

Professor Ľubomír Snoha, 60 years old

Gabriela Monoszová

Department of Mathematics, Faculty of Natural Sciences, Matej Bel University,

Tajovského 40, 974 01 Banská Bystrica, Slovakia

gabriela.monoszova@umb.sk

Alfonz Haviar

Povstalecká 6, 974 09 Banská Bystrica, Slovakia

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On 18 March 2015, we celebrated the 60th birthday of our colleague, Prof. RNDr. Ľubomír Snoha, DSc., DrSc. His arrival to our Department of Mathematics in 1978 has significantly influenced its further development. With his admirable diligence, commitment and general knowledge (which he acquired during his studies at the Faculty of Natural Sciences, Comenius University in Bratislava), he proved that even small departments can achieve excellent results at the international level.

Ľubomír Snoha attended the secondary school in Lučenec between 1970 and 1973. After graduation in 1973, he enrolled at the Faculty of Natural Sciences, Comenius University in Bratislava, where he studied Mathematics and Physics from 1973 to 1978. Due to his excellent study results (Honours diploma) and admirable achievements within his master's thesis (on a theorem of Sophie Piccard and on points of connectivity and Darboux continuity of real functions), that were later published, he managed to acquire the post-graduate academic degree RNDr (Rerum Naturalium Doctor), only several months after finishing his studies in 1978. He was recommended by the Professors Štefan Znám and Jaroslav Smítal from the Faculty of Natural Sciences, Comenius University, to work as an assistant at the then Pedagogical Faculty in Banská Bystrica.

In 1978, he was appointed as an assistant to the Department of Mathematics of the above-mentioned faculty, and works there to this day. Today, the department is a part of the Faculty of Natural Sciences of Matej Bel University. In 1979, immediately after finishing his duty in the army, he went onto to hold a position of teaching, and in 1980, he was appointed to the Faculty of Mathematics and Physics at the Comenius University in Bratislava, where he studied within an external research assistantship (today known as a postgraduate doctoral study) in the field of Mathematical Analysis. During his studies



there, he was tutored by Prof. Jaroslav Smítal, under whose guidance he elaborated two works within ŠVOČ (Student Scientific and Professional Activity), the master's thesis and the RNDr dissertation. Being an enthusiast, he regularly attended the scientific seminars that were led by Prof. Tibor Šalát (seminar on real functions) and Prof. Jaroslav Smítal (seminar on dynamical systems) at the Faculty of Mathematics and Physics, Comenius University in Bratislava. In 1986, he became a Candidate of Sciences of the Faculty of Mathematics and Physics, after he had defended the doctoral dissertation on dynamical systems, in which he completed the characterization of minimal periodic orbits of continuous maps of an interval (the same results were independently proven by Ll. Alsedà, J. Llibre and R. Serra). At the age of 34, he managed to obtain the scientific-pedagogical degree "docent" (equivalent to associate professor) at the Faculty of Mathematics and Physics, Comenius University (in 1989). In 2005, he was awarded an academic degree DSc (the Doctor of Science) by the Academy of Sciences of the Czech Republic and in 2007, an academic degree DrSc (the Doctor of Science) by the Comenius University in Bratislava. In 2008, the Silesian University in Opava awarded him the scientific-pedagogical degree of a Professor.

Initially, he dealt with the theory of real functions, however, he soon moved to the theory of discrete dynamical systems, in which he is a highly respected figure today. He deals mainly with topological dynamics, chaos theory and low-dimensional dynamics. He began with interval dynamics, explored minimal periodic orbits, generic and dense chaos and mappings of type 2^∞ . For instance, he found a full characterization of generically chaotic maps and densely chaotic maps. He also published several papers with V. Jiménez López; one of their outstanding findings is that there are no continuous piecewise linear maps (with finitely many pieces and no constant piece) of type 2^∞ . Along with interval dynamics, he engaged in dynamics of triangular maps (skew products), dynamics on graphs, dendrites and spaces with a free interval, as well as in dynamics on metric spaces. He explored, for example, ω -limit sets, topological transitivity, topological entropy, stroboscopical property, scrambled sets etc. In collaboration with Ll. Alsedà, S. Kolyada and J. Llibre, they investigated the connection between qualitative dynamical properties and possible values of topological entropy. In an extensive paper with F. Blanchard and W. Huang they investigated in great depth the question of how large (from the topological point of view) scrambled sets may be. In the theory of non-autonomous dynamical systems, his seminal paper with S. Kolyada on topological entropy is best known. Jointly with J. Auslander and S. Kolyada they introduced the notion of the functional envelope of a dynamical system. With M. Misiurewicz and S. Kolyada they explored the topology of the space of transitive interval maps; they propose the name Dynamical Topology for the investigation of topological properties of spaces of maps that can be described in dynamical terms.

His favourite subjects within his field of scientific research are minimal dynamical systems, i.e. the systems with all orbits dense. He is a highly reputable expert in the field of topological structure of minimal sets and topological properties of minimal maps. Jointly with S. Kolyada and S. Trofimchuk they showed that minimal maps in compact metric spaces are almost one-to-one. They also proved that proper minimal sets on compact connected 2-manifolds are nowhere dense. Further, they described topological structure of minimal sets of fibre-preserving maps in graph bundles. Another deep result on minimality, now obtained jointly with F. Balibrea, T. Downarowicz, R. Hric and V. Špitalský, is that an almost totally disconnected compact metric space admits a minimal map if and only if either it is a finite set or it has no isolated point. Let us also mention that very recently, with T. Downarowicz and D. Tywoniuk, they have constructed a

continuum that is uniquely minimal in the sense that its group of self-homeomorphisms is isomorphic to \mathbb{Z} and all the self-homeomorphisms, except of the identity, are minimal.

He has been an author or co-author of approximately 50 scientific works that have been followed by many respected foreign mathematicians. He has given lectures on many foreign scientific conferences, very often as an invited speaker. He is an editor of *Journal of Difference Equations and Applications* (Taylor and Francis), *Non-autonomous Dynamical Systems* (de Gruyter) and *Acta Universitatis Matthiae Belii*, series Mathematics.

Prof. Snoha spent a year as a visiting professor at University of Murcia. He has visited Max Planck Institute for Mathematics in Bonn several times, and spent a semester in Stefan Banach International Mathematical Center in Warsaw. He has also visited many other research institutes and universities (Barcelona, Murcia, Lisbon, Marseille, Paris, Oberwolfach, Vienna, Warsaw, Kiev, Santiago, Talca, Vadodara, Hefei, ...).

Since 1995, he has been running a scientific seminar on Dynamical Systems at Matej Bel University. He is the team leader of the dynamical systems group whose members are also his former PhD students, Roman Hric, Vladimír Špitalský and Matúš Dirbák.

L. Snoha loves teaching. He has been teaching mainly subjects from the field of mathematical analysis and dynamical systems. Apart from scientific and pedagogical activities at the university, he has dealt with gifted pupils in elementary and secondary schools. In the 1980s, he was an organizer of ten summer camps for young ‘mathematicians’ (in fact schoolchildren) from central Slovakia and he led mathematics correspondence courses in problem solving for secondary school students from central Slovakia for five years. Moreover, he has lectured dozens of seminars for gifted secondary school students, mainly from grammar schools in the regions of central Slovakia.

He has always endeavoured to build the department, faculty, university, mainly for the purpose of maintaining a high level of science. In 1992, after merging the former faculties in Banská Bystrica, the present Matej Bel University came into existence, in which he was appointed the Vice-Rector for Science and as such, he urged to enhance the role of science at the university. In other words, his main idea was to substitute the regional research for international standards.

Our colleague, L. Snoha, has left a deep mark in our department during his 37 years of work and has succeeded in building an outstanding school of dynamical systems. His opinions have had a positive influence on the direction of the department in recent years. Thanks also to him, the Department of Mathematics has been valued as one of the best mathematics departments in Slovakia today.

Dear Lubo, on the occasion of your jubilee, we would like to thank you for your on-going and outstanding work you have done for our department and mathematics in Slovakia. We wish you a good health, a success not only in scientific but also in pedagogical activities, and a lot of professional and personal satisfaction.

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