1068-42-25 **J. Marshall Ash*** (mash@math.depaul.edu), DePaul University, Mathematics Department, Chicsgo, IL 60614. *A survey of multidimensional generalizations of Cantor's uniqueness theorem for trigonometric series.* Preliminary report.

Georg Cantor's pointwise uniqueness theorem for one dimensional trigonometric series says that if, for each x in $[0, 2\pi)$, $\sum c_n e^{inx} = 0$, then all $c_n = 0$. The meaning of the summation is $\lim_{N\to\infty}(c_0+\sum_{n=1}^{N} t_n(x))$, where $t_n(x) = c_n e^{inx} + c_{-n}e^{-inx}$. In dimension d, $d \geq 2$, we begin by assuming that for each x in $[0, 2\pi)^d$, $\sum c_n e^{inx} = 0$ where $n = (n_1, \ldots, n_d)$ and $nx = n_1x_1 + \cdots + n_dx_d$. It is quite natural to group together all terms whose indices differ only by signs, just as was done by Cantor in the one dimensional case. This removed all ambiguity in the one dimensional case. But here there are still several different natural interpretations of the infinite multiple sum, and, correspondingly, several different potential generalizations of Cantor's Theorem. For example, in two dimensions, two natural methods of convergence are circular convergence and square convergence. In the former case, the generalization is true, and this has been known since 1971. In the latter case, this is still an open question. In this historical survey, I will discuss these two cases as well as the cases of unrestricted rectangular convergence, iterated convergence, and restricted rectangular convergence. (Received December 15, 2010)