Prof. Achi Brandt

Born in Israel and having served for several years in its army, Prof. Achi Brandt received an M.Sc. degree from the Hebrew University of Jerusalem in 1963 and a Ph.D. from the Weizmann Institute of Science in 1965. He conducted postdoctoral studies at New York University's Courant Institute of Mathematical Sciences, and in 1968 joined the Weizmann Institute as a senior scientist and promoted later to associate and then full professor. Between 1973 and 1975 he served as Head of Weizmann's Pure Mathematics Department, and between 1978 and 1982 as Head of the Applied Mathematics Department. From 1992 to 2004 he was Director of the Institute's Carl F. Gauss Minerva Center for Scientific Computation. He has been a visiting scientist or professor at Stanford University, IBM Thomas J. Watson Research Center, NASA Langley Research Center, Colorado State University and Colorado University at Denver, and currently has a position of Professor in Residence in UCLA Department of Mathematics. He has received the Landau Prize in Mathematics (1978), the Rothschild Prize in Mathematics (1990) and the SIAM/ACM Prize in Computational Science and Engineering (2005). The SIAM/ACM Prize, which is the highest international prize in this field, was established in 2003, and Brandt was its second winner (and first sole winner) ever. The citation for this prize reads that it was awarded to Prof. Brandt for "pioneering modern multilevel methods, from multigrid solvers for partial differential equations to multiscale techniques for statistical physics, and for influencing almost every aspect of contemporary computational science and engineering."

Prof. Brandt is best known for the development of advanced methods for solving partial differential equations and other problems with a multitude of unknowns. More recently, extensions of these methods to large graph problems, data analysis and image processing have gained much recognition. Most recently, he has developed a new computational method called systematic upscaling, which dramatically increases the speed and efficiency of computations for systems with a large number of variables. For example, it can speed up atom-by-atom simulations of polymer design by two orders of magnitude. This research paves the way for the solution of vital computational problems in science and engineering, such as certain calculations required for the design of proteins, drugs, nanosystems, materials, chemical reactions and industrial processes.