Scientific report about the visit of Prof. V.V. Sokolov to SISSA

Prof. Vladimir Sokolov have visited SISSA from 06.06.2005 to 13.06.2005.

The goals of his visit to the International School for Advanced Studies (SISSA -Trieste) were the following:

a) Classification theory of decompositions of current algebras into Taylor series and complementary subalgebras; applications to the classification theory of integrable ODEs and PDEs via Lax representation.

b) Classification theory of pencils of linear Poisson brackets on the dual of a semisimple Lie algebra and elliptic bihamiltonian structures

d) Applications to the algebro-geometrical integrability theory of generalized tops and other systems via the method of Separation of Variables.

The properties of compatible linear Poisson brackets for the XXX-Gaudin model and the elliptic XYZ-Gaudin model and relations between bihamiltonian structures and separation of variables for these models have been discussed with Prof. G. Falqui.

A computation of admissible shifts of argument for quadratic Poisson brackets related to Frobenius manifolds have been done together with Prof. B. Dubrovin. As the result, some new examples of Frobenius manifolds have been constructed.

Prof. Sokolov gave the talk "Compatible Lie brackets and integrable models" (June 08) within the seminar of the mathematical physics group of SISSA. In the seminar, among other results, the construction of new classes of solutions of the classical Yang-Baxter Equations has been discussed. This construction, based on the notion of compatible Lie brackets, leads to solutions $R(\mu, \nu)$ of cYBE that, contrary to the usual case, are not invariant under shifts $\mu \to \mu + c, \nu \to \nu + c$.

The beginning of a collaboration on the above-mentioned topics with Prof. G. Falqui have been established. The goal is to further clarify the relations between bihamiltonian theory and algebraic integrability of physically significant models.

The visit has been particularly useful for Prof. Sokolov in the clarifications of some parts of the paper "Compatible Elliptic Lie Brackets", which will soon be submitted for publication. ESF support will be acknowledged in this forthcoming paper.