Coloquio IMAFI
Instituto de Matemática y Física
Universidad de Talca
Camino Lircay S/N, Campus Norte, Talca-Chile

On Waring's problem for integral quadratic forms

María Inés Icaza*
Instituto de Matemática y Física, Universidad de Talca

Abstract

For each positive integer n, let $g_{\mathbb{Z}}(n)$ be the smallest integer such that if an integral quadratic form in n variables can be written as a sum of squares of integral linear forms, then it must be written as a sum of $g_{\mathbb{Z}}(n)$ squares of integral linear forms. We show that as n goes to infinity, the growth of $g_{\mathbb{Z}}(n)$ is at most an exponent of $\sqrt{n}$. Our result improves the best known upper bound on $g_{\mathbb{Z}}(n)$ which is in the order of an exponential of n. We also define an analogous number $g^*_{\mathcal{O}}(n)$ for writing hermitian forms over the ring of integers $\mathcal{O}$ of an imaginary quadratic field as sums of norms of integral linear forms, and when the imaginary quadratic field is Euclidean, we also show that the growth of $g^*_{\mathcal{O}}(n)$ is at most of an exponential of $\sqrt{n}$.

*e-mail: icazap@inst-mat.utalca.cl