

AN INTRODUCTION TO SEVERAL COMPLEX VARIABLES

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Most of us are familiar with complex analysis in one variable and the classical results there within. A natural question to ask is the following: do the classical results from one complex variable still hold in the setting of several complex variables? The answer to this question is somewhat surprising. We will see throughout these lectures, while developing the necessary theory, that some results hold in \mathbb{C} but fail in \mathbb{C}^n for $n \geq 2$. For instance, the zeros of a holomorphic function in \mathbb{C}^n are *never* isolated!

During this series of lectures we will explore some of the basic notions of several complex variables, including the notion of holomorphic functions in \mathbb{C}^n , extension theorems, complex submanifolds, pseudoconvexity, and domains of holomorphy. We will also highlight the beautiful interplay between analysis and geometry in \mathbb{C}^n . Along the way we will review the classical results of one complex variable as needed.

Time permitting we will discuss the relationship between the curvature of hypersurfaces in \mathbb{C}^n , pseudoconvexity, and fully nonlinear partial differential operators.