1096-13-2532 **Paul Baginski*** (pbaginski@fairfield.edu), Department of Mathematics and Computer Scienc, 1073 North Benson Rd., Fairfield, CT 06824, and **George T Schaeffer**. *Length multiset-complete Krull monoids.*

Let H be a Krull monoid or Krull domain, let G be its divisor class group, and let $G_0 \subset G$ be the classes containing prime divisors. It is well known that each nonunit $x \in H$ has only finitely many factorizations into irreducibles. If $x = a_1 \cdots a_n$ is a factorization $\mathbf{z}$ of x into irreducibles, the length of this factorization is $n = |\mathbf{z}|$. We elaborate upon the well-studied set $\mathcal{L}(x)$ of factorization lengths of x to account for the number of factorizations of a given length. If $Z(x)$ is the set of factorizations of x (a subset of the free monoid over the irreducibles of H), then the length multiset of x, denote $\mathcal{LM}(x)$, is the multiset $\{\{\ |\mathbf{z}|\ :\ \mathbf{z} \in Z(x)\ \}\}$.

Kainrath has shown that if the Krull monoid H has infinite class group G and $G_0 = G$, then for any finite multiset S on $\mathbb{N}\backslash\{1\}$, there is an $x \in H$ with $\mathcal{LM}(x) = S$. Kainrath's proof was nonconstructive. In this talk we will give the background on Kainrath's result and illustrate a constructive proof for $G = \mathbb{Z}$. We will also discuss recent work to extending Kainrath's result to Krull monoids with $G = \mathbb{Z}$ but G_0 a proper subset of $\mathbb{Z}$. (Received September 17, 2013)