1176-52-75 **Barry Monson*** (bmonson@unb.ca), 4 Shamrock Terrace, Fredericton, NB E3B2S4, Canada.
Realizing Cubical Toroids of Higher Rank.

We can think of the cubical toroid $\mathcal{T}_b$ as a $b \times \cdots \times b$ block of n-cubes, with opposite outer facets identified. The case $n = 2$, in which a checkerboard is wrapped onto a torus, is familiar. If we take a finer look at the combinatorics of the faces these b^n cubes, then $\mathcal{T}_b$ becomes an *abstract regular polytope* of rank $n + 1$. In realizing $\mathcal{T}_b$, we attempt to give $\mathcal{T}_b$ a more concrete polytopal structure, with straight edges, for instance, in some Euclidean space.

Here we describe the realization space of $\mathcal{T}_b$ for $n \geq 3$ (thus generalizing work with Asia Weiss in 1999 on the case $n = 2$). We find that the pure realizations of $\mathcal{T}_b$ are parametrized in a wonderful way by the orbits of the vertices in $\mathcal{T}_b$ under the action of its point group. (Received January 13, 2022)