

Семинар «Геометрические структуры на многообразиях»

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Алексей Пискунов Quiver varieties and ADHM construction

In the paper "Construction of Instantons" (1978) Atiyah, Drinfeld, Hitchin, and Manin showed that the so-called instantons (anti-self-dual connections with some additional property) can be constructed using methods of representation theory. Namely, there is a correspondence between these anti-self-dual connections on \mathbb{R}^4 and the points of the moduli space of framed vector bundles on $\mathbb{C}P^2$. The latter is isomorphic to the so-called quiver variety of Jordan type (that is an algebraic variety associated to the quiver consisting of just one vertex and one loop). I will explain in all details what is a quiver variety, how to construct the isomorphism between this variety and the moduli space of framed vector bundles, and formulate the main theorem about their correspondence with the moduli space of instantons. I will remind all necessary facts, but knowledge about representations of quivers, some affine algebraic geometry and vector bundles theory would be useful for the better understanding of the talk.