大连理工大学
DALIAN UNIVERSITY OF TECHNOLOGY

School of Mathematical Sciences
Dalian University of Technology
Linggong Road 2
116024 Dalian, P.R.China

DDES - DUT Differential Equations Seminar
Seminar Room 114
9-11 am, Thursday, Nov 6, 2025

Yang-Mills equations

Samuel Adrian Antz (DUT)

Abstract. Yang-Mills theory is fundamental for both mathematics and theoretical physics. It underlies electrodynamics with the first unitary group U(1) as gauge group or quantum chromodynamics with the third special unitary group SU(3) as gauge group. It has also lead to a deeper understanding of four-dimensional manifolds, for example the Fields Medal winning proof of Donaldson's theorem. All applications are based on the study of the Yang-Mills equations, which are partial differential equations of second order as well as linear for an abelian gauge group and non-linear for a non-abelian gauge group. Since the formulation of the Yang-Mills equations connects differential forms with Lie algebras, a differential and algebraic perspective are inseparable in Yang-Mills theory.

Some uniqueness and direct sampling methods for inverse scattering problems with multi-frequency data

Qingxiang Shi (史庆祥, DUT)

Abstract. In this talk, I will introduce some uniqueness of inverse source scattering and inverse obstacle scattering problems with multi-frequency data. I will also present some direct sampling methods for inverse source scattering problems. With sparse data, these numerical methods can reconstruct the support of source. The stability estimation based on dense data are also provided. Additionally, I will propose some direct sampling methods for the simultaneous reconstruction of both the obstacle shape and the impedance value in the context of inverse acoustic scattering problems, backscattering data are used in this problem.