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THE GERMANIUM QUANTUM INFORMATION ROUTE

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Martedì 10 Maggio 2022 ore 15:00 – Piattaforma TEAMS
(short-link: https://bit.ly/3kEadlp)

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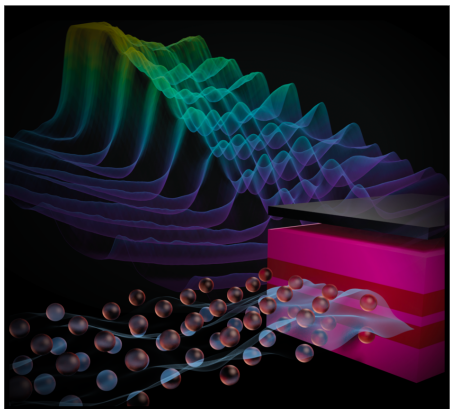
The semiconductor industry knows how to make and integrate billions of excellent transistors. What materials do we need to integrate excellent qubits at large scale for the quantum information age of tomorrow? I will make a case for the germanium quantum information route [1]. Germanium is emerging as a versatile material to realize devices capable of encoding, processing and transmitting quantum information. I will examine the materials science progress underpinning germanium-based planar heterostructures [2], review our most significant experimental results demonstrating key building blocks for quantum technology [3,4], and identify the most promising avenues toward scalable quantum information processing in germanium-based systems.



[1] G. Scappucci et al, The germanium quantum information route, Nat Rev Mater (2020). https://doi.org/10.1038/s41578-020-00262-z
[2] A. Sammak et al, Low disordered, stable, and shallow germanium quantum wells: a playground for spin and hybrid quantum technology, Advanced Functional Materials 1807613 (2019)
[3] N. Hendrickx et al, Fast two-qubit logic with holes in germanium, Nature 577, 487 (2020)
[4] N. Hendrickx et al, A four qubit germanium quantum processor, Nature 591, 580 (2021)

TEAMS extended link:
https://teams.microsoft.com/l/meetup-join/19%3a8f9ec19800e7467ab9bae6e627dfcb21%40thread.tacv2/1648138910757?context=%7b%22Tid%22%3a%22ffb4df68-f464-458c-a546-00fb3af66f6a%22%2c%22Oid%22%3a%2234c00d0e-4085-4def-be95-f11f6239bc3d%22%7d