Preface

The C.I.M.E. Session "Real Methods in Complex and CR Geometry" was held in Martina Franca (Taranto), Italy, from June 30 to July 6, 2002. Lecture series were given by:

M. Abate: *Angular derivatives in several complex variables*
J. E. Fornaess: *Real methods in complex dynamics*
X. Huang: *On the Chern-Moser theory and rigidity problem for holomorphic maps*
J. P. Rosay: *Theory of analytic functionals and boundary values in the sense of hyperfunctions*
A. Tumanov: *Extremal analytic discs and the geometry of CR manifolds*

These proceedings contain the expanded versions of these five courses. In their lectures the authors present at a level accessible to graduate students the current state of the art in classical fields of the geometry of complex manifolds (Complex Geometry) and their real submanifolds (CR Geometry). One of the central questions relating both Complex and CR Geometry is the behavior of holomorphic functions in complex domains and holomorphic mappings between different complex domains at their boundaries. The existence problem for boundary limits of holomorphic functions (called boundary values) is addressed in the Julia-Wolff-Caratheodory theorem and the Lindelöf principle presented in the lectures of M. Abate. A very general theory of boundary values of (not necessarily holomorphic) functions is presented in the lectures of J.-P. Rosay. The boundary values of a holomorphic function always satisfy the tangential Cauchy-Riemann (CR) equations obtained by restricting the classical CR equations from the ambient complex manifold to a real submanifold. Conversely, given a function on the boundary satisfying the tangential CR equations (a CR function), it can often be extended to a holomorphic function in a suitable domain. Extension problems for CR mappings are addressed in the lectures of A. Tumanov via the powerful method of the extremal and stationary discs. Another powerful method coming from the formal theory and

inspired by the work of Chern and Moser is presented in the lectures of X. Huang addressing the existence questions for CR maps. Finally, the dynamics of holomorphic maps in several complex variables is the topic of the lectures of J. E. Fornaess linking Complex Geometry and its methods with the theory of Dynamical Systems.

We hope that these lecture notes will be useful not only to experienced readers but also to the beginners aiming to learn basic ideas and methods in these fields.

We are thankful to the authors for their beautiful lectures, all participants from Italy and abroad for their attendance and contribution and last but not least CIME for providing a charming and stimulating atmosphere during the school.

<div align="right">Dmitri Zaitsev and Giuseppe Zampieri</div>