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FAKULTÄT FÜR MATHEMATIK
Dekan Univ.-Prof. Dr. Christian Krattenthaler

Einladung zur öffentlichen Defensio von

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Thema der Dissertation:

Topics in the spectral theory of the $\bar{\partial}$-Neumann problem

Abstract:
My thesis is concerned with questions regarding the spectral theory of the Dolbeault Laplacian with -Neumann boundary conditions, considered as a self-adjoint operator acting on the space of square integrable differential forms on a Hermitian manifold. The corresponding boundary value problem, the so-called -Neumann problem, arises naturally in the investigation of the (inhomogeneous) Cauchy–Riemann equations through the methods of (L^2-) Hodge theory. From this point of view, spectral properties of the Dolbeault Laplacian give information on the solvability of the Cauchy–Riemann equations and, by extension, on the construction of holomorphic functions with prescribed properties. For a lot of the results of my thesis, I consider the -Neumann problem on Kähler manifolds with some bounded geometry, in order to show that known theorems in the setting of (domains in) ^{n} continue to hold more generally. One of these is that the discreteness of spectrum of the Dolbeault Laplacian "percolates" up the Dolbeault complex, provided some boundary and curvature assumptions are made. Therefore, necessary conditions for the discreteness of spectrum can be studied on the top end of the Dolbeault complex, where the Dolbeault Laplacian can more easily be analyzed with methods from Schrödinger operator theory. In addition, the -Neumann problem is considered for the product of two Hermitian manifolds, where one can describe the (essential) spectrum of the Laplacian in terms of the spectra of the Laplacians on the individual factors.

Prüfungssenat:

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