**Homogenization of elliptic and parabolic Dirichlet problems in a bounded domain**

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The talk is based on a joint work with T. A. Suslina.

Let $\mathcal{O} \subset \mathbb{R}^d$ be a bounded domain of class $C^{1,1}$. In $L_2(\mathcal{O};\mathbb{C}^n)$, we consider a self-adjoint second order elliptic differential operator $B_{D,\varepsilon}$ with the Dirichlet boundary condition. The coefficients of $B_{D,\varepsilon}$ are periodic and depend on $\mathbf{x}/\varepsilon$; so, they oscillate rapidly as $\varepsilon \to 0$. We obtain approximations for the resolvent $(B_{D,\varepsilon} - \zeta I)^{-1}$ and for the semigroup $\exp(-B_{D,\varepsilon} t)$, $t \geq 0$, both in the $(L_2 \to L_2)$- and $(L_2 \to H^1)$-norms. The results of such type are called operator error estimates in homogenization theory.