Stochastic fluid mechanics, attractors and nonstandard analysis

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Abstract: Over the past 12 years a variety of new results in theoretical stochastic fluid mechanics have been obtained (in collaboration with Marek Capinski and Jerry Keisler) using nonstandard analysis - particularly Loeb measure techniques. The most recent work is on attractors and involves the Fajardo/Keisler neometric space machinery.

This talk will survey these results with emphasis on aspects where the use of NSA/Loeb measures (or some equivalent such as saturated adapted probability spaces) seems to be essential. For example, the strongest formulation of a new result about existence of attractors for 3-D stochastic Navier-Stokes equations involves the notion of neo-compactness.

The talk will not assume any prior knowledge of fluid mechanics and only the rudiments of NSA.