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.