Distinsguishing Legendrian and transverse knots

Ivan Dynnikov

(Steklov Mathematical Institute of Russian Academy of Science, 8 Gubkina Str., Moscow 119991, Russia)

E-mail: dynnikov@mech.math.msu.su

The talk is based on joint works (recent and in progress) with Maxim Prasolov and Vladimir Shastin.

A smooth knot (or link) K in the three-space $\mathbb{R}^3$ is called *Legendrian* if the restriction of the 1-form $\alpha = x \, dy + dz$ on K vanishes, where x, y, z are the standard coordinates in $\mathbb{R}^3$. If $\alpha|_K$ is everywhere non-vanishing on K, then K is called *transverse*.

Classification of Legendrian and transverse knots up to respectively Legendrian and transverse isotopy is an important unsolved problem of contact topology. A number of useful invariants have been constructed in the literature, but there are still small complexity examples in which the existing methods do not suffice to decide whether or not the given Legendrain (or transverse) knots are equivalent.

We propose a totally new approach to the equivalence problem for Legendrian and transverse knots, which allows to practically distinguish between non-equivalent Legendrain (or transverse) knots in small complexity cases, and gives rise to a complete algorithmic solution in the general case.