

Speaker: Andreas Bolleyer (Karlsruhe Institute of Technology)

Title: Strichartz estimates on waveguides

Abstract: The nonlinear Schroedinger equation has recieved a huge amount of attention over the past 30 years, where the most considered cases are that of the real euclidean space and compact manifolds. In both situations one of the frequently used method of solving the nonlinear Schroedinger equation is the construction of mild solutions via a contraction argument introduced by Kato. This argument relies on so-called Strichartz estimates, which are a-priori estimates for the corresponding homogeneous and inhomogeneous problem. The case of the nonlinear Schroedinger equation on a flat waveguide however, e.g. on an infinitely long cylinder, is not very developed and I want to address this issue in my talk. The first part of the talk will serve as an introduction to the contraction argument in the case of the real euclidean space. This is very well understood and there is extensive literature on the subject. Thus I will focus on the most crucial points and ideas behind the construction of mild solutions and the origin of Strichartz estimates. In the second part of the talk I will consider the homogeneous Schroedinger equation on a flat waveguide in order to generate Strichartz-type estimates. The proof of these estimates relies on the structure of flat waveguides and the available Strichartz estimates in the case of the real euclidean space. I will then discuss these estimates with respect to their applicability for the construction of mild solutions of the nonlinear Schroedinger equation.