

Mathematical Colloquia

Monday, May 13, 2019

17:15 h, Lecture Room 119

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Hypercyclicity and Infinite Transitivity in Complex Analysis

Abstract:

One of the first examples of hypercyclicity was discovered by George Birkhoff, who proved that, given any translation, there exists an entire holomorphic function such that the compositions of this function with all iterates of the given translation form a dense subset of all entire holomorphic functions.

We prove an analog for holomorphic automorphisms of complex-Euclidean space (of dimension at least 2) and conjugations with a translation.

A related idea is to use flows of finitely many completely integrable vector fields to construct a dense subgroup of the group of holomorphic automorphisms. We can even show a stronger result: For any finite number of points in the complex-Euclidean space (of dimension at least 2) and for any distinct prescribed images of these points we can find an interpolating holomorphic automorphism. We prove that such an automorphism can be constructed using only the flow maps of three complete polynomial vector fields which can be given explicitly.