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Born Brooklyn, 5/6/27; Infantry, Army of the U.S. '45-'47; B.S. Yale '48; Ph.D. U. of Chicago '51; Frank B. Jewett Postdoctoral Fellowships '51-'52 at Harvard, '52-'53 at Institute for Advanced Study. Employment: U. of Pennsylvania, Ass't Prof. '53, Assoc. Prof. '58, Full Prof. '61 to present. Chairman of Faculty Senate '82-'83. J.D. '73 U. of Pennsylvania. Admitted to PA bar '74. Lecturer in Law, U. of Pennsylvania Law School (alternate years, course on Statistics for Law). Invited speaker, opening of Euler International Mathematics Institute, Leningrad, October '90. Activities for American Mathematical Society: Created series of joint AMS-MAA-SIAM symposia on "Some Mathematical Questions in Biology", former member of Council, former Managing Editor of Bulletin, present member and former chair of Committee on Academic Freedom, Tenure and Employment Security, member of ad hoc Committee on Professional Ethics (drafted Ethical Guidelines). Fellow American Association for Advancement of Science. Former Trustee, Solomon Schechter Day School. Specialties: Algebraic Deformation Theory, Statistics for Law.

BIBLIOGRAPHY

1. M. Gerstenhaber, *Theory of convex cones*, in Activity Analysis of Production and Allocation (T.C. Koopmans, ed.), Wiley, New York, 1951, pp. 298–316.
2. ———, *On a theorem of Haupt and Wirtinger concerning the periods of a differential of the first kind, and a related topological theorem*, Proc. Amer. Math. Soc. **4** (1953), 476–481.
3. ———, *On the algebraic structure of discontinuous groups*, Proc. Amer. Math. Soc. **4** (1953), 745–750.
4. ———, *A characterization of the modular group and certain similar groups*, Duke Math. J. **40** (1954), 113–122.
5. ——— and H. E. Rauch, *On extremal quasi-conformal mappings I*, Proc. Nat. Acad. Sci. **40** (1954), 808–812.
6. ——— and H.E. Rauch, *On extremal quasi-conformal mappings II*, Proc. Nat. Acad. Sci. **40** (1954), 991–994.
7. ———, *On canonical constructions I*, Proc. Nat. Acad. Sci. **41** (1955), 233–236.
8. ———, *On canonical constructions II*, Proc. Nat. Acad. Sci. **42** (1956), 881–883.
9. ———, *On canonical constructions III*, Proc. Amer. Math. Soc. **7** (1956), 543–550.
10. ——— and E. Galanter, *On thought: The extrinsic theory*, Psych. Review **63** (1956), 318–327.
11. ———, *On canonical constructions IV*, Proc. Amer. Math. Soc. **8** (1957), 745–749.
12. ———, *On nilalgebras and linear varieties of nilpotent matrices, I*, Amer. J. Math. **80** (1958), 614–622.

13. ———, *A solution method for the transportation problem*, J. Soc. Ind. Appl. Math. **6** (1958), 321–334.
14. ———, *On nilalgebras and linear varieties of nilpotent matrices III*, Ann. of Math. **70** (1959), 167–205.
15. ———, *Note on a theorem of Wielandt*, Math. Zeit. **71** (1959), 141–142.
16. ———, *Solution of large scale transportation problems*, in Combinatorial Analysis, Proceedings of Symposia in Applied Mathematics, Volume X (Richard Bellman and Marshall Hall, Jr., eds.), American Mathematical Society, Providence, 1960, pp. 251–259.
17. ———, *On nilalgebras and linear varieties of nilpotent matrices, II*, Duke Math. J. **27** (1960), 31–32.
18. ———, *A procedure for finding a zero of a vector-valued function with certain monotonicity properties*, J. Soc. Ind. Appl. Math. **8** (1960), 514–517.
19. ——— and C. T. Yang, *Division rings containing a real closed field*, Duke Math. J. **27** (1960), 461–466.
20. ———, *On dominance and varieties of commuting matrices*, Ann. of Math. **73** (1961), 324–348.
21. ———, *The number of nilpotent matrices with coefficients in a finite field*, Illinois J. Math. **5** (1961), 330–333.
22. ———, *Dominance over the classical groups*, Ann. of Math. **74** (1960), 532–569.
23. ———, *On nilalgebras and linear varieties of nilpotent matrices, IV*, Ann. of Math. **75** (1962), 382–418.
24. ——— and Oscar S. Rothaus, *The solution of sets of equations in groups*, Proc. Nat. Acad. Sci. **48** (1962), 1531–1533.
25. ———, *The 152nd proof of the law of quadratic reciprocity*, Amer. Math. Monthly **70** (1963), 397–398.
26. ———, *The cohomology structure of an associative ring*, Ann. of Math. **78** (1963), 267–288.
27. ———, *On the deformation of rings and algebras*, Ann. of Math. **79** (1964), 59–103.
28. ———, *On semicommuting matrices*, Math. Zeit. **83** (1964), 250–260.
29. ———, *A uniform cohomology theory for algebras*, Proc. Nat. Acad. Sci. **51** (1964), 626–629.
30. ———, *On the Galois theory of inseparable extensions*, Bull. Amer. Math. Soc. **70** (1964), 561–566.
31. ———, *On infinite inseparable extensions of exponent one*, Bull. Amer. Math. Soc. **71** (1965), 878–881.
32. ———, *On the construction of division rings by the deformation of fields*, Proc. Nat. Acad. Sci. **55** (1966), 690–692.
33. ———, *On the deformation of rings and algebras, II*, Ann. of Math. **84** (1966), 1–19.
34. ———, *The third cohomology group of a ring and the commutative cohomology theory*, Bull. Amer. Math. Soc. **73** (1967), 950–954.
35. ———, *On the deformation of rings and algebras, III*, Ann. of Math. **88** (1968), 1–34.
36. ———, *The obstruction to an automorphism of a filtered ring*, Bull. Amer. Math. Soc. **74** (1968), 695–697.
37. ———, *On modular field extensions*, J. of Algebra **10** (1968), 478–484.
38. M. Gerstenhaber (ed.), *Some Mathematical Problems in Biology* Lectures on Mathematics in the Life Sciences, Vol. 1, Amer. Math. Soc., Providence, 1968.
39. ———, *On the deformation of sheaves of rings*, in Global Analysis, Papers in Honor of K. Kodaira (D. C. Spencer and S. Iyanaga, eds.), University of Tokyo Press and Princeton University Press, 1969, pp. 149–157.
40. ———, *A categorical setting for the Baer extension theory*, in Applications of Categorical Algebra Proceedings of Symposia in Pure Mathematics, Volume XVII (Alex Heller, ed.), Amer. Math. Soc., Providence, 1970, pp. 50–64.
41. ———, *On the Galois theory of purely inseparable field extensions*, Bull. Amer. Math. Soc. **76** (1970), 1011–1014.
42. M. Gerstenhaber (ed.), *Some Mathematical Problems in Biology* Lectures on Mathematics in the Life Sciences, Vol. 2, Amer. Math. Soc., Providence, 1970.
43. ———, *Undergraduate mathematics training in 1984—some predictions*, Amer. Mat. Monthly **79** (1972), 658–662.

44. ———, *The fundamental form of a purely inseparable field extension*, Bull. Amer. Math. Soc. **78** (1972), 717–720.
45. ———, *On the deformation of rings and algebras, IV*, Ann. of Math. **99** (1974), 257–276.
46. ——— and H. C. Myung, *On commutative power-associative nilalgebras of low dimension*, Proc. Amer. Math. Soc. **48** (1975), 29–32.
47. ———, *The fundamental form of an inseparable extension*, Trans. Amer. Math. Soc. **227** (1977), 165–184.
48. ——— and Ralph May, *Geometry of subalgebras and inseparable extensions*, J. of Algebra **72** (1981), 29–53.
49. ——— and S. D. Schack, *On the deformation of diagrams of algebras*, in Algebraists' Homage: Papers in Ring Theory and Related Topics (dedicated to Nathan Jacobson), Contemporary Mathematics, Volume 13 (S. A. Amitsur, D. A. Saltman, and G. B. Seligman, eds.), Amer. Math. Soc., Providence, 1982, pp. 193–197.
50. ——— and S. D. Schack, *On the deformation of algebra morphisms and diagrams*, Trans. Amer. Math. Soc. **279** (1983), 1–50.
51. ——— and S. D. Schack, *Simplicial cohomology is Hochschild cohomology*, J. Pure and Appl. Algebra **30** (1983), 143–156.
52. ——— and S. D. Schack, *On the cohomology of an algebra morphism*, J. of Algebra **95** (1985), 245–262.
53. ——— and S. D. Schack, *Rigid algebras and the Bockstein as an obstruction morphism*, J. Pure and Appl. Algebra **43** (1986), 53–74.
54. ——— and S. D. Schack, *A Hodge-type decomposition for commutative algebra cohomology*, J. Pure and Appl. Algebra **48** (1987), 229–247.
55. M. Hazewinkel and M. Gerstenhaber (eds.), *Deformation Theory of Algebras and Structure and Applications*, NATO ASI Series C, Volume 247, Kluwer and Academic Publishers, Norwell, MA and Dordrecht, 1988.
56. ——— and S. D. Schack, *Algebraic deformation theory and cohomology*, (in the foregoing), pp. 11–264.
57. ——— and S. D. Schack, *Triangular algebras*, (ibid.), pp. 447–498.
58. ——— and S. D. Schack, *Sometimes H^1 is H^2 and discrete groups deform*, in Geometry of Group Representations, Contemporary Mathematics, Volume 74 (W. M. Goldman and A. R. Magid, eds.), Amer. Math. Soc., Providence, 1988, pp. 149–168.
59. ——— and S. D. Schack, *Cohomology of presheaves of algebras, I. Presheaves over a partially ordered set*, Trans. Amer. Math. Soc. **310** (1988), 135–165.
60. ———, V. Coll, and A. Giaquinto, *An explicit deformation formula with non-commuting derivations*, in Ring Theory 1989, Proceedings of a conference in honor of S. A. Amitsur, Israel Mathematical Conference Proceedings, Volume I (Louis Rowen, ed.), Amer. Math. Soc., Providence, 1989, pp. 396–403.
61. ——— and S. D. Schack, *Bialgebra cohomology, deformations, and quantum groups*, Proc. Nat. Acad. Sci. **87** (1990), 478–481.
62. ——— and S. D. Schack, *The shuffle bialgebra and the cohomology of commutative algebras*, J. Pure and Appl. Algebras **20** (1991), 263–272.
63. ———, A. Giaquinto, and S. D. Schack, *Quantum symmetry*, in Quantum Groups, Lecture Notes in Mathematics, Vol. 1510 (P. P. Kulish, ed.), Springer, New York, 1992, pp. 9–46.
64. Murray Gerstenhaber and Jim Stasheff (eds.), *Deformation Theory and Quantum Groups with Applications to Mathematical Physics*, Contemporary Mathematics, Vol. 134, Amer. Math. Soc., Providence, 1992.
65. ——— and S. D. Schack, *Algebras, bialgebras, quantum groups, and algebraic deformations*, (in the foregoing), pp. 51–92.
66. ———, A. Giaquinto, and S. D. Schack, *Quantum groups, cohomology, and preferred deformations*, XXth International Conference on Differential Geometric Methods in Theoretical Physics, Vol. 1 (S. Catto and Alvany Rocha, eds.), World Scientific, Singapore and River Edge, NJ, 1992, pp. 529–538.
67. ———, A. Giaquinto, S. D. Schack, *Construction of quantum groups from Belavin–Drinfel'd infinitesimals*, in Quantum Deformation of Algebras, Israel Mathematical Conference Pro-

- ceedings, vol. 7 (A. Joseph and S. Shnider, eds.), (available through American Mathematical Society, Providence), Bar-Ilan University, Ramat-Gan, Israel, 1993, pp. 45–64.
68. _____, V. Coll, and S. D. Schack, *Universal deformation formulas*, J. Pure and Appl. Algebra **90** (1993), 201–219.
 69. _____ and D. J. Green, *A group-theoretic consequence of the Donald–Flanigan conjecture*, J. of Algebra **166** (1994), 356–363.
 70. _____, P. Bonneau, M. Flato, and G. Pinczon, *The hidden group structure of quantum groups: strong duality, rigidity, and preferred deformations*, Comm. in Math. Phys. **161** (1994), 125–156.
 71. _____ and Mary E. Schaps, *The modular version of Maschke’s theorem for normal abelian p -Sylows*, J. Pure and Applied Algebra **108** (1996), 257–264.
 72. _____ and A. Voronov, *Higher operations on Hochschild complex*, Functional Anal. and Appl. **29** (1995), 141–153. (Russian)
 73. _____ and A. Voronov, *Homotopy G -algebras and moduli space operad*, Internat. Math. Res. Notices **3** (1995), 141–153.
 74. _____, M. Flato, and A. Voronov, *Cohomology and deformation of Leibniz pairs*, Letters in Math. Phys. **34** (1995), 77–90.
 75. _____ and Mary E. Schaps, *Hecke algebras, $U_q sl_n$, and the Donald–Flanigan conjecture for S_n* , Trans. Amer. Math. Soc. **349** (1997), 3353–3371.
 76. _____ and A. Giaquinto, *Boundary solutions of the classical Yang-Baxter equation*, Letters in Math. Phys. **40** (1997), 337–353.
 77. _____, *Quantized intersection cardinalities*, Deformation Theory and Symplectic Geometry (D. Sternheimer, J. Rawnsley, and Simone Gutt, eds.), Kluwer, Dordrecht, 1996, pp. 85–102.
 78. _____, *Deformation of towers of algebras and quantized intersection cardinality functions*, Letters in Math. Phys. **43** (1998), 87–103.
 79. _____ and A. Giaquinto, *Boundary Solutions of the quantum Yang-Baxter equation and solutions in three dimensions*, Lett. Math. Phys. **44** (1998), 131–141.
 80. _____ and C. Wilkerson, *On the deformation of rings and algebras, V: Deformation of differential graded algebras*, in Higher Homotopy Structures in Topology and Mathematical Physics, Contemporary Mathematics, Vol. 227 (J. McCleary, ed.), Amer. Math. Soc., Providence, 1999, pp. 89–101.
 81. _____ and A. Giaquinto, *Compatible deformations*, in Trends in the Representation Theory of Finite Dimensional Algebras, Contemporary Mathematics, Vol. 229 (E. L. Green and Birge Huisgen-Zimmermann, eds.), Amer. Math. Soc., Providence, 1999, pp. 159–168.
 82. *Developments from Barr’s thesis*, in press, J. Pure Appl. Math.
 - A. *Intersection cardinality matrices and representations of S_n* , submitted to Amer. Math. Monthly.
 - B. _____ and S. D. Schack, *Cohomology of presheaves of algebras, II: Barycentric subdivision of a small category*, submitted to Trans. Amer. Math. Soc..
 - C. _____ and S. D. Schack, –, *III: Embedding theorems*, submitted to Trans. Amer. Math. Soc..
 - D. _____ and S. D. Schack, *How do you reduce analytic deformation theory to algebraic deformation theory?*, preprint.