1123-35-39 **Nestor Guillen*** (nguillen@math.umass.edu) and **Russell Schwab** (rschwab@math.msu.edu).

Min-max formulas for elliptic operators.

We investigate nonlinear, Lipschitz operators that satisfy the global comparison property – i.e. those that preserve the global ordering of input functions at any points where their graphs may touch, often called "elliptic" operators. In particular, we show that all such operators can be written as a min-max over linear operators that are a combination of drift-diffusion and integro-differential parts. The result applies to operators acting on complete Riemannian manifolds; its proof is based on a finite dimensional approximation –involving large finite graphs that converge to the manifold– and it uses tools from non smooth analysis, like the Clarke subdifferential, and also the Whitney extension.

These results have a number of implications. On one hand, they open up the study Dirichlet-to-Neumann mappings for fully nonlinear equations as integro-differential operators on the boundary. On the other hand, they suggest that certain free boundary problems can be studied as nonlinear degenerate parabolic integro-differential equations. Based on joint work with Russell Schwab. (Received August 07, 2016)