



# The 13<sup>th</sup> Joint Seminar

(Co-organised by MEXT Fugaku Battery & Fuel Cell Project)



## Quantum Computing and First-Principles Calculations: Seeking a Killer Application of Quantum Computers

Co-Chair: Dr. Y. TATEYAMA (MANA (PI) / GREEN) & Dr. A. Ishikawa (GREEN)

### Prof. Wataru Mizukami

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The development of quantum computers has made significant progress in recent years. Say, IBM announced a 127-qubit quantum computer on the 16th of this November. The realization of a fault-tolerant quantum computer with error correction is becoming a reality, although all the current quantum computers are without error corrections. In this light, the search for applications of quantum computers becomes more and more active. Among them, first-principles computation is attracting attention as a killer application. This talk starts with a brief description of quantum computers and explains why first-principles computing matters. Next, I illustrate the current status of first-principles computation using quantum computers, including our research results. Finally, I talk about the current challenges and outlooks in this field.

**Venue:** Auditorium, 1F, WPI-MANA Bldg., Namiki-site / Zoom (Hybrid)

**Date:** December 21<sup>st</sup>, Tuesday      **Time:** 13:30-14:30

**Registration for ONLINE participation:** <https://forms.gle/vCF3p13C5PxFXMwb6>

(\*Registration Deadline: Evening on 20<sup>th</sup> December)

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