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Jim Agler* (jagler@ucsd.edu), **John E. McCarthy** and **Nicholas Young**. *nc-Manifolds and their Application to the Analysis of Free Holomorphic Functions*. Preliminary report.

The richly developed theory of complex manifolds plays important roles in our understanding of holomorphic functions in several complex variables. It is natural to consider manifolds that will play similar roles in the theory of holomorphic functions in several non-commuting variables. We introduce the class of *nc-manifolds*, the mathematical objects that at each point possess a neighborhood that has the structure of an nc-domain in the d-dimensional nc-universe \mathbb{M}^d . We then describe applications of nc-manifolds to the free square root function, free homogenous functions, and free symmetric functions. (Received September 24, 2017)