Workshop dedicated to the memory of Professor Gabriela Kohr
(4th edition)
Geometric Function Theory in Several Complex Variables and Complex Banach Spaces

Cluj-Napoca, Romania   November 29 – December 1, 2024

The Extension Problem for CR functions on Uniformly Rectifiable Sets

Marius Mitrea

Baylor University, Texas, USA

Abstract

In this talk I will be concerned with extension phenomena in several complex variables. Virtually all results of this nature originate in the pioneering work of Friedrich Hartogs who used Cauchy's integral formula to prove in 1906 his famous theorem to the effect that if $n \geq 2$ and Ω is an open bounded subset of $\mathbb{C}^n$ with connected boundary, then any holomorphic function f in a neighborhood U of $\partial\Omega$ extends to a holomorphic function in Ω. In the limiting case when the neighborhood U shrinks to $\partial\Omega$, the standard holomorphicity assumption for f should be replaced by the demand that f is a CR-function on $\partial\Omega$. The latter condition is meaningful under suitable assumptions on f and $\partial\Omega$, a scenario in which we shall refer to this question as the Extension Problem (EP). The history of EP is very distinguished, but progress has stopped at domains of class C^1. The goal here is to solve EP merely assuming that the underlying domain has a uniformly rectifiable boundary.