Quantum triangulations : moduli spaces, strings, and quantum computing

Carfora, Mauro, author

Abstrak

Research on polyhedral manifolds often points to unexpected connections between very distinct aspects of Mathematics and Physics. In particular triangulated manifolds play quite a distinguished role in such settings as Riemann moduli space theory, strings and quantum gravity, topological quantum field theory, condensed matter physics, and critical phenomena. Not only do they provide a natural discrete analogue to the smooth manifolds on which physical theories are typically formulated, but their appearance is rather often a consequence of an underlying structure which naturally calls into play non-trivial aspects of representation theory, of complex analysis and topology in a way which makes manifest the basic geometric structures of the physical interactions involved. Yet, in most of the existing literature, triangulated manifolds are still merely viewed as a convenient discretization of a given physical theory to make it more amenable for numerical treatment.