

Kolloquium Mathematische Physik

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Bose-Einstein condensation: the physical phenomenon and its mathematical proof

In 1924, Bose discovered that, at very low temperature, some quantum particles can suddenly all behave in the same way. After the idea was developed by Albert Einstein, this new state of matter was called a Bose-Einstein condensate. This theoretical prediction was confirmed by experiments many years later in 1995.

In this talk I will present the mathematical formalism of Bose-Einstein condensation, and then review recent works obtained in collaboration with Phan Thanh Nam (Vienna) and Nicolas Rougerie (Grenoble). Of importance is an abstract theorem about the structure of the convex set of quantum states, which says that infinitely many exchangeable particles have to be somewhat independent.

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