CALIFORNIA INSTITUTE OF TECHNOLOGY

Inaugural Thomas Wolff Memorial Lectures In Mathematics

2001

November 27, 29 December 4, 6
4:15 p.m.
Room 151 Sloan

Speaker:
Charles Fefferman

Chair, Department of Mathematics
Herbert E. Jones, Jr. Professor of Mathematics
Princeton University

Tuesday, November 27, 2001
Sharp fronts for incompressible fluids

A simple condition rules out the formation of certain types of singularities in 2-dimensional fluids.

Thursday, November 29, 2001
Local conformal invariants

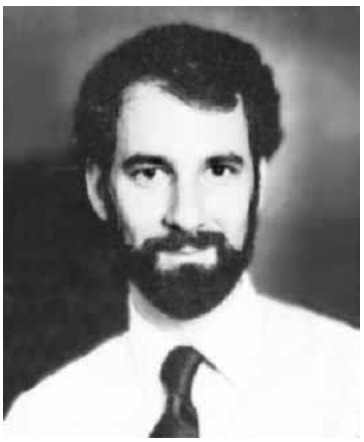
An explanation of a procedure to construct local invariants from a conformal metric, including "Q" curvature" and "renormalized volume."

Tuesday, December 4, 2001
Domination of pseudodifferential operators

A discussion of two given pseudodifferential operators A and B having the property that Af has larger L^2 norm than Bf for any function f.

Thursday, December 6, 2001
Hedging of options with transaction costs

Black and Scholes showed how to hedge an option perfectly if one can trace without transaction costs. This talk discusses how well one can hedge in the presence of transaction costs.



CHARLES FEFFERMAN is one of the major analysts of the 20th century. He was a prodigy who delved into his father's calculus books at age 10, and started classes at Maryland as a 12-year-old, graduating with high honors in math and physics at 17. Three years later, he added a Princeton doctorate to his credentials. Then began a series of "youngest ever's" including a full professorship (at University of Chicago) at age 22, the youngest to hold that rank at the time; the youngest recipient of the prestigious Fields Medal; awarded every four years to a mathematician under 40 and considered mathematics' equivalent of the Nobel; the first winner of the Waterman Prize; and the youngest person elected to the US National Academy of Sciences since the early 19th century.

In 1974, Fefferman joined the faculty at Princeton where he remains today as the Herbert E. Jones Jr. Professor of Mathematics and Mathematics Department Chair.

Of course, what matters to mathematicians is the string of deep insights and theorems that Charlie has produced, not the honors he has garnered. His work has impacted classical harmonic analysis, complex manifold theory, partial differential equations, and even mathematical physics and mathematical economics. His discovery of BMO duality theory for H^1 spaces made previously subtle and complex results into simple corollaries. His work on singular integrals provided a new proof of Carleson's result on the almost everywhere convergence of L^2-fourier series. His work on canonical transformations and uncertainty principle bounds provided important new tools in PDEs. His discovery and masterful analysis of the logarithmic singularity of the Bergmann metric proved regularity of biholomorphic maps up to the boundary. His work with Seco on the binding energy of large Z atoms went far beyond the earlier results of Lieb-Simon and of Hughes-Siedentop-Weikard.

The breadth of Fefferman's interest and scope can be seen in the series of Wolff lectures he'll be giving on four different areas of analysis.