

COMPLEX ANALYSIS AND TRANSCENDENTAL DYNAMICS

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ABSTRACT. We discuss some function theoretic methods that have proved particularly useful when studying the dynamics of transcendental entire and meromorphic functions.

1. LECTURES

Lecture 1 will focus on some results of the Ahlfors theory of covering surfaces, including the celebrated Ahlfors five islands theorem. We will sketch a proof of this result via a rescaling lemma for normal families and will then turn to some applications in dynamics.

Lecture 2 will discuss singularities of the inverse to a meromorphic function. In particular, we will describe Iversen's classification of transcendental singularities in direct and indirect singularities and the Denjoy-Carleman-Ahlfors theorem concerning direct singularities. Applications to dynamics will also be discussed.

Lecture 3 deals with Wiman-Valiron theory and its applications in dynamics, in particular to the escaping set of entire functions. We will describe a new approach to this subject via potential theory and real growth lemmas, which may be easier than the classical approach based on the power series expansion. It also has the advantage of working not only for entire functions, but more generally for meromorphic functions with a direct singularity over infinity.