

## **Matrix Hydrodynamics and Mixing**

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In 1991, Vladimir Zeitlin realized that quantization naturally leads to spatial discretizations of the two-dimensional incompressible Euler equations. Contrary to other discretizations, this approach – matrix hydrodynamics – preserves the rich geometry in phase space (Lie-Poisson structure, co-adjoint orbits, Casimirs, spatial symmetries, etcetera). Matrix hydrodynamics is therefore suitable for long-time computer simulations aiming to study statistical properties of generic solutions. In this talk, I shall give an overview of recent developments in matrix hydrodynamics while emphasizing its relevance to mixing.