

Workshop IV: Topology, Quantum Error Correction and Quantum Gravity

November 27 - December, 2023

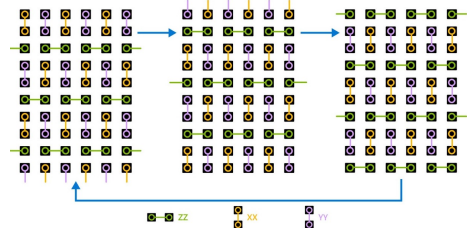
Scientific Overview

Quantum error correction has deep implications beyond quantum computing—two examples being its connections to topological phases of matter and quantum gravity. Recent exciting developments in these directions include the discovery of optimal quantum LDPC codes, progress towards the quantum PCP conjecture such as the proof of the NTLs conjecture, and the invention of Floquet codes. The workshop will focus on such new developments with the goal of finding better quantum error correction codes and new applications to open problems in quantum complexity theory, topological phases of matter, and quantum gravity. Error correction is also crucial in black hole physics. This workshop will explore (not necessarily unital) coding and complexity problems emerging from the information paradox.

This workshop will include a poster session; a request for posters will be sent to registered participants in advance of the workshop.

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the web page listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.



Organizers

Anurag Anshu (Harvard University), Colleen Delaney (University of California, Berkeley), Marlus Junge (University of Illinois at Urbana-Champaign), Roman Lutchyn (Microsoft Research), Zhenghan Wang (Microsoft Research), John Wright (University of Texas at Austin)

Speakers

Dave Aasen (University of California, Santa Barbara)
 Anurag Anshu (Harvard University)
 Toby Cubitt (University College London)
 Colleen Delaney (University of California, Berkeley)
 Thom Faulkner (University of Illinois)
 Lukasz Fidkowski (University of Washington)
 Matthew Hastings (Microsoft Research)
 Marius Junge (University of Illinois at Urbana-Champaign)
 Tamara Kohler (Institute of Mathematical Sciences)
 Roman Lutchyn (Microsoft Research)
 Chinmay Nirkhe (IBM Watson Research Center)
 Pavel Panteleev (Moscow State University)
 Sakura Schafer-Nameki (University of Oxford)
 Peter Shor (Massachusetts Institute of Technology)
 Zhenghan Wang (Microsoft Research)
 John Wright (University of Texas at Austin)

