Quantum Research Activities at the Institute for Quantum Computing & Quantum Innovation Laboratory

Na Young Kim[1]*
[1]*Institute for Quantum Computing, Department of Electrical and Computer Engineering, University of Waterloo, ON, Canada*

The Institute for Quantum Computing (IQC) was established at the University of Waterloo, making its distinction as the pioneer in quantum institutes globally. Over the past twenty years, rigorous explorations in both theoretical and experimental research have been undertaken across five fundamental domains of quantum information processing science and technology: quantum computation, quantum simulation, quantum communication, quantum sensing, and quantum materials. In this talk, I will accentuate numerous noteworthy advancements in quantum research initiatives and educational endeavors at IQC, while also unveiling a forward-looking strategic roadmap.

I lead the Quantum INnovation (QuIN) laboratory, which is dedicated to realizing a visionary objective: the development of a robust solid-state quantum architecture utilizing established semiconductors and cutting-edge nanomaterials. I will provide an overview of the latest advancements in our research activities.

*Corresponding author; E-mail nayoung.kim@uwaterloo.ca

Quantum Revolution 2.0

Na Young Kim[1]*
[1]*Institute for Quantum Computing, Department of Electrical and Computer Engineering, University of Waterloo, ON, Canada*

Quantum mechanics, which emerged at the dawn of the 20th century, stands as a cornerstone of contemporary science and technology, profoundly enriching our understanding of physics, chemistry, materials science, biology, semiconductors, and many more fields. Notably, the recent surge in quantum information science and technologies has ushered in remarkable progress, particularly in the realm of computation and communications, heralding what is commonly referred to as the second quantum revolution. In this presentation, I will give an overview of the present status of the quantum revolution 2.0 and explore its promising future prospects.