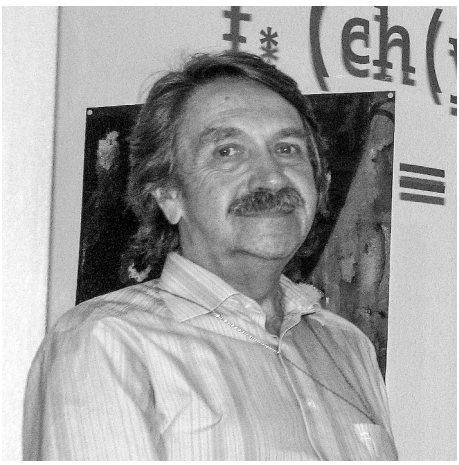
Yuriy Drozd

(dedicated to 75th Birthday)



On October 15, 2019 an outstanding Ukrainian mathematician, one of the founders of Kyiv algebraic school Yuriy Drozd celebrated his 75th birthday.

Yuriy Drozd was born in Kyiv, his mother was a physician and father an engineer. During the Second World War, they both served in the Red Army as army officers.

Yu. Drozd was interested in mathematics already while studying at school. In 1961 he became a winner of the 1st Mathematical Competition of Ukrainian Republic and of the 1st Mathematical Competition of the Russian Federative Republic. After graduation from high school, Yu. Drozd became a student of the Faculty of Mathematics and Mechanics of the Taras Shevchenko Kyiv State University. He graduated from the university in 1966, main results of his diploma thesis (written under the supervision of A. Roiter) were published in "Doklady AN SSSR" and influenced the development of the theory of integral representations. Yu. Drozd continued his postgraduate education at the Institute of Mathematics of Ukrainian Academy of Science as a Ph.D. student of I. Shafarevich. In 1969, Yu. Drozd began his academic carrier in the Kyiv State University, where he advanced from assistant professor to full professor, being the

head of the chair of Algebra and Mathematical Logic from 1980 till 1998. In 1970, Yu. Drozd defended his dissertation "Some questions of the theory of integral representations" at the Steklov Institute of Mathematics in Moscow, the leading mathematical institution of the former USSR. This thesis contained a criterion for a commutative order to have only finitely many indecomposable lattices, structure results on hereditary and Bass orders and many other results, which played a central role in the theory of integral representations afterwards.

In the 1970s, Yu. Drozd began to study matrix problems, a new branch of algebra and representation theory. His famous "tame-wild theorem" states that every finite dimensional algebra over an algebraically closed field has either finite, or tame, or wild representation type. This striking result sets a milestone of the modern representation theory of finite dimensional algebras. There were series of international mathematical conferences entirely devoted to the "tame-wild" questions area. Jointly with V. Bondarenko, Yu. Drozd described all finite groups that have tame representation type over a field of positive characteristic. In 1981, he defended his Dr. Sci. dissertation "Matrix methods in representation theory and ring theory" at Lenigrad State University.

A great contribution of Yu. Drozd to the development of modern algebra was application of the technique of matrix problems to get exhaustive classification results in other areas of mathematics, including algebraic geometry, algebraic topology, commutative algebra, and representation theory of Lie algebras.

At the beginning of the 1980s, Yu. Drozd initiated a new direction of research at the Kyiv state university devoted to the study of special classes of infinite dimensional representations of simple Lie algebras. Using the technique of matrix problems, he classified bounded representations of the Lie algebra $sl(2)$ over an arbitrary field of positive characteristic. Later, jointly with V. Futorny and S. Ovsienko he investigated new classes of representations of Lie algebras and algebraic groups: weight representations, Gelfand-Zeitlin representations and others. The obtained results and developed methods became standard tools for specialists working in this area of representation theory.

Yu. Drozd made an outstanding contribution to the representation theoretic study of Cohen-Macaulay modules over curve and surface singularities. Together with A. Roiter, he proved that simple curve singularities have only finitely many indecomposable Cohen-Macaulay modules. In a series of joint works with G.-M. Greuel, he proved semi-continuity/finite-tame-wild-trichotomy of the representation type of reduced curve sin-

gularities, explicitly characterizing singularities of tame representation type. In a subsequent joint work with I. Kashuba and G.-M. Greuel, Yu. Drozd established tameness of surface cusp singularities. In the last decade, together with I. Burban, Yu. Drozd discovered a new class of tame matrix problems called decorated bunches of chains and proved using them tameness of degenerate cusp surface singularities. Together with V. Gavran, he established tameness of some non-commutative analogues of minimally elliptic surface singularities.

This direction of research activity of Yu. Drozd was closely related with the study of vector bundles and torsion free sheaves on singular curves. Together with G.-M. Greuel, Yu. Drozd proved tame-wild dichotomy for the categories of vector bundles and torsion free sheaves on a projective curve. In a subsequent joint works with I. Burban, the latter results were generalized for coherent sheaves as well as on the corresponding derived categories. In a joint work with L. Bodnarchuk and G.-M. Greuel, Yu. Drozd applied again the technique of matrix problems to classify simple vector bundles on degenerate elliptic curves of wild representation type.

In the 1990s, Yu. Drozd began a fruitful collaboration with H.-G.Baues in algebraic topology. In several joint papers, they used the technique of matrix problems to achieve a crucial progress in stable homotopic classification of polyhedra.

In 2000s, Yu. Drozd proved semi-continuity of representation type for the bounded derived category of a finite dimensional algebra. Together with I. Burban, he established derived tameness of various classes of finite dimensional algebras. In a joint work with V. Bekkert, Yu. Drozd proved discrete-tame-wild trichotomy theorem in the framework of derived categories of finite dimensional algebras.

One of the current directions of the research of Yu. Drozd is devoted to the non-commutative algebraic geometry. In the 1990s, he introduced the notion of a nodal order and proved that these are the only orders of discrete/tame representation type. The global analogues of nodal orders, the so-called tame non-commutative nodal projective curves, appeared recently in a quite essential way in the framework of the homological mirror symmetry for compact surfaces with non-empty boundary.

These and other results of Yu. Drozd were published in top international journals. He had more than 30 Ph.D. students, four of whom later defended Dr. Sci. dissertations. From 2006 till now Yu. Drozd is the head of the Department of Algebra and Topology of the Institute of Mathematics of National Academy of Science of Ukraine, the main mathematical organization in Ukraine.

Yu. Drozd wrote several university textbooks, many students use his "Finite Dimensional Algebras" (with V. Kirichenko), "Galois Theory", "Theory of Algebraic Numbers", "Introduction to Algebraic Geometry", "Basic Mathematical Logic", "Discrete Mathematics" and others. The book "Finite Dimensional Algebras" was first published in 1980 in Kyiv. In 1983, it was translated from Russian to Chinese and Spanish. In 1994, an English translation of this book was published by Springer-Verlag. This book is one of the most used textbooks about finite-dimensional algebras in the world.

The book "Introduction to Algebraic Geometry" (based on the lecture course given by Yu. Drozd at the University of Kaiserslautern in the winter term 1998/99) is the first and so far the only textbook in algebraic geometry written in Ukrainian language.

Outstanding research achievements of Yu. Drozd were widely recognized by mathematical community. In 2012, he was elected the corresponding member of the National Academy of Science of Ukraine. In 2007, Yu. Drozd was awarded the State Prize of Ukraine. In 2017, he was elected president of Ukrainian Mathematical Society. Yu. Drozd is the Editor-in-Chief of the journal "Algebra and Discrete Mathematics" and a member of editorial boards of many mathematical journals, in particular "European Journal of Mathematics", "Ukrainian Mathematical Journal" and others. He is one of the founders of the biannual International Algebraic Conference in Ukraine (The first Conference was held in 1997 and the last-to-date in 2019). He worked in organizing committees of many international conferences around the world. Yu. Drozd is also one of the organizers of the Algebra Seminar in Kyiv University, which is one of the most important modern algebra seminars in Ukraine.

We warmly congratulate Yuriy Anatolijovych Drozd on the occasion of his 75th birthday and wish him strong health and many successful years of research and teaching.

V. Bavula, V. Bekkert, O. Bezushchak, V. Bondarenko,
Ie. Bondarenko, I. Burban, V. Futorny, R. Grigorchuk,
L. Kurdachenko, Ya. Lavrenyuk, V. Lyubashenko,
V. Mazorchuk, V. Nekrashevych, A. Oliynyk, B. Oliynyk,
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