1132-55-234 **Brenda Johnson*** (johnsonb@union.edu), Department of Mathematics, Union College, Schenectady, NY 12308. *Directional derivatives and chain rules in abelian functor calculus.*

The abelian functor calculus associates to a functor of abelian categories a sequence of functors and natural transformations that is analagous to the Taylor series of a real-valued function. Within this framework, one can also define the analog of a directional derivative for a functor. We show that this directional derivative gives a particular category of functors of abelian categories the structure of a cartesian differential category, as defined by Blute, Cockett, and Seely. We use the cartesian differential category structure to derive chain rules for higher order derivatives in abelian functor calculus. This is joint work with Kristine Bauer, Christina Osborne, Emily Riehl, and Amelia Tebbe. (Received July 23, 2017)