1167-14-269 **Sam Evens** and **Yu Li*** (liyu@math.uchicago.edu). *Wonderful Compactification of a Cartan Subalgebra of a Semisimple Lie Algebra.*

Let $H$ be a Cartan subgroup of a semisimple algebraic group $G$ over the complex numbers. The wonderful compactification $\bar{H}$ of $H$ was introduced and studied by De Concini and Procesi. For the Lie algebra $\mathfrak{h}$ of $H$, we define an analogous compactification $\bar{\mathfrak{h}}$ of $\mathfrak{h}$, to be referred to as the wonderful compactification of $\mathfrak{h}$. We establish a bijection between the set of irreducible components of the boundary $\bar{\mathfrak{h}} - \mathfrak{h}$ of $\mathfrak{h}$ and the set of maximal closed root subsystems of the root system for $(G, H)$ of rank $r-1$, where $r$ is the dimension of $\mathfrak{h}$. An algorithm based on Borel-de Siebenthal theory that constructs all such root subsystems is given. We prove that each irreducible component of $\bar{\mathfrak{h}} - \mathfrak{h}$ is isomorphic to the wonderful compactification of a Lie subalgebra of $\mathfrak{h}$ and is of dimension $r-1$. In particular, the boundary $\bar{\mathfrak{h}} - \mathfrak{h}$ is equidimensional. We describe a large subset of the regular locus of $\bar{\mathfrak{h}}$. As a consequence, we prove that $\bar{\mathfrak{h}}$ is a normal variety. (Received March 08, 2021)