

Mini-Workshop “Analysis of PDEs”  
March 27th - March 31st, 2023

**9:00 - 10:00 am, Friday, March 31st 2023**  
**Seminar room: SR 1.067, Math Building 20.30**

## The geometry of Gross-Pitaevskii in low regularity

Herbert Koch (Bonn University)

### Abstract

The Gross-Pitaevskii equation is essentially the one dimensional defocusing cubic nonlinear Schrödinger equation with a boundary condition  $|q| = 1$  at infinity. As a consequence the space of functions of finite energy is nonlinear. I will explain the construction of a family of metrics and of conserved quantities controlling  $|q|^2 - 1$  and  $q_x$  in  $H^{s-1}$  for  $s$  nonnegative. As a consequence we obtain global solvability and uniform in time bounds at low regularity. This is joint work with Xian Liao.