

Lecture Notes in Mathematics 2086

Sébastien Boucksom · Philippe Eyssidieux · Vincent Guedj *Editors*

An Introduction to the Kähler-Ricci Flow

This volume collects lecture notes from courses offered at several conferences and workshops, and provides the first exposition in book form of the basic theory of the Kähler-Ricci flow and its current state-of-the-art. While several excellent books on Kähler-Einstein geometry are available, there have been no such works on the Kähler-Ricci flow. The book will serve as a valuable resource for graduate students and researchers in complex differential geometry, complex algebraic geometry and Riemannian geometry, and will hopefully foster further developments in this fascinating area of research.

The Ricci flow was first introduced by R. Hamilton in the early 1980s, and is central in G. Perelman's celebrated proof of the Poincaré conjecture. When specialized for Kähler manifolds, it becomes the Kähler-Ricci flow, and reduces to a scalar PDE (parabolic complex Monge-Ampère equation). As a spin-off of his breakthrough, G. Perelman proved the convergence of the Kähler-Ricci flow on Kähler-Einstein manifolds of positive scalar curvature (Fano manifolds). Shortly after, G. Tian and J. Song discovered a complex analogue of Perelman's ideas: the Kähler-Ricci flow is a metric embodiment of the Minimal Model Program of the underlying manifold, and flips and divisorial contractions assume the role of Perelman's surgeries.

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