1000-46-5 **Palle E. T. Jorgensen*** (`jorgen@math.uiowa.edu`), P Jorgensen, Math, MLH, University of Iowa, Iowa City, IA 52242. *Scaling and asymptotics of heat operators: A spectral duality.*

We present some joint results with C. Batty, O. Bratteli, and D.W. Robinson. We consider heat equations with L^∞ coefficients, and we establish that the corresponding heat diffusion, with periodic conductivity, is governed by two scales: small time and large time. The first is described by a geodesic distance, and the second by a distance associated with a homogenized system. We use this to establish asymptotic estimates which are based on a certain scaling of the problem, and a time-frequency spectral duality. (Received February 10, 2004)