

**Programma del corso di**  
***Dinamica Olomorfa — Holomorphic Dynamics***

(Modulo specialistico, 6 crediti)

Prof. Marco Abate

The aim of this course is to present the theory of discrete local holomorphic dynamics in one and several complex variables, starting from the very beginning and arriving up to current research topics.

Discrete local holomorphic dynamics studies the dynamics of germs of holomorphic self-maps defined in a neighborhood of a fixed point. As such it is an indispensable tool in the study of global dynamical problems, but it also has its very own set of problems and techniques, being on the boundary of subjects as diverse as complex analysis, differential geometry, dynamical systems, number theory, algebraic geometry and mathematical physics.

The following theorems will surely be among the topics we shall touch upon: Königs linearization theorem in one variable, and its generalization to several variables by Poincaré; the Leau-Fatou flower theorem; Bryuno-Yoccoz linearization theorem; the holomorphic stable manifold theorem; Poincaré-Dulac normal forms; Écalle-Hakim theorem on parabolic dynamics in several variables. If time permits, and according to the interests of the students, we might also discuss the Écalle-Voronin classification of one-variable parabolic germs, Perez-Marco's hedgehogs, and very recent results on parabolic dynamics in several complex variables.

**Testi di riferimento**

- J. Milnor: *Dynamics in One Complex Variable*. Princeton University Press, Princeton, 2006.
- M. Abate: *Discrete holomorphic local dynamical systems*. In **Holomorphic dynamical systems**, G. Gentili, J. Guénot, G. Patrizio eds., Lect. Notes in Math. 1998, Springer, Berlin 2010, pp. 1–55.

**Obiettivi formativi**

Scopo di questo corso è fornire un'introduzione alla dinamica olomorfa locale partendo dalle origini fino a giungere ai confini della ricerca contemporanea.

**Prerequisiti**

Una buona conoscenza delle basi di topologia e di teoria delle funzioni olomorfe di una variabile è essenziale. Sono necessarie anche buone conoscenze di analisi matematica in più variabili, e delle basi di geometria differenziale. Qualche nozione di sistemi dinamici discreti può essere utile ma non è fondamentale.

**Metodi didattici**

Lezioni frontali.

**Modalità di verifica dell'apprendimento**

Prova orale finale.