

Colloquium at Max Born Institute
October 26, 11 a.m.

Title: From quantum theatre to scalable quantum simulators

Speaker: Prof. Enrique Solano (University of the Basque Country, Bilbao, Spain)

Abstract: I will introduce the field of quantum simulations from a wide scientific and aesthetic perspective. Along these lines, I will discuss the relevance of quantum simulations as a playground for our quantum theatre, as communicating vessels between unconnected fields, and as a scalable quantum technology. I will also provide pedagogical examples of quantum simulations in trapped ions and superconducting circuits, relating nonrelativistic and relativistic quantum dynamics, physical and unphysical quantum operations, as well as strong and ultrastrong light-matter interactions. Finally, I will discuss the advantages and disadvantages of current paradigms of quantum simulators, involving digital and analog concepts, and propose novel paths and concepts for assuring their scalability.