

Citation

1998 Euler medal of the Institute for Combinatorics and its Applications

ANTHONY J. W. HILTON. Since the mid 1960s, Tony Hilton has had a distinguished career in the work he has produced, the people he has trained, and his leadership in the development of combinatorics in Britain.

Two areas of his research stand out: colorings of graphs and embeddings of combinatorial structures. Tony pioneered two successful embedding techniques. The first was the use of edge-colorings in proving embedding results; this approach simplified classic results of Hall, Ryser and Cruse. Tony settled the Lindner conjecture, and obtained the optimal embedding result for partial idempotent latin squares; he also used his method to settle the Evans' conjecture. Solving these two conjectures was a great achievement. Tony's second technique involved amalgamations which he used in many ways, such as settling part of the celebrated conjecture on optimal embeddings for partial triple systems.

Tony is a leader in directions for research and in methods for combinatorial proofs. He stressed the connections between design theory and graph theory, and introduced the graph-theoretic concepts of connectivity and edge-colorings into design theory. He is now using Systems of Distinct Representatives in finding list colourings of graphs. In pure graph theory, he made a huge step forward in proving that regular graphs with large maximum degree have a 1-factorization. He has made major contributions to extremal set theory; he settled a conjecture of Erdos, Ko and Rado about the size of antichains in set systems, generalized Sperner's theorem, and gave a simple proof of the Kruskal–Katona theorem.

Tony's results show impressive breadth: 6 papers on Fibonacci numbers, 20 on extremal set theory and hypergraphs, 17 on design theory, 16 on embeddings, 11 on colorings, 7 on fractional colorings, 8 on k -to-1 maps between graphs; and 19 more papers in the pipeline! Tony also organized the successful colloquium in honor of Crispin Nash-Williams's retirement; he organized the British Mathematical Colloquium in 1993; he has supervised 9 Ph.D students; and he has encouraged other faculty members to become active combinatorialists. His abilities in working with other people help develop mathematics as well as a combinatorial mathematical community.