Curriculum Vitae and Published Papers

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Born: September 27, 1935 New York, NY

Education:

Ph.D. in Physics, University of Chicago, 1961.
M.S. in Physics, University of Chicago, 1957.
B.A. in Physics, University of California at Los Angeles, 1956.
Secondary education, Los Angeles, California

Family: Married, two children

Professional Positions:

2002 -	Professor Emeritus of Mathematics, University of Chicago
1969 - 2002	Professor of Mathematics, University of Chicago.
1966 - 1969	Associate Professor of Mathematics, University of Chicago.
1963 - 1966	Assistant Professor of Mathematics, University of Chicago.
1961 - 1963	Moore Instructor of Mathematics, MIT.

Principal Visiting Positions:

University of Colorado, Fall 1998
Panjab University, Winter 1978
Sussex University, Spring 1978
Tel-Aviv University, Spring 1970
Caltech, Winter 1968

Administrative Experience

Managing Editor, SIAM Journal on Applied Mathematics (1983-1988)
University Committee chairmanships (Applied Mathematics, Admissions)

Fellowships:

John Simon Guggenheim Foundation, 1977-78
Alfred P. Sloan Foundation, 1967-69
Senior Research Fellow, Caltech, Spring 1966
Belgian-American Foundation, July 1965

Research Interests

Differential equations; Asymptotics;
Dynamical-systems methods; Hamiltonian methods;
Fluid dynamics; Astrophysical applications.

Publications List[1]

1. On the equilibrium stability of a system of disk dynamos, Proc. Camb. Phil. Soc. 56, 154-173 (1960)

2. The real solutions of a certain nonlinear system of equations, Proc. Camb. Phil. Soc. 57, 503-506 (1961)

3. The stability of viscous flow in a curved channel in the presence of a magnetic field (with S. Chandrasekhar and Donna D. Elbert), Proc. Roy. Soc. A 264, 155-164 (1961)

4. The virial tensor and its application to self-gravitating fluids, Astroph. J. 134, 500-536 (1961)

5. On the super-potentials in the theory of Newtonian gravitation (with S. Chandrasekhar), Astroph. J. 135, 238-247 (1962)

6. On the oscillations and the stability of rotating gaseous masses, (with S. Chandrasekhar), Astroph. J. 135, 248-262 (1962)

7. On the super-potentials in the theory of Newtonian gravitation: tensors of higher rank (with S. Chandrasekhar), Astroph. J. 136, 1032-1036 (1962)

8. On the potentials and super-potentials of homogeneous ellipsoids (with S. Chandrasekhar), Astroph. J. 136, 1037-1047 (1962)

9. On the oscillations and the stability of rotating gaseous masses, II: the homogeneous, compressible model (with S. Chandrasekhar), Astroph. J. 136, 1069-1081 (1962)

10. On the oscillations and the stability of rotating gaseous masses, III: the distorted polytropes (with S. Chandrasekhar), Astroph. J. 136, 1082-1104 (1962)

[1]This list does not distinguish between publications in refereed journals and unrefereed contributions to conference proceedings and other volumes

11. On the occurrence of multiple periods and beats in the Beta Canis Majoris stars (with S. Chandrasekhar), Astroph. J. 136, 1105-1107 (1962)

12. On the stability of the Jacobi ellipsoids (with S. Chandrasekhar), Astroph. J. 137, 1142-1161 (1963)

13. On the oscillations of the Maclaurin spheroids belonging to the third harmonics (with S. Chandrasekhar), Astroph. J. 137, 1162-1171 (1963)

14. On the equlibrium and the stability of the Jeans spheroids (with S. Chandrasekhar), Astroph. J. 137, 1172-1184 (1963)

15. Non-radial oscillations and cnvective instability of gaseous masses (with S. Chandrasekhar), Astroph. J. 138, 185-199 (1963)

16. On the principle of the exchange of stabilities, I. the Roch ellipsoids, Astroph. J. 138, 1214-1217 (1963)

17. On the ellipsoidal figures of equilibrium of homogeneous masses (with S. Chandrasekhar), Astrophysica Norvegica IX, 323-332 (1964)

18. Non-radial oscillations of gaseous masses (with S. Chandrasekhar), Astroph. J. 140, 1517-1528 (1964)

19. On Schwarzschild's criterion for the stability of gaseous masses, Astroph. J. 142, 229-242 (1965)

20. On the onset of convective instability, Astroph. J. 137 142, 1257-1260 (1965)

21. The Riemann Ellipsoids (lecture notes, Inst. Ap., Cointe-Sclessin, Belgium) (1965)

22. On Riemann's criterion for the stability of liquid ellipsoids, Astroph. J. 145, 878-885 (1966)

23. On the necessity of Schwarzschild's criterion for stability, Astroph. J. 146, 947-949 (1966)

24. Convective instability in stars, in "Nonequilibrium Thermodynamics, Variational Techniques, and Stability," ed. R. Donnelly, R. Hermann and I. Prigogine (University of Chicago Press, Chicago), 199-205 (1966)

25. Rotating Fluid Masses , Ann. Rev. Astr. and Astroph. 5, 465-480 (1967)

26. The principle of exchange of stabilities, II. the onset of convection in the presence of rotation, Astroph. J. 150, 203-212 (1967)

27. The pulsations and the dynamical stability of gaseous masses in uniform rotation, Astroph. J. 152, 267-292 (1968)

28. The effect of an arbitrary law of slow rotation on the oscillations and the stability of gaseous masses, Astroph. J. 1160, 701-723 (1970)

29. On the asymptotic nature of Clairaut theory, Astroph. Space Sci. 9, 398-409 (1970)

30. On the pulsations of polytropic masses in rapid, uniform rotation (with G.W. Russell), Astroph. J. 171, 103-105 (1972)

31. On the fission theory of binary stars, Astroph. J. 175, 171-193 (1972)

32. On a criterion for the occurrence of a Dedekind-like point of bifurcation along a sequence of axisymmetric systems, II. Newtonian theory for differentially rotating configurations (with S. Chandrasekhar), Astroph. J. 185, 19-30 (1973)

33. On the fission theory of binary stars, II. Stability to third-harmonics disturbances, Astroph. J. 1190, 121-130 (1974)

34. The fission theory of binary stars, in Proc. Int. Coll. on Drops and Bubbles, ed. D.J. Collins, M.S. Plesset and M.M. Saffren (1974)

35. The fission theory of binary stars for compressible masses, Mem. Soc. Roy. des Sci. de Liege, 6e serie, tome VI (1975)

36. The quasidynamic method for rotating stars (with A. Kovetz and G. Shaviv), ibid.

37. Exchange of stabilities in autonomous systems (with R. Schaar), Stud. App. Math. LIV, 229-259 (1975)

38. Exchange of stabilities in autonomous systems II. Vertical bifurcation (with R. Schaar), Stud. App. Math. LVI, 1-50 (1977)

39. Bifurcation and stability problems in astrophysics, in "Applications of Bifurcation Theory," ed. P. Rabinowitz (Academic Press, New York), 259-284 (1977)

40. Rotating, Self-gravitating Masses, Ann. Rev. of Fl. Mech. 11, 229-246 (1979)

41. Ellipsoidal potentials of polynomial distributions of matter, Astroph. J. 234, 619-627 (1979)

42. On the origin of double stars, Scientia 115, 591-602 (1980)

43. On the fluid dynamics of evolving stars, Proc. Roy. Soc. A 375, 249-269 (1981)

44. Perturbation expansions on perturbed domains, SIAM Review 24, 381-400 (1982)

45. On the fission theory of binary stars, III. The formulation of the bifurcation problem, Astroph J. 275, 316-329 (1983)

46. On the onset of relativistic instability in highly centrally condensed stars (with S. Chandrasekhar), MNRAS 207, 13p-16p (1984)

47. On the fission theory of binary stars, IV. Exact solutions in polynomial spaces, Astroph J. 284, 364-380 (1984)

48. Binary fission via inviscid trajectories, Geophy. Astroph. Fl. Dyn. 38, 15-24 (1987)

49. The stability equations for rotating, inviscid fluids: Galerkin methods and orthonormal bases, Geophy. Astroph. Fl. Dyn. 46, 221-243 (1989)

50. Lagrangian perturbations of Riemann ellipsoids, Geophy. Astroph. Fl. Dyn. 47, 225-236 (1989)

51. Mathematical status of the fission theory, Proc. 20th General Assembly of the International Astronomical Union (1989)

52. Dynamics of self-gravitating liquid masses, Proc. 3rd International Colloquium on Drops and Bubbles, 268-274 (1989)

53. Bifurcation and unfolding in systems with two timescales, Proc. Fifth Florida Workshop on Nonlinear Fluid Dynamics, ed R. Buchler, Ann. N.Y. Acad. Sci. 617, 73-86 (1990)

54. Short wavelength instabilities of rotating, compressible fluid masses (with A. Lifschitz), Proc. R. Soc. Lond. A 438, 265-290 (1992)

55. Local hydrodynamic instability of rotating stars (with A. Lifschitz), Astroph. J. 408, 603-614 (1993)

56. Slow evolution in perturbed Hamiltonian systems (with A. Neishtadt), Stud. App. Math. 92, 127-144 (1994)

57. Dynamic bifurcation in Hamiltonian systems with one degree of freedom (with A. Pesci), SIAM J. Appl. Math. 55, no. 4, 1117-1133 (1995)

58. Short wavelength instabilities of asymmetric, rotating masses (with A. Lifschitz) in Three-Dimensional Systems (Volume 751 of the Annals of the N.Y. Acad. Sci) 144-151 (1995)

59. Short wavelength instabilities of Riemann Ellipsoids (with A. Lifschitz), Phil. Trans. Roy. Soc. A 354, 927-950 (1996).

60. New global instabilities of the Riemann ellipsoids (with A. Lifschitz), Astrophys. J. 458, 699-713 (1996).

61. The virial method and the classical ellipsoids, J. Astroph. and Astron. 17, 167-182 (1996)

62. Solutions of the Euler equations near the Riemann ellipsoids, (with A. Kar and A. Lifschitz), in Proceedings of the International Conference on Nonlinear Evolution Equations and Infinite-Dimensional Dynamical Systems ed. Li Tatsien (World Scientific, Singapore) p. 81 (1997)

63. The mathematical development of the classical ellipsoids, Int. J. Engr. Sci. 36, 1407-1420 (1998)

64. On the nonlinear development of the elliptic instability (with K.I. Saldanha), Phys. Fl. 11, 3374-3379 (1999).

65. Instabilities of exact time-periodic solutions of the incompressible Euler equations (with Joseph Biello and Kenneth Saldanha), JFM 404, 269-287 (2000).

66. Magnetoelliptic instabilities (with Ellen Zweibel), Astrophy. J. 609, 301 (2004).

67. Resonance bands and binary-star formation, Proc. NY Acad. Sci. 1045, 276 (2005).

68. Hamiltonian description of incompressible fluid ellipsoids (with Joseph Biello and Phil Morrison), Ann. Phys. 324, 1747-1770 (2009).

69. Shear-flow transition: the basin boundary, Nonlinearity 22 (2009) 2645-2655.

70. Boundary collapse in models of shear-flow transition, Commun. Nonlinear Sci. Numer. Simulat. 17 (2012) 2095-2100.

71. Edges in models of shear flows, J. Fluid Mech. 721, 386-402 (2013).

BOOKS EDITED

- Theoretical principles in astrophysics and relativity (with W.H. Reid and P.O. Vandervoort) (University of Chicago Press, Chicago) (1978)

- Astrophysical and Geophysical Fluid Dynamics (American Mathematical Society, Providence) (1983)