

The Second Quantum Revolution: A Unification of Matter and Information

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Physics, in particular, condensed matter physics, is a very old field. Many people are thinking that the exciting time of physics has passed, and we enter the beginning of the end of physics. The only important things in physics are its engineering applications. However, I feel that we only see the end of the beginning. The exciting time is still ahead of us. In particular, now is a very exciting time in physics, like 1900 - 1930. We are seeing/making the second quantum revolution which unifies information, matter and geometry. In this talk, the previous four revolutions in physics will be described: mechanical revolution, electromagnetic revolution, general relativity revolution, and quantum revolution, as well as the fifth -- the second quantum revolution, which unify matter and information. Each revolution unifies seemingly unrelated phenomena. Each revolution requires new mathematics to describe the new theory. Each revolution changes our world view.