

Recent advances in Loewner Theory

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Loewner Theory originated in a seminal paper of 1923 by Karel Löwner [known also as Charles Loewner]. He discovered a new method, based on a kind of *dynamical approach* in the spirit of Lie Group Theory, which turned out to be very fruitful for many problems in Complex Analysis and, particularly, in the theory of conformal mappings.

Initially aimed to *extremal problems* for univalent functions in the disk, Loewner Theory has gone far beyond the scope of that topic. As a remarkable example, a *stochastic* version of Loewner evolution (SLE), introduced in 2000 by Oded Schramm, has proved to have important applications in Statistical Physics.

Without an attempt to give an exhaustive review, in this survey talk some recent developments in (deterministic) Loewner Theory will be discussed. We will mainly follow the viewpoint of the abstract approach suggested in 2008 by Filippo Bracci, Manuel D. Contreras and Santiago Díaz-Madrigal. Another, in a sense complementary, viewpoint regards Loewner Theory as a non-autonomous analogue of the procedure to reconstruct a Lie group from the corresponding Lie algebra. If time permits, a problem of Loewner–type representation of univalent self-maps of the unit disk with given *boundary* fixed points will be considered within the framework that combines both viewpoints.