

Seminar

Dr. Roman O. Popovych
Wolfgang Pauli Institute, Vienna, Austria

Tuesday, September 20, 2016
2:00p.m., A-1043

Contractions of Lie algebras

Abstract:

Limiting processes (contractions) of Lie algebras appear in different areas of physics and mathematics, where Lie algebras arise, e.g., in the study of representations, invariants and special functions. The algebraic counterpart of the notion of contractions of Lie algebras is given by degenerations of Lie algebras.

The main attention in the talk is paid to the practical computation of contractions of Lie algebras. We present a wide list of necessary conditions for the contraction existence. Particular ways for realizing contractions, which are relevant to physics and includes simple and generalized Inönü–Wigner contractions and Saletan (linear) contractions, are discussed and the limitation for using them is clarified. We also present the complete description of contractions of Lie algebras of dimension not greater than four, of five- and six-dimensional nilpotent algebras and of almost Abelian Lie algebras over both the complex and real field.