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# Space-time structure may be topological and not geometrical

*Saturday 24 August 2019 12:30 (30 minutes)*

In a previous effort we have created a framework that explains why topological structures naturally arise within a scientific theory; namely, they capture the requirements of experimental verification. This is particularly interesting because topological structures are at the foundation of geometrical structures, which play a fundamental role within modern mathematical physics. In this talk we will show a set of necessary and sufficient conditions under which those topological structures lead to real quantities and manifolds, which are a typical requirement for geometry. These conditions will provide a physically meaningful procedure that is the physical counter-part of the use of Dedekind cuts in mathematics. We then show that those conditions are unlikely to be met at Planck scale, leading to a breakdown of the concept of ordering. This would indicate that the mathematical structures required to describe space-time at that scale, while still topological, may not be geometrical.

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