Equivariant genera of complex algebraic varieties

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Equivariant Hirzebruch genera of a quasi-projective variety X acted upon by a finite group G of algebraic automorphisms measure the difference between the (non-equivariant) Hodge-type invariants of X and, resp., those of the orbit space X/G. While for a projective algebraic manifold X, these can by computed by the Atiyah-Singer holomorphic Lefschetz theorem, we describe formulae that compute such equivariant genera in the case when X is neither smooth nor compact, but it fibers equivariantly (in the complex topology) over a compact algebraic manifold. This is joint work with S. Cappell and J. Shaneson.