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### MODERN METHODS AND NEW RESULTS IN COMPLEX ANALYSIS

Professor KENNETH M. HOFFMAN, Massachusetts Institute of Technology

Bounded Analytic Functions in the Unit Disk ..... 1

A discussion of the compactification of the unit disc which is induced by the algebra of bounded analytic functions, especially Carleson's work on the corona theorem and the speaker's work on analytic subsets of the compactification.

Professor HUGO ROSSI, Brandeis University

Strongly Pseudoconvex Domains ..... 10

Some of the most exciting work in several complex variables done in the past ten years centers around the solution of Levi's problem: to show that a pseudoconvex domain is holomorphically convex. Pseudoconvexity is a differential condition on the nature of the boundary; the latter implies the existence of many holomorphic functions. The key to the solution is the theorem of finite dimensionality of the cohomology groups of a coherent sheaf, proven by Grauert, Kohn, Hörmander. From this one can fully describe the analytic structure of a strongly pseudoconvex domain, and this gives rise to a method for studying isolated singularities of analytic spaces.

### BANACH ALGEBRAS AND APPLICATIONS

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Problems and methods in uniform approximation by holomorphic functions on compact sets in spaces of one or more complex variables.

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A function algebra, which does not contain all continuous functions, may exhibit certain properties reminiscent of analyticity. An example is the local maximum modulus principle proved by Hugo Rossi. This, along with various other results, suggests the beginnings of an abstract analytic function theory. At this stage, the program is to obtain analogues of certain results from several complex variables.

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For the Cauchy problem with data on a hyperplane there exists a unique solution for arbitrary data if and only if the equation is hyperbolic in the sense of Garding. When the hyperplane is characteristic there is no longer uniqueness, but we characterize the equations having a solution for arbitrary Cauchy data. This class contains all parabolic equations.

Professor F. TREVES, Purdue University

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Local Cauchy problems for systems of linear PDEs with analytic coefficients, with data on noncharacteristic hypersurfaces, have always unique solutions. But these in general need not be distributions, they are ultradistributions. A simple proof of this fact is possible, based on general results about abstract differential equations (also valid for nonlinear ones), suitably adapted blowing up of small domains and ladders of functional (Banach) spaces. This allows a detailed description of the situation, including of the symbols of "fundamental solutions", and reveals the links with the problem of solvability in more classical sense.

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\* This lecture was presented by Professor James Eells.