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## Renormalization and Universality for Hamiltonian Flows

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### **Abstract**

We will first review some key ideas of the renormalization theory for Hamiltonian flows, and describe a series of results that use renormalization to prove KAM theorems for flows in several different settings. We will next describe the universality associated with the break-up of invariant tori, and results, both numeric and rigorous computer-assisted, concerning this universality. Finally, we will mention our ongoing work in developing analytic machinery for non-trivial universality problems in area-preserving dynamics.