1161-13-297 **Ranthony A.C. Edmonds***, Edmonds.110@osu.edu, and **Austin Antoniou**, **Bethany Kubik**, **Christopher O'Neill** and **Shannon Talbott**. *On Atomic Density of Numerical Semigroup Algebras.*

A numerical semigroup S is a cofinite, additively-closed subset of the nonnegative integers that contains 0. In this talk, we discuss our initiation of the study of atomic density, an asymptotic measure of the proportion of irreducible elements in a given ring or semigroup, for semigroup algebras. For a fixed field $\mathbb{F}$ and a numerical semigroup S, the numerical semigroup algebra $\mathbb{F}[S]$ is the subring of $\mathbb{F}[x]$ consisting only of terms of the form x^a for $a \in S$.

It is known that the atomic density of the polynomial ring $\mathbb{F}_q[x]$ is zero for any finite field $\mathbb{F}_q$. We prove that the numerical semigroup algebra $\mathbb{F}_q[S]$ also has atomic density zero for any numerical semigroup S. We also examine the particular algebra $\mathbb{F}_2[x^2, x^3]$ in more detail, providing a bound on the rate of convergence of the atomic density as well as a counting formula for irreducible polynomials using Möbius inversion, comparable to the formula for irreducible polynomials over a finite field $\mathbb{F}_q$. (Received August 18, 2020)