1106-55-1780 **Gabriel Valenzuela*** (`gvalenzuela@wesleyan.edu`), Mathematics and Computer Science Department, Exley Science Center, 265 Church Street, Middletown, CT 06459. *How to Do Homological Algebra with Complete Modules.*

Let R be a finite-dimensional regular local ring with maximal ideal $\mathfrak{m}$. The category of $\mathfrak{m}$-complete R-modules is not abelian, but it can be enlarged to an abelian category of so-called L-complete modules. This category is an abelian subcategory of the full category of R-modules, but it is not usually a Grothendieck category. It is well known that a Grothendieck category always has a derived category, however, this is much more delicate for arbitrary abelian categories.

In this talk, we will show that the derived category of the L-complete modules exists, and that it is in fact equivalent to a certain Bousfield localization of the full derived category of R. L-complete modules should be dual to $\mathfrak{m}$-torsion modules, which do form a Grothendieck category. We will make this precise by showing that although these two abelian categories are clearly not equivalent, they are derived equivalent. (Received September 15, 2014)