

Project proposal and aim of the visit

As a Phd student at the International School for Advanced Studies - Trieste, I'm currently working, under the supervision of prof. B. Dubrovin, on my thesis project about Hamilton-Jacobi theory for integrable PDEs, Frobenius manifolds and Gromov-Witten invariants. The geometry of Integrable Hamiltonian PDEs possesses much of the richness of finite dimensional integrable systems, together with other features coming from classical analysis of partial differential equations. Nonetheless a satisfactory implementation of the infinite dimensional analogue of Hamilton-Jacobi theory, as an effective tool to actually find solutions to these PDEs, is missing. Moreover its importance seems to be related, as shown in recent works by Eliashberg, Givental, Hofer (see "Introduction to Symplectic Field Theory", GAFA 2000), to its application to the computation of some types of Gromov-Witten invariants. This last issue is of particular interest to me (and also explains my will to know more on the subject of Homological Mirror Symmetry and to attend to the lessons in Wien by M. Kontsevich), since it represents a further link between Gromov-Witten theory and Integrable Systems, besides the one emerging from Dubrovin and Zhang's study of dispersion expansion of integrable hierarchies and as a "quasiclassical" limit of the one related with their quantization (see e.g. Givental, "Symplectic Geometry of Frobenius Structures"). The aim of my visit to Wien conference on Homological Mirror Symmetry would then be to obtain a deeper understanding of the research topics about Mirror Symmetry and G-W invariants in view of applications of my research about Integrable Systems.