

## The Life and Work of Professor Martin Gavalec

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## THE LIFE AND WORK OF PROFESSOR MARTIN GAVALEC

(11.11.1942 – 23.3.2021)

On March 23, 2021, professor Martin Gavalec, who became a victim of COVID-19, left us suddenly. Such painful event deeply affected his family: his wife Tatiana, children Daniela and Lubor, son-in-law Miguel and daughter-in-law Vera, and four grandchildren Julian, William, Johan, Jara. The sad event touched friends, colleagues, students, everyone with whom he lived and worked as a mathematician for many years. A man gifted with talent has passed away. He dedicated his life to his loving family and the work to which he was immensely devoted: the education of young people and scientific research.

Martin Gavalec was born in Žilina, Slovakia, later the family also lived in Trenčín, Slovakia. In 1959 he graduated and started his studies at the Faculty of Natural Sciences of the Comenius University in Bratislava, specializing in mathematics. His future wife was a student of the same specialization at the same time. Due to open-minded team of teachers there, the faculty provided the inspiring atmosphere for its students, and Martin got engaged in dialogues with his talented and creative fellow students from the very beginning. Faculty teachers aroused students' first interest in mathematical research. They treated them as co-working partners, supplying them with problems that needed to be solved. The teachers thus provided the students with probably the first valuable contact with scientific research. Martin was directed to the branch of algebra.

After graduating from the faculty in 1964, Martin started his mathematical career at the Mathematical Institute of the Slovak Academy of Science in Bratislava. After two years, in 1966 he transferred to the Faculty of Natural Sciences of the Pavol Jozef Šafárik University in Košice, to the Department of Geometry and Algebra. In addition to rich scientific and pedagogical activities, he participated in the creation and implementation of a system for active search for talented students interested in studying mathematics. The result was an increased number of mathematically gifted students at the Faculty of Natural Sciences of the Pavol Jozef Šafárik University and a number of successful participants (including winners) in the regional, national and international rounds of the Mathematical Olympiad. Martin worked as the chairman of the Regional Committee of the Mathematical Olympiad for nine years, and he was one of the founders of the East Slovak Correspondence Mathematics Seminar with a relatively long tradition, popular among high school students in region.

In 1975, he defended his dissertation in the field of algebra and number theory. Martin's next workplace was the University of Veterinary Medicine and Pharmacy in Košice (at the time under the name University of Veterinary Medicine in Košice). Since 1992, he became a member of the Department of Mathematics and Theoretical Informatics

of the Faculty of Electrical Engineering and Informatics of the Technical University in Košice. At that time, he began to devote himself to discrete dynamical systems because he had experience with the necessary algebraic tools and methods. The obtained results and published works ranked him among the top in the field. Many of his publications were crucial and contained generalizations of up to that time incomplete knowledge.

Based on the results achieved, he obtained the position of associate professor at the Faculty of Informatics and Management of the University of Hradec Králové. It was a challenge and Martin decided to accept it in 1998, and subsequently in 2001 moved with the whole family to Hradec Králové. Working at a new, modern workplace with a very pleasant and efficient working atmosphere proved to be the most fruitful period of Martin's scientific career. He published in the most prestigious scientific journals, repeatedly won the university rector's award for the best publication outputs and deans recognition. In 2017, the city of Hradec Králové awarded him a medal in recognition of his academic work at the university as part of the celebration of the anniversary of the foundation of Czechoslovakia (1918).

Among his best-known works are publications focused on the interval analysis of discrete dynamical systems in extremal (max-plus, max-min and max-Lukasiewicz) algebras and algorithmic solutions of several previously open problems in the area of steady states of discrete dynamical systems with inexact data, as well as algorithms, which efficiently solve two-sided max-min linear systems. In addition to his main focus on extremal algebras and discrete dynamical systems, he also worked in other areas such as fuzzy logic, operational research, biomedical applications and others. He was the leading researcher of several basic research scientific projects, on which many of his colleagues from Charles University Prague, Silesian University in Opava, Palacký University Olomouc, University of Birmingham and Technical University of Košice also worked as highly qualified participants. In 2006, he was promoted to Professor in Applied Mathematics.

As part of his teaching activities, he became the author or co-author of several textbooks on optimization methods, probability and mathematical statistics, the university textbook "Algebra and Theoretical Arithmetic" and two monographs: "Periodicity in Extremal Algebras" and "Decision Making and Optimization".

The published articles pleased him, but since the journey is the goal, the research itself brought him more joy. His work was profound and careful, he was patient and always optimistic. The words he spoke and the thoughts he sent forth were kind, encouraging, profound.

He was also understanding and helpful to students and colleagues. Very soon after arriving in Hradec Králové, he became an active and full-fledged member of the Department of Information Technologies at the Faculty of Informatics and Management of the University of Hradec Králové. His analytical approach to problem solving with attention to detail was an inspiration for doctoral students how to find a systematic way in their own studies. And so, inspired by the experience passed to him by his own university teachers, he introduced a number of his doctoral students to mathematical research. At a time when the potential of joint seminars of doctoral students seemed to be less effective, as their supervisor he chose the time-consuming form of individual consultations. Such approach positively changed not only the relationship between supervisor and doctoral student, but also the relationship of students to research, resulting in a number of

high-quality scientific outputs and high success in doctoral studies. Professor Gavalec, in the role of its leader, created a working group named ODEMA (Optimization and Decision Making).

Fluent communication in four world languages was another of his gifts, with which he bridged professional contacts and used them at conferences and stays at universities in the United States, Mexico, Australia, Argentina, Japan, Russia and many European countries, as well as when organizing international scientific events. In addition to the professional part of the travel, they demonstrated his interest in contacts with different cultures and people living abroad.

Relaxing activities for him were reading books, travelling and admiring nature, especially mountains and landscapes. He enjoyed experiencing the beauty of mountains, forests and the sea at home and abroad, especially with friends and family. He appreciated humour, very often showed a subtle sense of humour, and he liked to tell jokes and listen to them.

Calm nature and balance were the strong points of his character, for which he was sought after by colleagues and friends. Each communication supported by a broad perspective was an opportunity for dialogue on various topics. He was able to see the problem in its entirety and at the same time capture the essence of the problem in one simple sentence. He respected people; his inner mission was not to change people, but to help them, to be a purposeful person. These ways of thinking and reasoning affected the conduct of his family members as well. Martin was able to make interesting and valuable contributions to any discussion. Active until the last days of his life, he completed a research grant project just weeks before his passing. He had other goals planned. A very cruel moment that was given to his life the impact of the epidemic - broke those goals and ideas. Man's work ended and his spiritual wealth and wisdom remained with us.

An esteemed colleague and respected scientist has left us. Martin, it was an honour to share our lives with you. We are graced with sharing our lives with you and we thank you for your human approach and professional contributions. You will be greatly missed not only by us, your colleagues around the world, but especially by your family.

Memories of you, Martin, will be held with deep devotion in our hearts.