global formulas, as well as in the Todd polynomials, which appear in the Hirzebruch–Riemann–Roch formula.

This latter is briefly discussed at the end of Section 3 but is not proved in the book. One reason is that there are by now an abundance of proofs from many differing viewpoints, and we have nothing to add. A second reason is that our application of the Riemann-Roch formula to specific geometric problems occur only for curves and surfaces, and we have given a direct argument establishing the result in these cases.

The final section of this chapter is about spectral sequences, together with a few of their applications to algebraic geometry, which we hope will give at least an idea of how they are utilized. Again the motif is differential forms, especially those with singularities. In our discussion of hypercohomology, the algebraic de Rham theorem, and differentials of the second kind it will be seen that the spectral sequence formalism distills out general patterns and yields sometimes deceptive derivations of classical results whose original proofs were responsible for introducing many of the techniques that have become second nature in the subject.

1. Distributions and Currents

Let M be a compact, oriented n-manifold. We know from Poincare duality and de Rham's theorem that if Γ is a p-cycle — for example, an oriented submanifold — then there exists a closed C^∞ $(n-p)$-form ω that is dual to Γ in the sense that for all closed p-forms φ

$$\int_\Gamma \varphi = \int_M \omega \wedge \varphi . \qquad \text{see } P\ 59.$$