UNIVERSITÀ DI PARMA

DIPARTIMENTO DI SCIENZE MATEMATICHE, FISICHE E INFORMATICHE

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COLLOQUIUM di DIPARTIMENTO

Martedì 20 dicembre 2022, ore 16:30, Aula A

Prof. Riccardo Adami

Politecnico di Torino

Nell'ambito dei Colloquium di Dipartimento, il prof. Riccardo Adami del Politecnico di Torino, martedì 20 dicembre 2022 alle ore 16:30 presso l'Aula A del Plesso di Matematica/Informatica terrà un seminario dal titolo:

Mathematics for quantum technology: some results and many challenges

Tutti sono invitati a partecipare.

Organizzatori: Proff. Adriano Tomassini, Alessandra Lunardi.

Abstract: *Since its early days, Quantum Mechanics has supplied problems and motivations for developing mathematical tools and techniques. Nowadays, in the imminence of the large scale impact of the application of the principles of Quantum Mechanics to communications and information, mathematics can play a relevant role in providing models, stating rigorous results and specifying the range of validity of approximations currently used in physics and engineering.*

One may distinguish between technology involving few-body and many-body systems. The former can be described through standard linear quantum mechanics, while the latter involves suitable nonlinear approximations and is related to the emerging field of atomtronics, namely the realization of circuits where bunches of ultracold atoms play the role of electrons in the ordinary circuits. We focus on the second class of models and give results on the existence of ground states for branched structures, that mimic atomtronic wires, and hybrid structures, possibily used for circuit elements. This is a joint project with Filippo Boni, Simone Dovetta, Enrico Serra, Lorenzo Tentarelli, and Paolo Tilli.