

# DETERMINISTIC LOEWNER THEORY IN ONE AND SEVERAL DIMENSIONS

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The aim of these lectures is to relate tools of several complex variables (such as Kobayashi metric, Runge-ness properties, Andersén-Lempert's theory) to Loewner's theory, starting from one dimension to higher dimensions.

The lectures will be mainly devoted to highlight common factors in the classical Loewner theory which allow to extend it to a general theory of evolution in one and several variables.

The first lecture consists of an overview of the classical theory in the disc introduced by Ch. Loewner and developed by P. Kufarev and Ch. Pommerenke and recently generalized by the speaker with M. Contreras and S. Diaz-Madrigal. The next lectures will be mainly devoted to study infinitesimal generators in hyperbolic complex manifolds, univalent mappings from an abstract point of view and increasing sequences of manifolds biholomorphic to a given domain, and applications of such ideas to Loewner theory: existence and uniqueness of solutions to the Loewner equation on hyperbolic complex manifolds, existence of solutions to the Loewner equation in the unit ball of  $\mathbb{C}^n$  with images in  $\mathbb{C}^n$ , the embedding problem.