



Научный Семинар «Математические модели турбулентности и смежные вопросы»

Research Seminar “Mathematical description of turbulence and related topics”

报告人 / Докладчик / Speaker: Владимир Гребенёв / Vladimir Grebenev

题目 / Название / Title:

Оптическая волновая турбулентность: конформные симметрии статистики поля завихренности / Optical wave turbulence: the conformal symmetry transformations of statistics of the quantum fluids of light

时间 / Время / Time：2026/11/16 18:00-19:30

地点 / Место / Venue: 主楼 336

摘要 / Аннотация / Abstract: We use the quantum fluid analogy (Nazarenko et. al. [Phys. Rev. E, 92(2015)]) for coherent structures (vortices or solitons) interacting among themselves and with the random wave component. This is performed for 2D defocusing media based on quantum fluid approximation of the two-dimensional nonlinear Schrödinger equation (NSLE) in the statistical frame. With this, the Lundgren-Monin-Novikov (LMN) infinite chain of equation for the n-point density function f n for the vorticity field is used. The conformal group of symmetry transformations calculated (Grebenev et. al. [Theor. Math. Phys. 217(2) (2023)]) is applied for the implementation of several elements of a gauge theory into the conformal transformation optics. Finally, we demonstrate how to use the variational generalized Brenier principle (Brenier [J. Am. Math. Soc. 1989]) together with the conformal invariance of statistics to close the infinite
chain of Landgren–Monin–Novikov equations.

Grebenev Vladimir 教授简介： Grebenev Vladimir: graduated from Novosibirsk State University in 1979(MS), in 1984 got PhD in Physics and Mathematics, 2024 got Dr.-Habilitation in Physics and Mathematics. Permanent position of Leading Researcher of FRC IVT at Novosibirsk, Visiting professor at Darmshtadt TU, present time he is Professor SMBU in Shenzhen. researcher in Lavrentyev Institute of Hydrodynamics SB RAS, since 2024 postdoctoral fellow in Shenzhen University.