

ADMA COLLOQUIUM LECTURE SERIES (ONLINE)

ABOUT ADMA

The Academy of Discrete Mathematics and Applications (ADMA) is a registered professional body functioning with the aim of promoting active and quality research in Discrete Mathematics and allied subjects. Established in 2005, it has been successfully disseminating front-line research culture among the discrete mathematicians in India.

NINTH LECTURE

TITLE: SIGNED GRAPHS, FLOWS AND HOMOMORPHISMS

Speaker: Prof. Pavol Hell, Simon Fraser University, CANADA

Date: 25th February, 2025 (Tuesday)

TIME: 07:00PM TO 08:00PM (IST)

Registration Link: <https://forms.gle/5XRnbXNpSHEcciDZ9>

Registration deadline is 23rd February, 2025 04:00pm (IST).

NOTE: E - certificate will be issued to only those participants who are members of ADMA.

For membership see www.adma.co.in

ABOUT SPEAKER

Pavol Hell is a Canadian mathematician and computer scientist, born in Czechoslovakia. He is a professor emeritus at Simon Fraser University. Hell started his mathematical studies at Charles University in Prague, and moved to Canada in August 1968 after the Warsaw Pact invasion of Czechoslovakia. He obtained his MSc from McMaster University in Hamilton and his PhD at the Universite de Montreal. He describes his area of interest as "computational combinatorics", including algorithmic graph theory and complexity of graph problems. He has written the book *Graphs and Homomorphisms* (with Jaroslav Nešetřil), and many highly cited papers; his h-index according to Google Scholar is 50. He was the managing editor of the *Journal of Graph Theory* between 2007 and 2020, and was named a Fellow of the Society for Industrial and Applied Mathematics (SIAM) in 2012.



Prof. Pavol Hell,
Simon Fraser University,
CANADA

Signed graphs, flows and homomorphisms

Prof. Pavol Hell,
Simon Fraser University, CANADA

ABSTRACT

Signed graphs first arose in the theory of social balance, but also in clustering in networks, in root systems, matroids, flows on non-orientable surfaces, and in many other areas. A signed graph is an undirected graph G together with a labeling of its edges by signs $+$ and $-$, where two signed graphs are considered the same if one can be obtained from the other by a sequence of switchings (flipping all $+$, $-$ signs at a vertex). The topic of signed graphs has long been championed by T. Zaslavsky, and more recently by R. Naserasr and E. Sopena. In this expository talk I will illustrate how natural the concept of signed graphs is, and how it offers a refined view of many basic graph theory results. This phenomenon will be further underscored by presenting new results on nowhere zero flows and on the complexity of homomorphism problems. Results of M. Devos, K. Nurse, R. Šámal, J. Bok, R. Brewster, T. Feder, N. Jedličková, H. Kim, A. Rafiey, M. Siggers, the speaker, and others will be discussed.