Let $A = \{\mathbf{a}_i \mid 1 \leq i \leq m\}$ be a subset of $\mathbb{Z}^n$ such that the semigroup generated by A, $\mathbb{N}A = \{\sum_{i=1}^{m} n_i \mathbf{a}_i \mid \mathbf{a}_i \in A,\ n_i \in \mathbb{N}\}$, is an affine semigroup. An *affine semigroup* S is a finitely generated subsemigroup of $\mathbb{Z}^n$ with no invertible elements, that means $S \cap (-S) = \{\mathbf{0}\}$. To the set A we associate the *toric ideal* I_A which is the kernel of the K-algebra homomorphism

$$\phi : K[x_1, \dots, x_m] \to K[t_1, \dots, t_n, t_1^{-1}, \dots, t_n^{-1}]$$

given by

$$\phi(x_i) = \mathbf{t}^{\mathbf{a}_i} = t_1^{a_{i,1}} \dots t_n^{a_{i,n}} \text{ for all } i = 1, \dots, m\,,$$

where $\mathbf{a}_i = (a_{i,1}, \dots, a_{i,n})$. The set of zeroes of I_A, $V(I_A) \subset K^m$ is an *affine toric variety*. To the toric variety $V(I_A)$ we associate a strongly convex rational polyhedral cone

$$\sigma = pos_{\mathbb{Q}}(A) := \{l_1\mathbf{a}_1 + \dots + l_m\mathbf{a}_m \mid l_i \in \mathbb{Q}^+\} := \mathbb{Q}^+ A,$$

where $\mathbb{Q}^+$ denotes the set of nonnegative rationals.

We will discuss the interaction between algebraic properties of the toric ideal I_A and geometric properties of the cone $\sigma = pos_{\mathbb{Q}}(A)$.