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Erwin Lutwak and **Deane Yang*** (dyang@poly.edu), Department of Mathematics, Polytechnic University, Six Metrotech Center, Brooklyn, NY 11201, and **Gaoyong Zhang**. *Optimal Sobolev Norms and the Minkowski Problem*.

The existence and uniqueness of an optimal L^p Sobolev norm for a function on \mathbf{R}^n is shown to be essentially equivalent to the existence and uniqueness of the solution to the L^p Minkowski problem for even measures. The former is established using the latter. This leads to new affine analytic inequalities, as well as a new proof of the affine L^p Sobolev inequality previously established by the authors. (Received February 24, 2007)