

# Contents

<i>Introduction</i>	page xi
<i>Biographical data</i>	xiii
<i>Acknowledgements</i>	xv
<b>Characteristic classes and calculations in <math>K</math>-theory</b>	
On formulae of Thom and Wu	1
On Chern characters and the structure of the unitary group	13
Chern characters revisited and addendum	24
The Hurewicz homomorphism for $MU$ and $BP$	29
Hopf algebras of cooperations for real and complex $K$ -theory	36
Operations of the $n$ th kind in $K$ -theory	60
Operations on $K$ -theory of torsion-free spaces	64
Stable operations on complex $K$ -theory	73
Primitive elements in the $K$ -theory of $BSU$	77
<b>Modules over the Steenrod algebra and their Ext groups</b>	
A finiteness theorem in homological algebra	87
A periodicity theorem in homological algebra	93
Modules over the Steenrod algebra	106
Sub-Hopf-algebras of the Steenrod algebra	118
What we don't know about $RP^\infty$	126
Calculation of Lin's Ext groups	132
The Segal conjecture for elementary abelian $p$ -groups	143
<b>Finite <math>H</math>-spaces and compact Lie groups</b>	
The sphere, considered as an $H$ -space mod $p$	169
$H$ -spaces with few cells	178
Finite $H$ -spaces and algebras over the Steenrod algebra and correction	184
Finite $H$ -spaces and Lie groups	235
$\text{Spin}(8)$ , triality, $F_4$ and all that	243
The fundamental representations of $E_8$	254
2-Tori in $E_8$	264

<b>Maps between classifying spaces of compact Lie groups</b>	
Maps between classifying spaces	275
Maps between classifying spaces, II	316
Maps between classifying spaces, III	381
Maps between $p$ -completed classifying spaces	399
<b>Miscellaneous papers in homotopy theory and cohomology theory</b>	
An example in homotopy theory	404
An example in homotopy theory	406
A variant of E. H. Brown's representability theorem	408
Idempotent functors in homotopy theory	422
The Kahn–Priddy theorem	429
Uniqueness of $BSO$	440
Graeme Segal's Burnside ring conjecture	475
A generalization of the Segal conjecture	485
A generalization of the Atiyah–Segal completion theorem	500
Atomic spaces and spectra	506
<b>Two unpublished expository papers</b>	
Two theorems of J. Lannes	515
The work of M. J. Hopkins	525

# Contents of Volume I

<i>Introduction</i>	page xi
<i>Biographical data</i>	xiii
<i>Acknowledgements</i>	xv
<b>The cobar construction, the Adams spectral sequence, higher order cohomology operations, and the Hopf invariant one problem</b>	
On the chain algebra of a loop space	1
On the cobar construction	27
On the structure and applications of the Steenrod algebra	34
On the non-existence of elements of Hopf invariant one	69
<b>Applications of <math>K</math>-theory</b>	
Applications of the Grothendieck–Atiyah–Hirzebruch functor $K(X)$	154
Vector fields on spheres	161
On complex Stiefel manifolds	191
On matrices whose real linear combinations are nonsingular and correction	214
On the groups $J(X)$ —I	222
On the groups $J(X)$ —II	237
On the groups $J(X)$ —III	272
On the groups $J(X)$ —IV and correction	302
$K$ -theory and the Hopf invariant	354
Geometric dimension of bundles over $RP^n$	362
<b>Generalised homology and cohomology theories, and a survey</b>	
Lectures on generalised cohomology	377
Algebraic topology in the last decade	515