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**Anya Michaelsen\***, 39 Chapin Hall Dr, 1841 Paresky, Williamstown, MA 01267. *Noetherian Rings with Unusual Prime Ideal Structures*. Preliminary report.

For a ring  $R$ , the set of prime ideals of  $R$ , called the spectrum of  $R$ , is a partially ordered set with respect to inclusion. Given a partially ordered set  $X$ , M. Hochster showed exactly when  $X$  can be realized as the spectrum of a commutative ring. It is unknown, however, when a partially ordered set can be realized as the spectrum of a commutative *Noetherian* ring. In 2016, C. Colbert showed that there exists an uncountable Noetherian commutative ring with Krull dimension at least 2 and a countable spectrum. We extend this result in two ways. First, we consider a spectrum with a countable and uncountable branch and discuss progress toward constructing a Noetherian ring with this spectrum. Second, we construct a 2-dimensional uncountable excellent ring with a countable spectrum. We will outline both constructions as well as future work to extend these results. (Received September 07, 2018)