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Sasa Kocic* (s.kocic@utoronto.ca), Department of Mathematics, University of Toronto, 40 St. George Street, Toronto, ON M5S 2E4, Canada, and **Hans Koch** (koch@math.utexas.edu), 1 University Station, C1200, Austin, TX 78712. *Renormalization and lower-dimensional Brjuno invariant tori of Hamiltonian systems.*

KAM theory establishes the persistence of invariant tori with Diophantine frequency vectors under small perturbations of integrable Hamiltonian systems. In this talk, we will discuss a renormalization approach to the problem. We construct a renormalization scheme and apply it to prove the existence of lower-dimensional invariant tori (tori of dimension d , lower than the number of degrees of freedom $d + D$) with Brjuno frequency vectors in near-integrable Hamiltonian flows. For every Brjuno frequency vector $\omega \in \mathbb{R}^d$ and every vector $\Omega \in \mathbb{R}^D$ satisfying an arithmetic condition with respect to ω , there exists an analytic manifold \mathcal{W} of infinitely renormalizable Hamiltonian vector fields; each vector field on \mathcal{W} is shown to have an analytic invariant torus with frequency vector ω . (Received September 22, 2009)