



A Non-Profit Association of a Learned Society

International Society of Nonlinear Mathematical Physics

isnmp.de

A Talk at the 2nd ISNMP Conference

Bad Ems, 28 June to 4 July 2026

Regular Session:

Speaker: Ivan Tsyfra (AGH University of Krakow, Poland)

Title: *On application of nonpoint symmetry reduction method to nonlinear evolutionary and wave type equations*

Abstract: We study the symmetry reduction of partial differential equations with two independent variables. We construct an ansatz for the dependent variable or its derivatives that reduces a scalar partial differential equation to a system of ordinary differential equations. One can obtain the ansatz for the dependent variable by solving an ordinary differential equation admitting operators of generalized symmetry. It is worth noting that, in the case of an evolutionary equation, the number of differential equations in the reduced system equals the number of unknown functions. At the same time, in the case of non-evolutionary equations, the number of ordinary differential equations in the reduced system may be less than the number of unknown functions. This enables us to obtain solutions that depend on arbitrary functions, as illustrated in the report by examples of nonlinear wave-type equations. We also show that this method can be applied to a system of two evolutionary equations related to the KdV equation.