



TO THE MEMORY OF ANATOLY VASILIEVICH ZHIBER

On February 7, 2022, being 76 years old, Professor Anatoly Vasilievich Zhiber, leading scientific researcher of Institute of Mathematics of Ufa Federal Research Center of Russian Academy of Sciences, Doctor of Physical and Mathematical Sciences, died suddenly. A talented mathematician left us, he was known in the entire world as one of the founders of the symmetry approach in theory of integrable systems, excellent teacher and a wonderful person.

Anatoly Vasilievich Zhiber was born on June 18, 1946 in Kazakhstan, in the village Kolkhoznaya of Karaganda region. In 1969 he graduated from the mechanical mathematical faculty of Novosibirsk State University and he defended his Diploma thesis in the Chair of Differential Equations under the supervision of the then young associate professor Alexey Borisovich Shabat. From 1969 till 1971 he passed an active service in Soviet Army in the 49th separate radio engineering unit for reconnaissance of outer space in Balkhash-9. After completing his military service, he worked as a senior geophysicist-interpreter at the Computing Center of the Siberian Branch of the USSR Academy of Sciences. At the same time, he continued scientific cooperation with his supervisor A.B. Shabat.

He defended his PhD thesis «Cauchy problem for one class of semilinear system of differential equations» in Moscow Institute of Electronics and Mathematics (Moscow) in 1975. A Habilitation thesis «Symmetries and integrals in nonlinear differential equations» was defended in 1994 in the Institute of Mathematics and Mechanics of Ural Branch of Russian Academy of Sciences in Ekaterinburg.

In 1973 he came to Ufa and started working at the Chair of Mathematics in Ufa State Aviation Institute. In 1990, he moved to the Institute of Mathematics of Ufa Federal Research Center of RAS, at which he worked till the end of his life except for the period from 1993 to 2001, during which he was employed at the Institute of Mechanics of the Russian Academy of Sciences. All this time he continued his active teaching activities in Bashkir State University and Ufa State Aviation Technical University. A.V. Zhiber successfully and fruitfully worked with young scientists. Under his supervision, six PhD theses were defended.

A.V. Zhiber was one of the leading specialists in the field of the modern group analysis of differential equations. He obtained important results for nonlinear hyperbolic equations and two-dimensional dynamical systems of equations:

- a class of system of nonlinear Schrödinger kind equations was selected, the solutions to the Cauchy problem for which form a singularity in a finite time;
- complete lists of Klein-Gordon equations and their generalization possessing higher symmetries were obtained (jointly with A.B. Shabat);
- a symmetry analysis was made for differential equations describing wave processes;
- a constructive criterion of Darboux integrability was established for differential equations in terms of higher Laplace invariants, a classical problem on listing nonlinear hyperbolic Liouville kind equations was solved by using higher symmetries, a generalization of Laplace cascade method for integrating hyperbolic equations was proposed (jointly in V.V. Sokolov);
- explicit formulae were proposed for generalized Laplace invariants were obtained for two-dimensional Toda chains defined by Cartan matrices of simple Lie algebras;
- a new approach for classification on integrable nonlinear equations was proposed on the base of studying the structure of the characteristic Lie algebra;
- a criterion for Darboux integrability was obtained for two-dimensional dynamical system of equations was obtained; a class of exactly integrable models possessing complete set of first and second order integrals was described;
- for linear hyperbolic system of equations with zero generalized Laplace invariants, explicit solutions to Goursat problem were found.

Anatoly Vasilievich published more than 30 scientific paper in leading scientific journals. He was an author of many textbooks and two scientific monographs.

A.V. Zhiber actively participated in the social life of the mathematical society of Ufa. He repeatedly was a chairman of State Examination Commission on mathematical disciplines in various universities of the Republic of Bashkortostan. He was an

editor of «Ufa Mathematical Journal» and a member of dissertation councils of Institute of Mathematics, UFRS RAS and of Ufa State Aviation Technical University. He was an expert of Russian Foundation for Basic Researches and of Russian Science Foundation.

Everyday communication with Anatoly Vasilyevich brought not only positivity, joy and a boost of energy, but also helped to enrich with valuable experience, which Anatoly Vasilyevich had a huge amount of and which he generously shared with everyone.

We will forever remember his irrepressible vitality, cheerfulness, goodwill, high spiritual and moral and ethical qualities.

Colleagues, pupils and friends.