

NuSTEC Outreach Working Group Report



Teppei Katori (King's College London)

Vishvas Pandey (Fermilab)

Outreach Working Group

Conveners: [Teppei Katori](#) and [Vishvas Pandey](#)

Members: [Afroditi Papadopoulou](#)

The outreach group focuses on enhancing NuSTEC's and community-wide neutrino interaction physics activities' outreach to and engagement with the broader neutrino and scientific community as well as with science enthusiasts.

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• [Listserv: NuSTEC-News](#)

(Subscriber ~ 550)

- [Advertise nuxsec workshops/schools](#)

- [Advertise NuSTEC WG activities](#)

- [Recent results \(have decreased\)](#)

[NUSTEC-NEWS] NuSTEC Hyperon Day by Christopher Thorpe (Manchester) and María Benítez (Granada)

NuSTEC new mailing list <NUSTEC-NEWS@LISTSERV.FNAL.GOV> on behalf of nustec-news
Tue 6/6/2023 5:29 PM

Dear all,

The NuSTEC Cross Theory and Generators Working Group announces its Hyperon Day on Wed. June 14 at 9:30 CDT (US) = 16:30 CSET = 00:30 (+1day) JST at

<https://uv-es.zoom.us/j/96206346778?pwd=MEdVN3pOV1Riem9xb0NGVlV5ZGo2UT09>
Meeting ID: 962 0634 6778
Passcode: 778996

All you wanted to know about antineutrino induced hyperon production (experiment, theory, simulations) in two short (30 and 20 min) presentations:

Speaker: Dr. Christopher Thorpe (Manchester)

Title: Hyperon Production in Neutrino Experiments.

Abstract: The mechanisms that lead to the production of hyperons during the interactions of neutrinos are among the most poorly understood processes to occur in neutrino oscillation experiments. The existing dataset almost entirely comprises results from bubble chambers, alongside a single recent measurement by the MicroBooNE collaboration. Hyperons are subject to a number of unique nuclear effects, and can offer additional handles to disentangle final state interactions from the physics of the primary neutrino-nucleon interaction, the latter itself being sensitive to the existence of second class currents and breaking of the SU(3) quark flavour symmetry. This talk will describe the main processes that lead to the creation of hyperons, before discussing the approaches to studying these interactions. The MicroBooNE measurement will be

[NUSTEC-NEWS] NuXTract Workshop at CERN, October 2 - 6, 2023

NuSTEC new mailing list <NUSTEC-NEWS@LISTSERV.FNAL.GOV> on behalf of nustec-news
Sun 7/9/2023 1:23 PM

Dear NuSTEC community,

We are thrilled to invite you to NuXTract, a new in-person NuSTEC workshop scheduled for the week of October 2nd 2023 at CERN.

This special workshop will be dedicated to open problems in neutrino cross section extraction and data presentation/preservation. It's a great opportunity for experiments to discuss the way they present their data, for theorists to specify their needs from a data release and for all of us to dive into the statistical challenges in cross-section extraction (e.g. unfolding, regularization methods, efficiency corrections, background constraints). The final agenda will be composed of invited talks, selected abstracts and lots of discussions. The exact dates and times will depend on the degree of interest following the registration deadline.

We have high hopes and wish to come out of this workshop with a set of NuSTEC best practice guidelines for how to extract a cross-section measurement and start a neutrino cross-section database with comparable results we know how to interpret.

We would like to bring together both experts as well as early career scientists to share experiences with cross-section extraction challenges and

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• [Facebook: NuSTEC-News](#)

(Followers ~ 1100)

- Highlight nu-xsec related activities

- Community engagement

NuSTEC-News
January 25 · 🌐

The 14th International Neutrino Summer School will be hosted at Fermi National Accelerator Laboratory in Batavia, Illinois from August 7 to 18, 2023. The school brings together graduate students and postdocs, along with some of the best teachers and researchers in neutrino physics, to create an intensive two-week-long learning experience in an open and interactive environment that covers the full range of modern neutrino physics. The school will provide training for the next ... [See more](#)

14th International Neutrino Summer School at the Fermilab NPC
07-19 August 2023

The International Neutrino Summer School provides training for the next generation of neutrino physicists in both theory and experiment. The school brings together graduate students and postdocs, along with some of the best teachers and researchers in neutrino physics. It provides an intensive, non-credit learning experience in an open and interactive environment that covers the full range of modern neutrino physics.

Registration and other information at: indico.fnal.gov/event/57378

[Fermilab](#)

NuSTEC-News
April 22 · 🌐

There was an interesting workshop this week at the Institute of Nuclear Theory (INT), Seattle: "Interplay of Nuclear, Neutrino and BSM Physics at Low-Energies"
<https://www.int.washington.edu/programs-and-workshops/23-85w>

Neutrino interaction physics is also interesting at low energies where elastic (CEvNS) and inelastic neutrino-nucleus interaction physics is subject to strong nuclear structure and dynamics. Many of our [#nuxsec](#) colleagues gave exciting talks.

NuSTEC-News
February 1 · 🌐

[Minerva Experiment](#) used the antineutrino-hydrogen interactions to measure the nucleon axial form factor. This is the golden channel and MINERvA is the first experiment to achieve this with high statistics and modern technologies. The result seems to be consistent with both recent Lattice QCD calculations and MA=1 dipole approximation. Congrats MINERvA!
paper ([Nature](https://www.nature.com/articles/s41586-022-05478-3)): <https://www.nature.com/articles/s41586-022-05478-3>

Symmetry magazine
February 1 · 🌐

Physicists used MINERvA, a Fermilab neutrino experiment, to measure the proton's size and structure using a neutrino-scattering technique.

SYMMETRYMAGAZINE.ORG
A new way to explore proton's structure with neutrinos yields first results

NuSTEC Website Updates

Home

NuSTEC News

NuSTEC school

NuInt conference series

Workshops, Conferences and Schools
Working Group

Cross Experiment Working Group

Cross Theory and Generators Working
Group

Long-term Community Planning
Working Group

Outreach Working Group

Publications Working Group

Resources

NuSTEC Website Updates

Home

NuSTEC News

NuSTEC school

NuInt conference series

Workshops, Conferences and Schools Working Group

Cross Experiment Working Group

Cross Theory and Generators Working Group

Long-term Community Planning Working Group

Outreach Working Group

Publications Working Group

Resources

Workshops, Conferences and Schools Working Group

Conveners: [Artur Ankowski](#), [Adi Ashkenazi](#) and [Clarence Wret](#)

Members: [Stephen Dolan](#), [Vishvas Pandey](#) and [Joanna Sobczyk](#)

The mission of our group is to foster the collaboration between the theoretical and experimental members of the community by organizing joint workshops and schools. Our workshops present the latest theoretical and experimental results in neutrino interactions, review the existing knowledge, recognize the needs of the community and stimulate developments in the desired directions, as well as provide early-career researchers with opportunities to present their findings. Our schools play a fundamental role in fostering the understanding of neutrino interactions among students, ensuring the continuity of the expertise for the ongoing and future efforts of the community.

Below is a list of workshops, conferences, and schools about neutrino interaction physics around the world. One of the important tasks of NuSTEC is to coordinate the world-effort of neutrino interaction physics. If you are organizers of a new workshop, conference, and school on neutrino interaction physics, please contact us to avoid a potential conflict. For the details of listed events here, please contact organizers through the website links provided below.

2023

- [October 2-6, 2023, "NuXTract 2023 – Towards a consensus in neutrino cross sections", CERN](#)

Cross Experiment Working Group

Conveners: [Dan Cherdack](#), [Kirsty Duffy](#) and [Vishvas Pandey](#)

Members: [Luca Doria](#)

The goal of the NuSTEC CEWG is to provide a service to the neutrino-nucleus interaction community by aiding communication between experiments, and building consensus on how to best perform and report cross section measurements.

2022

Cross Theory and Generators Working Group

Conveners: [Luis Alvarez-Ruso](#), [Steven Dytman](#), [Noemi Rocco](#) and [Jan Sobczyk](#)

The group has the main mission of strengthening the exchange of ideas among the theory and generator communities. Special attention will be made to including early career researchers. Although the organizers will be NuSTEC members, participation will be open to the broader community of interested researchers. Seminars on an approximately monthly schedule will be sponsored. Topics will be relevant to the theory and generator communities and can be suggested by any member of the community. Early career researchers will be emphasized when speakers are chosen.

2022

- [February 2, 2022, "New CC0pi GENIE Tune for MicroBooNE", Steven Gardiner \(FNAL\)](#)
- [March 9, 2022, "Final-State Interactions in inclusive and exclusive one-nucleon knockout", Alexis Nikolakopoulos \(FNAL\)](#)
- [April 13, 2022, "Study of final-state interactions of protons in neutrino-nucleus scattering with INCL and NuWro cascade models",](#)

NuSTEC Website Updates

Home

NuSTEC News

NuSTEC school

NuInt conference series

Workshops, Conferences and Schools Working Group

Cross Experiment Working Group

Cross Theory and Generators Working Group

Long-term Community Planning Working Group

Outreach Working Group

Publications Working Group

Resources

Long-term Community Planning Working Group

Conveners: [Luis Alvarez-Ruso](#), [Yoshinari Hayato](#) and [Saori Pastore](#)

Members: Sonia Bacca

The group's mission is to:

- Advertise activities happening around the world to both the NuSTEC Board and NuSTEC-News.
- Organize meetings to discuss NuSTEC's activities and roles in international long-term planning programs.

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Publications Working Group

Conveners: [Andrew Furmanski](#), [Jorge Morfin](#), [Kajetan Niewczas](#)

The NuSTEC Publications Working Group oversees the preparation and publication of NuSTEC papers and documents.

A list of publications commissioned by NuSTEC is listed below.

- **NuSTEC White Paper: Status and challenges of neutrino–nucleus scattering**
L. Alvarez-Ruso *et al.*. Jun 12, 2017. 68 pp.
Published in **Prog.Part.Nucl.Phys. 100 (2018) 1-68**
FERMILAB-PUB-17-195-ND-T, INT-PUB-17-020
DOI: [10.1016/j.ppnp.2018.01.006](https://doi.org/10.1016/j.ppnp.2018.01.006)
e-Print: [arXiv:1706.03621](https://arxiv.org/abs/1706.03621) [hep-ph] | [PDF](#)

Home

NuSTEC News

NuSTEC school

NuInt conference series

Workshops, Conferences and Schools Working Group

Cross Experiment Working Group

Cross Theory and Generators Working Group

Long-term Community Planning Working Group

Outreach Working Group

Publications Working Group

Resources

- **Editing NuSTEC WG webpages, path forward:**

- I opened a service desk ticket, learnt that Jorge and Gabe are owners and they can give anyone (with Fermilab service account) edit access
- It was straightforward for them to add me as an editor
- Spoke to Jon, who would take over from Gabe as owner
- Jon can then give access to conveners of each group to keep webpage of their respective WG up to date themselves
- Outreach group will keep the responsibility of overseeing website updates, pinging WG conveners to update their webpages routinely



■ Plan to propose a Symmetry Magazine article about NuSTEC:

- Earlier this year, Jon and I met with Kurt Riesselmann at Fermilab's office of communications
- Explored an opportunity to write a symmetry magazine article highlighting unique and special aspect of the story of NuSTEC:
 - we bring Theory/Experiment/Generator as well as a HEP/NP communities together, international collaboration, etc. focused on improving the physics of neutrino experiments
- A draft with key points/outline is complete and is ready to be sent to Kurt, he will forward that to Kathryn Jepsen of Symmetry. They will help developing into a full article.
- Hope to be published early in 2024.

NuSTEC Outreach Working Group

- ◆ This completes my two-year term as co-convener of Outreach WG, I am stepping down from this role now :-)!
- ◆ It has been a pleasure to serve in this role! Happy to help the new co-convener to get up to speed.
- ◆ Looking forward to continue carrying out NuSTEC mission in other roles!



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Thank You!