Abstract: Ongoing ideas developed from the quantum matter and quantum field theory frontier may guide us to explore new physics beyond the 4d Standard Model. I will mention a few such ideas. First, new physics for neutrinos: right-handed neutrinos can carry a $Z_{16}$ class mixed gauge-gravitational global anomaly index, which could be replaced by 4d or 5d topological quantum field theory, or 4d interacting conformal field theory. These theories provide possible new neutrino mass mechanisms [arXiv:2012.15860]. Second, deconfined quantum criticality between Grand Unified Theories: dictated by a $Z_2$ class global anomaly, a gapless quantum critical region can happen between Georgi-Glashow and Pati-Salam models as deformation of Standard Model, where Beyond Standard Model physics occurs as neighbor phases [arXiv:2106.16248, arXiv:2112.14765, arXiv:2202.13498]. Third, the familiar C, P, and T symmetries together with fermion parity $(-1)^F$ could "fractionalize" to form a non-abelian finite group structure. Examples include the familiar 4d spin-1/2 Dirac fermion [arXiv:2109.15320], and 1d Majorana zero modes [arXiv:2011.12320, arXiv:2011.13921], etc.