

## Bibliography

- [1] A. Adem, D. Karagueuzian, and J. Mináč, *On the cohomology of Galois groups determined by Witt rings*, Adv. Math. **148** (1999), no. 1, 105–160.
- [2] A. Adem and R. J. Milgram, *Cohomology of Finite Groups*, 1 ed., Springer-Verlag, 1994.
- [3] M. F. Atiyah and I. G. MacDonald, *Introduction to commutative algebra*, Addison-Wesley Publishing Company, Inc., 1969.
- [4] D. Benson, *Stably splitting BG*, Bull. Amer. Math. Soc. **33** (1996), no. 2, 189–198.
- [5] ———, *Representations and cohomology II: Cohomology of groups and modules*, Cambridge Studies in Advanced Mathematics, no. 31, Cambridge University Press, 1998.
- [6] D. Benson and J. Carlson, *Projective resolutions and Poincaré duality complexes*, Trans. Amer. Math. Soc. **342** (1994), no. 2, 447–488.

- [7] D. Bourguiba and S. Zarati, *Depth and the Steenrod algebra*, Invent. Math. **128** (1997), no. 3, 589–602.
- [8] C. Broto and S. Zarati, *Nil-localization of unstable algebras over the Steenrod algebra*, Math. Z. **199** (1988), no. 4, 525–537.
- [9] ———, *On sub- $\mathcal{A}_p^*$ -algebras of  $H^*V$* , Algebraic topology (San Feliu de Guixols, 1990), Lecture Notes in Math., no. 1509, Springer-Verlag, 1992, pp. 35–49.
- [10] J. Carlson, *The mod 2-cohomology of 2-groups*, <http://www.math.uga.edu/~lvalero/cohointro.html>.
- [11] J. Carlson, L. Townsley, L. Valeri-Elizondo, and M. Zhang, *Cohomology rings of finite groups*, Algebras and Applications, vol. 3, Kluwer Academic Publishers.
- [12] T. Diethelm and U. Stambach, *On the module structure of the mod  $p$  cohomology of a  $p$ -group*, Arch. Math. (Basel) **43** (1984), no. 6, 488–492.
- [13] J. Dufлот, *Depth and equivariant cohomology*, Comment. Math. Helv. **56** (1981), no. 4, 627–637.
- [14] L. Evens, *The cohomology ring of a finite group*, Trans. Amer. Math. Soc. **101** (1961), 224–239.
- [15] P. Gabriel, *Des catégories abéliennes*, Bull. Soc. Math. Fr. **90** (1962), 323–448.
- [16] M. Hall, Jr. and J. Senior, *The groups of order  $2^n$  ( $n \leq 6$ )*, The Macmillan Co., New York, 1964.

- [17] J. Harris and N. Kuhn, *Stable decompositions of classifying spaces of finite abelian  $p$ -groups*, Math. Proc. Camb. Phil. Soc. **103** (1988), 427–449.
- [18] H. W. Henn, *Finiteness properties of injective resolutions of certain unstable modules over the Steenrod algebra and applications*, Math. Ann. **291** (1991), no. 2, 191–203.
- [19] H. W. Henn, J. Lannes, and L. Schwartz, *The categories of unstable modules and unstable algebras over the Steenrod algebra modulo nilpotent objects*, Amer. J. Math. **115** (1993), no. 5, 1053–1106.
- [20] ———, *Localizations of unstable  $\mathcal{A}$ -modules and equivariant mod  $p$  cohomology*, Math. Ann. **301** (1995), no. 1, 23–68.
- [21] N. Kuhn, *On topologically realizing modules over the Steenrod algebra*, Ann. of Math. **141** (1995), no. 2, 321–347.
- [22] P. Landrock, *Finite group algebras and their modules*, London Mathematical Society Lecture Note Series, no. 84, Cambridge University Press, 1983.
- [23] S. Mac Lane, *Categories for the Working Mathematician*, 2 ed., Graduate Texts in Mathematics, no. 5, Springer, 1998.
- [24] J. Lannes, *Sur les espaces fonctionnels dont la source est le classifiant d'un  $p$ -groupe abélien élémentaire*, Inst. Hautes Études Sci. Publ. Math. **75** (1992), 135–244.

- [25] H. R. Margolis, *Spectra and the Steenrod Algebra*, North-Holland mathematical library, vol. 29, Elsevier Science Publishers B.V., 1983.
- [26] J. Martino and S. Priddy, *On the dimension theory of dominant summands*, Adams Memorial Symposium on Algebraic Topology, vol. 1, London Mathematical Society Lecture Note Series, no. 175, Cambridge Univ. Press, 1992, pp. 281–292.
- [27] J. P. May, *A concise course in algebraic topology*, Chicago Lectures in Mathematics, University of Chicago Press, 1999.
- [28] S. Mitchell, *Splitting  $B(\mathbb{Z}/p)^n$  and  $BT^n$  via modular representation theory*, Math. Z. **189** (1985), 1–9.
- [29] G. Nishida, *Stable homotopy type of classifying spaces of finite groups*, Algebraic and Topological Theories (1985), 391–404.
- [30] D. Quillen, *The spectrum of an equivariant cohomology ring I*, Ann. of Math. **94** (1971), 549–572.
- [31] D. Rusin, *The cohomology of the groups of order 32*, Math. Comp. **53** (1989), no. 187, 359–385.
- [32] L. Schwartz, *La filtration nilpotente de la catégorie  $\mathcal{U}$  et la cohomologie des espaces de lacets*, Algebraic topology—rational homotopy (Louvain-la-Neuve, 1986), Lecture Notes in Math., no. 1318, Springer, 1988, pp. 208–218.

- [33] ———, *Unstable modules over the Steenrod algebra and Sullivan's fixed point set conjecture*, Chicago Lectures in Mathematics, University of Chicago Press, 1994.
- [34] T. S. Weigel, *p-central groups and Poincaré duality*, Trans. Amer. Math. Soc. **352** (2000), no. 9, 4143–4154.
- [35] C. Wilkerson, *A primer on the Dickson invariants*, Proceedings of the Northwestern Homotopy Theory Conference (Evanston, Ill., 1982), Contemp. Math., vol. 19, Amer. Math. Soc., 1983, pp. 421–434.

## List of Symbols

- $\mathcal{A}$ , 11  
 $\mathcal{A}_C(P)$ , iv, 84  
 $\mathcal{A}_k(P)$ , 60  
 $\mathcal{A}(P)$ , iii, 25  
 $BP$ , 3  
 $\mathcal{C}_\sharp$ , 74  
 $d(M)$ , 29  
 $D(P)$ , 6, 43  
 $\dim(M)$ , 28  
 $\dim(R)$ , 27  
 $\mathcal{E}$ , 20  
 $\text{Epi}(W, V)$ , 50  
 $f$ , 20  
 $\mathcal{F}$ , 20  
 $F_k\text{Rep}(W, P)$ , 54  
 $\text{GL}(V)_P$ , 50  
 $H^*(P)$ , i  
 $\mathcal{H}^*(P)$ , 26  
 $\mathcal{H}_{(k)}^*(P)$ , 60  
 $K_{fg} - \mathcal{U}$ , 32  
 $\text{LF}(M)$ , 79  
 $\lambda_n$ , 18  
 $L_n$ , 18  
 $m$ , 21  
 $\overline{M}$ , 18  
 $\text{mrk}_G(V)$ , 66  
 $\mathcal{N}il$ , 18  
 $\text{nil}_n$ , ii, 19  
 $\mathcal{N}il_n$ , 18  
 $\text{Out}(G)$ , 4  
 $\text{Out}(P)_V$ , iii, 47  
 $P_j$ , 12  
 $P_C H^s(G)$ , 78  
 $\text{PS}(V, t)$ , 28  
 $P(V)$ , 43  
 $\text{Rep}(W, P)$ , iii  
 $\text{Rep}(W, P)_V$ , 49  
 $r_p(P)$ , i  
 $R_s(M)$ , ii, 20  
 $\overline{R}_s(M)$ , iii, 20  
 $\Sigma^\infty BP$ , 3  
 $\text{SCN}(G)$ , 68  
 $\Sigma M$ , 14  
 $\text{Sq}_j$ , 12  
 $\tau_n$ , 22  
 $T_V$ , 17  
 $\mathcal{U}$ , 12  
 $\omega_V$ , 55  
 $|x|$ , 11  
 $\mathbb{Z}_p$ , 4

## Index of Terminology

- $\mathcal{B}$ -closed, 16
- $\mathcal{B}$ -closure, 17
- $\mathcal{B}$ -isomorphism, 15
- Cartan formula, 13
- category
  - Quillen's, 25
  - twisted arrow, 74
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- depth, 96
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  - Krull, 28
  - of a module, 28, 37
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  - unstable, 11
- $n$ -nilpotent, 18
- nilpotent filtration, ii, 19
- $p$ -central group, v, 94
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  - dominant, 3
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