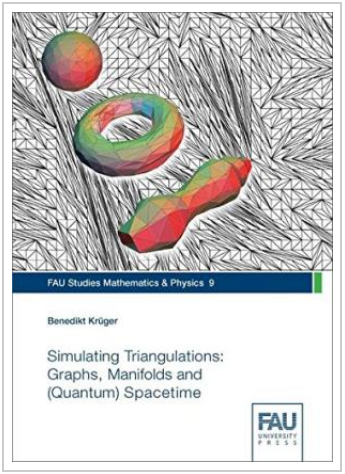

Simulating Triangulations: Graphs, Manifolds and (Quantum) Spacetime

By Benedikt Krüger

FAU University Press Sep 2016, 2016. Taschenbuch. Condition: Neu. Neuware - Triangulations, which can intuitively be described as a tessellation of space into simplicial building blocks, are structures that arise in various different branches of physics: They can be used for describing complicated and curved objects in a discretized way, e.g., in foams, gels or porous media, or for discretizing curved boundaries for fluid simulations or dissipative systems. Interpreting triangulations as (maximal planar) graphs makes it possible to use them in graph theory or statistical physics, e.g., as small-world networks, as networks of spins or in biological physics as actin networks. Since one can find an analogue of the Einstein-Hilbert action on triangulations, they can even be used for formulating theories of quantum gravity. Triangulations have also important applications in mathematics, especially in discrete topology. Despite their wide occurrence in different branches of physics and mathematics, there are still some fundamental open questions about triangulations in general. It is a prior unknown how many triangulations there are for a given set of points or a given manifold, or even whether there are exponentially many triangulations or more, a question that relates to a well-defined behavior of certain quantum geometry models....

Reviews

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