

Valentin Vitalievich Rumyantsev

(19th July, 1921 – 10th June, 2007)

<http://stab12.ipu.ru/stab10/08/english/rumyantsev.html>



The X-th International Seminar is devoted to the memory of the academician **Valentin Vitalevich Rumyantsev** who was the first-rate expert in the field of general mechanics and the theory of stability of motion.

To understand the place and the role of academician Rumyantsev in the development and augmentation of the scientific Lyapunov's heritage, it is necessary to recall the development of the theory of stability in the 20th century. The interest to Lyapunov's works on the theory of stability of motion was revived in 30-s' years in Kazan by the well-known Vermutungsseminar which worked under supervising of the Corresponding Member of the USSR Academy of Sciences Nikolay Gurievich Chetaev (1902-1959). Among the participants of this seminar there were K.S. Persidsky, P.A. Kuzmin, I.G. Malkin, M.S. Aminov, N.G. Chebotarev and others. Most scientists who took part in the Seminar became later widely known. Then, according to the Academician Tchapygin's representation, N.G. Chetaev moved to Moscow where he organized the Moscow school of analytical mechanics and stability of motion. Many well-known scientists originated from this school, among them N.N. Krasovsky, V.V. Rumyantsev, B.S. Razumikhin, V.M. Starzhinsky, G.K. Pozharitsky and others. After Chetaev's death in 1959, V.V. Rumyantsev headed the Moscow Chetaev School. During almost half of the century this School had the incontestable authority not only in the USSR but also far abroad. All this time the Rumyantsev's Seminar in analytical mechanics and stability worked regularly in the Moscow State University. Mathematicians and mechanicians from different regions of the USSR and from many countries of the world considered as the honor to present their papers at this Seminar.

Valentine Vitalievich Rumyantsev was the largest expert in the field of the general mechanics. He developed the theory of motion stability for bodies with cavities containing liquid, the theory of stability relative to the part of variables, obtained a number of fundamental results in analytical mechanics and in dynamics of rigid body. His results made up the basis of various

engineering applications, including the specific problems in dynamics of missiles and space vehicles. During the last 5 years V.V. Rumyantsev accomplished a large series of works on the methods of analytical mechanics. He developed the theory of generalized equations of dynamics in the form of Poincaré-Chetaev. Basing on the Poincaré's idea on the groups of displacements of holonomic systems, V.V. Rumyantsev proposed the modified Poincare-Chetaev equations for the case of closed systems of the differential operators of virtual and real displacements. The connection between these equations and the basic equations of analytical dynamics was established. The received generalized equations describe both holonomic and nonholonomic systems in the generalized coordinates and in quasi-coordinates including the case of superfluous variables. So the equations of motion obtained by V.V. Rumyantsev represent the most general equations of dynamics.

Academician V.V. Rumyantsev published more than 200 [scientific works](#), including 7 monographs. He was scientific supervisor for more than 20 Full Professors and 50 scientists with PhD degree. In addition to the brilliant academic and pedagogical career, V.V. Rumyantsev revealed his great talent in organizational work. He was Editor-in-Chief of the authoritative academic journal "Applied Mathematics and Mechanics" (PMM). Almost all International and National scientific forums on mechanics of the last 30-40 years were organized with the assistance of V.V. Rumyantsev.

V.V. Rumyantsev was the permanent member of the Programming Committee and the regular lecturer of the E.S. Pyatnitsky International Workshop "Stability and oscillations of nonlinear control systems". In 1992 Valentine Vitalievich Rumyantsev made the first in the Seminars history plenary report «A.M. Ljapunov and development of his ideas in the theory of stability of motion». Rumyantsev's last plenary report was in 2006.



Valentin Vitalievich Rumyantsev

at University of Niš

by pape 2000 and by Plenary Lecture 2993

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FORMS OF HAMILTON'S PRINCIPLE FOR NONHOLONOMIC SYSTEMS

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Abstract. The conditions under which the three forms of Hamilton's principle were derived for nonholonomic systems with linear constraints by Hölder, Voronets and Suslov are analysed in the general case of nonlinear constraints. It is proved, that these three forms are equivalent and transformable to each other.

The analogous questions are analysed for the case of nonlinear quasi-coordinates and quasi-velocities. In addition the forms of Hölder, Voronets and Suslov are exhibited in the case of Legendre transformation reducing the motion's equations to canonical form in quasi-coordinates. Also the conditions under which Hamilton's principle for nonholonomic systems has the characteristics of the principle of stationary action are derived.

 6th ISNM NSA NIŠ '2003	INTERNATIONAL SYMPOSIUM ON NONLINEAR MECHANICS <i>Faculty of Mechanical Engineering University of Niš</i> 18000 - NIŠ, A. Medvedeva 14 Tel.: (+381 18) 524-915
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On Application the Poincare's and Chetayev's Equations on Some Problems of Nonlinear Mechanics

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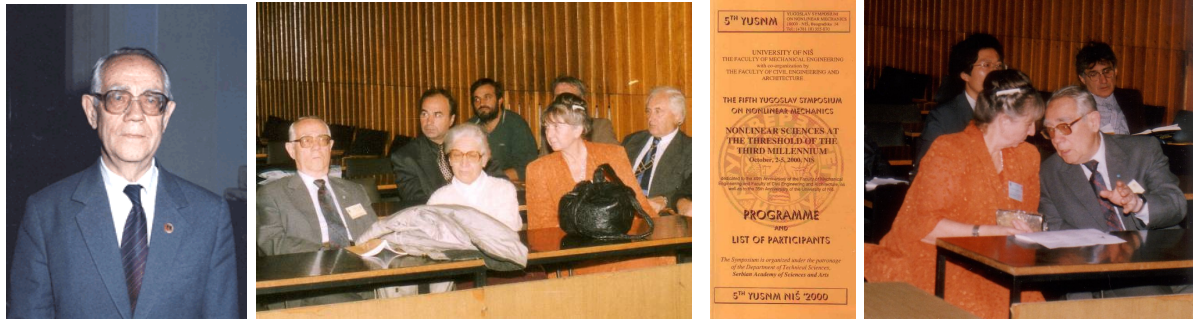


Figure 18. Academician RAS Valentin Vitalevich Rumyantsev (19th July, 1921 – 10th June, 2007) give Lecture titled: “On Application the Poincare's and Chetayev's Equations on Some Problems of Nonlinear Mechanics” (6th ISNM NSA NIŠ '2003)



Niš 2000

Niš 2000

Niš 2003

Niš 2003

Figure 17. Photo Gallery: Participants of two International Symposiums on “Nonlinear Sciences at the Threshold of the Third Millenium” Niš 2000 and 6th ISNM NSA NIŠ '2003 in Niš 2003. (Photo left up: between participants in middle: Academicians *N. Hajdin*, *V.V. Rumyantsev* and *M. Prvanović* and Professors *D.S. Sophianopoulos*, *G.T.Michaltos*, *Ji Huan He*, *I. Finogenko*, *P.S. Krasil'nikov*; Photo right up: group of participants from Greece with Organizer; Photo left down: between participants in middle: *Tomoaki Kawaguchi* (President of Tensor Society), *V. Lasmikantham* (President of International Federaion of Nonlinear Analysists IFNA), Professor *Leela*, and Professor *Anagaya Vatsala* (Luisiana University); Photo righy down: between participants in middle: Giuseppe Rega (member of IUTAM Scientific Committee), Frantishek Peterka, Jirzi Waerminski, Ulriht Gabert, Liviu Barreteu and other)