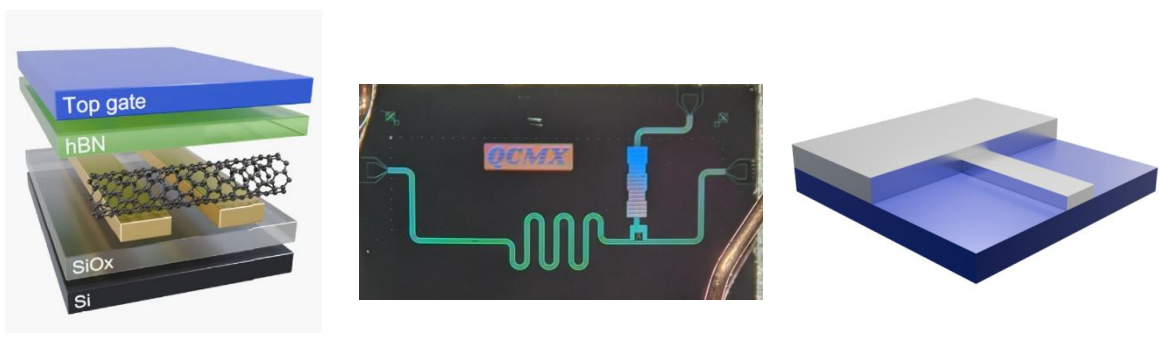


Title : Exploring Quantum States in Carbon Nanotubes and Novel Josephson Junctions		
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Email : joel.griesmar@polytechnique.edu		
Webpage: https://qcmx.fr/		
Research Area: Condensed Matter / Quantum Science and Technology		
Methods: Cryogenics, electronics, microwave measurements, low noise DC measurements, nanofabrication, numerical simulations		
PhD track subject: This project explores quantum states localized between two superconductors: the Andreev bound states. We study these states in carbon nanotubes (CNTs), where a single molecule hosts a single conduction channel [1], and in novel aluminum Josephson junctions with pinholes through an insulating barrier [2]. A key goal is to achieve coherent control of these quantum states, building on our recent realization of a superconducting qubit based on a CNT [3]. The project will explore these platforms as building blocks for quantum devices.  Left: a Josephson junction made with a carbon nanotube. Center: microwave circuit to control the CNT-based qubit. Right: a pinhole Josephson junction.		
References: [1] S. Annabi <i>et al.</i>, Phys. Rev. Applied 22, 064035 (2024) [2] J. Griesmar <i>et al.</i>, Phys. Rev. Applied 24, 064065 (2025) [3] H. Riechert <i>et al.</i>, Nat. Commun. 16, 7197 (2025)		