1113-51-136 **Jordan Watts*** (`jordan.watts@colorado.edu`), Department of Mathematics, Campus Box 395, Boulder, CO 80309. *The differential structure of an orbifold.*

There are many ways of viewing an (effective) orbifold besides the classical way: as a Lie groupoid, a stack, a diffeological space, a (Sikorski) differential space, a topological space... Not all of these are equivalent. In fact, in the categorical sense, all of the above categories are generally completely different. However, when restricting our attention to "quotients" of manifolds by proper Lie group actions, there is a chain of functors between the above categories, each of which forgets information along the way. If we ignore "maps between orbifolds" and focus only on a fixed orbifold, one may ask: how far along this chain of functors can one go before losing so much information that our orbifold cannot be recovered? (Going all the way to topological spaces, for example, would be too far.)

In this talk I will answer this question with "differential spaces". I will give a minimal set of invariants required to "remember" the orbifold, and show that these all live in the category of differential spaces. Going back to our chain of categories above, what I will be showing can be restated as follows: there is a functor from orbifolds (as effective proper étale Lie groupoids, say) to differential spaces that is essentially injective. (Received August 17, 2015)