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A Talk at the 2nd ISNMP Conference

Bad Ems, 28 June to 4 July 2026

Regular Session:

Speaker: Marianna Euler (ISNMP, Bad Ems, Germany & CIC AC, Cuernavaca, Mexico)

Collaborator: Norbert Euler

Title: *On fully-nonlinear and quasilinear 5th-order symmetry-integrable evolution equations invariant under the Möbius transformation*

Abstract: We identify nonlinear evolution equations of order five that are both symmetry-integrable and invariant under the Möbius (or projective) transformation. Those 5th-order evolution equations are of the form

$$u_t = u_x \Phi(S, S_x, S_{xx}), \tag{1}$$

where S is the Schwarzian derivative, which is the 3rd-order invariant of the projective transformation. We show that there exist only three fully-nonlinear equations of this type that are symmetry-integrable. The quasilinear 5th-order case is also discussed in some detail.