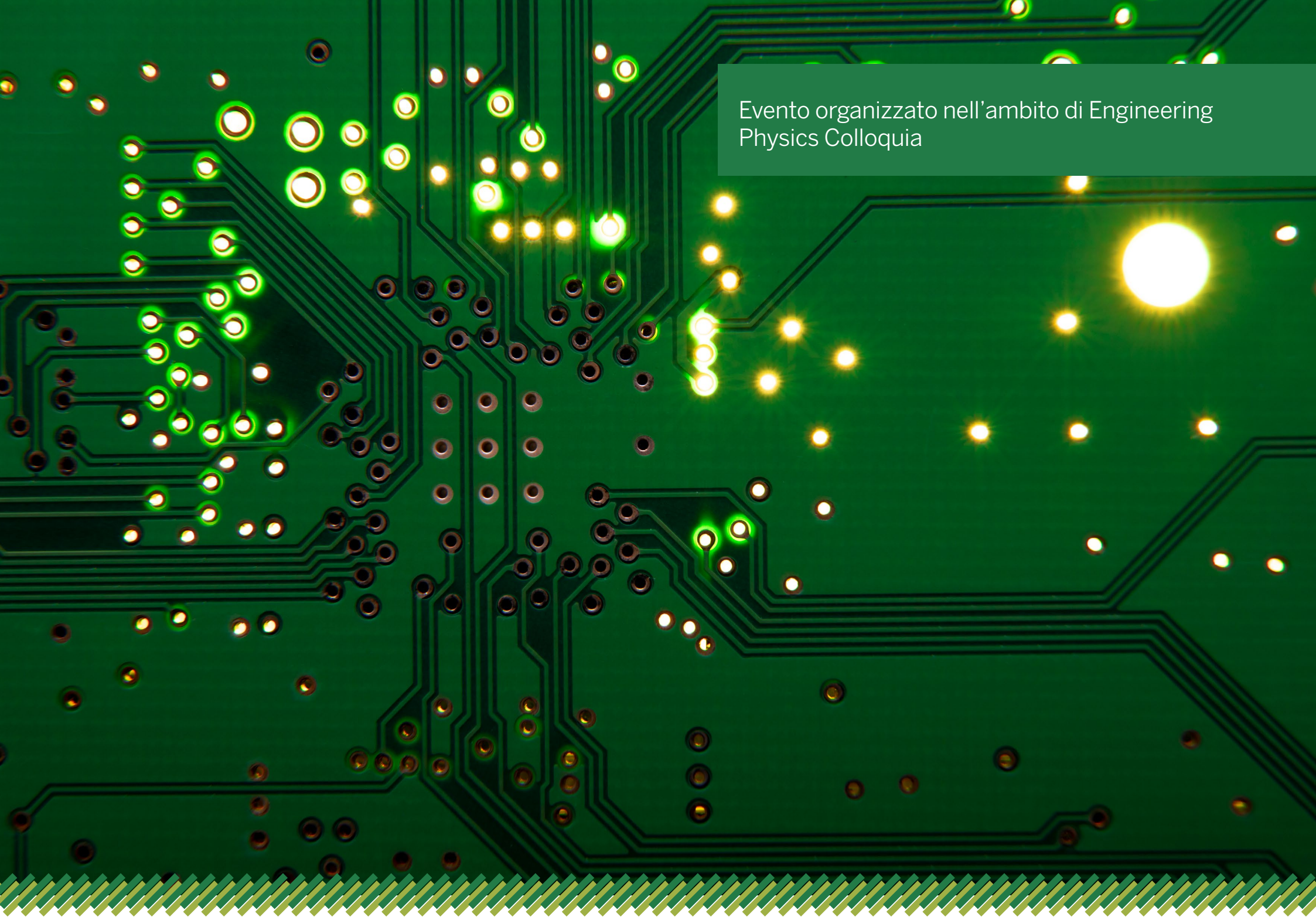

Evento organizzato nell'ambito di Engineering Physics Colloquia

Ca' Foscari University of Venice

Department of Molecular Sciences and Nanosystems

Superconducting electronics: promising approaches and related challenges

21 gennaio 2025, 11.00

Room Delta 1A, Delta Building

Gli organizzatori offriranno coffee & cookies ai partecipanti

Sarà possibile seguire il seminario anche da remoto, collegandosi al seguente link:
https://unive.zoom.us/j/81419954712
Password: seminar1

Organizzazione di
Domenico De Fazio

Prof. **Angelo Di Bernardo**

University of Salerno (Italy) and University of Konstanz (Germany)

The encoding and processing of digital information with superconducting circuits has raised increasing interest over the past decades because it can offer low power consumption, fast operating speeds and ease of coupling with other superconducting devices like superconducting single photon detectors and superconducting qubits.
Several approaches and material platforms have been proposed and tested to realise superconducting circuits, to determine whether they can offer better performance than existing conventional metal-oxide semiconductor (CMOS) architectures or already-existing superconducting logics like single flux quantum. These approaches include superconducting spintronics, where superconductor/ferromagnet (S/F) hybrids are used for the generation of spin-polarised Cooper pairs of electrons, and three-terminal superconducting devices, where a gate voltage is applied to control the supercurrent flowing in a narrow superconducting constriction and set the device logic state. In this talk, I will review the main progress done in these research fields and discuss the material platforms that hold the greatest potential for their future development. I will also outline the main challenges that have to be overcome, for each of the approaches discussed, toward the realisation of superconducting circuits that can be scaled up and fully integrated in large-scale computing and quantum computing architectures.