Given an integer n, I constructed a simplicial complex $\tau_n(\mathbb{Z})$, called the nth Torus Complex over $\mathbb{Z}$, on which $SL(n, \mathbb{Z})$ acts simplicially. The construction is analogous to that of the curve complex of a 2 dimensional torus, a complex on which $SL(2, \mathbb{Z})$ acts. In fact, $\tau_2(\mathbb{Z})$ is the Curve Complex of the Torus. I then found an equivalent algebraic definition of this complex that allowed me to extend the construction to rings other than $\mathbb{Z}$. The following table show some of the properties of $\tau_n(R)$ that are consequences of properties of the ring R.

n	Properties of R	Properties of $\tau_n(R)$
2	$R = \mathbb{Z}$	Farey Graph
2	R generated additively by units	link of every vertex is connected
2	$R = \mathbb{Z}[\sqrt{-n}], n = 1, 3$	$\pi_1 = \{1\}$, not contractible for $n = -1$
3	$R = \mathbb{Z}$	connected, $\pi_1 = \{1\}$, diameter 2
n	Euclidean	connected
$n \geq 3$	$R = \mathbb{Z}$	$\pi_{n-2}(\tau_n(\mathbb{Z})) \cong \{1\}$

The **Unoriented Torus Complex**, denoted τ_n, is the simplicial complex whose vertices correspond to isotopy classes of essential unoriented co-dimension 1 tori. A $k-1$-simplex of τ_n $(k-1 \leq n)$ is spanned by k vertices if and only if the codimension one tori to which these vertices correspond intersect transversally in exactly one codimension k torus after isotopy. This topological definition can be extended to the following algebraic definition.

The **nth Torus Complex over** R (R a commutative ring with one), denoted $\tau_n(R)$, is the simplicial complex whose vertices correspond to elements of an R-basis for R^n modulo sign. A $k - 1$-simplex of $\tau_n(R)$ $(k - 1 \leq n)$ is spanned by k vertices if and only if those vertices form a subset of an R-basis of R^n.

Theorem 1. *$\tau_3(\mathbb{Z})$ is simply connected and $SL(3, \mathbb{Z})$ acts on $\tau_3(\mathbb{Z})$ cocompactly (but not properly). Taking the fundamental group of the complex of groups obtained by labeling cells in the quotient by their stabilizer groups yields the following presentation for $SL(3, \mathbb{Z})$.*

$$\langle a, b, c | a^4, b^6, c^2, a^2b^3, (a^2cabc)^2, (cabcb^2)^3, (ac)^3,$$
$$ab(cabc)(ab)^{-1}(cabc)^{-1}, ba(cbac)(ba)^{-1}(cbac)^{-1} \rangle$$