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Research field: Complex geometry, conformal geometry

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Current research

I have been working on function theory of several complex variables.

One of the main object is the Bergman kernel for complex domains. The kernel function contains several complex geometric information of the domain (or CR geometric information of the boundary), especially in its singularities. To describe the singularity of the Bergman kernel, I use complete Einstein metric of the domain and invariant theory associated with the curvature of the metric. This approach of asymptotic analysis has been generalized to more larger class of geometry including conformal and projective geometry (these are called Parabolic geometries). Recently, it turns out that the analysis in conformal case has intimate relation to AdS/CFT correspondence in theoretical physics. This gives new input to the field of research and I'm much attracted by the study of conformal case.

Prerequisites

There is no standard text book I can recommend, but the lecture notes by Charles Fefferman (Beals, Fefferman and Grossmann: Strictly pseudoconvex domains in C^n, Bull. A.M.S. 8 (198), 125--322) contains most of the tools I have been using. It is helpful if you know the basics of PDE or differential geometry contained in the notes.