

INVITATION TO THE LECTURE

MAY 28, 2025

13:15

ROOM 213

MATHEMATICAL BACKGROUND OF QUANTUM COMPUTING

Tomáš Luber

Institute of Geonics of the Czech Academy of Sciences, Ostrava

As quantum computing transitions from theoretical curiosity to practical application, the question "How does it actually work?" becomes more and more common. This is often answered by popular science narratives which, while accessible, usually introduce various misconceptions.

This talk will try to clear some of those misconceptions by presenting an axiomatic introduction to the mathematical theory of quantum mechanics, focusing on aspects directly relevant to quantum computing. We will explore the linear algebraic structure of the quantum state space, time evolution, and measurement and show how these concepts map to the building blocks of quantum computation.

Finally, the idea behind Grover's search algorithm will be presented to illustrate the concepts.