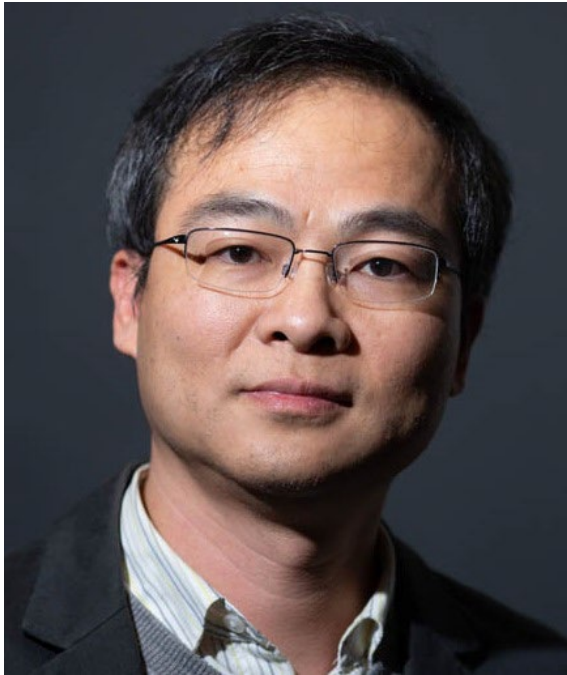




HARVARD UNIVERSITY  
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# Mathematical Picture Language Seminar



**Tuesday, October 24**

**9:30 a.m. Boston time**

**Jefferson 453**

**Tzu-Chieh Wei**

**Stony Brook University**

## Learning marginals suffices!

**Abstract:** Beyond computer science, quantum complexity theory can potentially revolutionize multiple branches of physics, ranging from quantum many-body systems to quantum field theory. I will present our work that centers on the intriguing relationship between the sample complexity of learning a quantum state and its circuit complexity. Our tool is a kind of quantum overlapping tomography, which only relies on random Pauli measurements. Our proof overcomes difficulties characterizing short-range entanglement by bridging quantum circuit complexity and ground states of gapped local Hamiltonians. Our result, for example, settles the quantum circuit complexity of the multi-qubit GHZ state exactly. This is a joint work with Nengkun Yu, arXiv:arXiv:2303.08938



**Zoom QR Code & Link:**

<https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUIJVzZqT3lwV2pCT1ZUQT09>

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