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**Lenny Fukshansky\*** ([lenny@cmc.edu](mailto:lenny@cmc.edu)), Department of Mathematics, Claremont McKenna College, 850 Columbia Avenue, Claremont, CA 91711. *Points of small height missing a union of varieties.*

Let  $K$  be a number field,  $\overline{\mathbb{Q}}$ , or the field of rational functions on a smooth projective curve of genus 0 or 1 over a perfect field, and let  $V$  be a subspace of  $K^N$ ,  $N > 1$ . Let  $Z_K$  be a union of varieties defined over  $K$  such that  $V$  is not contained in  $Z_K$ . We prove the existence of a point of small height in  $V$  outside of  $Z_K$ , providing an explicit upper bound on the height of such a point in terms of the height of  $V$  and the degree of a hypersurface containing  $Z_K$ , where dependence on both is optimal. Our method is based on some counting lattice points in slices of a cube, a version of combinatorial nullstellensatz, and a version of Siegel's lemma with inhomogeneous heights. As a corollary of the method, we derive an explicit lower bound for the number of algebraic integers of bounded height in a fixed number field. (Received February 24, 2009)