Boğaziçi Math Seminar

Cauchy Problems for Novikov-type Equations

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Abstract:

The partial differential equations in the following form has attracted attention in partial differential equations theory:

$$(1-D_x^2)u_t = F(u,u_x,u_{xx},\ldots). \tag{1}$$

The equations which have quadratic and cubic nonlinearities and proved to be integrable will appear in this talk. The most prominent examples are Camassa-Holm and Degasperis-Procesi equations. Novikov proved that there are more integrable equations in the class. Initial value problems corresponding to these equations either on the line or on the circle will be presented and in particular the periodic problem for

$$(1-D_x^2)u_t \quad = \quad D_x(2-D_x)(1+D_x)u^2 \tag{2}$$

will be discussed. The recent results obtained for the local well-posedness of (2) reveal that less regular solutions give rise to pseudospherical surfaces.

Date : Wednesday, May 14, 2025
Time: 13:30
Place: TB 130, Boğaziçi University