




VITALIY SUSHCHANSKY

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(11.11.1946 – 29.10.2016)

Vitaliy Ivanovych Sushchansky was born on November 11, 1946 in Khodorkiv in Zhytomyr region west of Kyiv. He died half a month before his seventieth birthday on October 29, 2016 in Gliwice, Poland. He was an outstanding mathematician and teacher, one of the most prominent researchers in group theory in Ukraine and Poland.

After finishing school in Khodorkiv, he entered Kyiv Taras Shevchenko University, which he graduated in 1969. His Master thesis (defended in 1969), and later his Candidate of Sciences thesis (defended in 1971) were directed by Lev Kaluzhnin, one of the founders of the modern Kyiv algebraic school. Sushchansky's first research paper was "*Verbal subgroups of the Sylow p -subgroups of finite symmetric groups*", published in 1970, see [S70].

Vitaliy Sushchansky's early work was centered around wreath products of groups and related questions (e.g., structure of the Sylow subgroups of the symmetric groups). Importance of wreath products and of structures

connected with them (automorphisms of rooted trees, isometries of spaces of sequences, triangular transformations, automata, etc.) for algebra, dynamical systems, and probability theory has been growing ever since. For example, modern theory of amenable groups and of random walks on groups can not be imagined without examples involving wreath products and groups acting on rooted trees. The works of V. Sushchansky and L. Kaluzhnin formed foundations of this theory. Moreover, it is clear that importance of their works for modern mathematics is still growing.

One of unexpected applications of the theory developed in the study of wreath products (in particular, the techniques of *tableaux* due to L. Kaluzhnin) was the discovery by Vitaliy Sushchansky of new examples of finitely generated infinite torsion groups [S79a,S79b]. His examples were substantially new and had properties very different from the properties of the previously known groups of Burnside type. We know now that they were the first examples from a wide class of groups, which is still being intensively studied. It was observed later by R. Grigorchuk that these groups are of intermediate growth, and have other interesting properties (the first proof of the existense of groups of intermediate growth was given in [Gri83] by R. Grigorchuk using his example from [Gri80]). See a modern exposition of the Sushchansky's examples in the paper of his students I. Bondarenko and D. Savchuk [BS07]. Using the newly developed techniques Sushchansky also solved two problems from the Kourovka notebook on factorizations of groups [S89]. These results were a part of his habilitation thesis (Doctor of Sciences), which was defended in 1991 in Leningrad.

Starting from the middle of the nineties V. Sushchansky was developing the theory of automatic transformations and groups generated by them [S98]. One of the most cited works in this area is his joint paper with R. Grigorchuk and V. Nekrashevych [GNS00]. This article and problems asked in it have laid groundwork for many future developments in the field. See also a recent paper [GLNS16] where interesting connections with automatic sequences, automatic transformations, and some old work of V. Sushchansky and L. Kaluzhnin are described.

Vitaliy Sushchansky worked in many other areas of Algebra. For example, together with his students he initiated a systematic study of locally finite groups obtained as direct limits of block-diagonal embeddings of finite groups [KS98]. Other interests include: groups generated by infinite matrices, algebras of relations (AR-algebras), Boolean functions, computer algebra, etc..

Vitaliy Sushchansky published over 140 articles and 9 textbooks. He collaborated with over 60 coauthors from many countries, and took part in various international research projects (e.g., joint INTAS project in Geometric Group Theory joint with University of Paris XI from 1994 till 1998), visited many universities for scientific collaboration (Texas A&M, Vanderbilt University, University of Brasilia, Freiburg University, University of Manitoba, and other). He was an editor of the journals “*Algebra and Discrete Mathematics*”, “*Matematychni Studii*”, and “*Mathematical Bulletin of Shevchenko Scientific Society*”. As the editor-in-chief and a very active contributor to the journal for school children “*In the world of Mathematics*”, he was popularizing Mathematics and its history among younger readers and their teachers in Ukraine.

His professional life was connected with two countries: Ukraine and Poland. Starting from 1971 and till his retirement in 2004 he worked in Kyiv Taras Shevchenko University (Assistant Professor from 1971, Associate Professor from 1980, Professor from 1992). From 1998 till 2004 he was head of the Department of Algebra. He and his wife Nina worked in Silesian University of Technology in Poland starting from 1996, where he was head of department (zakład) of Discrete Mathematics and Computer Science and, since 2009, of department of Algebra. Vitaliy Sushchansky actively contributed his service to the mathematical communities of both countries. He helped to organize many conferences and seminars (in particular the traditional workshop “*At the year’s end*” in Kyiv), was a founding member and head of the doctoral dissertation committee in Algebra and Discrete Mathematics at Kyiv Taras Shevchenko University, which has played an important role in the scientific life in Ukraine.

Vitaliy Sushchansky was a talented lecturer and mentor. He has directed research of 32 graduate students (27 in Ukraine and 5 in Poland) and was the advisor of 5 habilitation theses in Ukraine. Long conversations with Vitaliy Ivanovych about Mathematics, history, literature and life, his kindness, sense of humor, and support will be forever alive in the memory of all of us.

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