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Stringy operations in equivariant K-theory and cohomology

We describe algebraic structures in the K-theory and the cohomology of complex orbifolds in the framework of equivariant K-theory and cohomology which generalize familiar operations from topology. These include Chen-Ruan products on orbifold cohomology whose K-theoretic analog, under some conditions, admit power operations and compatible characteristic classes. We will explain how this structure can be used to endow such a K-theory with a positive structure which plays a role analogous to classes of vector bundles in topology. We describe some applications and some open problems.