1052-46-262 **Todd Kemp*** (tkemp@math.mit.edu), 2-175 MIT, Cambridge, MA 02139. *Free heat kernel analysis and liberation.* Preliminary report.

The intersection of heat kernel analysis and random matrix theory is a "hot" new field. Consider the Euclidean heat kernel on R^{n^2}, written as the entries of an $n \times n$ Hermitian matrix. A lot of work has gone into understanding the "heat flow" of the eigenvalues of this matrix. Interestingly, as $n \to \infty$, this kernel has finite propagation speed.

In this lecture, I will discuss recent work in the unitary case: studying the flow of eigenvalues of a random matrix sampled from the heat kernel measure on the unitary group $U(n)$. Seen from a certain angle as $n \to \infty$, one can write down a (semi-linear) PDE that describes a kind of heat kernel that, once again, has finite propagation speed.

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