1146-52-368 **Dan Ismailescu*** (dan.p.ismailescu@hofstra.edu), Hofstra University, NY, and **Piotr Laskawiec** (plaskawiec1@pride.hofstra.edu), Hofstra University, NY. *Dense packings with nonparallel cylinders.*

A *cylinder packing* is a family of congruent infinite circular cylinders with mutually disjoint interiors in 3-dimensional Euclidean space. The *local density* of a cylinder packing is the ratio between the volume occupied by the cylinders within a given sphere and the volume of the entire sphere. The *global density* of the cylinder packing is obtained by letting the radius of the sphere approach infinity.

A. Bezdek and W. Kuperberg proved that the greatest global density is obtained when all cylinders are parallel to each other and each cylinder is surrounded by exactly six others. In this case, the global density of the cylinder packing equals $\pi/\sqrt{12} = 0.90689\ldots$. The question is how large a density can a cylinder packing have if one imposes the restriction that *no two cylinders are parallel*.

In this paper we prove two results. First, we show that there exist cylinder packings with no two cylinders parallel to each other, whose local density is arbitrarily close to the local density of a packing with parallel cylinders. Second, we construct a cylinder packing with no two cylinders parallel to each other, and whose global density is $1/2$. This improves previous results of K. Kuperberg, C. Graf and P. Paukowitsch. (Received January 27, 2019)