



Co-funded by the European Union

Report on DEB activities in 2024

Tamer Tolba (for the DEB)

ESSnuSB+ 2nd Annual meeting

23.09.2024

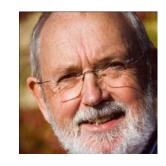


ESSnuSB+ DEB members





Elian BOUQUEREL



Colin CARLILE



Georgios FANOURAKIS



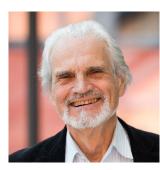
Natalia MILAS



Tamer TOLBA



Marcos DRACOS



Tord EKELÖF



Carole MABROUK

https://essnusb.eu/dissemination-exploitation-board-essnusb/

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Project Dissemination Strategy in 2024



➤ We are still in the visibility phase → be present at as many conferences/workshops as possible

- → Year 2024 is very important for the ESFRI application, priority goes for EU-based events
- → so far, project introduction talks are the dominant presentation style!!
- → we must increase participation in technical conferences, i.e. WP related presentations
- > Diversity in personnel -> all WPs, all institutes and most important students and postdocs must participate
 - → WPs (co)coordinators to distribute the conferences' calls sent by DEB
 - → WPs (co)coordinators to encourage students and postdocs to participate in conferences
- ➢ Financing of event participation → each partner institute has allocated traveling money from the EU budget
 - → DEB budget will be used for project dissemination activities

➢ Feedback from WPs (co)coordinators on the DEB performance in 2023 → improve DEB strategy and performance

ESSnuSB+ Conferences' Attendance in 2023

	ESSITUSD+ CONTENENCES ALLEHUATICE IT 2025												
	FOLLOW-UP OF ABSTRACT SUBMISSIONS (updated 14/09/2023)												
	Accronym	Conference	Date of the event	Abstract submission deadline at the conference	Type of Abstract	Approval by the organizers	Proposed author	Submitted	Title	website	Proceeding	Carbon Footprint	
1	CP2023	International workshop on the Origin of Matter- Antimatter Asymmetry, Les Houches, France	12-17 Feb. 2023	09.12.2022	Talk	yes	Monojit Gosh, WP5	yes	Measuring δCP and constraining lepton flavour models at ESSnuSB	https://indico.in2p3.fr/event/27893/	No Proceeding	0.45 t CO ₂	
2	DPG2023	German Physics Sciety spring meeting, Dresden, Germany	20-25 March 2023	15.12.2022	Talk	yes	Tamer Tolba	yes	The ESSvSB(+) design study: Achievements and Prospects	https://skm23.dpg-tagungen.de/	No Proceeding	0.008 t CO ₂	
3	KITP2023	KITP Muon Collider Workshop, University of California, Santa Barbara, USA	27 Feb 10 Mar. 2023	Invited only	Talk	yes	Marcos Dracos	yes	The European Spallation Source neutrino Super Beam and muon synergies	https://www.kitp.ucsb.edu/activities/muoncollider-m23		3.5 t CO₂	
4	ICPTI2023	International Conference on the Physics of the Two Infinities, Kyoto, Japan	27-30 Mar. 2024	19.02.2023	Invited Talk	yes	Marcos Dracos	yes	The European Spallation Source neutrino Super Beam project	https://indico.in2p3.fr/event/28466/	No Proceeding	3.2 t CO ₂	
5	IPAC2023	International Particle Accelerator Conference, Venice, Italy	7-12 May 2023	07.12.2022	Poster	yes	Tamer Tolba	yes	The ESSvSB+ Project	https://www.ipac23.org/	Published T. Tolba et al., JACoW IPAC2023 (2023) 911 – 914	0.01 t CO ₂	
6	Blois 2023	Particle Physics and Cosmology, Blois, France	14-19 May 2023	01.04.2023	Talk	yes	Eric Baussan	yes	The ESSvSB+ Project	http://blois.in2p3.fr/2023/index.html		0.0 t CO ₂	
7	DESY colloquium2023	DESY Particle and Astroparticle Physics Colloquia, Hamburg, Germany	23 May 2023	Invited only	Talk	yes	Marcos Dracos	yes	The European Spallation Source neutrino Super Beam project	https://physikseminar.desy.de/hamburg/colloquia_in_2023/23_ma y_2023/	No Proceeding	0.38 t CO ₂	
8	Muon4Future	Muon4Future workshop, Venice, Italy	29-31 May 2024	Invited only	Invited Talk	yes	Marcos Dracos	yes	Muon activity at the ESS facility	https://agenda.infn.it/event/33270/	in progress	0.008 t CO ₂	
9	Fysikdagarna 2023	The conference of the Swedish Physical Society, Stockholm, Sweden	14-16 June 2023	05.05.2023	Talk	yes	Maja Olvegård	yes	The nuSTORM project in ESSnuSBplus	https://indico.fysik.su.se/event/7762/	No Proceeding	0.0 t CO ₂	
10	CRETE2023	The 2023 International Conference on Applications of Nuclear Techniques, Crete, Greece	18-24 June 2023	28.02.2023	Talk	yes	Marcos Dracos	yes	The physics performance of the European Spallation Source neutrino Super Beam	https://www.creteconf.org/	not submitted	0.65 t CO ₂	
11	NSLIE2023	Neutrino Scattering at Low and Intermediate Energies 2023, Mainz, Germany	26-30 June 2023	Invited only	Talk	yes	Joakim Cederkall	yes	The ESSnuSB project	https://indico.mitp.uni-mainz.de/event/324/		0.45 t CO ₂	
12	WIN2023	The 29th International Workshop on Weak Interactions and Neutrinos, Zhuhai, China	3-8 July 2023	31.05.2023	Talk	yes	Tamer Tolba	yes	The European Spallation Source neutrino Super Beam plus Project	https://indico.ihep.ac.cn/event/18269/	in progress	3.5 t CO ₂	
13	NulF2023	19th Rencontres du Vietnam, Neutrino Workshop at IFIRSE, Quy Nhon city, Vietnam	16-19 July 2024	10.06.2023	Invited Talk	Not yet	Budimir Kliček	Not Yet	Neutrino oscillation prospects with ESSnuSB	https://ifirse.icise.vn/nugroup/nuworkshop2023/index.html		2.7 t CO ₂	
15	ICRC2023	The 38th International Cosmic Ray Conference (ICRC2023), Nagoya, Japan	26 July - 3 Aug. 2023	20.02.2023	poster	yes	Tsutomu Fukuda	yes	The European Spallation Source neutrino Super Beam project	https://www.icrc2023.org/	in progress	0.0 t CO ₂	
16	NUFAC2023	24th Internartional Workshop on Neutrinos From Accelerators, Seoul, South Korea	21-26 Aug. 2023	21.05.2023	Talk	yes	Marcos Dracos and Karre Iversen	yes	ESSnuSB+ and summary of the mini workshop (satellite) Classification of muon- and electron neutrino events for the ESSnuSB Near Detector using Graph Neural Networks	https://indico.cern.ch/event/1216905/	in progress in progress	2.7 t*6 = 16.2 t CO ₂	
17	ESSnuSB+ workshop	ESSnuSB+ dedictaed workshp in NuFact2023, Seoul, South Korea	19-20 Aug. 2023	Invited only	Talks	yes	Marcos Dracos, Tamer Tolba, Natalia Milas, Andrea Longhin, George Fanorakis, Kaare Iversen	yes	TBD	https://indico.cern.ch/event/1216905/timetable/#20230820	5 * in progress		
18	EPS-HEP2023	European Physical Society Conference on High Energy Physics, Hamburg	21-25 Aug. 2023	02.06.2023	Talk	yes	Alessio Giarnetti	yes	ESSnuSB+ project: towards precision measurement of the CP violation at the second neutrino oscillation maximum	https://www.eps-hep2023.eu/	in progress	0.54 t CO ₂	
19	TAUP 2023	XVIII International Conference on Topics in Astroparticle and Underground Physics 2023, Vienna, Austria	28 Aug 1 Sept. 2023	12.05.2023	Talk	yes	Vidhya Thara Hariharan	yes	The European Spallation Source neutrino Super Beam plus Project	https://taup2023.hephy.at/	in progress	0.01 t CO ₂	
20	Matter to the Deepest 2023	Matter to the deepest: Recent developments in physics of fundamental interactions XLV international conference of theoretical physics (MTTD 2023), Ustroń, Poland	17 - 22 Spet. 2023	Invited only	Talk	yes	Monojit Gosh	yes	Present status and future prospects of neutrino oscillation experiments	https://indico.if.us.edu.pl/event/18/	in progress	0.34 t CO ₂	
21	HB2023	68th ICFA Advanced Deam Dynamics Workshop on High-Intensity and High-Brightness Hadron Beams, Geneva, Switzerland	09-13 Oct. 2023	15.07.2023	Talk	yes	Natalia Milas	yes	TBD	https://indico.cern.ch/event/1138716/		0.62 t CO ₂	
22	ESSnuSB+ annual meeting	ESSnuSB+ first collaboration meeting, TBD	16-19 Oct. 2023	No dealline	Talks		all ESSnuSB+ members			https://indico.cern.ch/event/1309436/sessions/502888/#20231019	No Proceeding		
23		The XX International Workshop on Neutrino	23-27 Oct. 2023	31.05.2023 T	Invited Talk	olbyø, ES	SnuSB ^{Eeläf} nnua	al n¶eeti	ng, HamBurg 2024	https://agenda.infn.it/event/33107/		0.62 t CO ₂	
24	BSM2023	Beyond Standard Model: From Theory to Experiment, Hurghada, Egypt	06-09 Nov. 2023	15.09.2023	Talk	yes	Tamer Tolba	yes	Search for the leptonic CP violation with the ESSnuSB(+) project	https://indico.cern.ch/event/1258407/		1.9 t CO ₂	



	FOLLOW-UP OF ABSTRACT SUBMISSIONS (updated 19/09/2024)												
	Accronym	Conference	Date of the event	Abstract submission deadline at the conference		Approval by the organisers	Proposed author	Submitted	Title	website	Proceed ing		
1	11th European Networking Event	Successful R & I in Europe 2024 11th European Networking Event, Düsseldorf, Germany	15 - 16 Feb. 2024	12.01.2024	talk	yes	Tamer Tolba	yes	Towards a Neutrino Beam Experiment in EU	https://horizont.zenit.de/en/events/successful-r-i-in-europe- 2024/			
2	DPG2024	German Physics Society Spring Meeting, KIT, Karlsruhe, Germany	04 - 08 Mar. 2024	15.12.2023	talk	yes	Tamer Tolba	yes	Search for the leptonic CP violation with the ESSnuSB(+) project	https://karlsruhe24.dpg-tagungen.de/			
3	TIARA 2024	26th Meeting of the TIARA Collaboration Council on meeting, CERN, Switzerland	05 Mar. 2024	Invitation	talk	yes	Marcos Dracos	yes	Status Report on ESSnuSB 2nd DS	https://indico.cern.ch/event/1385973/			
4	PhD Symposium 8	th PhD Student Symposium, Zagreb, Coartia	26 - 27 April 2024	16.02.2024	talk		Leon Halić & Doris Barčot	no	Detecting CP violation with ESSnuSB experiment & Neutrino oscillations and ESSnuSB project	https://phdss.pmf.unizg.hr/program/			
5	IPAC2024	International Particle Accelerator Conference, Nashville, USA	19 - 24 May 2024	11.12.2023	poster	yes	Marcos Dracos	yes	The ESSvSB Project	https://ipac24.org/			
6	FCPC2024	22nd Conference on Flavor Physics and CP Violation, Bangkok, Thailand	27 -31 May 2024	22.03.2024	talk	yes	Alessio Giarnetti	yes	ESSnuSB and the precise measurement of leptonic CP violation at the second neutrino oscillation maximum	https://indico.cern.ch/event/1291023/			
7	Neutrino2024	31th International Conference on Neutrino Physics and Astrophysics, Milano, Italy	16 - 22 June 2024	Invitiaon	poster, talk	yes	Eric Baussan, Budimir Kliček, Monojit Ghosh, Alessio Giarnetti, Aman Gupta and Tamer Tolba	yes	Investigating Quantum Decoherence in Neutrino Oscillation at ESSnuSB Experiment, The ESSnuSB/ESSnuSB+ detector design, Physics opportunities at the ESSnuSB/ESSnuSB+ setup, Search for the leptonic CP violation with the ESSnuSBplus project, Exploring new physics at ESSnuSB+	https://neutrino2024.org/			
8	ICHEP2024	The 42nd International Conference on High Energy Physics, Prague, Czech Republic	17 - 24 July 2024	16.02.2024	poster, talk	yes	Tamer Tolba, Spyros Tzamarias, Alessio Giarnetti and David Meloni	yes	ESSnsSBplus Target Station Design Study, The European Spallation Source neutrino Super Beam plus Project, ESSnuSB+: non-beam neutrino physics and sterile neutrinos at near detectors, Exploring new physics in neutrino oscilllation at ESSnuSB	https://ichep2024.org/			
9	HAMLET- PHYSICS 2024	HAMLET-PHYSICS 2024 Conference/Workshop, Copenhagen, Denmark	19 - 21 Aug. 2024	12.07.2024	talk	yes	Kaare Iversen	yes	GNN Classification of Muon- and Electron Neutrino Events for the ESSnuSB+ Near WC Detector	https://indico.nbi.ku.dk/event/2067/overview			
10	NOW2024	Neutrino Oscillation Workshop, Otranto, Lecce, Italy	2 – 8 September 2024	Invitation	talk	yes	Monojit Ghosh/Joakim Cederkäll	yes	Decoherence in Neutrino Oscillation at the ESSnuSB Experiment	https://home.ba.infn.it/~now/now2024/Fee.html			
11	NuFact2024	The 25th International Workshop on Neutrinos from Accelerators, Argonne National Laboratory, USA	16 - 21 Sept. 2024	15.07.2024	talk	yes	George Fanourakis	yes	TBD	https://indico.fnal.gov/event/63406/			
	LHC Days Split 2024	2024 LHC Days Split	30 Sept 04 Oct. 2024	Invitation	talk	yes	Budimir Kliček	yes	TBD	https://indico.cern.ch/event/1383586/			
13	NBI2024	13th International Workshop on Neutrino Beams and Instrumentation (NBI2024), Tokai, Japan	07 - 10 Oct. 2024	Invitation	talk	yes	Tamer Tolba	yes	Current status and plans of ESSvSBplus	https://conference-indico.kek.jp/event/270/overview			
14	NuDM202 <u>@</u> 3.0	International Conference on Neutrinos and Dark Matter, Cairo, Egypt	11 - 14 Dec. 2024	Tameniolba,	ES6knus	SB+ annı	ual me ep ing, Ha	amburg	2024 твр	https://indico.cern.ch/event/1368274/			
15	PIC2024	43rd International Symposium on Physics in Collision, NCSR Demokritos in Athens	22 – 25 Oct. 2024	Invitation	talk		George Fanourakis	no	TBD	TBD			

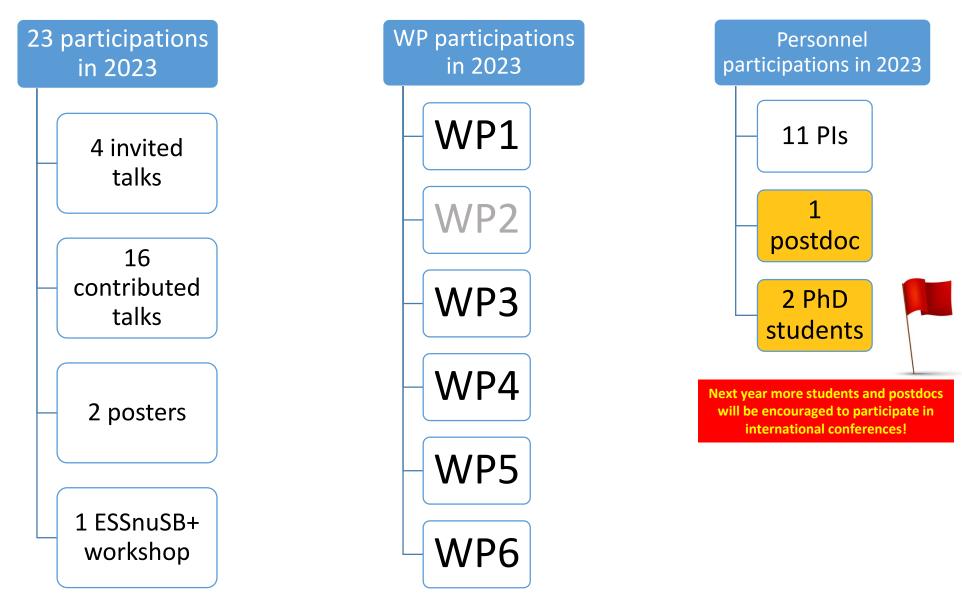






Some statistics on 2023 participations

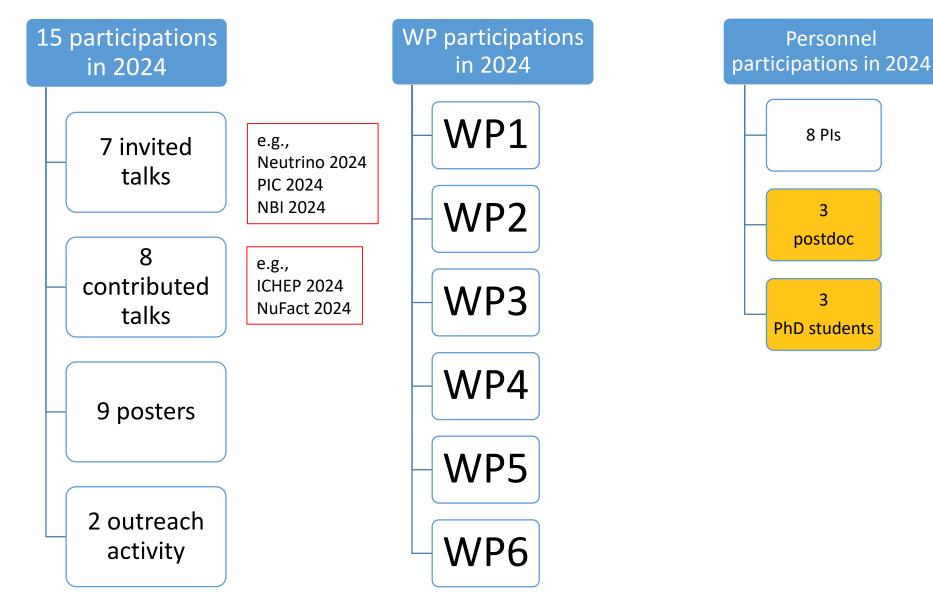






Some statistics on 2024 participations







Outreach activity (Big Science Day Sweden)

Swedish Big Science Forum 2024



- Big Science Day Sweden 2024:
- ESSnuSB+ outreach activity that took place in the Lund's Stadshallen
 on 31.01.2024 as part of the Big Science Sweden event.
- A 3-hour workshop with 6 talks of 15 minutes each was organised and about 50 local persons attended in the "booth".
- Some pictures, the ESSnuSB+ poster, the English text of the poster and the agenda of the workshop were uploaded onto DocDB.



• Marianne Ekdahl, a journalist, had worked for the event preparation and during the event itself and had publicised it.



https://www.b2match.com/e/swedish-big-science-forum-2024



Outreach activity (Zinkgruvan mine visit)



Wednesday 16 October 2024 13:00 – ca 15:00 hrs at the Zinkgruvan Mining AB site between members of the Management of the Zinkgruvan Mining AB and members of the ESSnuSB Executive Committee

- 1. Introduction of the persons attending the meeting 13:00-13:10
- 2. Brief presentation of the Zinkgruvan Mining AB company 13:10-13:20
- 3. The purpose and organization of the ESSnuSB research project and status of its design study 13:20-13:40
- 4. The proposed EU-application for funding of a design study of the construction and operation of the large ESSnuSB neutrino detector in Zinkgruvan 13:40-14:30
 - The EU HORIZON-INFRA-2024-DEV-01-03 call for applications expected to appear in autumn 2024
 - The required core drilling program in the mine
 - The construction design-study of the detector cavern, of the technical galleries and of the access shaft
 - The design study of the water Cherenkov neutrino detector and its operation
- 5. Discussion on possible terms of cooperation between Zinkgruvan Mining AB and the ESSnuSB Consortium for the proposed design study 14:30-14:45
- 6. Communication 14:45-14:50
- 7. Concluding remarks 14:50-14:00





Publications:

ESSnuSBplus: Letters in High Energy Physics (LHEP). Published

A. Aguilar et al., LHEP 517, (2024) 1

"Search for Leptonic CP Violation with the ESSnuSBplus Project"

(Corresponding author: Tamer Tolba)

Phenomenology: Physics Review D. (Internal Ref. George and Budimir). Published

J. Aguilar Phys. Rev. D 109, (2024) 115010

"Study of non-standard interaction mediated by a scalar field at ESSnuSB experiment"

(Corresponding author: Monojit Gosh, Deepak Raikwal, Sandhya Choubey and William Brorsson)

Decoherance studies in ESSnuSB. (Internal Ref. Natalie Jachowicz). Published

J. Aguilar et al., JHEP08(2024)063

"Decoherence in Neutrino Oscillationsat ESSnuSB Experiment"

(Corresponding author: Monojit Gosh, Aman Gupta, Alessio Giarnetti and Davide Meloni)

Atmospheric studies in ESSnuSB (Internal Ref. George Fanourakis and Davide Meloni) **Submitted to JHEP and received positive report** J. Aguilar et al., arXiv:2407.21663v1 [hep-ex] (2024)

"Exploring atmospheric neutrino oscillations at ESSnuSB"

(Corresponding author: Sandhya Choubey, Tommy Ohisson and Sampsa Vinonen)^{g, Hamburg 2024}

In 2023 we had 1 publication and 1 proceeding



Publications and Proceedings



Proceedings:

1. Vidhya Thara Hariharan (for the ESSnuSBplus collaboration) PoS(TAUP2023)339 (2024)

"The European Spallation Source neutrino Super Beam plus Project"

- M. Dracos and I. Efthymiopoulos, "The European Spallation Source neutrino super beam", in Proc. IPAC'24, Nashville, TN, May 2024, pp. 2571-2574. doi:10.18429/JACoW-IPAC2024-WEPR37
- M. Ghosh, "Present Status and Future Prospects of Neutrino Oscillation Experiments," Acta Phys. Polon. Supp. 17 (2024), 2-A18, doi:10.5506/APhysPolBSupp.17.2-A18 (Proceedings for "Matter to the deepest: Recent developments in physics of fundamental interactions, XLV international conference of theoretical physics (MTTD 2023)", Ustron, Poland, September 17 - 22, 2023)



Publication Rules



- For the dissemination and publication of the project results we are governed by:
- 1- The Consortium Agreement, and the grant agreement for details
 - → IN GENERAL (i.e. defines the frame/layout of the internal publication and dissemination policy)
- 2- Our internal publication policy
- → IN DETAIL (i.e. defines the internal regulations of the publication procedure, which was agreed on directly by the consortium members)



Publication Rules



ESSnuSB+ Dissemination and Publication Policy (DPP)

This document states/defines the tasks to be carried out by the ESSvSB+ DEB committee, and the **internal*** regulations that the ESSvSB+ collaboration members must follow, regarding the publication and the dissemination of the results obtained from the work that has been, or will be, conducted within the current EU funding grant.

