

Algebraic curves and integrable nonlinear differential equations

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Integrable nonlinear PDEs such as, for example, the Korteweg-de Vries equation, have a large number of interesting exact solutions. Those usually come in families and are constructed by beautiful algebraic and geometric methods. Particularly well known are the *soliton solutions*, but there also exist other, more sophisticated solutions which are closely related to algebraic curves. (An algebraic curve is a curve in the plane described by a polynomial equation $f(x, y) = 0$.) This project will introduce you into this area. Along the way, you will learn elements of the theory of Riemann surfaces and some basic algebraic geometry. There are no essential prerequisites for this project; however, some knowledge of complex analysis would be a plus. The project can serve as an introduction to a circle of problems for the future postgraduate study.

REFERENCES

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