

# The 216<sup>th</sup> MANA Special Seminar



## The different possible designs of atomic scale logic gates

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An atomic scale logic gate is a single quantum system (a molecule or a surface dangling bond circuit) electronically interacting with atomic scale metallic electrodes performing alone an “M inputs - P outputs” digital logic function. We will show how all the known designs of atomic scale logic gates: semi-classical circuits, quantum Hamiltonian circuits and qubit circuits are different versions of quantum control. Semi-classical and quantum circuit design rules will be recalled. They differ in the way the classical input data are encoded on the quantum system and how the quantum to classical conversion proceeds to read the output. We will compare classical and quantum design from the point of view of their intrinsic performances but also from a more practical point of view: how a quantum design can benefit from decoherence coming from the interconnections when designing the Boolean logic gate.

**Venue:** 4F, Seminar room #431, MANA Bldg.,

**Date:** July 28th (Thu) **Time:** 15:30-16:30

**NAMIKI Site**

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