In this talk we will discuss properties of triangulations of $n$-dimensional Euclidean space with the vertex set $\mathbb{Z}^n$ that are preserved by all translations by the vectors of $\mathbb{Z}^n$. This family of triangulations can be seen as a generalization of Delone triangulations of $\mathbb{Z}^n$ with respect to generic quadratic forms.

We will describe a local approach that allows to obtain all such periodic triangulations for $n \leq 4$ and explain why this approach does not work for higher dimensions. We will also provide some computational results for five-dimensional triangulations.

This talk is based on a joint work with Mathieu Dutour Sikirić. (Received January 21, 2019)