1116-13-1962 **Evan M. O'Dorney*** (emo916math@gmail.com). *Rings of small rank over a Dedekind domain and their ideals.*

In 2001, M. Bhargava stunned the mathematical world by extending Gauss's 200-year-old group law on integral binary quadratic forms, now familiar as the ideal class group of a quadratic ring, to yield group laws on a vast assortment of analogous objects. His method yields parametrizations of rings of degree up to 5 over the integers, as well as aspects of their ideal structure, and can be employed to yield statistical information about such rings and the associated number fields.

I will speak about my Harvard senior thesis, which extends a selection of Bhargava's most striking parametrizations to cases where the base ring is not $\mathbb{Z}$ but an arbitrary Dedekind domain R. We find that, once the ideal classes of R are properly included, we readily get bijections parametrizing quadratic, cubic, and quartic rings, as well as an analogue of the $2 \times 2 \times 2$ cube law reinterpreting Gauss composition for which Bhargava is famous. We expect that these results will shed light on the analytic distribution of extensions of degree up to 5 of a fixed number field and their ideal structure. (Received September 21, 2015)