

1036-46-82

Andrea Cianchi (cianchi@unifi.it), Dipartimento di Matematica, Università di Firenze, Piazza Ghiberti 27, 50122 Firenze, Italy, **Erwin Lutwak** (elutwak@poly.edu), Department of Mathematics, Polytechnic University, 6 Metrotech Center, Brooklyn, NY 11201, **Deane Yang** (dyang@poly.edu), Department of Mathematics, Polytechnic University, 6 Metrotech Center, Brooklyn, NY 11201, and **Gaoyong Zhang*** (gzhang@poly.edu), Department of Mathematics, Polytechnic University, 6 Metrotech Center, Brooklyn, NY 11201. *Affine Moser-Trudinger and Morrey-Sobolev inequalities.*

An affine Moser-Trudinger inequality, which is stronger than the Euclidean Moser-Trudinger inequality, is established. In this new affine analytic inequality an affine energy of the gradient replaces the standard L^n energy of gradient. The geometric inequality at the core of the affine Moser-Trudinger inequality is a recently established affine isoperimetric inequality for convex bodies. Critical use is made of the solution to a normalized version of the L^n Minkowski Problem. An affine Morrey-Sobolev inequality is also established, where the standard L^p energy, with $p > n$, is replaced by the affine energy. (Received January 14, 2008)