UTRGV

School of Mathematical and Statistical Sciences

Distinguished Colloquium Series

Two nonlocal problems: Equations in infinitely many derivatives and the Cauchy problem for the Kadomtsev–Petviashvili hierarchy

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Abstract

I will talk briefly on equations depending on infinitely many derivatives and then I will focus on the Cauchy problem of the Kadomtsev-Petviashvili (KP) hierarchy. My goal is to show that one can solve the Cauchy problem of the KP hierarchy by using some delicate results on infinite dimensional Lie groups of pseudo-differential operators. This result can be studied in several contexts:

- Algebraic: formal pseudo-differential operators are defined on algebras equipped with derivations and valuations, and the group is a formal object.
- Geometric: formal pseudo-differential operators are defined on algebras equipped with a Frolicher (or Frechet) structure, and the group is a Frolicher (or Frechet) Lie group.
- Analytic: pseudo-differential operators are not formal. The KP hierarchy is understood as a non-linear equation on a Frolicher group built with the help of a class of true pseudo-differential operators.

In this talk I will focus mainly on the algebraic and geometric contexts, and I will mention the analytic one at the end.

Date: Friday, April 29, 2022

Time: 4:00-5:00 pm CT

Zoom: https://utrgv.zoom.us/j/83377626313

For further information or for special accommodations, please contact Dr. Alexey Glazyrin via email alexey.glazyrin@utrgv.edu and Dr. Zhijun Qiao via email zhijun.qiao@utrgv.edu