



Welcome to KMI School 2024

- The 5th KMI School is dedicated to exploring “**Quantum Computing and Technology for Particle Physics and Astrophysics**” in collaboration with ICEPP (University of Tokyo).
- Quantum computing, an emerging technology, has the potential to change the landscape of particle physics and astrophysics. Its potential lies in unlocking the ability to study phenomena that have been beyond the reach of traditional computing power. This breakthrough has the potential to explore a new era of research

Lectures/Hands-on: Quantum Computing for Particle Physics and Astrophysics

Koji Tereashi, Tatsumi Nitta, Shion Chen, Yutaro Iiyama (ICEPP, University of Tokyo)

Introduction to quantum computation

Representation of physical systems and quantum dynamics simulation

Applications to high-energy experiments (quantum machine learning, tracking, optimization, etc.)

Introduction to superconducting qubits and quantum computers

Introduction to quantum sensors

In addition to lecture/hands-on sessions, the event will feature topical seminars focused on quantum computing and quantum sensors in the field of particle physics and astrophysics.

Topical seminars

Kosuke Mitarai (Osaka University)

Introduction to Quantum Computation and Its Application in Particle Physics

Sofia Vallecorsa (CERN)

Quantum Machine Learning in High Energy Physics

Raphael Cervantes (FNAL)

Wavelike Dark Matter with SRF cavities and Superconducting Qubits at SQMS

Sam Posen (FNAL)

Overview of the Superconducting Quantum Materials and Systems (SQMS) Center, a US Department of Energy Quantum Research Center

Tatsuma Nishioka (Osaka University)

Quantum error correction and high energy physics

Haruna Katayama (Hiroshima)

Analogue black hole solitons in a superconducting transmission line

Yuimaru Kubo (OIST)

Quantum Technologies with Hybrid Systems



Some Information from LOC

Some remarks about the logistical arrangements:

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- **Network:** Please use eduroam or nuwnet. For nuwnet, please open the web browser after joining the network, then you will be asked to fill Username and Password. Both of them can be found on your name tag. If you cannot access both of them, please let us know.
- **ZOOM connection:**
<https://us06web.zoom.us/j/81875942020?pwd=LnJJukoYn6Jy6nT6HUmam2O4B3JKR3.1>
Meeting ID: 818 7594 2020
Passcode: 535202
- **Coffee break:** just in front of this room
- **Group photo:** We will take a group photo before lunch time today
- **Poster session:** The poster session will be held in front of this room this evening. Light meals and drinks will be served.
- **IBMid Account:**
During the tutorial, we will use IBM Quantum. Please make an IBMid account before the tutorial. If you still don't have an account, please visit the following website and then make an account ASAP:
<https://quantum.ibm.com/>
- **Campus Map:** https://web-honbu.jimu.nagoya-u.ac.jp/fmd/06other/shisetukanribu/image/various_map/higashiyama_eng.pdf

Lunch/Shops

<https://www.google.com/maps/d/viewer?mid=1YC7OpTlv3jq5AUazw0poxpOWCXQJaVU&hl=en&usp=sharing>

☰ ICRC2023 Venue 🔍 ⋮

✓ **Foods on Campus**

- ✕ Chez Jiroud (Restaurant)
- ✕ "Hana-no-ki" (Restaurant)
- ✕ Hokubu Shokudo (North Canteen)
- ✕ Universal Club (Restaurant)
- ✕ Nambu Shokudo (South Cafeteria)
- ✕ Dining Forest (Canteen)
- ☕ Seattle Espresso (Cafe)
- ☕ Café Blanc
- ☕ Starbucks Coffee

✓ **Foods outside Campus**

- ✕ Dhom Dhadaka
- ✕ Pion (not meson but Korean BBQ)
- ✕ Haloki
- ✕ Cafe Mountain
- ✕ Mega Kebab
- ✕ Hoja Nasreddin
- ✕ Yamate Cafe
- ✕ Tarkari
- ✕ Syunsai Cafe Oteate
- ✕ Gran Piatto
- ✕ musubi

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Nagoyadaigaku 名古屋大学

Nagoya Daigaku Station 名古屋大学駅

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Enjoy the school !