RUELLE TRANSFER OPERATORS WITH EXPLICIT SPECTRA

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In a seminal paper Ruelle showed that the long time asymptotic behaviour of analytic hyperbolic systems can be understood in terms of the eigenvalues, also known as Pollicott-Ruelle resonances, of the so-called Ruelle transfer operator, a compact operator acting on a suitable Banach space of holomorphic functions.

Until recently, there were no examples of Ruelle transfer operators arising from analytic hyperbolic circle or toral maps, with non-trivial spectra, that is, spectra different from $\{0, 1\}$.

In this talk I will survey recent work with Wolfram Just and Julia Slipantschuk on how to construct analytic expanding circle maps or analytic Anosov diffeomorphisms on the torus with non-trivial Pollicott-Ruelle resonances. I will also discuss applications of these results.