A detailed biography of Vadim Kuznetsov has already been published in Sahi (2006). In this brief note, I shall concentrate on his scientific activity.

Vadim’s career as a mathematician can be set in three distinct periods.


While in the Graduate School at the Leningrad University, Vadim came under the influence of Professor Igor V. Komarov who instilled in him a lasting interest in the phenomenon of integrability in classical and quantum mechanics. Vadim’s first work (Komarov & Kuznetsov 1987) gave voice to his remarkable creativity in finding a new explicit formula for the angle variables in the Kowalevski top. Following this Vadim continued, in collaboration with Komarov, to study integrable tops, their generalizations and quantization (Komarov & Kuznetsov 1991a,b).

During this period, Vadim became an active member of L. D. Faddeev’s seminar at the Leningrad branch of the Steklov Mathematical Institute. These were exciting times; Faddeev’s group was enjoying an explosive period of creativity in developing a whole new framework for understanding quantum integrability based on a synthesis of the classical inverse scattering method and the quantum techniques embodied in the Bethe Ansatz, Yang–Baxter equation and quantum groups.

In his PhD (Candidate Sci.) thesis (Kuznetsov 1990), Vadim successfully applied the new $R$-matrix techniques to a generalized separation of variables (SoVs) in integrable systems. This view of ‘SoVs’, understood in a very broad sense, together with the study of integrable systems with a finite number of degrees of freedom became central to much of Vadim’s subsequent research. Samples of work exploiting these ideas are given in Kuznetsov (1992, 1993).

One contribution of 15 to a Theme Issue ‘30 years of finite-gap integration’.
The years 1993–1996 were spent with visiting positions in Denmark, Holland and Canada in which Vadim made a number of important contributions. Perhaps his most significant results obtained during this period were in Amsterdam in the group of Thomas Koornwinder, where he had the unique opportunity to enrich his arsenal with the modern approaches to the study of special functions and orthogonal polynomials. For example in the paper of Koornwinder & Kuznetsov (1994), Vadim applies his knowledge of quadratic algebras and $R$-matrices to obtain a fresh insight into the well-established subject of hypergeometric functions.

In 1996, Vadim, already a mature and internationally recognized mathematician, entered his most fruitful period when he settled down in the University of Leeds. He concentrated on developing the theory of generalized SoVs using a canonical transformation involving both coordinates and momenta. I considered myself fortunate to collaborate with Vadim on this subject over the last decade and to enjoy his contagious enthusiasm and uninhibited creativity.

Two key ideas formed the basis of a collaborative programme of generalizing the SoV method with the ambitious aim to treat (possibly) all integrable systems. The first was the idea of obtaining an SoV from a composition of Bäcklund transformation (or Baxter’s $Q$-operators in the quantum mechanical case) as proposed in Kuznetsov & Sklyanin (1998). The second idea was that of the hierarchical factorization of the separation operator, i.e. the $A$-chain as proposed in Kuznetsov et al. (2003). The programme has already established its viability in application to the Calogero–Moser and related systems; just before his death, Vadim and myself had discussed projects concerning other models including spin chains, Toda chains (Kuznetsov 1997) and tops.

Though the study of SoV was central to Vadim’s work, it was by no means the only one. Being a very sociable person, Vadim always enjoyed making new friends and was eager to learn from them. His numerous collaborations resulted in an impressive range of research interests, including algebraic–geometric methods (Kuznetsov & Vanhaecke 2002), tau functions (Adler et al. 2002) and solid-state physics (Yuzbashyan et al. 2005) to name but a few. He also liked to bring people together. The international workshops organized by him (Kuznetsov & Nijhoff 2001; Kuznetsov 2002) were highly praised by all the participants.

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References


