1105-35-129 **Ahmad El Soufi**, UMR CNRS 7350, Universite F. Rabelais, Parc de Grandmont, 37200 Tours, France, and **Evans M Harrell*** (harrell@math.gatech.edu), School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332-0160. *Placing an obstacle to optimize the heat trace.*

We consider the Dirichlet problem for the Laplacian on Euclidean domains, from which a spherical obstacle is removed, and attempt to place the obstacle so as to maximize or minimize Z(t), the trace of the heat kernel.

For suitable domains we characterize the optimal placement of the obstacle inside a domain. We find that for each t the maximizing position of the center of the obstacle belongs to the "heart" of the domain, while the minimizing situation occurs either in the interior of the heart at a point where the obstacle is in contact with the outer boundary.

Similar statements hold for the spectral zeta function and the regularized determinant. (Received September 14, 2014)