



Analysis Seminar

Title: Fischer decomposition for entire functions and the Dirichlet problem for unbounded quadratic surfaces

Speaker: H. Render

Date: Tue 19th April 2022 at 3:00PM

Location: Seminar Room SCN 1.25

Abstract: Let P_{2k} be a homogeneous non-negative polynomial of degree $2k$ and assume that P_j for $j = 0, \dots, \beta < 2k$ are homogeneous polynomials of degree j . Further a certain integral inequality depending on a parameter α and P_{2k} is assumed which is valid for all homogeneous polynomials of degree m .

The main result of the talk states that for any entire function f of order $\rho < (2k - \beta)/\alpha$ there exist entire functions q and r of finite order with

$$f = (P_{2k} - P_\beta - \dots - P_0)q + r$$

and $\Delta^k r = 0$ where Δ is the Laplace operator.

This result is used to establish the existence of entire harmonic solutions of the Dirichlet problem for cylinders and parabola-shaped domains for data given by entire functions of order smaller than 1 and $1/2$ respectively.

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