

# H.-T. Yau Receives MacArthur Fellowship

In June 2000 the John D. and Catherine T. MacArthur Foundation announced the names of twenty-five individuals who will receive MacArthur Fellowships. Each will receive \$500,000 over five years of “no strings attached” support.

One of the fellowships has been awarded to HORNG-TZER YAU of the Courant Institute of Mathematical Sciences, New York University.

Yau is a mathematician who applies profound mathematical insights and analysis to the explanation of important physical processes. Although the scale of the phenomena he studies varies from microscopic to astronomical, his work concentrates on reinterpreting descriptive models of large-scale physical behavior within the context of statistical mechanics.

Early in his career Yau focused on describing in quantum mechanical terms the stability of matter in complex (many-body) systems. This work produced sound mathematical support for earlier astrophysical theories on the limits of stellar stability. Yau then shifted the direction of his research toward explaining the macroscopic properties of fluids based on the microscopic behavior of their constituent particles—the hydrodynamic limit. He developed the novel concept of “relative entropy” to derive descriptive formulae of fluid behavior (for example, Euler, Navier-Stokes) from basic principles of statistical mechanics. Although the problems that Yau works on are rooted in physical phenomena, he has made important contributions to fundamental mathematics in several areas: probability theory, nonlinear partial differential equations, spectral theory, and dynamical systems theory.

Yau is a professor of mathematics at the Courant Institute of Mathematical Sciences, New York University. He received a B.S. (1981) from National Taiwan University and a Ph.D. (1987) from Princeton University. He has received fellowships from the Sloan Foundation and the Packard Foundation (1991).

Each year the MacArthur Fellowships program provides unrestricted fellowships to exceptionally talented individuals. Several hundred people serve as nominators for the program. A 13-member selection committee, whose members also serve anonymously, makes recommendations to the Board of Directors of the MacArthur Foundation.

The Foundation neither requires nor expects specific projects from the fellows, nor does it ask for reports on how the money is used. While there are no quotas or limits, typically between twenty and forty Fellows are selected annually.

—From a MacArthur Foundation news release



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