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Dmitri Nikshych*, University of New Hampshire. *Algebraic theory of tensor categories.*

This talk is based on a joint work with Pavel Etingof and Viktor Ostrik. Tensor categories arise as "non-commutative symmetries" in many areas of mathematics and physics – representation theory of quantum groups and Hopf algebras, operator algebras, low-dimensional topology, and conformal field theory. In this talk we will explain how finite tensor categories can be studied from an algebraic point of view, including the theory of module categories, properties of the duality functor, Maschke's theorem, and reconstruction theory. We will prove that semisimple tensor categories and functors between them do not admit non-trivial deformations. In particular, the number of semisimple tensor categories with a given Grothendieck ring is finite. We will also discuss the notion of a Frobenius-Perron dimension in a tensor category, arithmetic properties of the dimension (Lagrange's theorem, Class equation), and classification results. (Received April 07, 2005)