

Special ASC and TMP Lecture Course

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Studying Bethe Ansatz and Allied Integrable Models using Numerical Renormalization Groups

Week 1				Week 2			
1.	Mo.	15.6	12:15-14:00	4.	Mo.	22.	12:15-14:00
2.	Fr.	19.6	12:15-14:00	5.	Fr.	26.	12:15-14:00
3.	Fr.	19.6	16:15-18:00	6.	Fr.	26.	16:15-18:00

Room 348/349, Theresienstr. 37

The aim of these lectures is two-fold. One is to introduce the student to models that are exactly solvable with the Bethe ansatz. The second is to show how information coming from their exact solvability can be exploited through numerical renormalization groups to study strong (integrability-breaking) perturbations of these same models.

The main example I will employ in these lectures will be the one-dimensional Bose gas as represented by the Lieb-Liniger model, both with one and two components. This will allow me to both introduce the coordinate Bethe ansatz as well as the algebraic Bethe ansatz. Time permitting, I will also discuss the continuum reduction of the Lieb-Liniger model to a theory of a massless Bose field and how the same set of numerical techniques used to study perturbations of the Lieb-Liniger model can be used study perturbations of conformal field theories.