



**Welcome to Neutrino 2022**

**XXX International Conference on Neutrino Physics and Astrophysics**

**May 30 ~ June 4**

**Yeongduk Kim**

**Co-chair with Sunny Seo**

# It's 50<sup>th</sup> anniversary !

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From András Patkós article, *fizikai szemle*, 2022

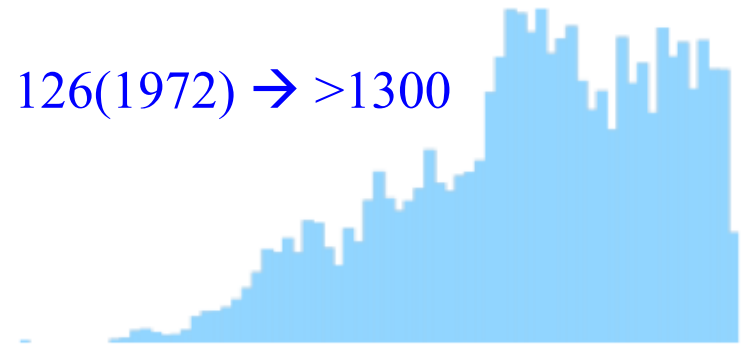


13<sup>th</sup> of June 1972: Feynman and Pontecorvo planting



June 2021: Memorial trees of the First INC

Date of paper



1952 Spires “t neutrino” 2022

No of Participants @ INC :  
139(1972)  $\rightarrow$  ~ 1000

Like the memorial trees, Neutrino Conference and neutrino physics have grown mature.

# Conference overview

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- Visit the website <https://neutrino2022.org/>
  - You already logged in with ID/PW.
- The conference consists of ;
  1. **Talks** : All talks are invited plenary.
  2. **Posters** : Posters are in the metaverse.
  3. **Public talk** : by Takaaki Kajita,
  4. **Virtual Seoul** : Exhibition hall, Seoul theater etc.
- Participants
  - Number of registered : 1,272 participants from 44 countries
  - Number of posters submitted : 657

# Topics

16 Topics  
21 Sessions

Will begin S1 after  
opening.

Topic		Session	No. of posters
T01	Neutrino oscillation	S9	76
T02	Leptonic CP violation	S10	3
T03	Neutrino mass	S8	36
T04	Neutrinoless double beta decay	S4, S5	70
T05	Neutrino interactions	S17, S18	65
T06	Reactor neutrinos	S6, S7	53
T07	Accelerator neutrinos	S9, S10, S11	26
T08	Geo-neutrinos	S13	2
T09	Atmospheric neutrinos	S12	20
T10	Solar neutrinos	S13	19
T11	Diffuse Supernova Neutrino Background	S13	5
T12	Astrophysical neutrinos	S14, S15	84
T13	Neutrinos and Cosmology	S20	6
T14	Sterile neutrinos	S1, S2, S3	41
T15	BSM searches in neutrinos	S21	53
T16	New neutrino technologies	S19	72
T17	Other		26
Total			657

# Features of the program

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- Omicron hit Korea end of Jan. 2022, peaked March 20<sup>th</sup>, and LOC decided to go on-line only.
- To maximize the number of participants, the program spans from 6am to 12 pm in Korean Standard Time (KST).
- There are Europe-friendly and US-friendly talk and poster sessions and long breaks between sessions.
- No. of Poster sessions increased to 8 to accommodate in metaverse format.
- Registration is open until June 4<sup>th</sup>.
- Go to homepage, <https://neutrino2022.org>, and login to begin.

# Program at a glance (KST)

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## Program

Program at a Glance

Detailed Program

Public Talk

Talk Guidelines for speakers

Talk Guidelines for Chairs

This is an active map. If you click the session, it will go to the “detailed program” page.

## Online Neutrino 2022 Program at a Glance

Time	May 30 (Mon) (KST)	May 31 (Tue) (KST)	June 1 (Wed) (KST)	June 2 (Thu) (KST)	June 3 (Fri) (KST)	June 4 (Sat) (KST)	Time
6:00		<b>Poster I-b @Dirac</b> 06:00-07:30 KST May 30, 23:00-24:30 EU May 30, 16:00-17:30 CDT, US	<b>Poster II-b @Dirac</b> 06:00-07:30 KST May 31, 23:00-24:30 EU May 31, 16:00-17:30 CDT, US	<b>Poster III-b @Majorana</b> 06:00-07:30 KST June 1, 23:00-24:30 EU June 1, 16:00-17:30 CDT, US	<b>Poster IV-b @Majorana</b> 06:00-07:30 KST June 2, 23:00-24:30 EU June 2, 16:00-17:30 CDT, US		6:00
7:00							7:00
8:00		Long Break: 90 min.	Long Break: 90 min.	Long Break: 90 min.	Long Break: 90 min.		8:00
9:00		<b>S2: Sterile Nu II</b> 09:00-10:30 KST May 31, 02:00-03:30 EU May 30, 19:00-20:30 CDT, US	<b>S6: Reactor Nu I</b> 09:00-10:30 KST June 1, 02:00-03:30 EU May 31, 19:00-20:30 CDT, US	<b>S10: Accelerator Nu II</b> 09:00-10:31 KST June 2, 02:00-03:31 EU June 1, 19:00-20:31 CDT, US	<b>S14: Astrophysical Nu I</b> 09:00-10:30 KST June 3, 02:00-03:30 EU June 2, 19:00-20:30 CDT, US	<b>S18: Nu Interactions II</b> 09:00-10:47 KST June 4, 02:00-03:47 EU June 3, 19:00-20:47 CDT, US	9:00
10:00		Break: 30 min.	Break: 30 min.	Break: 29 min.	Break: 30 min.	Short Break: 13 min.	10:00
11:00		<b>S3: Sterile Nu III</b> 11:00-12:30 KST May 31, 04:00-05:30 EU May 30, 21:00-22:30 CDT, US	<b>S7: Reactor Nu II</b> 11:00-12:30 KST June 1, 04:00-05:30 EU May 31, 21:00-22:30 CDT, US	<b>S11: Accelerator Nu III</b> 11:00-12:22 KST June 2, 04:00-05:22 EU June 1, 21:00-22:22 CDT, US	<b>S15: Astrophysical Nu II</b> 11:00-12:30 KST June 3, 04:00-05:30 EU June 2, 21:00-22:30 CDT, US	<b>S19: New Nu Tech.</b> 11:00-12:40 KST June 4, 04:00-05:40 EU June 3, 21:00-22:40 CDT, US	11:00
12:00							12:00
13:00		Long Break: 150 min.	Long Break: 150 min.	Long Break: 158 min.	Long Break: 150 min.	Long Break: 200 min.	13:00
14:00							14:00
15:00	<b>Poster I-a @Dirac</b> 15:00-16:30 KST May 30, 08:00-09:30 EU May 30, 01:00-02:30 CDT, US	<b>Poster II-a @Dirac</b> 15:00-16:30 KST May 31, 08:00-09:30 EU May 31, 01:00-02:30 CDT, US	<b>Poster III-a @Majorana</b> 15:00-16:30 KST June 1, 08:00-09:30 EU June 1, 01:00-02:30 CDT, US	<b>S12: Atmospheric Nu</b> 15:00-16:30 KST June 2, 08:00-09:30 EU June 2, 01:00-02:30 CDT, US	<b>Poster IV-a @Majorana</b> 15:00-16:30 KST June 3, 08:00-09:30 EU June 3, 01:00-02:30 CDT, US	<b>S20: Nu and Cosmology</b> 16:00-17:30 KST June 4, 09:00-10:30 EU June 4, 02:00-03:30 CDT, US	15:00
16:00		Break: 30 min.	Break: 30 min.	Break: 30 min.	Break: 30 min.		16:00
17:00		<b>S4: <math>0\nu\beta\beta</math> I</b> 17:00-18:30 KST May 31, 10:00-11:30 EU May 31, 03:00-04:30 CDT, US	<b>S8: Nu Mass</b> 17:00-18:40 KST June 1, 10:00-11:40 EU June 1, 03:00-04:40 CDT, US	<b>Public talk</b> 17:00-18:00 KST / 10:00-11:00 EU June 2, 03:00-04:00 CDT, US	<b>S16: Heavy Nu, R&amp;D</b> 17:00-18:30 KST June 3, 10:00-11:30 EU June 3, 03:00-04:30 CDT, US	Long Break: 150 min.	17:00
18:00	Long Break: 270 min.						18:00
19:00		Long Break: 180 min.	Long Break: 170 min.	Long Break: 210 min.	Long Break: 180 min.		19:00
20:00						<b>S21: BSM Nu</b> 20:00-21:30 KST June 4, 13:00-14:30 EU June 4, 06:00-07:30 CDT, US	20:00
21:00	<b>Opening Session</b> 21:00-22:05 KST May 30, 14:00-15:05 EU May 30, 07:00-08:05 CDT, US	<b>S5: <math>0\nu\beta\beta</math> II</b> 21:30-23:00 KST May 31, 14:30-16:00 EU May 31, 07:30-09:00 CDT, US	<b>S9: Accelerator Nu I</b> 21:30-23:00 KST June 1, 14:30-16:00 EU June 1, 07:30-09:00 CDT, US	<b>S13: Solar/DSNB Nu</b> 21:30-23:20 KST June 2, 14:30-16:20 EU June 2, 07:30-09:20 CDT, US	<b>S17: Nu Interactions I</b> 21:30-23:30 KST June 3, 14:30-16:30 EU June 3, 07:30-09:30 CDT, US	Break: 30 min.	21:00
22:00	Short Break: 10 min.					<b>Closing Session</b> 22:00-23:30 KST June 4, 15:00-16:30 EU June 4, 08:00-09:30 CDT, US	22:00
23:00	<b>S1: Sterile Nu I</b> 22:15-23:45 KST May 30, 15:15-16:45 EU May 30, 08:15-09:45 CDT, US						23:00
24:00							24:00
				All Continent Time	USA Friendly Time	EU Friendly Time	

# Program at a glance (CDT, US)

7:30 AM

10:30 PM

Time	May 30 (Mon) (CDT, US)	May 31 (Tue) (CDT, US)	June 1 (Wed) (CDT, US)	June 2 (Thu) (CDT, US)	June 3 (Fri) (CDT, US)	June 4 (Sat) (CDT, US)	Time
0:00							0:00
1:00							1:00
2:00	<b>Poster I-a @Dirac</b> May 30, 15:00-16:30 KST May 30, 08:00-09:30 CEST, EU May 30, 01:00-02:30 CDT, US	<b>Poster II-a @Dirac</b> May 31, 15:00-16:30 KST May 31, 08:00-09:30 CEST, EU May 31, 01:00-02:30 CDT, US	<b>Poster III-a @Majorana</b> June 1, 15:00-16:30 KST June 1, 08:00-09:30 CEST, EU June 1, 01:00-02:30 CDT, US	<b>S12: Atmospheric Nu</b> June 2, 15:00-16:30 KST June 2, 08:00-09:30 CEST, EU June 2, 01:00-02:30 CDT, US	<b>Poster IV-a @Majorana</b> June 3, 15:00-16:30 KST June 3, 08:00-09:30 CEST, EU June 3, 01:00-02:30 CDT, US		2:00
3:00		Break: 30 min.	Break: 30 min.	Break: 30 min.	Break: 30 min.	<b>S20: Nu and Cosmology</b> June 4, 16:00-17:30 KST June 4, 09:00-10:30 CEST, EU June 4, 02:00-03:30 CDT, US	3:00
4:00		<b>S4: <math>0\nu\beta\beta</math> I</b> May 31, 17:00-18:30 KST May 31, 10:00-11:30 CEST, EU May 31, 03:00-04:30 CDT, US	<b>S8: Nu Mass</b> June 1, 17:00-18:40 KST June 1, 10:00-11:40 CEST, EU June 1, 03:00-04:40 CDT, US	<b>Public talk</b> 17:00-18:00 KST / 10:00-11:00 CEST, EU June 2 03:00-04:00 CDT, US	<b>S16: Heavy Nu, R&amp;D</b> June 3, 17:00-18:30 KST June 3, 10:00-11:30 CEST, EU June 3, 03:00-04:30 CDT, US		4:00
5:00	Long Break: 270 min.					Long Break: 150 min.	5:00
6:00		Long Break: 180 min.	Long Break: 150 min.	Long Break: 210 min.	Long Break: 180 min.		6:00
7:00						<b>S21: BSM Nu</b> June 4, 20:00-21:30 KST June 4, 13:00-14:30 CEST, EU June 4, 06:00-07:30 CDT, US	7:00
8:00	<b>Opening Session</b> May 30, 14:00-15:05 CEST, EU May 30, 07:00-08:05 CDT, US Short Break: 10 min.	<b>S5: <math>0\nu\beta\beta</math> II</b> May 31, 01:30-23:00 KST May 31, 14:30-16:00 CEST, EU May 31, 07:30-09:00 CDT, US	<b>S9: Accelerator Nu I</b> June 1, 21:30-23:00 KST June 1, 14:30-16:00 CEST, EU June 1, 07:30-09:00 CDT, US	<b>S13: Solar/DSNB Nu</b> June 2, 21:30-23:00 KST June 2, 14:30-16:20 CEST, EU June 2, 07:30-09:20 CDT, US	<b>S17: Nu Interactions I</b> June 3, 21:30-23:30 KST June 3, 14:30-16:30 CEST, EU June 3, 07:30-09:30 CDT, US	Break: 30 min.	8:00
9:00	<b>S1: Sterile Nu I</b> May 30, 22:15-23:45 KST May 30, 15:15-16:45 CEST, EU May 30, 08:15-09:45 CDT, US					<b>Closing Session</b> June 4, 22:00-23:30 KST June 4, 15:00-16:30 CEST, EU June 4, 08:00-09:30 CDT, US	9:00
10:00							10:00
11:00							11:00
12:00		Long Break: 420 min.	Long Break: 420 min.	Long Break: 400 min.			12:00
13:00	Long Break: 375 min.						13:00
14:00					Long Break: 570 min.		14:00
15:00							15:00
16:00							16:00
17:00	<b>Poster I-b @Dirac</b> May 31, 06:00-07:30 KST May 30, 23:00-24:30 CEST, EU May 30, 16:00-17:30 CDT, US	<b>Poster II-b @Dirac</b> June 1, 06:00-07:30 KST May 31, 23:00-24:30 CEST, EU May 31, 16:00-17:30 CDT, US	<b>Poster III-b @Majorana</b> June 2, 06:00-07:30 KST June 1, 23:00-24:30 CEST, EU June 1, 16:00-17:30 CDT, US	<b>Poster IV-b @Majorana</b> June 3, 06:00-07:30 KST June 2, 23:00-24:30 CEST, EU June 2, 16:00-17:30 CDT, US			17:00
18:00	Long Break: 90 min.	Long Break: 90 min.	Long Break: 90 min.	Long Break: 90 min.			18:00
19:00							19:00
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21:00	Break: 30 min.	Break: 30 min.	Break: 29 min.	Break: 30 min.	Short Break: 13 min.		21:00
22:00	<b>S3: Sterile Nu III</b> May 31, 01:00-12:30 KST May 31, 04:00-05:30 CEST, EU May 30, 21:00-22:30 CDT, US	<b>S7: Reactor Nu II</b> June 1, 11:00-12:30 KST June 1, 04:00-05:30 CEST, EU May 31, 21:00-22:30 CDT, US	<b>S11: Accelerator Nu III</b> June 2, 11:00-12:22 KST June 2, 04:00-05:22 CEST, EU June 1, 21:00-22:22 CDT, US	<b>S15: Astrophysical Nu II</b> June 3, 11:00-12:30 KST June 3, 04:00-05:30 CEST, EU June 2, 21:00-22:30 CDT, US	<b>S19: New Nu Tech.</b> June 4, 1:00-12:40 KST June 4, 04:00-05:40 CEST, EU June 3 21:00-22:40 CDT, US		22:00
23:00							23:00
24:00							24:00
				All Continent Time	USA Friendly Time	EU Friendly Time	

# Program at a glance (CEST, EU)

8:00 AM

4:00 PM

11:00 PM  
12:30 PM

Time	May 30 (Mon) (CEST, EU)	May 31 (Tue) (CEST, EU)	June 1 (Wed) (CEST, EU)	June 2 (Thu) (CEST, EU)	June 3 (Fri) (CEST, EU)	June 4 (Sat) (CEST, EU)	Time
0:00							0:00
1:00							1:00
2:00							2:00
3:00		<b>S2: Sterile Nu II</b> May 31, 09:00-10:30 KST May 31, 02:00-03:30 CEST, EU May 30, 19:00-20:30 CDT, US	<b>S6: Reactor Nu I</b> June 1, 9:00-10:30 KST June 1, 02:00-03:30 CEST, EU May 31, 19:00-20:30 CDT, US	<b>S10: Accelerator Nu II</b> June 2, 09:00-10:31 KST June 2, 02:00-03:31 CEST, EU June 1, 19:00-20:31 CDT, US	<b>S14: Astrophysical Nu I</b> June 3, 09:00-10:30 KST June 3, 02:00-03:30 CEST, EU June 2, 19:00-20:30 CDT, US	<b>S18: Nu Interactions II</b> June 4, 09:00-10:47 KST June 4, 02:00-03:47 CEST, EU June 3, 19:00-20:47 CDT, US	3:00
4:00		Break: 30 min.	Break: 30 min.	Break: 29 min.	Break: 30 min.	Short Break: 13 min.	4:00
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12:00	Long Break: 270 min.						12:00
13:00		Long Break: 180 min.	Long Break: 170 min.	Long Break: 210 min.	Long Break: 180 min.		13:00
14:00	<b>Opening Session</b> May 30, 21:00-22:05 KST May 30, 14:00-15:05 CEST, EU May 30, 07:00-08:05 CDT, US					<b>S21: BSM Nu</b> June 4, 20:00-21:30 KST June 4, 13:00-14:30 CEST, EU June 4, 06:00-07:30 CDT, US	14:00
15:00	Short Break: 10 min.	<b>S5: <math>0\nu\beta\beta</math> II</b> May 31, 01:30-23:00 KST May 31, 14:30-16:00 CEST, EU May 31, 07:30-09:00 CDT, US	<b>S9: Accelerator Nu I</b> June 1, 21:30-23:00 KST June 1, 14:30-16:00 CEST, EU June 1, 07:30-09:00 CDT, US	<b>S13: Solar/DSNB Nu</b> June 2, 21:30-23:00 KST June 2, 14:30-16:20 CEST, EU June 2, 07:30-09:20 CDT, US	<b>S17: Nu Interactions I</b> June 3, 21:30-23:30 KST June 3, 14:30-16:30 CEST, EU June 3, 07:30-09:30 CDT, US	Break: 30 min.	15:00
16:00	<b>S1: Sterile Nu I</b> May 30, 22:15-23:45 KST May 30, 15:15-16:45 CEST, EU May 30, 08:15-09:45 CDT, US					<b>Closing Session</b> June 4, 22:00-23:30 KST June 4, 15:00-16:30 CEST, EU June 4, 08:00-09:30 CDT, US	16:00
17:00							17:00
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23:00	<b>Poster I-b @Dirac</b> May 31, 06:00-07:30 KST May 30, 23:00-24:30 CEST, EU May 30, 16:00-17:30 CDT, US	<b>Poster II-b @Dirac</b> June 1, 06:00-07:30 KST May 31, 23:00-24:30 CEST, EU May 31, 16:00-17:30 CDT, US	<b>Poster III-b @Majorana</b> June 2, 06:00-07:30 KST June 2, 23:00-24:30 CEST, EU June 2, 16:00-17:30 CDT, US	<b>Poster IV-b @Majorana</b> June 3, 06:00-07:30 KST June 2, 23:00-24:30 CEST, EU June 2, 16:00-17:30 CDT, US			23:00
24:00							24:00
					All Continent Time	USA Friendly Time	EU Friendly Time



- Speakers ;

- Recommended to submit the slide file 1 day before the talk and slides will be available in the "detailed program" page.
- Should connect with the zoom link sent by email for your talk.
- Please test the zoom connection before your talk, as instructed by email.
- Slides will appear "indico" and zenodo page after the conference.

- Participants;

- "Virtual Venue" → "Live session room"
- Click "**Live**" button with a Passcode.
- For questions, click "Q&A" button and enter your name and the question text.
- All the questions will be displayed in "Chat" window.
- Further question, please use "Slack".

Virtual Venue

Code of Conduct

Live Session  
Room

Poster Session  
(ZEP Metaverse)

Poster Exhibition

Virtual Seoul

IUPAP Poster

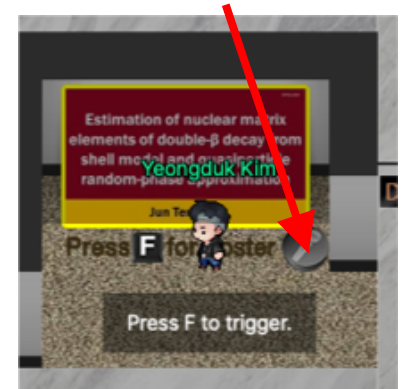
# Metaverse – poster session

Code of Conduct  
Live Session Room  
**Poster Session (ZEP Metaverse)**  
Poster Exhibition  
Virtual Seoul  
IUPAP Poster

- The entire posters can be viewed at a Zep based metaverse.
- Go to “Poster session (ZEP metaverse)”
- 2nd-8th floors, D and M rooms for each floor.
- Double click where you want to go.
- Press “F”, to see the poster in a separate window in the browser.
- Ask question to the presenter and talk with people in the poster room.



Presenter Location



# Poster arrangement

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Session (KST time)	Building	Floor
1-a (5/30, 3-4:30 pm) 1-b (5/31, 6-7:30 am)	Dirac	2F : Sterile Nus 3F : Neutrinoless DBD 4F : Neutrinoless DBD, Nu mass
II-a (5/31, 3-4:30 pm) II-b (6/1, 6-7:30 am)	Dirac	5F : Nus and Cosmology, BSM 6F : BSM, Reactor Nus 7F : Reactor Nus, Nu Oscillation 8F : Nu Oscillation, Leptonic CP Violation
III-a (6/1, 3-4:30 pm) III-b (6/2, 6-7:30 am)	Majorana	2F : Accelerator Nus, Atmospheric Nus 3F : Solar Neutrinos, DSNB, New Nu Tech. 4F : New Nu Tech.
IV-a (6/3, 3-4:30 pm) IV-b (6/3, 6-7:30 am)	Majorana	5F : Astrophysical Nus 6F : Astrophysical Nus 7F : Nu Interactions 8F : Nu Interactions, Other

# Poster exhibition

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- The entire poster can be found on this “Poster Exhibition” too.
- If participants are not able to attend the poster session, leave a question in Q&A and the [question will be forwarded to the poster presenter.](#)
- [If click “Go to Zep” button, it will go to the floor of that poster of the Metaverse.](#)

Select Topics: Neutrino Mass

select Search

No.36 **Poster Session I-b**  
**THE ORIGIN OF THE MASS OF THE NEUTRINOS**  
Neutrino Mass  
Enrique Arrieta-Díaz (Universidad del Magdalena)

No.35 **Poster Session I-b**  
**Physics Opportunities Beyond the Neutrino Mass Measurement wi...**  
Neutrino Mass  
Pranava Teja Surukuchi (Yale University)

No.34 **Poster Session I-a**  
**Observables of the Electrical Potential of the KATRIN Tritium...**  
Neutrino Mass  
Moritz Machatschek (KIT)

No.33 **Poster Session I-a**  
**Atom-Source Development for Project 8**  
Neutrino Mass  
Alec Lindman (Institute for Physics, Johannes Gutenberg University Mainz)

No.32 **Poster Session I-a**  
**Background investigations using a passive transverse energy filt...**  
Neutrino Mass  
Dominic Hinz (Karlsruhe Institute of Technology (KIT))

No.31 **Poster Session I-b**

List

**Poster Session I-a**

**From ECHO-1k to ECHO-100k: Optimisation of the High-Resolution Metallic Magnetic Calorimeters with Embedded  $^{163}\text{Ho}$**

Neven Kovac (Kirchhoff Institute for Physics)

Topic : Neutrino Mass ZEP location : 4F, Drac, DT03-696

**Go to Zep**

**Abstract**

Arrays with tens to hundreds of Metallic Magnetic Calorimeters (MMCs), each implanted with  $^{163}\text{Ho}$ , were selected for the ECHO experiment, because of the excellent energy resolution of up to 2-3 eV, a fast response time below 1  $\mu\text{s}$ , and a near-linear detector response that allows for a reliable energy calibration. Based on the performance achieved with the detectors developed for the first phase of the ECHO experiment, the ECHO-1k phase, a new design of 64-pixel ECHO-100k arrays has been conceived. This new design features an optimised single pixel geometry, allowing for a larger  $^{163}\text{Ho}$  activity of 10 Bq per pixel. First wafers, each with 40 ECHO-100k detector chips, have been fabricated, and the characterisation of the newly developed detector arrays at different temperatures has been performed. We present the measured performance of both the implanted and non-implanted ECHO-100k detector pixels. In conclusion, we discuss the on-going R&D to demonstrate the scalability of detector fabrication, including the ion-implantation of  $^{163}\text{Ho}$ , as a preparation for the large-scale production of the 12000 MMC pixels, foreseen for the ECHO-100k phase of the experiment.

**Q&A and Comments (0)**

Yeonduk Kim (Institute for Basic Science) Send

[Q&A / Comment](#)

# Public talk

**NEUTRINO 2022**  
XXX International Conference on Neutrino Physics and Astrophysics  
*Virtual Seoul* May 30 (Mon) - June 4 (Sat), 2022

2015 노벨물리학상 수상  
카지타 타카아키 교수와 함께하는  
**Public Talk**

**Topic**  
Oscillating Neutrinos  
- a key to understanding the Universe  
진동하는 중성미자 - 우주를 이해하는 열쇠

—  
**2022. 6. 2. (목) 오후 5시**  
*Virtual Seoul*

카지타 타카아키  
Takaaki Kajita  
慶 道 府 大 学 教 授

주최 KPS 한국물리학회 iBS Institute for Basic Science KIAS  
후원 APC KEK J-PARC

Forum is a sponsor of NEUTRINO 2022.  
The APCIF is supported by the Korean Government through the Science and Technology Promotion Fund and Lottery Fund and aims to maximize social value through its various activities.

참가 등록

- Public talk by Prof. Takaaki Kajita is on June 2<sup>nd</sup>, 5pm.
- You can join the talk through “virtual Seoul” and connecting to “open stage” or via Youtube.
- Goto “Public Talk” menu.

- We have opened Slack channels for information exchange between participants.
- The invitation letter has been sent to registrants.
- Slack Channels have been set up :
  1. **talks\_<session name>**: After the session, you can leave further questions or have a variety of discussions about the session. Ex) # talks\_astro\_nu
  2. **poster\_sess\_<session>**: You can ask questions or discuss about posters. Ex) # poster\_sess\_1
  3. **Announcements** : Important notices are displayed here.



# Virtual Seoul

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- **Various events of NEUTRINO 2022**

- Open Stage for participating **public talk**
- Exhibition Hall for the **50th anniversary**
- **Network Lounge** where you can **make your own Korean name**
- **Seoul Theater**, a video of Seoul that has both traditional and modern beauty.



“The 50<sup>th</sup> Anniversary” menu

**NEUTRINO 1972  
Proceedings**

**NEUTRINO 1972  
Participants**

**The 50th Anniversary  
Photos**

**Hungarian Physical Review  
for the 50th Anniversary**

**Europhysics News for  
the 50th Anniversary**

**History of the Neutrino**

**The 50th Anniversary  
Committee**

# **INTERNATIONAL CONFERENCE ON NEUTRINO PHYSICS AND ASTROPHYSICS 1972–2022**

**Stephen Parke**

Neutrino '72 had two exceptional aspects: first, it was the dawn of the Glashow–Weinberg–Salam era where neutrino physics was of paramount importance for the discovery of a new weak force of Nature, mediated by the  $Z^0$  boson, and unified the weak and electromagnetic interactions. This led to the  $SU(3) \times SU(2) \times U(1)$  gauge theory of the Standard Model, a monumental step in our understanding of Strong, Weak and Electro-magnetic Interactions. Second, this conference launched what is now the International Conference on Neutrino Physics and Astrophysics Series, a conference dedicated to the Neutrino.

In June of 2022, the 50th anniversary of Neutrino '72, thirty such Neutrino Conferences will have been held in locations in Europe, North America and Asia/ Oceania. George Marx, as founder of this series, pre-sided over the first twenty of these meetings. Many important results in neutrino physics have been re-reported at one of these conferences. Ray Davis and John Bahcall frequently reported on the updated measurements and calculations, respectively, of the solar neutrino flux puzzle. Other examples are the definitive discovery of neutrino oscillations by Super-KamiokaNDE at the 18th conference in 1998 and the SNO results on solar neutrinos fluxes at



## Code of Conduct

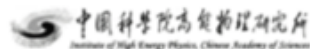
Just as with an in-person conference, participants of the online Neutrino 2022 conference will conduct themselves in a professional manner that is welcoming to all and free from any form of discrimination, harassment, bullying, or retaliation. Participants will treat each other with respect and consideration 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 2022 conference Co-Chairs: Yeoungduk Kim, Sunny Seo. You are also welcome to send a direct email to any or all of the two Co-Chairs.

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# Contacts, ....

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- General questions : [office@neutrino2022.org](mailto:office@neutrino2022.org)
- Talks : [1.sunny.seo@gmail.com](mailto:1.sunny.seo@gmail.com)
- Posters : [office@neutrino2022.org](mailto:office@neutrino2022.org)

**The organizers wish all of you**  
**enjoy the monumental conference !**

**Let's start the conference talks !**