

Table of Contents

PART 1

Preface	xi
I. Expository Papers	
Cohomology is representation theory J. L. ALPERIN	3
Families of irreducible characters of Weyl groups DEAN ALVIS	13
Modular representations of algebraic groups HENNING HAAHR ANDERSEN	23
Varieties for modules JON F. CARLSON	37
Irreducible characters of finite groups of Lie type R. W. CARTER	45
The Hecke algebra of a finite Coxeter group CHARLES W. CURTIS	51
Shintani descent and \mathcal{L} functions on Deligne-Lusztig varieties FRANÇOIS DIGNE	61
Good filtrations of rational modules for reductive groups S. DONKIN	69
Problems in representation theory arising from Galois modules A. FRÖHLICH	81
Holonomic \mathcal{D} -modules in representation theory RYOSHI HOTTA	87
Characters of solvable groups I. M. ISAACS	103
The representation theory of the symmetric groups GORDON JAMES	111
Representations of Chevalley groups in their own characteristic J. C. JANTZEN	127
Shintani lifting and Gelfand-Graev representations NORIAKI KAWANAKA	147
Introduction to character sheaves GEORGE LUSZTIG	165
Finite groups and modular functions GEOFFREY MASON	181

Representation theory and translation planes	
GEOFFREY MASON	211
Modular representation theory and the classification of finite simple groups	
GERHARD O. MICHLER	223
Cohomology of algebraic groups	
BRIAN J. PARSHALL	233
Double cosets and modular representation theory	
GEOFFREY R. ROBINSON	249
Recent progress on the isomorphism problem	
LEONARD L. SCOTT	259
Representations and maximal subgroups	
GARY M. SEITZ	275
Green functions of reductive groups over a finite field	
TOSHIAKI SHOJI	289
Constructing representations from group geometries	
STEPHEN D. SMITH	303
Perverse sheaves and representation theory	
T. A. SPRINGER	315
Toward Lusztig's classification of characters	
BHAMA SRINIVASAN	323
Tensor product theorems	
ROBERT STEINBERG	331
Coding theory and representation theory	
HAROLD N. WARD	339
Subgroup complexes	
P. J. WEBB	349
II. Block Theory and Modular Representations	
Weights for finite groups	
J. L. ALPERIN	369
Some remarks on the decomposition numbers for the symmetric groups	
DAVE BENSON	381
On block induction	
HARVEY I. BLAU	395
Products and projective resolutions	
JON F. CARLSON	399
Extending self-dual modules	
CLAUDE CIBILS	409
Order-theoretic properties of the center of a block	
G. H. CLIFF, W. PLESKEN, AND A. WEISS	413
Real 2-blocks of S_n , A_n and their double covers	
R. GOW	421

Hypercohomology varieties for complexes of modules, the realizability criterion, and equivalent formulations of a conjecture of Carlsson NATHAN HABEGGER	431
Blocks of projective representations of the symmetric groups JOHN F. HUMPHREYS	439
A condition for the existence of p -blocks of defect 0 ZHANG JI-PING	443
The Loewy structure of projective indecomposable modules for some modular group algebras SHIGEO KOSHITANI	447
The λ -structure of the Green rings of cyclic p -groups FRANK M. KOUWENHOVEN	451
On the cohomology of p -constrained groups P. A. LINNELL AND U. STAMMBACH	467
Block invariants in A_n , \hat{A}_n , and \hat{S}_n JØRN B. OLSSON	471
On the Loewy structure of the modular group-algebra over a group of small p -length REINER STASZEWSKI	475
Blocks of defect zero and degree problems W. WILLEMS	481
Degrees of Brauer characters in p -solvable groups THOMAS R. WOLF	485

PART II

III. Characters and Representations

On products of conjugacy classes and irreducible characters in finite groups ZVI ARAD	3
On products of irreducible characters and conjugacy classes of finite groups in complementary sets ZVI ARAD AND ELSA FISMAN	11
Monomial representations and generalizations CHRISTINE BESSENRODT	25
Characters, nonnegative matrices, and generalized circulants DAVID CHILLAG	33
Character restriction and the existence of relative normal complements in finite groups PAMELA A. FERGUSON	41
Primes dividing character degrees and character orbit sizes DAVID GLUCK	45
Degree problems over \mathbb{Q} BERTRAM HUPPERT	47

Characters and Hall subgroups of solvable groups	
I. M. ISAACS	51
On the Brauer-Suzuki theorem	
HENRY S. LEONARD	57
Arithmetical conditions on character degrees and group structure	
OLAF MANZ	65
Noncommutators and the number of projective characters of a finite group	
WILLIAM F. REYNOLDS	71
Clifford theory of simple modules	
PETER SCHMID	75
Fully ramified characters	
SHAHRIAR SHAHRIARI	83
Character degrees of finite p -groups	
MICHAEL C. SLATTERY	89
The Schur indices of quasiprimitive characters	
A. TURULL	93
IV. Finite Groups of Lie Type	
Twisting operators on the space of class functions of finite special linear groups	
TERUAKI ASAI	99
Simulating algebraic geometry with algebra, III: The Lusztig conjecture as a TG_1 -problem	
ED CLINE	149
Composition factors of induced modules for algebraic groups and their Frobenius subgroups	
STEPHEN DOTY	163
A Hopf algebra associated to the cohomology of the symmetric groups	
JEANNE DUFLOT	171
Cohomology of irreducible modules with large weights	
ERIC M. FRIEDLANDER	187
On the generic cohomology	
WANG JIANPAN	195
On the symmetry of inverse Kazhdan-Lusztig polynomials for affine Weyl groups	
MASAHARU KANEDA	201
Some representations of special linear groups	
L. G. KOVÁCS	207
On hyperoctahedral hyperplane complements	
G. I. LEHRER	219
Leading coefficients of character values of Hecke algebras	
G. LUSZTIG	235

Simulating algebraic geometry with algebra, II: Stratifying representation categories BRIAN J. PARSHALL	263
Simulating algebraic geometry with algebra, I: The algebraic theory of derived categories LEONARD L. SCOTT	271
Blocks and Brauer trees for groups of type $G_2(q)$ JOSEPHINE SHAMASH	283
Shintani descent for exceptional groups over a finite field TOSHIAKI SHOJI	297
Geometrical Gel'fand models, tensor quotients, and Weil representations JORGE SOTO-ANDRADE	305
The values of irreducible characters of the symmetric group MICHIO SUZUKI	317
The characters of $G_2(2^n)$ and its subgroups HIROMICHI YAMADA	321
V. Related topics	
On the representations of the Weyl groups of type D corresponding to the zero weights of the representations of $SO(2n, \mathbb{C})$ SUSUMU ARIKI	327
The study of distance-regular graphs from the algebraic (i.e., character theoretical) viewpoint EIICHI BANNAI AND TATSURO ITO	343
Raising and lowering operators for \mathfrak{sl}_n , with applications to orthogonal bases of \mathfrak{sl}_n -modules R. W. CARTER	351
On finite simple subgroups of the complex Lie group of type E_8 ARJEY COHEN AND ROBERT GRIESS	367
Symmetric powers of cyclic sets and the definition of A. Weil's zeta-functions ANDREAS W. M. DRESS AND CHRISTIAN SIEBENEICHER	407
The geometry of homogeneous extension categories K. W. GRUENBERG AND K. W. ROGGENKAMP	413
On self-normalizing cyclic subgroups ZHANG GUANGXIANG	419
On the order of a projective plane and planes with a totally irregular collineation group CHAT YIN HO	423
Permanents, immanants, and determinants GORDON JAMES	431
Young-diagrammatic methods for the representation theory of the groups Sp and SO KAZUHIKO KOIKE AND ITARU TERADE	437

On maximal subgroups and maximal factorizations of almost simple groups MARTIN W. LIEBECK, CHERYL E. PRAEGER, AND JAN SAXL	449
The local maximal subgroups of the finite simple groups MARTIN W. LIEBECK	455
On the generalized exponents of classical Lie groups JUN-ICHI MATSUZAWA	463
Automorphisms and isomorphisms of linear groups over skew fields HONGSHUO REN, ZHEXIAN WAN, AND XIAOLONG WU	473
Picard groups of integral group rings of nilpotent groups K. W. ROGGENKAMP	477
Maximal subgroups in classical groups over arbitrary fields LI SHANGZHI	487
Applications of explicit Brauer induction VICTOR SNAITH	495
A characterization of $\text{PSU}(3, 4)$ RONALD SOLOMON	533
Highest weight vectors associated to some branchings TAKESHI TOKUYAMA	541
Eigenvalues connected to the radical of Brauer's centralizer algebras DAVID WALES	547