

(V5B1). Advanced Topics in Analysis and PDEs.
(Summer Semester 2019).

The theory of solitons.

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The goal of the course is to describe the Inverse Scattering Transform (IST) and how can be used to solve the Cauchy problem for several Partial Differential Equations. In particular, applications of the ISM to the solution of the KdV equation, the cubic nonlinear Schrödinger equation and other similar equations will be discussed. Topics like Lax pairs, Bäcklund transformations and their application to the study of completely integrable PDEs will be discussed.

Prerequisites: Basic knowledge of the Theory of Partial Differential Equations and the Theory of Analytic Functions in \mathbb{C} .

References

- [1] P. G. Drazin and R. S. Johnson, Solitons: an introduction. Cambridge Texts in Applied Mathematics, 1989.
- [2] G. B. Whitham, Linear and nonlinear waves. New York, Wiley, 1974.