Lifetime Achievement: Ronald Graham

Citation

Ron Graham has been one of the principal architects of the rapid development worldwide of discrete mathematics in recent years. He has made many important research contributions to this subject, including the development, with Fan Chung, of the theory of quasirandom combinatorial and graphical families, Ramsey theory, the theory of packing and covering, etc., as well as to the theory of numbers, and seminal contributions to approximation algorithms and computational geometry (the "Graham scan"). Furthermore, his talks and his writings have done much to shape the positive public image of mathematical research in the USA, as well as to inspire young people to enter the subject. He was chief scientist at Bell Labs for many years and built it into a world-class center for research in discrete mathematics and theoretical computer science. He served as president of the AMS in 1993–94.

Biographical Sketch

Ronald Graham's undergraduate training included three years at the University of Chicago (in Robert Maynard Hutchins' Great Books program); a year at Berkeley as an electrical engineering major; and four years in the U.S. Air Force, three of which were spent in Fairbanks, Alaska, where he concurrently received a B.S. in physics in 1959. He subsequently was awarded a Ph.D. in mathematics from the University of California, Berkeley, in 1962.

He spent the next thirty-seven years at Bell Labs as a researcher, leaving from what is now AT&T Labs in 1999 as chief scientist. During that time he also held visiting positions at Princeton University, Stanford University, the California Institute of Technology, and the University of California, Los Angeles, and was a (part-time) University Professor at Rutgers for ten years. He currently holds the Irwin and Joan Jacobs Chair of Computer and Information Science at the University of California at San Diego.

Graham has received the Pólya Prize in Combinatorics from the Society for Industrial and Applied Mathematics, the Euler Medal from the Institute of Combinatorics and Its Applications, the Lester R. Ford Award from the Mathematical Association of America (MAA), and the Carl Allendoerfer Award

from the MAA. He is currently treasurer of the National Academy of Sciences, a foreign member of the Hungarian Academy of Sciences, a fellow of the American Academy of Arts and Sciences, a fellow of the American Association for the Advancement of Science, and past president of the International Jugglers Association. He was an invited speaker at the International Congress of Mathematicians in Warsaw in 1983 and was the AMS Gibbs Lecturer in 2000.

Response from Professor Graham

I must say that it is a great honor and pleasure for me to receive this award in recognition of a life in mathematics, and I would like to express my deep appreciation to the American Mathematical Society and to the Steele Prize Committee for their selection. When I was first notified, my initial reaction was to recall the famous quote of Mark Twain, who, upon seeing his obituary printed in a local newspaper, wrote that "the reports of my death are greatly exaggerated."

I can't remember a time when I didn't love doing mathematics, and that desire has not dimmed over the years (yet!). But I also get great pleasure sharing mathematical discoveries and insights with others, even though this can present a special challenge for mathematicians talking to nonmathematicians. However, I really believe that this type of communication will become increasingly important in the future.

As an undergraduate at Berkeley, a one-year course in number theory taught by D. H. Lehmer fired my imagination for the subject and formed the basis for my Ph.D. dissertation under him (after a slight detour of four years in the military and Alaska). Although I never took another course from Dick Lehmer, he taught me the value of independence of thought and an appreciation for the algorithmic issues in mathematics. I feel that I have been very lucky to have been at the right place and time in history for participating in the rapid and exciting current developments in combinatorics. No doubt, all mathematicians in every generation feel this way! In particular, I have had the good fortune to work with, and be inspired by, such giants as Paul Erdős and Gian-Carlo Rota, who, though different in many ways, were both driven by grand visions which have helped guide the paths of many combinatorial researchers today.

Number theory and combinatorics are especially rife with simple-looking problems which, like Socratic gadflies, constantly remind us how little we really know. (For example, are there infinitely many pairs of primes which differ by 2? The answer, of course, is yes! However, at present we don't have a clue how to prove this.) I recall the story of a civilization so advanced that a prize was awarded to the first mathematician who realized that the Riemann Hypothesis actually needed a proof. Perhaps more imminent (and more likely?) is the related version in which the Great Computer a hundred years from now, when asked whether the Riemann Hypothesis is true, pauses for a moment and then says, "Yes, it is true. But you wouldn't be able to understand the proof!" Still, I am a firm believer in Hilbert's famous dictum "Wir müssen wissen, wir werden wissen" ("We must know, we shall know"). And with this thought in mind, I will happily continue to keep hammering pitons into the sides of the infinite mountain of mathematical truth, as we all slowly inch our way up its irresistible slopes.