Algebraically Integrable Systems

short course by

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June 14-17 and June 28 to July 1

Schedule:

- Mondays 16-17h
- Tuesdays 15-16h
- Wednesdays 10-11h and 15-16h
- Thursdays 10-11h

Discussion sessions: Wednesdays and Thursdays 11-12h, Tuesdays and Wednesdays 17-18h. Professor Audin will give two seminar talks on June 17, 3-4 and 4:30-5:30 pm, at the "Topological Quantum Field Theory Club".

Room:

- First week: PA1
- Second week: PA2

(both in the Math department buiding, floor 01)

Sketch:

- The basics of the theory of integrable systems;
- Algebro-geometric concepts which have become useful in this theory, namely algebraic curves, (moduli) spaces of algebraic curves and jacobians;
- Description of the ingredients of a symplectic geometry (Poisson structures, Lagrangian foliations) on these algebro-geometric objects;
- How to solve actual (mechanical) integrable systems using this approach.

The whole course will rely on classical constructions and results of Adams-Harnad-Previato-Hurtubise, Beauville, Griffiths, Moser, Reyman-Semenov-Tyan-Shanski, and others.

References:

- Audin, M., "Spinning Tops", A Course on Integrable Systems, Cambridge Studies in Advanced Mathematics, 51, Cambridge University Press, Cambridge, 1996.
- Donagi, R., Markman, E., Spectral covers, algebraically completely integrable Hamiltonian systems, and moduli of bundles, in "Integrable systems and quantum groups" (Montecatini Terme, 1993), Lecture Notes in Math., 1620, pp. 1-119, Springer, Berlin, 1996.
- Dubrovin, B., Krichever I., Novikov S.P., Integrable Systems I, in "Dynamical systems IV; Symplectic Geometry and its Applications", Encyclopaedia of Mathematical Sciences, 4, ed. by V. I. Arnol'd and S. P. Novikov, Springer-Verlag, Berlin-New York, 1990.
- Reyman, A. G., Semenov-Tyan-Shanski, M., Group Theoretical methods in the Theory of Finite-Dimensional Integrable Systems, in "Dynamical systems VII; Integrable Systems, Nonholonomic Dynamical Systems", Encyclopaedia of Mathematical Sciences, 16, ed. by V. I. Arnol'd and S. P. Novikov, Springer-Verlag, Berlin-New York, 1994.