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Zhengan Wang* (zhenghwa@math.ucsb.edu). *Mathematics for Second Quantum Revolution.*

A second quantum revolution is underway centering on the construction of a useful quantum computer and demands new mathematical framework to formulate the emerging new sciences. One tip of the iceberg is the mathematics of topological phases of matter and its application to topological quantum computing including topological quantum field theories (TQFTs)/Modular tensor categories (MTCs) and chiral conformal field theories (CFTs)/Vertex operator algebras (VOAs). I will survey some progress and speculate on a program to reconstruct CFTs/VOAs from TQFTs/MTCs via vector-valued modular forms as inspired by edge-bulk correspondence in physics and Tannaka-Krein duality in mathematics. (Received August 13, 2019)