

# CURRICULUM VITAE

George C. Goldenbaum

Professor of Physics and Associate Dean

## I. Personal Data:

Birthdate: August 11, 1936

## II. Education:

B.S.	Muhlenberg College, Allentown, PA	1957	Physics
Ph.D.	University of Maryland, College Park	1966	Physics

## III. Experience in Higher Education:

Univ. of Maryland	1992-98	Associate Dean	College of Computer, Mathematical and Physical Sciences
Univ. of Tokyo	1991	TEPCO Professor	Dept. of Electrical Engineering
Univ. of Maryland	1987-89	Acting Chairman	Dept. of Meteorology
Univ. of Maryland	1980-	Professor	Dept. of Physics and Astronomy
Univ. of Maryland	1978-80	Assoc. Chairman	Dept. of Physics and Astronomy
Univ. of Maryland	1974-80	Assoc. Professor	Dept. of Physics and Astronomy
Univ. of Maryland	1967-69	Res. Associate	Dept. of Physics and Astronomy
Univ. of Maryland	1961-66	Grad. Res. Asst.	Dept. of Physics and Astronomy

## IV. Experience Other Than in Higher Education:

Lawrence Livermore National Laboratory, Livermore	1980-81	Visiting Scientist
Naval Research Laboratory, Washington	1974-80	Consultant
Naval Research Laboratory, Washington	1969-73	Research Physicist
Culham Laboratory, Berkshire, England	1966-67	Visiting Scientist
National Bureau of Standards, Washington	1958-61	Research Physicist

## V. Membership in Honorary and Professional Societies:

American Physical Society (Fellow)  
University Fusion Association (Vice President 1989, President 1990)  
Sigma Xi

## VI. (a) Theses Directed:

Ph.D. Andrew Allen	Experimental Observations of the Equilibrium and Stability of a Non-Circular Cross-Section Toroidal Plasma	1978
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Ph.D.	Robert Merlino	Electron Heating in a High Voltage Toroidal Theta Pinch	1980
Ph.D.	Donald P. Murphy	Macroscopic Plasma Behavior in a High Voltage Toroidal Theta Pinch	1980
Ph.D.	John Antoniadis	Particle Dynamics, Heating and Transport Studies in Terp II, a High $\beta$ Toroidal Plasma Experiment	1982
Ph.D.	Bruce Weber	Magnetic Field Structure in a Finite Beta Toroidal Plasma	1982
Ph.D.	Grant W. Hart	The Magnetic Structure of Spheromaks During Formation, Equilibrium, and Decay	1983
Ph.D.	Thomas Peyser	Plasma Motion During the Formation Phase of the PS-3 and PS-3.1 Spheromaks	1987
Ph.D.	Alexander B. Filuk	Particle Confinement and Fueling Effects on the Maryland Spheromak	1991
Ph.D.	Bruce J. Barrow	Magnetic Helicity and Plasma Velocities in the PS-3.5 Spheromak Experiment	1991
Ph.D.	Jean-Luc Gauvreau	Ion Temperature Measurements in the Maryland Spheromak	1992
Ph.D.	David Falconer	Relative Elemental Abundance and Heating Constraints Determined for the Solar Corona from SERTS Measurements	1994

## VII. Grants, Contracts, and Awards:

NO<sub>x</sub> Production by Atmospheric Discharge  
National Science Foundation \$330K

## VIII. University Service Other Than Teaching:

### (a) Departmental

1991-92 Physics Majors Course Committee

- 1989-90 Departmental Salary Committee  
Laboratory for Plasma Research Executive Committee
- 1986-87 Departmental Salary Committee  
Space Allocation Committee
- 1985-86 Departmental APT Committee  
Departmental Course Group Leader (other service courses)  
(Acting Chairman) Space Allocation Committee
- 1984-85 APT Committee  
Course Group Leader (other service courses)
- 1983-84 Salary Committee
- 1982-83 Salary Committee
- 1979-80 Associate Chairman, Facilities and Personnel
- 1978-79 Associate Chairman, Facilities and Personnel  
Graduate Admissions Committee  
Chairman, Technical Services Committee  
Appointments, Promotions, and Tenure Committee
- 1977-78 Chairman, Graduate Admissions Committee  
General Committee on Graduate Education  
Junior Advisor  
General Honors Program Senior Advisor
- 1976-77 Chairman, Cooperative Program on Fusion Technology  
Chairman, Health and Safety Committee  
Honors Committee  
Graduate Advisor Committee  
Marshall, Commencement
- 1974-75 Chairman, Graduate Advising Committee  
Marshall, Commencement

(b) University

- 1997-98 Essic Director and Faculty Search Committee  
International Affairs Executive Committee
- 1995-97 CMPS Service:  
Administrative Council

Oversight of APT Process and Data Collection  
Equity Officer  
Administer Teaching Evaluation  
Administer Unit Reviews  
Work with corporate research collaborators  
Numerous ad hoc committees and jobs

University Service:

Campus Wide Recruiting Committee  
Facilities Advisory Committee  
Teaching Facilities Committee  
International Affairs Committee — Chair  
OIS Resource Group

- 1994-95 Comprehensive Site Planning Committee  
Campus Wide Graduate Recruitment Committee  
Equity Council  
College Personnel Officers  
Research Scientists Salary Committee  
Diversity Steering Committee  
Chen Scholarship Selection Committee  
Computer and Space Sciences Building Addition Supervision Committee  
A.V. Williams Building Committee  
CESDIS Director Search Committee  
CCA Search Committee  
M.S. in Robotics Committee  
Asst. to the Dean Search Committee, Chair  
CMPS Administrative Council  
International Affairs Committee, Chair  
Academic Procedures and Standards Committee  
Teaching Facilities Committee  
Facilities Advisory Committee  
Computer Advisory Committee
- 1992-93 Diversity Council  
Campus Wide Recruitment Committee  
Diversity Year Steering Committee  
Numerous Ad Hoc Committees
- 1990-91 Blue Ribbon Committee on the Colleges of Agriculture  
and Life Sciences (Chair)
- 1989-90 University Appeals Committee  
Geology Appointment Review Committee  
Senate Nominations Committee

Center for Automation Research Review Committee (Chair)

- 1988-89 Acting Chairman, Department of Meteorology  
Campus Senate  
Dean's Advisory Committee on Community Service
- 1987-88 Acting Chairman, Department of Meteorology  
Campus Senate  
Chairman, Adjunct Committee on Academic Standards and Procedures  
General Committee on Academic Affairs
- 1986-87 Campus Senate  
LPF Director Search Committee  
Chair – Subcommittee 2 – Ad Hoc Committee to  
rewrite the plan of organization of the Campus Senate
- 1985-86 Senate Adjunct Committee on Instructional Procedures
- 1984-85 Campus Senate  
Chairman, Adjunct Committee on Instructional Procedure  
General Committee on Educational Affairs
- 1983-84 Campus Senate  
Search Committee for the Director of the Laboratory  
for Plasma and Fusion Energy Studies  
Committee on Conflict of Interest, Conflict of Commitments,  
Proprietary and Secret Research
- 1982-83 Campus Senate  
Senate Adjunct Committee on Instructional Procedures  
Search Committee for the Director of the Laboratory  
for Plasma and Fusion Energy Studies
- 1977-78 MPSE Division Council
- 1976-77 MPSE Division Council  
Educational Affairs Committee Chairman (MPSE)  
Student Affairs Committee (MPSE)

(c) State, National, or International

- 1994-95 NAS/NRC Convocation on Scientific Misconduct  
NOAA/Universities Partnership  
Science Dean's Council

- 1991-92 Referee for Physics of Fluids, Physical Review Letters and Nuclear Fusion
- 1990-91 President, University Fusion Association  
Referee for Physics of Fluids and Physical Review Letters
- 1989-90 Vice President (President Elect) University Fusion Association  
US-Japan Joint Planning Committee for Compact Toroid  
Fusion Research  
Referee for Physics of Fluids, Physical Review Letters,  
and Nuclear Fusion
- 1988-89 Vice President (President Elect) University Fusion Association  
US-Japan Joint Planning Committee for Compact Toroid  
Fusion Research  
Referee for Physics of Fluids, Physical Review Letters,  
and Nuclear Fusion
- 1987-88 US DOE Compact Torus Long Range Planning Committee  
US-Japan Joint Planning Committee (CT-Fusion Research)  
Referee for Physics of Fluids, Physical Review Letters,  
Fusion Technology, Nuclear Fusion
- 1986-87 US DOE Compact Torus Long Range Planning Committee  
US-Japan Joint Planning Committee (CT-Fusion Research)  
Referee for Physics of Fluids, Physical Review Letters,  
Nuclear Fusion  
Co-Chairman, US Workshop on Compact Toroid Research
- 1985-86 US DOE Compact Torus Research Long Range Planning Committee  
US-Japan Joint Planning Committee (CT-Fusion Research)  
Referee for Physics of Fluids, Physical Review Letters,  
Nuclear Fusion  
Mentor, Rickover Science Institute
- 1984-85 US DOE Long Range Planning Committee for Compact Toroid  
Research  
US - Govt. of Japan CT Joint Planning Committee  
Referee for Physics of Fluids, Physical Review Letters, Nuclear Fusion  
Mentor, Rickover Science Institute  
Session Chairman, 1984 APS-DPP Meeting
- 1983-84 US DOE Long Range Planning Committee for Compact Torus  
Research  
US - Government of Japan CT Joint Planning Committee  
Referee for Physics of Fluids, Physical Review Letters, US DOE

Proposals

- 1982-83 US DOE Long Range Planning Committee for Compact Torus Research  
US DOE S-1 Review Panel (Chairman)  
Referee for Physical Review Letters, Physics of Fluids, Nuclear Fusion, U.S. DOE Proposals  
Science Fair Judge, Eleanor Roosevelt Senior High School
- 1981-82 Referee for Physical Review Letters, Physics of Fluids, Nuclear Fusion
- 1980-81 Referee for Physical Review Letters, Physics of Fluids
- 1979-80 Member LASL Compact Torus Program Review Panel, US DOE  
Member, Princeton Plasma Physics Laboratory S-1  
Spheromak Program Review Panel, US DOE  
Referee, US DOE Proposals  
Referee for Physics of Fluids, Physical Review Letters
- 1978-79 Consultant, US Naval Research Laboratory  
Referee for Physics of Fluids, Physical Review Letters  
Referee, US DOE proposals  
Member, Tormac Program Review Panel, US DOE
- 1976-77 Consultant, US Naval Research Laboratory
- 1975-76 Consultant, US Naval Research Laboratory
- 1974-75 Consultant, US Naval Research Laboratory  
Project Custer Technical Review Panel, US Army  
Missile Command and Ballistics Research Laboratory
- 1973-74 Reviewer for Nuclear Fusion and Plasma Science  
Consultant, US Naval Research Laboratory  
Member, US AEC Review Panel of the Uses of  
Relativistic Electron Beams in Controlled  
Thermonuclear Fusion Research

IX. Courses Taught

PHYS 286	Intermediate Physics Laboratory	(2)	1974 Spring
PHYS 899	Doctoral Dissertation Research	(3)	1974 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1974 Fall
PHYS 286	Intermediate Physics Laboratory	(2)	1974 Fall
PHYS 899	Doctoral Dissertation Research	(3)	1975 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1975 Spring
PHYS 899	Doctoral Dissertation Research	(3)	1975 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1975 Fall
PHYS 295	Introductory Lab	(2)	1975 Fall
PHYS 899	Doctoral Dissertation Research	(3)	1976 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1976 Spring
PHYS 296	Introductory Lab	(2)	1976 Spring
PHYS 899	Doctoral Dissertation Research	(3)	1976 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1976 Fall
PHYS 398B	Independent Studies Seminar		1977 Spring
PHYS 869	Special Topics on Plasma Physics Plasma Equilibrium, Stability and Transport	(2)	1977 Spring
PHYS 899	Doctoral Dissertation Research	(3)	1977 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1977 Fall
PHYS 398	Independent Research	(2)	1977 Fall
PHYS 121	Fundamentals of Physics	(4)	1977 Spring
PHYS 899	Doctoral Dissertation Research	(4)	1978 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1978 Spring
PHYS 122	Fundamentals of Physics	(4)	1978 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1978 Fall
PHYS 899	Doctoral Dissertation Research	(3)	1978 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1979 Spring
PHYS 122	Fundamentals of Physics	(4)	1978 Spring
PHYS 299	Undergraduate Research	(3)	1979 Spring
PHYS 863	Plasma Equilibrium, Stability, and Transport	(3)	1979 Fall
PHYS 499	Undergraduate Research	(3)	1979 Fall
PHYS 899	Doctoral Dissertation Research	(9)	1979 Fall
PHYS 769	Seminar in Plasma Research	(1)	1979 Fall
PHYS 863	Plasma Equilibrium Stability and Transport	(3)	1981 Fall
PHYS 122	Fundamentals of Physics	(4)	1982 Spring
PHYS 111	Physics in the Modern World	(3)	1982 Fall
PHYS 400	Basic Concepts of Physics	(3)	1982 Fall
PHYS 399	Special Problems in Physics	(1)	1982 Fall
PHYS 899	Doctoral Dissertation Research	(2)	1982 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1982 Fall

PHYS 112	Physics in the Modern World	(3)	1983 Spring
PHYS 401	Basic Concepts of Physics	(3)	1983 Spring
PHYS 899	Doctoral Dissertation Research	(2)	1983 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1983 Spring
PHYS 111	Physics in the Modern World	(3)	1983 Fall
PHYS 400	Basic Concepts of Physics	(3)	1983 Fall
PHYS 899	Doctoral Dissertation Research	(3)	1983 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1983 Fall
PHYS 112	Physics in the Modern World	(3)	1984 Spring
PHYS 401	Basic Concepts of Physics	(3)	1984 Spring
PHYS 899	Doctoral Dissertation Research	(3)	1984 Spring
PHYS 769	Seminar in Plasma Physics	(3)	1984 Spring
PHYS 111	Physics in the Modern World	(3)	1984 Fall
PHYS 400	Basic Concepts of Physics	(3)	1984 Fall
PHYS P899	Doctoral Dissertation Research	(3)	1984 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1984 Fall
PHYS 112	Physics in the Modern World	(3)	1985 Spring
PHYS 401	Basic Concepts of Physics	(3)	1985 Spring
PHYS 899	Doctoral Dissertation Research	(6)	1985 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1985 Spring
PHYS 111	Physics in the Modern World	(3)	1985 Fall
PHYS 400	Basic Concepts of Physics	(3)	1985 Fall
PHYS 899	Doctoral Dissertation Research	(3)	1985 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1985 Fall
PHYS 112	Physics in the Modern World	(3)	1986 Spring
PHYS 401	Basic Concepts of Physics	(3)	1986 Spring
PHYS 899	Doctoral Dissertation Research	(3)	1986 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1986 Spring
PHYS 461	Introduction to Fluid Mechanics	(3)	1986 Fall
PHYS 899	Doctoral Dissertation Research	(6)	1986 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1986 Fall
PHYS 862	Physics and Technology of Controlled Fusion	(3)	1987 Spring
PHYS 899	Doctoral Dissertation Research	(9)	1987 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1987 Spring
PHYS 621	Graduate Laboratory	(3)	1987 Fall
PHYS 429	Advanced Laboratory	(3)	1987 Fall
PHYS 899	Doctoral Dissertation Research	(9)	1987 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1987 Fall
PHYS 461	Introduction to Fluid Mechanics	(3)	1989 Fall
PHYS 899	Doctoral Dissertation Research	(9)	1989 Fall
PHYS 102	Physics of Music	(3)	1990 Fall
PHYS 899	Doctoral Dissertation Research	(9)	1990 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1990 Fall
PHYS 171	Introductory Physics	(3)	1991 Fall

PHYS 899	Doctoral Dissertation Research	(6)	1991 Fall
PHYS 769	Seminar in Plasma Physics	(1)	1991 Fall
PHYS 275	Experimental Physics I	(1)	1992 Spring
PHYS 899	Doctoral Dissertation Research	(9)	1992 Spring
PHYS 769	Seminar in Plasma Physics	(1)	1992 Spring
PHYS 899	Doctoral Dissertation Research	(1)	1993 Fall
PHYS 899	Doctoral Dissertation Research	(1)	1994 Spring
PHYS 117	Introduction to Physics	(4)	1993 Fall
PHYS 461	Introduction to Fluid Mechanics	(3)	1994 Spring
PHYS 761	Plasma Physics	(3)	1998 Fall
PHYS 121	Fundamentals of Physics	(3)	1999 Spring

## X. Publications:

### A. Papers Published in Refereed Journals

#### A-1. Physics Research

1. Experimental Study of Shock Wave Formation in an Almost Collision-Free Plasma, with E. A. Hintz, *Phys. Fluids* **8**, 2111 (1965).
2. Measurement of Electron Temperatures Produced by Collisionless Shock Waves in a Magnetized Plasma, with J. W. M. Paul, A. Iiyoshi, L. S. Holmes, and R. A. Hardcastle, *Nature* **216**, 363 (1967).
3. Experimental Study of Collision-Free Shock Waves and Anomalous Electron Heating, *Phys. Fluids* **10**, 1897 (1967).
4. Spectroscopic Investigation of Enhanced Oscillations in a High Voltage Theta Pinch, with H. J. Kunze, H. R. Griem, A. W. DeSilva, and I. J. Spalding, *Phys. Fluids* **12**, 2669 (1969).
5. Experimental Study of the Magnetic Piston-Shockwave Problem in a Collisionless Plasma, with A. W. DeSilva, W. F. Dove, and I. J. Spalding, *Phys. Fluids* **14**, 42 (1971).
6. Fusion of Electron Beam Accelerated Ions, *Phys. Lett.* **39A**, 17 (1972).
7. Solitary Waves in a Two Ion Beam, Magnetized Plasma, with K. A. Gerber, L. S. Levine, and N. A. Krall, *Phys. Fluids* **15**, 1491 (1972).
8. Energy Loss Effects on Turbulent Heating, with K. A. Gerber, *Phys. Lett.* **42A**, 339 (1973).
9. Experimental Observations on the Thermal Expansion of a Plasma, *Phys. Fluids* **16**, 1289 (1973).
10. Plasma Heating by Intense Relativistic Electron Beams, with W. F. Dove, K. A. Gerber, and B. G. Logan, *Phys. Rev. Lett.* **32**, 830 (1974).
11. X-Ray Bremsstrahlung Measurements of an Intense Relativistic Electron Beam Propagating in a Plasma, with B. G. Logan, W. F. Dove, and K. A. Gerber, *IEEE Trans. on Plasma Science* Sept. RS-2, 182 (1974).
12. Plasma Heating in a High Voltage Toroidal Pinch, with Y. G. Chen, C. Chin-Fatt, Y. P. Chong, A. W. DeSilva, H. R. Griem, R. A. Hess, R. L. Merlino, and D. P. Murphy, *Phys. Rev. Lett.* **38**, 1400 (1977).
13. Experimental and Numerical Studies of Magnetohydrodynamic Stability Properties of a Rectangular Cross Section Finite  $\beta$  Toroidal Plasma, with A. W. Allen, F. L. Cochran, and P. C. Liewer, *Phys. Rev. Lett.* **39**, 404 (1977).

14. Intense Relativistic Electron Beam Interaction with a Cool Theta Pinch Plasma, with D. Hammer, K. A. Gerber, W. F. Dove, B. G. Logan, and K. Papadopoulos, *Phys. Fluids* **21**, 483 (1978).
15. Reversed Field Configuration Generated by a Rotating Relativistic Electron Beam, with J. D. Sethian, D. A. Hammer, K. A. Gerber, D. N. Spector, and A. E. Robson, *Phys. Fluids* **21**, 1277 (1978).
16. Observation of the Nonlinear Phase of a Noncircular Cross-Section Toroidal Kink Instability, with A. W. Allen, *Phys. Fluids* **22**, 795 (1979).
17. Observations of a Highly Collisional Toroidal Plasma Equilibrium, with A. W. Allen and J. A. Antoniadis, *Phys. Fluids* **22**, 2394 (1979).
18. Formation of a Spheromak Plasma Configuration, with J. H. Irby, Y. P. Chong, and G. Hart, *Phys. Rev. Lett.* **44**, 393 (1980).
19. Electron and Ion Heating in a High Voltage Toroidal Theta Pinch with Parallel or Antiparallel Bias Fields, with R. L. Merlino, C. Chin-Fatt, Y. P. Chong, A. W. DeSilva, H. R. Griem, R. A. Hess, and D. P. Murphy, *Phys. Fluids* **24**, 2358 (1981).
20. Experimental Studies of Spheromak Formation, with H. Bruhns, C. Chin-Fatt, Y. P. Chong, A. W. DeSilva, H. R. Griem, G. W. Hart, R. A. Hess, J. H. Irby, R. S. Shaw, *Phys. Fluids* **26**, 1616 (1983).
21. Macroscopic Plasma Behavior in a High Voltage Toroidal Theta Pinch, with D. P. Murphy, C. Chin-Fatt, Y. P. Chong, A. W. DeSilva, H. R. Griem, R. A. Hess, R. L. Merlino, *Phys. Fluids* **26**, 1061 (1983).
22. Investigation of the Magnetic Structure and the Decay of a Plasma Gun Generated Compact Torus Experiment, with W. C. Turner, H. E. Dalhed, E. H. A. Granneman, J. H. Hammer, C. W. Hartman, D. S. Prono, and J. Taska, *Phys. Fluids* **26**, 1965 (1983).
23. Finite Pressure Gradient Influences on Ideal Spheromak Equilibrium, with G. W. Hart, C. Chin-Fatt, A. W. DeSilva, G. C. Goldenbaum, R. Hess, and R. S. Shaw, *Phys. Rev. Lett.* **51**, 1558 (1983).
24. Critical Field Index for Passive Coil Stabilization of the Spheromak Shift Instability, with R. A. Hess and R. S. Shaw, *Rev. Sci. Instrum.* **57**, 2961 (1986).
25. Poloidal Ion Motion During Formation of Toroidal High Beta Plasmas, with J. Antoniadis and B. Weber, *Phys. Fluids* **31**, 1244 (1988).
26. Equilibrium Sailing Velocities, *Am. J. Phys.* **56**, 209 (1988).
27. Plasma Rotation During Spheromak Formation, with T. Peyser, *Phys. Rev. Lett.* **61**, 955 (1988).

28. Mechanical Injection of Magnetic Helicity during Spheromak Formation, with B. Barrow, Phys. Rev. Lett. **64**, 1369 (1990).
29. Vacuum-Plasma Boundary Helicity Injection, with B. Barrow, Phys. Fluids **4B**, 2577 (1992).
30. Nitric Oxide Production by Lightning Discharge, with R. R. Dickerson, J. Geophys. Res. **98**, 1833 (1993).
31. Formation and Decay of a Spheromak Plasma, with C. Chin-Fatt, A. W. DeSilva, R. Hess, C. Coté, A. Filuk, J.-L. Gauvreau and F. K. Hwang, Phys. Fluids B **5**, 1816 (1993).
32. Nitric Oxide Production by Simulated Lightning: Dependence on Current, Energy and Pressure, with Y. Wang, A. W. DeSilva and R. R. Dickerson, J. Geophys. Res. **103**, No. D15, 19,149-19,159 (1998).

## A-2. Instrumentation or Techniques

1. A New Collective Effect, High Flux Ion Accelerator, IEEE Trans. on Nucl. Science **NS-22**, 1009 (1975).

## B. Papers Presented at Scientific Meetings

### B-1. Invited Papers

1. Toroidal Experiments at the University of Maryland, Proc. of the High Beta Workshop, Los Alamos, New Mexico, Aug. 1975, ERDA, Washington D.C. (1975) (Invited talk, published in entirety).
2. Dynamically Formed Spheromak Plasma (PS-1), U.S.-Japan Joint Symposium on Compact Toruses and Energetic Particle Injection, Princeton, N.J., Dec. 13, 1979.
3. Dynamically Formed High Beta Tokamak Plasma, U.S.- Japan Workshop on Tokamak Results, Oak Ridge, Nov. 18-20, 1980.
4. Summary of Spheromak Equilibrium and Stability Experiments, 3rd Symposium on Physics and Technology of Compact Toroids in the Magnetic Fusion Energy Program, Los Alamos, Dec. 4, 1980.
5. The Paramagnetic Spheromak, Division of Plasma Physics of the American Physical Society, Boston, Nov. 15, 1979.
6. Review of Spheromak Experiments, 4th Symposium on Physics and Technology of Compact Toroids, Livermore, California, Oct. 27-29, 1981.
7. The Physics of the Spheromak, Physica Scripta **T2:2**, 359 (1982), Proceedings of the Invited Talks at the 1982 International Conference on Plasma Physics, Goteborg, Sweden, June 1982.

8. The Maryland Spheromak Program, 6th U.S. Symposium on Physics and Technology of Compact Toroids and U.S.-Japan Joint Symposium on Compact Toroid Research, Princeton, Feb. 20-23, 1984.
9. The Spheromak Approach to a Controlled Nuclear Fusion Reactor, 20th Intersociety Energy Conversion Engineering Conference, Miami Beach, August 18-23, 1985, reprinted in Proceedings of the 20th Intersociety Energy Conversion Conference, Engineering Conference (SAE Warrendale, PA, 1985), p. 3.23.
10. Initial Results from the Maryland Spheromak Experiment, Proceedings of the Eighth U.S.-Japan Symposium on Compact Toroid Research, Osaka, Japan, Nov. 21-22, 1986.
11. Recent Results on the MS Spheromak, with C. Chin-Fatt, A. W. DeSilva, R. Hess, C. Cote, A. Filuk, J.-L. Gauvreau and F. K. Hwang, Proceedings of the 10th U.S.-Japan Workshop on Compact Toroids, Hakone, Japan, Nov. 11-16, 1988.
12. Maryland Spheromak Research, with B. Barrow, C. Chin-Fatt, C. Cote, A. W. DeSilva, A. Filuk, J.-L. Gauvreau, R. Hess and F.-K. Hwang, Proceedings of the 12th U.S.-Japan Workshop on Compact Toroids, Tokyo, March 18-20, 1991.
13. Magnetic Helicity Injection in Spheromaks, International School of Plasma Physics-8, Varenna, October 15-24, 1990.
14. Laboratory Simulation of Nitric Oxide Production by Lightning, APS/DPP Meeting, New Orleans, Nov. 20, 1998.

## B-2. Colloquia, Seminars, and Special Lectures

1. Toroidal High Beta Equilibrium and Stability, Colloquium, Oct. 11, 1975, Columbia University.
2. Resistive Toroidal Equilibria, Colloquium, Dec. 11, 1975, Courant Institute of Mathematical Sciences, New York University.
3. High Beta Tokamaks, Colloquium, Feb. 11, 1975, Cornell University.
4. High Beta Heating and Equilibrium Experiments, Colloquium, Sept. 21, 1977, Cornell University.
5. High Beta Stability Results from TERP, Small Tokamak Users Conference, Princeton Plasma Physics Laboratory, Mar. 5, 1979.
6. Paramagnetic Spheromak, Colloquium, Auburn University, June 18, 1979.
7. Paramagnetic Spheromak, Seminar, US DOE, Aug. 29, 1979.
8. Spheromak Results at the University of Maryland, US DOE Fusion Power Coordinating Committee Meeting, Los Alamos, NM, Oct. 15, 1979.

9. Paramagnetic Spheromak, Colloquium, Columbia University, Nov. 2, 1979.
10. Paramagnetic Spheromak, Colloquium, Cornell University, Dec. 5, 1979.
11. The Paramagnetic Spheromak, Colloquium, Princeton Plasma Physics Laboratory, Princeton University, Feb. 13, 1980.
12. The Spheromak, Colloquium, Department of Electrical Engineering, University of Maryland, March 7, 1980.
13. The PS-1 Spheromak Experiment, Seminar, Lawrence Livermore National Laboratory, Sept. 24, 1980.
14. The Spheromak, Colloquium, California Institute of Technology, Dec. 16, 1980.
15. The Physics of the Spheromak, Colloquium, Auburn University, Feb. 28, 1982.
16. Plasma Lense for  $\bar{p}$  Source, Fermilab, March 29, 1982.
17. The Spheromak, Colloquium, Columbia University, Sept. 17, 1982.
18. Spheromak Experiments at Maryland, Waseda University (Tokyo), November 20, 1984.
19. Spheromak Experiments at Maryland, Osaka University, November 16, 1984.
20. The Spheromak, Cornell University, March 5, 1986.
21. Spheromak Formation and Coronal Loops, Cornell University, October 18, 1989.
22. Introduction to Fusion Power, Univ. of Tokyo (8 hrs), Spring 1991.
23. Magnetic Helicity Injection, Nihon Univ., March, 1991.
24. Magnetic Helicity and Flux Tube Twisting, Univ. of Tokyo, April, 1991.
25. Fusion Research in the U.S., Tokyo Electric Power Company Research Laboratories, April, 1991.
26. Fusion Research in the U.S., Institute of Electrical Engineering of Japan, Tokyo, March, 1991.
27. Maryland Spheromak Research, Ministry of Education of Japan Fusion Research Meeting, Nagoya, February, 1991.
28. Lightning and Nitric Oxide in the Atmosphere, Dept. of Meteorology, University of Maryland, College Park, March, 1998.

**B-3. Contributed Papers (abstract only)**

1. Inverse Compton Scattering of L Photons to X-Ray Energies, with R. U. Datla, BAPS **20**, 1283 (1975).
2. Diagnostic Measurements on the Maryland Rectangular Toroidal Pinch (TERP), with A. W. Allen, BAPS **20**, 1328 (1975).
3. Studies of Preheater Plasma in the Maryland Toroidal Theta Pinch (THOR), with C. Chin-Fatt et al., BAPS **20**, 1328 (1975).
4. Resistive Toroidal Plasma Equilibria, with A. W. Allen, Washington Spring APS Meeting (1976).
5. THOR, A High Beta Shock Heated, Toroidal Theta Pinch, with C. Chin-Fatt, Y. G. Chen, A. W. DeSilva, H. R. Griem, and D. Markens, BAPS II **21**, 1034 (1976).
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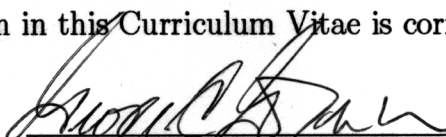
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#### G. Contracts, Grants, and Proposals

1. NSF — NO<sub>x</sub> Production by Atmospheric Discharge, \$330 K.

To the best of my knowledge the information in this Curriculum Vitae is correct.

  
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