Cauchy-Riemann Equations in several variables: suggested preliminary readings

The aim of this program is to introduce participants to the modern approach to holomorphic functions of several variables using L^2-techniques. This technique combines methods of functional analysis and differential geometry to gain a deep understanding of complex analysis on manifolds. A general reference for this topic is *Complex Analytic and Differential Geometry* by J. P. Demailly (available online), chapters 1, 5 and 8.

The following topics will be assumed known to the participants. It may be a good idea for the participants to review these topics before the workshop if required, in order to gain the most from the program.

1. **Complex Analysis:** Basic theory of holomorphic functions of one variable, as found in standard texts like D. Sarason's *Notes on Complex Function Theory* or J. B. Conway's *Functions of one complex variable* (Chapters 1 through 5 and Chapter 8.)

2. **Real Analysis:** Basic facts about measure and integration in Euclidean spaces. Basic facts about Banach spaces and Hilbert spaces (including Riesz representation theorem).

   This material is found in many standard texts such as Royden's *Real Analysis.*

3. **Smooth manifolds:** Basic definitions and facts about smooth manifolds, smooth maps, tangent vectors and the tangent bundle, differential forms and their integration, Stokes' formula, smooth vector bundles. For participants who are students, this will probably be the most challenging prerequisite. A good source for this material is John M Lee's *An introduction to smooth manifolds.* The following chapters of this book will provide an adequate background for the workshop: Chapters 1 –5, 8, 10–16.

   Other sources of this material include Loring W. Tu's *Introduction to manifolds.*