1125-13-1174        **Sarah M. Fleming**, **Lena Ji**, **S. Loepp**, **Peter M. McDonald**, **Nina Pande\***
(`ngp3@williams.edu`) and **David Schwein**. *Strange Formal Fibers: An Excellent Counterexample.*

The relationship between a local ring $R$ and its completion $\widehat{R}$ is often studied through the natural map from the prime ideals of $\widehat{R}$ to the prime ideals of $R$ given by $\mathfrak{q} \mapsto \mathfrak{q} \cap R$, where $\mathfrak{q}$ is a prime ideal of $\widehat{R}$. If $\mathfrak{p}$ is a prime ideal of $R$, then the inverse image of $\mathfrak{p}$ under this map is called the formal fiber of $R$ at $\mathfrak{p}$. In general, this map is not well understood.

We discuss several properties of formal fibers and provide a counterexample to a question about formal fibers posed by Heinzer, Rotthaus, and Sally. Our counterexample is an excellent regular local ring whose formal fibers have an unexpected structure. We discuss the general technique for constructing a ring while controlling its formal fibers and some of the challenges associated with our problem. This research was carried out by five undergraduates and advised by Susan Loepp at the 2015 SMALL REU at Williams College. (Received September 15, 2016)

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