# 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.

#### **Eleventh Lecture**

TITLE: INTRODUCTION TO GRAPH PRODUCTS

Speaker: **Prof. Wilfried Imrich, Montanuniversität Leoben, Austria** 

Date: 26th April, 2025 (Saturday)

TIME: 07:30PM TO 08:30PM (IST)

Registration Link: https://forms.gle/i7a4zNtXTw54fiqNA

Registration deadline is 24th April, 2025 04:00pm (IST).

NOTE: E - certificate will be issued to only those participants who are members of ADMA. For membership see <u>www.adma.co.in</u>

## **ABOUT SPEAKER**

Wilfried Imrich served the Technical University of Vienna from 1965 to 1973, was full Professor of Applied Mathematics at MontanUniversität Leoben from 1973 until 2009 and is now Professor Emeritus.

He also served at the State University of New York, Lomonosov University, Moscow, and Universities in Syracuse, Montreal, Vancouver, Waterloo and Melbourne. For many years (1973 – 1990) he taught courses on Combinatorial Group Theory at the University of Graz (Austria). More recently he taught and still teaches courses in Graphs and Groups at the University of Maribor (Slovenia, 2005/06), the University of Koper (Slovenia, 2012), at the Technical University Graz 2011, 2016/17, and 2020/21. At the AGH University of Krakow (Poland) he teaches regularly from 2010 to the present. He published more than 140 scientific publications, including 3 research monographs.

His research interests include the structure of finite and infinite graphs, graph automorphisms, product graphs, combinatorial group theory, and graph algorithms.

Since 2013 he is also member of Academia Europea and became Dr.h.c. of the University of Maribor in 2018.



**Prof. Wilfried Imrich,** Montanuniversität Leoben, Austria

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## **INTRODUCTION TO GRAPH PRODUCTS**

#### PROF. WILFRIED IMRICH,

Montanuniversität Leoben, Austria

#### <u>Abstract</u>

This talk introduces the Cartesian, the strong, the direct, and related products of graphs. It begins with basic definitions, and shows how the embedding of graphs into products of simpler graphs motivated the study of products. For example, embedding median graphs into hypercubes, or embedding benzenoid graphs into products of trees, facilitated their investigation and the design of recognition algorithms.

We continue with algebraic features, such as prime factorizations, and cancellation properties for finite and infinite graphs. Furthermore, we present new results about the Laplacian spectrum of graphs and of graph products, as well as open problems.

At the end of the talk the idea to study classes of graphs as subgraphs of products of graphs of simpler classes is briefly taken up again. But this time we embed into products of graphs with bounded treewidth or similar properties. This is now known as graph product structure theory.