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**Bruce K. Driver, Brian C. Hall\*** (bhall@nd.edu) and **Todd Kemp**. *The heat equation on unitary groups in the large- $N$  limit.*

I will describe results about the heat equation on the unitary group  $U(N)$ , in the limit as  $N$  tends to infinity. A key result is that in this limit, the Laplacian, acting on certain natural types of functions, behaves like a first-order differential operator. The heat kernel, meanwhile, is concentrating onto a single conjugacy class in the limit. I will then discuss applications of these results to the large- $N$  limit of the generalized Segal-Bargmann transform for  $U(N)$ . (Received July 17, 2014)