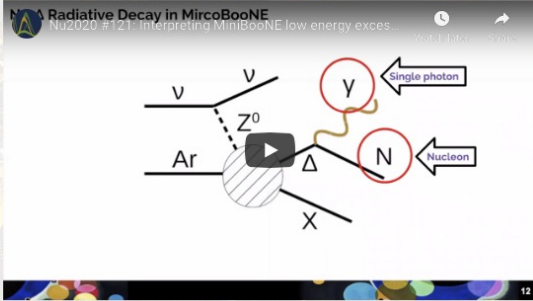
- **79 talks** given by neutrino physicists from around the globe from their homes
- broadcast live every morning
- talks were recorded live (with permission) and posted daily

- Having an opportunity to present a poster on your research at a conference like this is really important for young scientists
- Many included a 2 minute summary video (this was optional); we encouraged creativity
- Web portal: <https://nu2020.fnal.gov>
- 532 posters (this was also a record)
- 5,800 YouTube views of posters

Poster #121
(Poster is in session #1)

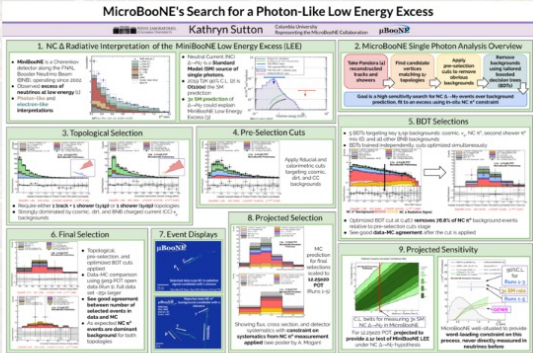
MicroBooNE's Search for a Photon-Like Low Energy Excess

Kathryn Sutton
for MicroBooNE



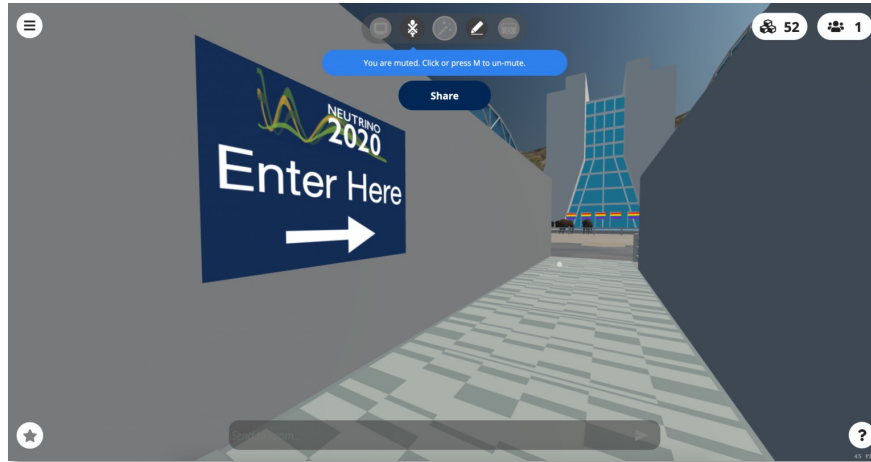
Interpreting MiniBooNE low energy excess using neutral current delta radiative decays in MicroBooNE

FULL ABSTRACT



MicroBooNE's Search for a Photon-Like Low Energy Excess
Kathryn Sutton
1. NC Δ Radiative Interpretation of the MiniBooNE Low Energy Excess (LEE)
2. MicroBooNE Single Photon Analysis Overview
3. Topological Selection
4. Pre-Selection Cuts
5. BDT Selections
6. Final Selection
7. Event Displays
8. Projected Selection
9. Projected Sensitivity

- Developed an innovative way to interact, through a Virtual Reality (VR) platform
 - *532 early career scientists presented posters*



3,409 conference attendees visited the VR platform



- A single postdoc, Marco Del Tutto, designed, built, and ran the VR
- **Mozilla Hubs** provided the open source software & support
- Very popular, overwhelmingly positive feedback

- VR was used for live poster sessions at set times during the conference. Posters displayed in multiple rooms. We ended up keeping the VR live throughout.



- Participants could customize avatars.
- Visitors were able to move within & between rooms. When a person approached another person's avatar, people could speak and hear each others voices.

- Registration was free and handled via **Indico**.
- We required registrants to agree to the Code of Conduct. You could not register for the conference or receive connection details without doing so.
- We setup an **online reporting system**.
- Reports of violations of the conference Code of Conduct could be made anonymously.

Code of Conduct and Reporting

Just as with an in-person conference, participants of the online Neutrino 2020 conference will conduct themselves in a professional manner that is welcoming to all and free from any form of discrimination, harassment, bullying, or retaliation. Participants will treat each other with respect and consideration to create a collegial, inclusive, and professional environment. Participants will avoid any inappropriate actions or statements based on individual characteristics of any kind. Disruptive behavior or harassment of any kind will not be tolerated. Harassment includes but is not limited to inappropriate or intimidating behavior or language, unwelcome jokes or comments, unwanted attention, and stalking. Participants will abide by this code in all virtual and professional activities associated with the conference. In addition, participants in the online conference will also be required to share their full identity (first and last names) in all online platforms and virtual environments connected to the conference. Sanctions for violations of this code may range from verbal warning, to ejection from the online conference, to notifying appropriate authorities, at the discretion of the organizers.

If you have witnessed or experienced a violation of this Code of Conduct, you can submit an [online report](#). Reports can be sent anonymously. Such reports will be viewable only by the Neutrino 2020 conference Co-Chairs: Steve Brice, Marvin Marshak, and Sam Zeller. You are also welcome to send a direct email to any or all of the three Co-Chairs.

[FILE AN ONLINE REPORT](#)

Inclusivity at an Online Conference

- Online conferences are an opportunity to be more inclusive

Bernadette Cogswell on the Neutrino 2020 slack

(reproduced with permission. Full, unedited text in the backup slides)

I'd just like to add my voice to the conversation and share, as an American black woman neutrino theorist, why I find a virtual platform makes me feel included in our community.

... this virtual conference is one of the first times in my physics career that I have even felt comfortable talking because it's virtual. For me it has never yet been comfortable going to lunch/coffee/dinner/drinks to discuss physics in conference groups. Someone might feel they can offer me "helpful advice" on my place in physics. And yes, for me it has been disquieting being the only female of color in the room in many situations. It can be so mentally disruptive it makes it hard to participate.

So, yes, I think it might be useful for us to think about ways that can include people who are passionate about physics, regardless of their background, and to ensure all of us feel like "it's our place" to be able to join in the discussion. So we not only get all of us passionate people in, but we keep us in.

...

This conference has been so much fun for me. I've felt free to participate by chatting more than I ever have in a previous conference and by drinking in all the lovely neutrino physics our community has been pursuing. Because it's been virtual, it's the first time I've ever "sat" in a room full of physicists and felt like I was in the right place.

...

What Worked Well: Before the Conference



- We organized dress **rehearsals**. We rehearsed the conference with our local organizing committee and session chairs in the time leading up to the conference with “fake” talks.
 - *This was very important in gaining experience with the webinar & working together as a team*
- We assigned explicit roles to each member of the local organizing committee. The roles each had written **job descriptions**. This included the following assignments:
 - *Webinar host (**checklist**)*
 - *Speaker assistance*
 - *Talk recording and posting*
 - *Session chairing*
 - *Q&A handling*
 - *Poster assistance*
 - *VR assistance*
 - *Slack on-boarding and monitoring*
 - *Email list monitoring*
 - *Social media posting*
 - *ZOOM webinar tech support*
- We also tried to anticipate problems and created a **trouble-shooting guide**. If this happens, this is who and how we should respond (*for ex., what if a speaker does not show up, etc.*)

What Worked Well: Before the Conference



- We consulted a very helpful 30+ page guide on “*Virtual Conferences: A Guide to Best Practices*” that was published by the ACM Presidential Task Force (2020).
 - https://people.clarkson.edu/~jmatthew/acm/VirtualConferences_GuideToBestPractices_CURRENT.pdf
- We scheduled **rehearsal sessions for speakers** in the weeks leading up to the conference so that speakers could practice sharing their slides, audio, and video.
- We provided **audio recordings of presenters saying their names** to our session chairs. Session chairs really appreciated this.
- We provided **speakers instruction** including a checklist and ZOOM tips.
 - <https://conferences.fnal.gov/nu2020/wp-content/uploads/2020/08/Nu2020-speaker-instructions.pdf>
 - *We spent quite a bit of time on this after pulling together content from a variety of places.*
 - *We have shared this document (link above) which you might also find useful.*

- We set up a ½ hour **practice session before the conference each day** in case speakers wanted to do a last minute check of their setup.
- We set up **multiple ways for participants to communicate with the organizers** (email, Slack channel, in the VR) so as to be able to ask direct questions of the conference team.
- We also posted a **FAQ page** for conference participants that was updated daily.
 - <https://conferences.fnal.gov/nu2020/faqs/>
- We held a **regrouping session for the local organizing team** over ZOOM at the end of each day of the conference so we could discuss (and solve) any issues that came up.

- We allowed people to register during the conference. Many people registered while the conference was going on and expected an immediate response (*e.g., I registered this morning, why haven't I received connection details yet*). This was an unanticipated large task that, in future, we would have assigned in advance.
- We attempted to partially address the timezone problem by insisting slides be put online 24 hours before each talk and soliciting questions over slack from people unable for timezone reasons to attend the live talk. This capability was not used much.
- Attempted to pay close attention to the timezones of our speakers and schedule timeslots accordingly. Did not always work. (*Beware of scheduling talks that need to be given back-to-back where the two speakers are on opposite sides of the globe!*)

- Neutrino 2020 was hosted as an entirely online conference last summer (June 22-July 2, 2020)
- This virtual conference was put together by a small team (~15 people) in 2.5 months
 - *ZOOM webinar + Slack + poster web portal + Virtual Reality*
 - *The Virtual Reality was especially popular*
- We were pleasantly surprised by the turnout & how well it went
- Record attendance for this conference series
 - *4,350 people from 67 countries and all 7 continents (in-person attendance is typically ~600-900 people)*
 - *60% of participants were students and postdocs*
- Allowed people to attend who might otherwise have been unable to
- While there are aspects of an in-person conference that can not be replicated virtually, **this increased inclusivity and accessibility is important to maintain moving forward**
- Read more: <https://www.symmetrymagazine.org/article/more-than-3000-scientists-gather-online-for-neutrino-2020>
<https://cerncourier.com/a/neutrino-2020-zooms-into-virtual-reality/> (CERN Courier, July 23, 2020)

Backups





- VR also included social gathering rooms and portals for sight-seeing at Fermilab and in Chicago.



Archiving Content

- We did not have proceedings.
- All of the conference content was archived on our Neutrino 2020 conference website.
- With help from Fermilab, we archived all talks, recordings (with speaker permission), and posters on **Zenodo**.

zenodo Search Upload Communities

Log in Sign up

Neutrino 2020 - Virtual Meeting (talks)

Recent uploads

Search Neutrino 2020 - Virtual Meeting (talks) View

June 24, 2020 (v2) Presentation Open Access View

Warm dark matter and sterile neutrinos
Kevork Abazajian;
Plenary Talk from Neutrino 2020
Uploaded on October 30, 2020
1 more version(s) exist for this record

June 24, 2020 (v2) Presentation Open Access View

BSM Searches in Neutrino Experiments
Sanjib Kumar Agarwalla;
Plenary Talk from Neutrino 2020
Uploaded on October 30, 2020
1 more version(s) exist for this record

June 25, 2020 (v2) Presentation Open Access View

Antineutrino Monitoring of Reactors for Nuclear Nonproliferation
Tomí Akindele;
Plenary Talk from Neutrino 2020
Uploaded on October 30, 2020
1 more version(s) exist for this record

Inclusivity at an Online Conference

Piece by Bernadette Cogswell on the Neutrino 2020 slack (reproduced with permission)

I'd just like to add my voice to the conversation and share, as an American black woman neutrino theorist, why I find a virtual platform makes me feel included in our community.

My personal experiences have been less than favorable in continuing on in physics.

At a young age, I was made to feel like I didn't know my place by wanting to pursue physics. At a bit older age, I was told I would never discover anything new in physics. Later on I was told, after I had already earned my Ph.D., that I would need to go back to graduate school in physics to be qualified for a job in physics. And at an even later stage, I was told I needed to be more "vanilla" to get along in my career in physics.

Now, I don't know what experiences others have had, and I can't speak for others. But I know how these experiences made me feel. I have left physics and comeback to physics three times as a result of many of these interactions.

But this virtual conference is one of the first times in my physics career that I have even felt comfortable talking because it's virtual. For me it has never yet been comfortable going to lunch/coffee/dinner/drinks to discuss physics in conference groups. Someone might feel they can offer me "helpful advice" on my place in physics. And yes, for me it has been disquieting being the only female of color in the room in many situations. It can be so mentally disruptive it makes it hard to participate.

So, yes, I think it might be useful for us to think about ways that can include people who are passionate about physics, regardless of their background, and to ensure all of us feel like "it's our place" to be able to join in the discussion. So we not only get all of us passionate people in, but we keep us in.

(On a lighter note, of course I'm also a vegan so going out for food in work groups is hard, no one likes a spoil sport who makes picking a restaurant hard.)

But in all seriousness, I've realized over the years that people can't be aware of my experiences unless I share them.

This conference has been so much fun for me. I've felt free to participate by chatting more than I ever have in a previous conference and by drinking in all the lovely neutrino physics our community has been pursuing. Because it's been virtual, it's the first time I've ever "sat" in a room full of physicists and felt like I was in the right place.

Throughout my career I have kept all my experiences to myself as I have not known how to share them or make constructive use of them. But I think the time has come to contribute to the conversation that I've seen so many of me fellow neutrino physicists be brave enough to start.

Thank You!



Peter B Denton @jazzwhiz · 22h
Holy hell, @nu2020_chicago has people signing in from SEVEN continents!



Dr. Zara Bagdasarian @ZaraBa... · 23h
Thanks again to the organizers @nu2020_chicago for an amazing job 🙌🙌🙌 all speakers for well-prepared talks, all the effort put into posters and poster videos, and of course, participants for the fun interesting discussions on twitter, slack, and VR #Neutrino2020 #Nu2020



Andrew Santos @PhysicsAndrew · 18h
A friend of mine (not in physics) told me that all my (overly) excited posting about #Neutrino2020 has compelled him to learn about neutrinos. I have peaked



Kevin J. Kelly
@kjkelly_physics

As a #neutrino community, we were fortunate enough to have the biannual @nu2020_chicago conference held completely online a few weeks ago. Many thanks to the conference organizers for providing a great experience and a venue for many wonderful talks.

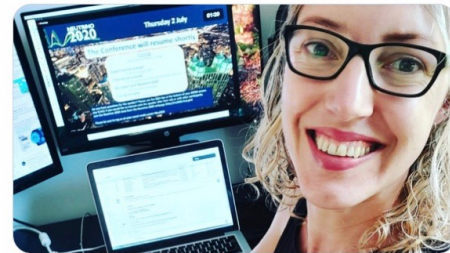
9:28 AM · 7/20/20 · Twitter Web App



Kareem Farrag @kareemfarrag · 22h
Thanks @nu2020_chicago organisers for such an excellent and extraordinary conference, this was such an legendary conference with many exciting talks and results, looking forward to the next one! Thanks @KingsEPAP! Hope all #Neutrino2020 participants take a well deserved break!



Dr. Claire Lee 🇷🇺 🇬🇧 in 🇫🇷 @Cl... · 23h
It's after 5pm here in France so champagne is allowed 😊 Ready for the closing plenaries, and saying a huge congratulations and cheers to the @nu2020_chicago team for a superb conference! #Nu2020 #Neutrino2020



Justin Vasel @justinvasel · 23h
And that's a wrap for #Neutrino2020! 🎉🎉

Thank you to the organizers for a producing a wonderful conference under such stressful conditions!

I hope everyone has safe travels to the other side of their houses 😊