Special Issue

Exploring Spacetime Emergence from the Quantum Level

Message from the Guest Editor

This Special Issue explores the possibility that quantum theory and relativity describe distinctly different aspects or domains of physical reality, yet which are ultimately reconcilable. In particular, the spacetime construct might be viewed as a structure that is emergent from the quantum level. Since emergence is a process that implies a directional component, and thus some form of irreversibility, consideration of spacetime emergence could break new ground in understanding time-asymmetrical processes such as those described by thermodynamics. This possibility raises intriguing questions, such as:

- What is the relation between the quantum level and the spacetime level?
- Might the arrow of time emerge from the quantum level along with the spacetime construct? If so, does "measurement" play a role in this emergence?
- What sorts of correspondence (or other) principles would reconcile local spacetime processes with the apparently nonlocal quantum level?
- Might consideration of spacetime emergence lead to a novel approach to a theory of quantum gravity?

Guest Editor

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