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Type: **Lecture Talk**

Asymptotic control theory for affine switching systems of oscillators

The talk will be devoted to continuous-time affine control systems and their reachable sets. I will focus on the case when all eigenvalues of the linear part of the system have zero real part. In this case, the reachable sets usually have a non-exponential growth rate as $T \rightarrow \infty$, and it is usually polynomial. The simplest non-trivial example is the problem of stabilisation (or, conversely, destabilisation) of two pendulums by the same common control. An exact description of reachable sets is most often impossible here, but their asymptotic behaviour as $T \rightarrow \infty$ can be found with high accuracy. In the talk, I will present the asymptotic behaviour of reachable sets in the problem of controlling a system of N independent oscillators, and in the problem of controlling the wave equation for a closed string. In particular, in these problems the corresponding analog of the Lyapunov function can be found explicitly, and, consequently, the optimal behaviour at high energies can be found very accurately.

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