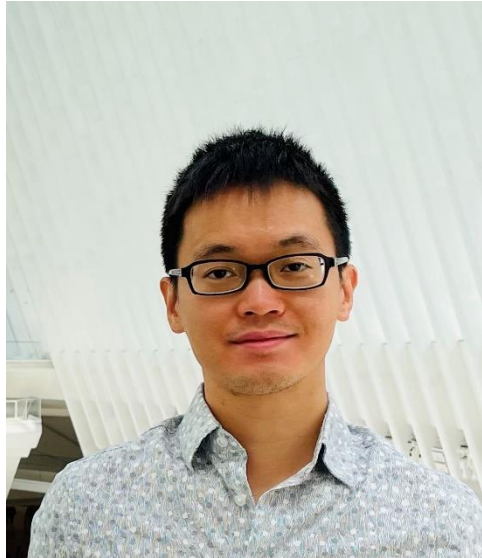




HARVARD UNIVERSITY  
17 Oxford Street  
Cambridge, MA 02138

# Mathematical Picture Language Seminar



**Monday, May 6**

**4:30 p.m. Boston time**

**Jefferson 453 and Zoom**

**Shu-Heng Shao**

Stony Brook University

## What's Done Cannot Be Undone: Non-Invertible Symmetries

**Abstract:** I will discuss recent developments on a novel kind of global symmetry, the non-invertible symmetry. It is implemented by conserved operators that do not have an inverse, going outside the paradigm set by Wigner's theorem. Non-invertible symmetries exist in many familiar quantum systems, including the Ising model, QED, QCD, axions, and the low-energy limit of string/M-theory. They lead to new conservation laws and new notions of naturalness, with applications in quantum field theory, particle physics, condensed matter systems, and quantum gravity. In particular, the neutral pion decay for the real world can be reinterpreted as a consequence of matching the non-invertible global symmetry.



Zoom QR Code & Link:

<https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUIJVzZqT3lwV2pCT1ZUQTog>

Passcode: 657361

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