

Overview of KU Particle Physics Program and Research Network Program

2025/Feb/21

Tamaki YOSHIOKA

Kyushu University was established in 1911.

→ Celebrated 111th anniversary in 4 years ago!

Elementary particle physics laboratory was born in April 2011.



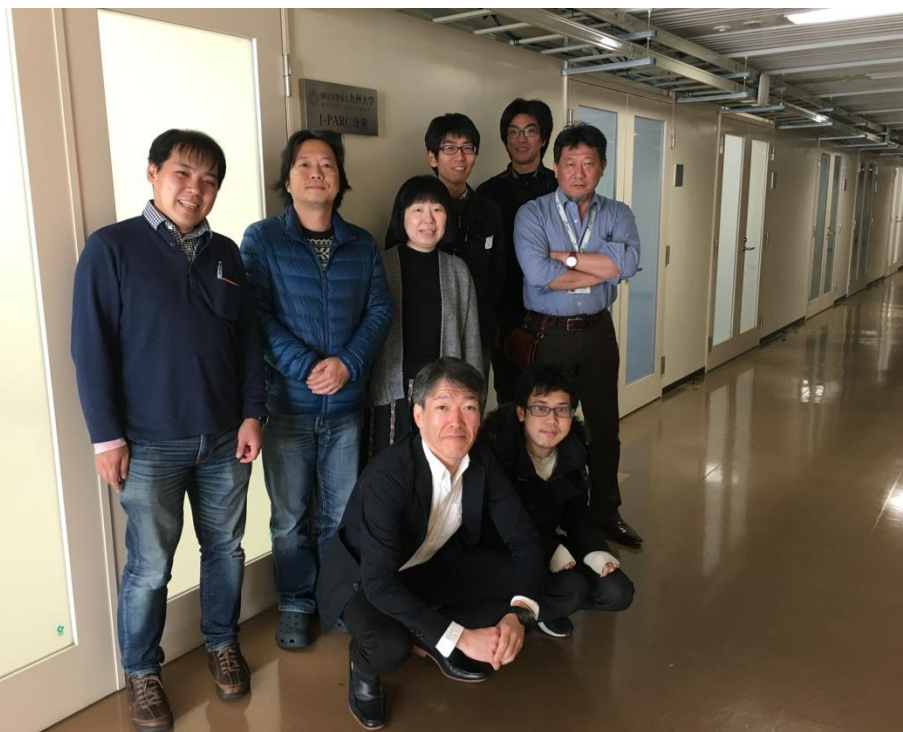


New Research Center for Advanced Particle Physics (RCAPP) has been established in October 2012.

- Energy Frontier Experimental Division
- High-Intensity Quantum-Beam Experimental Division
- Advanced Theoretical Particle-Physics Division



J-PARC branch has been established in March 2018.

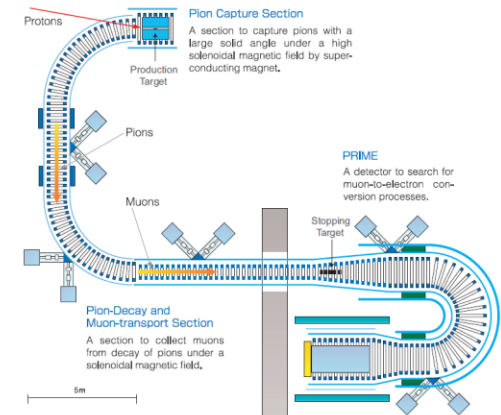
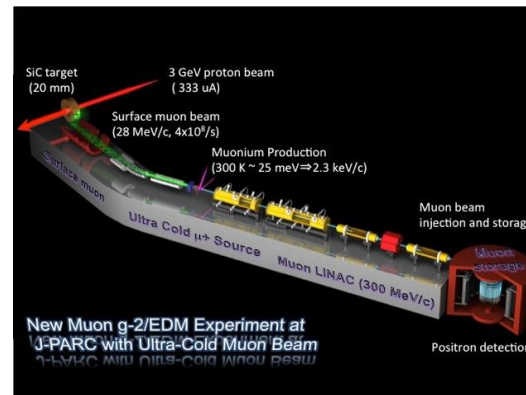
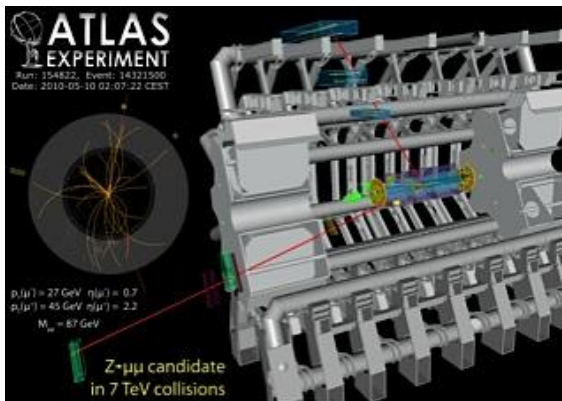


Energy Frontier Experiment

- ATLAS experiment

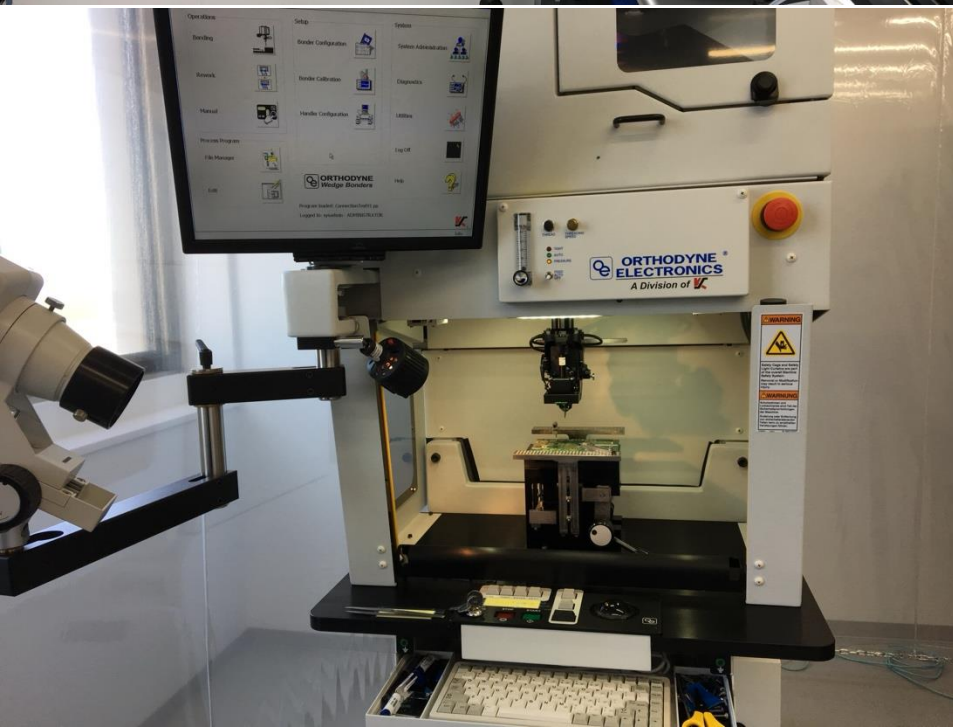
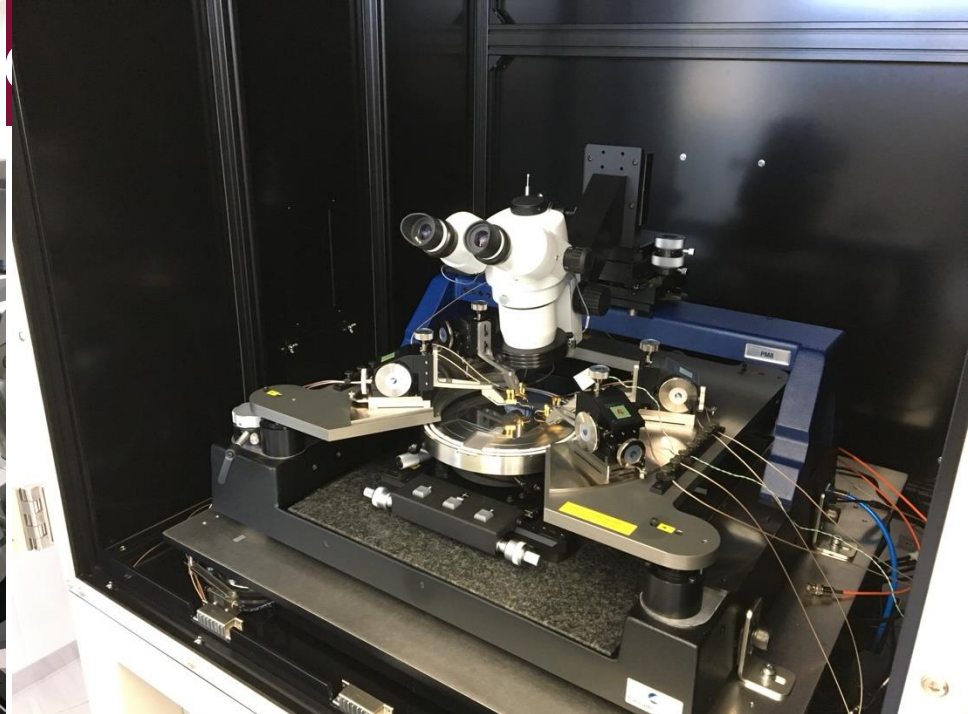
Precision Experiment

- Muon experiments @ J-PARC (COMET & muon g-2/EDM)
- FASER experiment @ CERN



Details will be presented in this workshop.

Facility for Silicon detector at Kyushu



Staff

- 1P, 2AP, 3A, 2PD

Students

- 2 doctor course,
- 11 master course,
- 3 undergraduate





Long history on collaboration of J-PARC g-2/EDM exp.

- CM15 @ KU
 - Prof. Seonho Choi visited KU
- CM18 @ SNU
 - Many KU members participated.
- First workshop in 2023 @ SNU
 - Mibe-san / myself visited

→ These bring us to submit the “Research Network Program” to strengthen our relationship.

Mini-workshop on Hidden Symmetries of the Universe			
📅 Friday 10 Nov 2023, 10:00 → 22:20 Asia/Seoul			
📍 23-317 (SNU Physics)			
Description A Mini-workshop on hidden symmetries of the universe. Main topics would be muon g-2/edm, neutrinos, dark matter, anti-gravity etc.			
Participants bongho kim Eunil Won Inseok Yoon Jeongsu Ha Jonghee Yoo Latsamy Xayavong MyeongJae Lee Seonho CHOI Sun Kee Kim Sunghoon Jung Tamaki Yoshioka Tautomu Mibe Un-ki Yang			
Contact ✉ faibala@snu.ac.kr			
10:00 → 12:00 Mini-Workshop: Session 1			
10:00	Precision Measurement of muon g-2/edm with novel approach at J-PARC	🕒 40m	Speaker: Prof. Tautomu Mibe (KIX)
10:40	Fundamental physics using cold neutrons at J-PARC	🕒 40m	Speaker: Prof. Tamaki Yoshioka (Kyushu University)
11:20	Hidden Symmetries in Cosmic Microwave Background	🕒 40m	Speaker: Prof. Eunil Won (Korea University)
12:00 → 13:30	Lunch	🕒 1h 30m	
13:30 → 15:30 Mini-Workshop: Session 2			
13:30	Antihydrogen Freefall experiment at CERN	🕒 40m	Speaker: Dr Bongho Kim (Center for Underground Physics, IBS)
14:10	Precision Frontier in Nuclear and Particle Physics from nuclear beta decay	🕒 40m	Speaker: Dr Jeongsu Ha (Center for Exotic Nuclear Studies, IBS)
14:50	TBA	🕒 40m	Speaker: Prof. Myeong Jae Lee (Sungkyunkwan University)
15:30 → 15:50	Break	🕒 20m	
15:50 → 17:30 Mini-Workshop: Session 3			
15:50	Search for hidden heavy neutrinos at the LHC	🕒 40m	Speaker: Prof. Un-ki Yang (Seoul National University)
16:30	Large Scale Neutrino Telescope in Deep Sea	🕒 40m	Speaker: Prof. Jonghee Yoo (Seoul National University)
17:10	Discussion	🕒 20m	
17:30 → 19:30	Dinner	🕒 2h	



Program Title: Japan-Korea Exchange for the Development of Muon Particle Physics

Purpose of the Exchange Plan: The significant discrepancy observed between the experimental and theoretical values of the muon's anomalous magnetic moment is a major issue in the field. The Particle Experiment Laboratory and the Advanced Particle Physics Research Center of the Department of Physics at the Faculty of Science have identified this problem as a critical issue and are promoting an experimental plan to precisely measure the muon's anomalous magnetic moment using a method different from previous studies. This experiment is an international collaboration involving over 100 participants, with Kyushu University and Seoul National University having established a cooperative relationship in developing the key positron track detector. The goal of this program is to accelerate international exchange with Seoul National University and foster international young leaders, thereby significantly contributing to the internationalization of Kyushu University.



Kyushu University

- Applicant
 - Tamaki Yoshioka (PI)
 - Shohei Shirabe (Co-PI)
- Amount of grand : 700,000 JPY

Seoul National University

- Counterpart researcher
 - Seonho Choi
- Matching fund : 10,000,000 KRW



- **July:** Once the results of this program's review are available, the applicant and the associate will visit Seoul National University to discuss the year-end workshop and future research cooperation. Travel expenses will be covered by the program's support fund. Additionally, Professor Tsutomu Mibe from KEK will be invited. His travel expenses will be covered by other sources at Kyushu University. **Done !**
- **September:** Professor Seonho Choi will be invited to Kyushu University to give a seminar for the faculty and students of the Department of Physics at the Faculty of Science. He will also visit the semiconductor detector development facility at Kyushu University, followed by discussions on possible research collaborations. **Done !**
- **November:** The associate will visit Seoul National University to further discuss future research cooperation. Travel expenses will be covered by the program's support fund. **Done !**
- **January:** The applicant and the associate will visit Seoul National University to finalize the workshop arrangements. Travel expenses will be covered by the program's support fund.
- **End of February:** A workshop will be held at Kyushu University. Six participants from Seoul National University (including Professor Seonho Choi and 2 staff members, and 4 students) will attend. Their travel expenses will be covered by Seoul National University's matching fund. The students from Seoul National University will also visit the semiconductor detector development facility at Kyushu University. Additionally, Professor Tsutomu Mibe from KEK will be invited to this workshop, with his travel expenses covered by other sources at Kyushu University.

**This workshop:
we will expect a fruitful
discussion for future
collaboration**

Please send me your presentation slide.

Lab tour in this afternoon.

- Yamanaka-san is a tour conductor.
- Please get together in this room at 13:30

Dinner

- Dinner will start at 19:00 around Nakasu-Kawabara sta.
 - 兼平鮮魚店(かねひらせんぎょてん)
 - <https://tabelog.com/fukuoka/A4001/A400102/40004026/>
- Workshop will end around 17:00, so Korean colleagues have a time to once back to hotel and put their baggage. Yamanaka-san/myself will be accompanying.