Analysis Seminar

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

Speaker: Hermann Render

Date: Tue 25th October 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,...,$\beta < 2k$ are homogeneous polynomials of degree j. Further a certain integral inequality depending on a parameter αandP$_2k$ 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

$f = (P_2k - P_\beta - .... - P_0)q + r$ 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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