UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Seminar announcement

Monday 3 April 2023, Time: 10:30 - 11:30

"Aula Seminari DIETI", Floor 1, Building 3/A, DIETI - Via Claudio, 21 – NAPOLI

https://teams.microsoft.com/l/meetup-join/19%3ameeting_MWQ4ZDliZDQtZmJlNS00Y2UwLTg5NTYtNWM3MjczMmZhY2Zi%40thread.v2/0?context=%7b%22Tid%22%3a%222fcfe26a-bb62-46b0-b1e3-28f9da0c45fd%22%2c%22Oid%22%3a%22bd21ee8c-cfa0-4160-951b-f0d21106565b%22%7d

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Accurate and Efficient Numerical Modeling Methods for Superconducting Circuit Quantum Information Processing Devices

Abstract: As emerging quantum technologies become increasingly sophisticated, high-fidelity numerical modeling methods can serve as vital analysis and design tools to continue improving system performance. In this talk, we will first introduce a field-based description of superconducting circuit quantum electrodynamics devices useful for developing such high-fidelity numerical models. We will then show various examples of its use for modeling quantum devices, like single photon sources. Next, we will discuss self-consistent semiclassical modeling approaches for superconducting circuit quantum devices that treat microwave fields classically and qubits quantum mechanically and show how these methods can efficiently characterize the fidelity of state control and readout of transmon and fluxonium qubits. Time permitting, we will also discuss our related efforts on using numerical mode decomposition methods to analyze a wider range of inhomogeneous quantum electromagnetic system

Lecturer short bio: *Thomas E. Roth is an Assistant Professor in the Elmore Family School of Electrical and Computer Engineering at Purdue University. Prior to joining Purdue, he was a Senior Member of the Technical Staff at Sandia National Laboratories. He received all his degrees in electrical and computer engineering, with the B.S. degrees from Missouri University of Science and Technology and the M.S. and Ph.D degrees from the University of Illinois at Urbana-Champaign. His research interests include multiscale and multiphysics modeling, particularly for quantum electromagnetic devices.*

For information: Prof. Carlo Forestiere (DIETI, UniNA) – carlo.forestiere@unina.it *(organizer)*