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An introduction to Kähler groups

A Kähler group is a group which can be realized as the fundamental group of a compact Kähler manifolds. Not much is known about such groups besides a list of obstructions for a group to be a Kähler group as well as a list of classes of examples which is slowing growing over the years.

The goal of the seminar is to give an introduction to this fascinating topic mainly from the viewpoint of a geometric group theorist. Only very basic knowledge of Kähler geometry is needed, which can be aquired following simultaneously the class of Kähler geometry.

The seminar will mostly follow the very recent monograph of Pierre Py, written with the viewpoint of a geometric group theorist. A very solid knowledge of manifolds and functions on one complex variables is indispensable.

References

[A+96]   J. Amoros, M. Burger, K. Corlette, D. Kotschick and D. Toledo, *Fundamental groups of compact Kähler manifolds*, Math. Surveys and Monographs 44, AMS 1996.

[Ko98]   S. Kobayashi, *Hyperbolic complex spaces*, Springer Grundlehren 1998.

[P25]   P. Py, *Lectures on Kähler groups*, Princeton Math. Series 52 (2025).

Talks:

(1) Complex orbifolds and fibrations. P25, p.19-26.
(2) The Kobayashi metric and finiteness for fibration. P25, p.26-34, Ko98.
(3) The fibration problem. P25 Chapter 3, A+96.
(4) Groups acting on trees. P25 p.67-78.
(5) Kähler groups acting on trees. P25 p.78-89.
(6) Fibrations and ℓ^2-invariants. P25 p.40-52.
(7) Ends of Kähler groups. P25, p.90-105.