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Long time dynamics of random data NLS and invariant measures.

In this talk we show how certain well posedness results that are not available using only deterministic techniques (eg. Fourier and harmonic analysis) can be obtained when introducing randomization in the set of initial data and using powerful but still classical tools from probability.

These ideas go back to seminal work by J. Bourgain on the almost sure global well posedness and invariance of Gibbs measures for NLS and other dispersive PDE.

After explaining some of these ideas , we describe in more detail some further ideas in recent probabilistic well posedness results for NLS (joint with G. Staffilani) and new work on the existence and uniqueness of non-equilibrium in variant measures associated to resonant NLS (joint with Z. Hani, J. Mattingly, L. Rey-Bellet and G. Staffilani).