

# Welcome

**H. Nanjo for organizers  
(Osaka U.)**

# Welcome

- Motivation of the workshop
  - To discuss the future of kaon physics.
    - Kaon physics is at a turning point. While the kaon rare decay experiments NA62 and KOTO are in full swing, the future experimental landscape is unclear.
      - CERN's decision not to have HIKE
      - Extension of hadron experimental facility and KOTO II at J-PARC are not funded yet
    - It's a good time to discuss the future of kaon physics with theorists and experimentalists.
    - Based on the status of the current NA62, LHCb, and KOTO experiments,
    - We would like to have international discussions, especially focusing on the realization of the future planned KOTO II experiment at J-PARC and the development of a broader physics program and detectors.
- Prepare for inputs to **European Strategy** process

# European Strategy

- March 21, 2024 : Start of the update of process on the European Strategy
- **March 31, 2025 : Deadline to submit written input from community**
  - May 26, 2025 : deadline of further opportunities of inputs
- June 23-27, 2025 : Scientific Open Symposium
- By the end of September 2025 : Physics Briefing Book by a group.
  - November 14, 2025 : deadline of further opportunities of inputs
- December 1-5, 2025 : Drafting session
- In a first step, the particle physics community is invited to submit written input by 31 March 2025

# Program

- 1st day
  - Theory
  - Current
  - Strategy

- 2nd day

- Future  $K_L \rightarrow \pi^0 \nu \bar{\nu}$
- Future  $K_L \rightarrow (\pi^0) l l$

- 3rd day

- Technology

- Q&A at the last of presentation
  - Use microphones
- Discussion sessions
  - Relax with coffee
  - Try to avoid “Negative words” to be constructive

	July. 27 (Day 1)	July. 28 (Day 2)	July. 29 (Day 3) <sup>4</sup>
9:00	Registration (from 8:00 50 min)		
	Welcome (10)		
	KEK's strategy (20) <i>Naohito Saito</i>	Exotic Kaon decays and New Physics (40) <i>Frank Deppisch</i>	Low-energy QCD theory from a theoretical perspective (20) <i>Karol Kamn</i>
	Strategies to test beyond the Standard Model with Kaon physics (50) <i>Nazila Mahmoudi</i>		Evolution of the NA62 DAQ toward HIKE (25) <i>Enrico Gamberini</i>
10:00		KOTO II (50) <i>Hajime Nanjo</i>	KOTO/KOTO II DAQ (25) <i>Chieh Lin</i>
	Connecting theories of flavour to Kaon physics (50) <i>Marzia Bordone</i>		Concepts of a crystalline Small Angle Calorimeter (25) <i>Mattia Soldani</i>
	Break (10 min)	Break (10 min)	Development of nanocomposite scintillator for high-energy physics (25) <i>Matthew Moulson</i>
11:00	Lattice QCD for $K \rightarrow \pi l^+ l^-$ decays (40) <i>Antonin Portelli</i>	HIKE main electromagnetic calorimeter (25) <i>Ilaria Rosa</i>	Recent development of semiconductor detector for the particle physics (25) <i>Manabu Togawa</i>
	Discussion I (50) <i>Giancarlo D'Ambrosio</i>	Calorimeter (25) <i>GeiYoub Lim</i>	Discussion V (25 min)
12:00		Discussion II (50) <i>Matthew Moulson and Koji Shiomi</i>	Concluding remarks (10)
	Lunch (60 min)	Lunch (60 min)	Lunch (60 min)
13:00			IPNS seminar : Recent results from NA62 and future directions of kaon physics (60) <i>Cristina Lazzeroni</i>
	NA62 results and prospects (50) <i>Francesco Brizioli</i>	On $K_L \rightarrow (\pi^0) l^+ l^-$ decays (40) <i>Martin Hoferichter</i>	
14:00		$K_L \rightarrow \mu^+ \mu^-$ from lattice (40) <i>En-Hung Chao</i>	J-PARC Tour (160 min)
	Kaon programs in LHCb (50) <i>Diego Martinez</i>	$K \rightarrow \mu \mu$ as a clean probe of short-distance physics (25) <i>Avital Dery</i>	
15:00		Discussion III (30) <i>Andreas Juettner</i>	
	Break (30 min)	Break (30 min)	
16:00	KOTO results and prospects (50) <i>Tadashi Nomura</i>	$K_L \rightarrow \pi^0 l^+ l^-$ (30) <i>Yu-Chen Tung</i>	
	Break (20 min)	$K_L \rightarrow \pi^0 l^+ l^-$ (30) <i>Evgueni Goudzovski</i>	
17:00	CERN's strategy/decision (20) <i>Andreas Juettner</i>	Straw Tracker (25) <i>Hans Danielsson</i>	
	J-PARC/HEF and extension (25) <i>Hitoshi Takahashi</i>	Discussion IV (50) <i>Cristina Lazzeroni</i>	
18:00			
19:00	Reception (120 min until 20:30)		

# Onsite registration, Group photo, and Reception

- Onsite registration (break)
- Group photo : July 27 15:20-
- Reception : July 27 18:30-
  - Room 115
  - Foods and Drinks

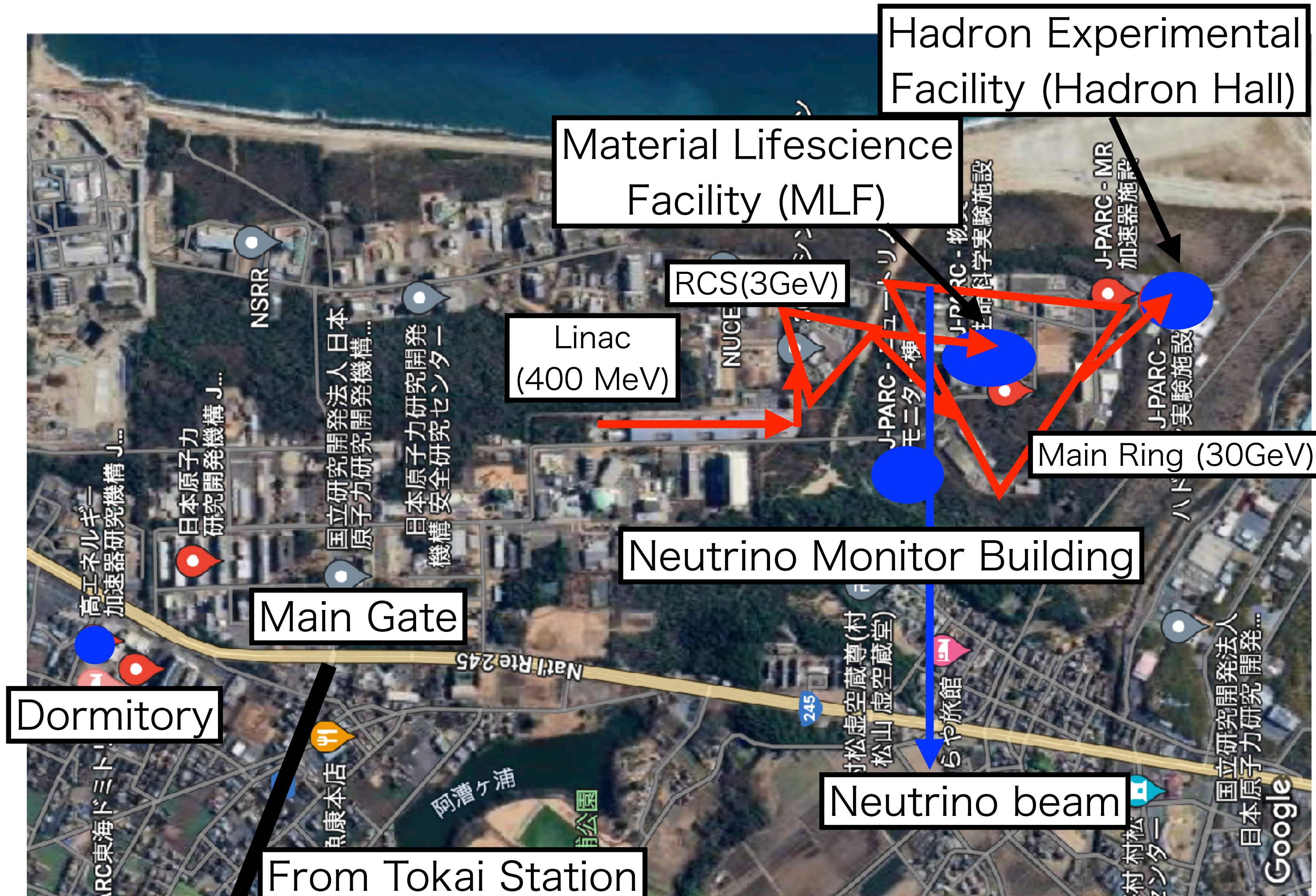
15:00	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	14:30 - 15:20
	<b>Break</b>	
	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	15:20 - 15:50
16:00	<b>KOTO results and prospects</b>	Tadashi NOMURA
	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	15:50 - 16:40
	<b>Break</b>	
	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	16:40 - 17:00
17:00	<b>CERN's strategy and decision</b>	Andreas JUETTNER
	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	17:00 - 17:20
	<b>J-PARC Hadron Experimental Facility and extension</b>	Hitoshi TAKAHASHI
	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	17:20 - 17:45
18:00	<b>Reception</b>	
19:00		
20:00		
	Room 116 , Room 116 in Tokai Building #1 (Tokai-1-go-kan) at KEK Tokai campus	18:30 - 20:30



# J-PARC Visit

Organized by J-PARC PR division

- 3 items
- Neutrino near detector (Neutrino Monitor building)
- first acceleration of muon for muon  $g-2$ / EDM experiment (MLF)
- KOTO detector (Hadron hall)





# J-PARC Visit

- Should be ready to enter the experimental site.
  - **Long sleeves, long pants, and shoes** are required. (No sandals or high heels)  
If it is inappropriate, you may not go to the most interesting regions.  
(Strict rule exists. No long-sleeve clothes are prepared at the MLF site.)
- Need an ID card with your photo
  - Please wear the official ID with your photo.
    - **Your passport** is necessary for the **foreign participants**.
    - For domestic participants, an ID including a student ID card from your institute or a driver's license is also possible.  
(Strict rule exists, since the site has a research nuclear reactor.)

# Plan of J-PARC visit with two groups


- Ask you to fill google spread sheet to which group you will join
- **Group 1 : neutrino→muon g-2/EDM→ KOTO**
  - 14:15 Leave Tokai Building #1
  - 14:40 - 15:00 Neutrino Near Detector (Neutrino Monitor site)
  - 15:10 - 15:50 MLF for muon acceleration toward muon g-2/EDM experiment
  - 16:00 - 15:40 Hadron Experimental Facility for KOTO
  - 16:55 Arrive at Tokai Building #1
- **Group 2 : KOTO→neutrino→muon g-2/EDM→ KOTO**
  - 14:15 Leave Tokai Building #1
  - 14:45 - 15:25 Hadron Experimental Facility for KOTO
  - 15:35 - 15:55 Neutrino Near Detector (Neutrino Monitor site)
  - 16:05 - 16:45 MLF for muon acceleration toward muon g-2/EDM experiment
  - 16:55 Arrive at Tokai Building #1













# Weather

- Hot and Humid weather

## Weather forecast for Tokai Village, Ibaraki Prefecture

 The latest view of the week

Day	28 (Sunday)	29 (Mon)	30 (Tuesday)	31 (Wed)	1 (Thursday)	2 (Friday)	3 (Saturday)	4 (Sunday)	5 (Mon)	6 (Tuesday)
weather										
The best	33°C	33°C	30°C	31°C	30°C	30°C	30°C	29°C	29°C	29°C
The lowest	25°C	26°C	24°C	23°C	24°C	25°C	25°C	24°C	24°C	24°C
precipitation	40%	40%	40%	30%	20%	20%	40%	60%	40%	40%

Every 5 minutes | 
 Every hour | 
 today, tomorrow | 
 weekly weather

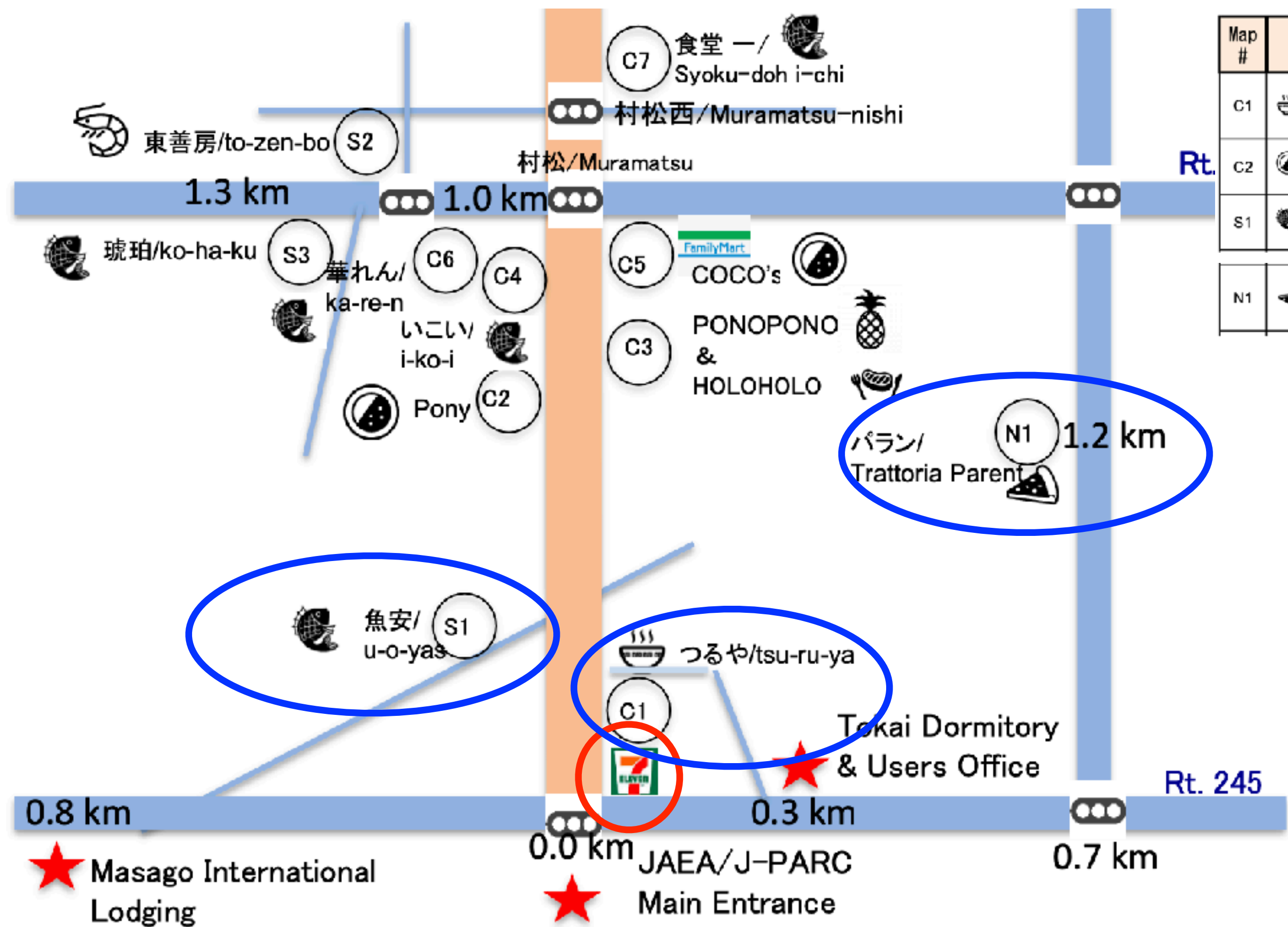
# Be careful of heat stroke

- <https://www.mhlw.go.jp/english/policy/health-medical/health/dl/heatstork.pdf>
- High temperature, High humidity
  - the balance of water and salt in the body is disrupted
  - thermoregulation does not function
  - heat is accumulated in the body
- muscle aches, heavy sweating, nausea, and fatigue, the loss of consciousness.
- **Take water and salt**



# Foods

- <https://is.j-parc.jp/uo/data/life/RestaurantMap.pdf>



Map #	Name (pronunciation)	Adress	Phone	Hours	Closed	Remarks	Englis
C1	つるや (tsu-ru-ya)	村松234-1 Muramatsu	029-282-2055	11:00-14:45, 17:00-18:45	Mon	UDON (wheat noodle)	○
C2	Pony	村松471-3 Muramatsu	029-282-3161	11:30-14:00, 17:00-21:00	Sun	Lunch (hamburger steak & croquette) 850yen	◎
S1	魚屋 (u-o-yas)	村松214-13 Muramatsu	029-283-2068	11:30-14:00, 17:00-20:50	Tue	Specialized in fish dishes	
N1	パラン Trattoria Parent	白方443-1 Shirakata	029-282-0456	11:00-15:00, 17:30-22:00/ weekends 11:00-16:00, 17:30-22:00	Mon	pizza 1050yen~	◎

Western= 🇺🇸 Italian= 🇮🇹 French= 🇫🇷 Chinese= 🇨🇳 lawaiian= 🇺🇸 / 🇵🇾 PPAN= 🇵🇾 / 🇮🇵 IBURI= 🇮🇵 / 🇨🇳 dle= 🇨🇳 / 🇮🇵 iHI= 🇮🇵

# Thank you

- Supported by KEK IPNS → KEK IPNS workshop
  - Local travel expense, coffee
  - KEK IPNS seminar by Cristina on July 29
- Co-host
  - KEK Theory Center, J-PARC center, Hadron Hall User's Association
- Lots of participants
  - All participants : 113, Onsite participants : 47
- Organizers
  - Yau W. Wah, Evgueni Goudzovski, Cristina Lazzeroni, Karim Massri, Matthew Moulson, Motoi Endo, Andreas Jüttner
  - Local : Tadashi Nomura, Koji Shiomi, Hajime Nanjo