



HARVARD UNIVERSITY
17 Oxford Street
Cambridge, MA 02138

Mathematical Picture Language Seminar



Tuesday, October 1

4:30 p.m. Boston time

Jefferson 356 and Zoom

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MIT

Quantum Algorithms for Computing Homology

Abstract: This talk reviews quantum algorithms for computing Betti numbers and homology for arbitrary chain complexes. Given a description of the boundary map on a chain complex, the algorithm operates by using the quantum phase estimation algorithm to project onto the kernel of the Hodge Laplacian, giving estimates of Betti numbers and revealing the representatives of the homology. The quantum algorithms provide an exponential speedup over their classical counterparts. Applications to persistent homology and Khovanov homology are given.



Zoom QR Code & Link:

<https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUJlVzZqT3lwV2pCT1ZUQTog>

Passcode: 657361

<https://mathpicture.fas.harvard.edu/seminar>