



## Colloquium

# Quantum computing with trapped-ion qudits

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Host: Maksym Serbyn

Current quantum computers and simulators are almost exclusively built for binary information processing. Yet, not only are underlying quantum information carriers almost always inherently multilevel systems, also many quantum simulation applications are naturally formulated in terms of high-dimensional Hilbert spaces. I will discuss the opportunities and challenges for universal quantum information processing with qudits in a trapped-ion system. I will then show how we can use these systems not only to natively simulate high-dimensional problems such as lattice gauge theories, but also to drastically improve the experimental overheads in the characterization of quantum states and the training of variational circuits.

**Tuesday, April 2, 2024 11:00am - 12:00pm**

Heinzel Seminar Room / Ground Floor / Office Building West



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

Please find a schedule of the ISTA Shuttle on our webpage:

<https://ista.ac.at/en/campus/how-to-get-here/> The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.