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The fundamental building blocks of nature

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What are the fundamental building blocks of matter? What is the microscopic quantum structure of space-time?

In this talk, I will review recent progress on a new theoretical paradigm that aims at answering these questions. It provides an understanding of the microscopic quantum structure of spacetime and matter based on a new symmetry principle, namely scale symmetry. I will explain the key ideas at the heart of this theoretical paradigm and then discuss how this new theoretical paradigm can be linked to observations and tested with observational data in elementary particle physics and black holes.

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