CURRICULUM VITAE

James Reid IPSER

Born July 13, 1942, New Orleans, Louisiana

ADDRESS

P.O. Box 118440
Dept. of Physics, New Physics Bldg.
University of Florida
Gainesville, FL 32611
Phone: (352) 392-0511
Fax: (352) 379-9942
E-mail: ipser@phys.ufl.edu

EDUCATION

B.S.	(Physics)	1964	Loyola University, New Orleans
M.S.	(Physics)	1967	California Institute of Technology
Ph.D.	(Physics)	1969	California Institute of Technology

PROFESSIONAL RECORD

Summer 1963	Lecturer in Physics	Loyola University
Summer 1964	Research Physicist	Shell Oil Company
1969-1970	Postdoctoral Fellow	California Institute of Technology
1970-1971	Postdoctoral Fellow	University of Washington
1971-1977	Assistant Professor	Astronomy and Astrophysics, U. Chicago
1974-1976	Lecturer	Adler Planetarium of the City of Chicago
Summer 1976	Visiting Associate	California Institute of Technology
1977-1981	Associate Professor with Tenure	Astronomy and Astrophysics, U. of Chicago
1981-present	Professor	Physics and Astronomy, Univ. of Florida
1984-1991	Consultant	Livermore National Laboratory
1988-1990	Divisional Assoc. Editor	Physical Review D
1993-1999	Vice Associate Chair	Physics Dept., Univ. of Florida
1993-present	Consultant: Accidents	Attorneys *et. al.*

PROFESSIONAL SOCIETIES

Society of Accident Reconstructionists
International Society of Biomechanics
Accident Reconstruction Network
Society of Automotive Engineers
American Physical Society
International Astronomical Union
American Astronomical Society
Intl. Soc. on General Relativity and Gravitation

CERTIFICATION: Accident Reconstructionist (Society of Accident Reconstructionists; 1997)

COURSES TAUGHT RECENTLY

PHYSICS I

(Physics for Premeds and other Preprofessionals)

PART ONE: MECHANICS

I. Mathematical Concepts

II. Vectors

III. Kinematics in One and Two Dimensions
- Displacement, Speed and Velocity, Acceleration
- Equations of Kinematics for Constant Acceleration

IV. Forces and Newton's Laws of Physics
- Newton's Three Laws
- Forces: Gravitation, Normal Forces, Friction, Tension
- Equilibrium and Nonequilibrium Applications
- Biomechanical Appications

V. Impulse and Momentum
- Conservation of Momentum
- Collisions (autos, particles, astrophysical systems, etc.)

VI. Elasticity
- Elastic and Plastic Deformation
- Stress and Strain
- Springs

VII. Fluids
- Density, Pressure, Bernoulli's Equation

PART TWO: WAVE MOTION

I. Waves and Sound

II. Superposition Principle and Interference

PART THREE: ELECTRICITY AND MAGNETISM

I. Electric Fields

II. Circuits

III. Magnetic Fields

IV. Optics

PHYSICS WITH CALCULUS

(Physics for Engineers)

Same Topics as in Physics I except at More Advanced Level

COURSES TAUGHT RECENTLY

PHY 5277: PHYSICS OF ACCIDENT RECONSTRUCTION AND BIOMECHANICS

Instructor: James R. Ipser (NPB 2174; 392-0511, 392-0521)

COURSE OUTLINE

Basic Elements of Accident Reconstruction

- 2-Body Collisions
  - Momentum Conservation
  - Coefficient of Restitution
  - Energy Conservation
- Spring Model for Vehicle Crush and Velocity Changes
  - Hooke's Law
  - Crush Stiffness Coefficients
  - Relative Velocity
  - Value of Coefficient of Restitution
  - Vehicle Change of Velocity (rear-end, frontal, side)
  - Allowances for Spin

Basic Elements of Object Dynamics and Biomechanics

- Restraint System and Headrest Efficacy
- Forces of Impact on Body Parts, and Comparisons with Published Damage Criteria:
  - Lumbar Spine
  - Thoracic Spine
  - Cervical Spine
  - Head
  - Face and Skull
  - TMJ
  - Shoulder
  - Thorax
  - Abdomen
  - Hand/Wrist Complex
  - Knee/Hip/Thigh Complex

Additional Concepts

- Coefficient of Friction
- Skidmark Analysis
- Restraint-System Analyses
- Rollover Accidents
- Reaction Times
- Curves in Roads
- Motorcycle and Bicycle Accidents
- Pedestrian Accidents
- Slip-and-Fall Accidents
- Visual Acuity

PUBLICATIONS James R. Ipser

1. "Stability of Relativistic Star Clusters" (with K.S. Thorne), *Bull Amer. Phys. Soc.*, **12**, 1122 (1967).
2. "White-Dwarf and Neutron-Star Interpretations of Pulsing Radio Sources" (with K.S. Thorne), *Ap. J.*, **152**, L71 (1968).
3. "Relativistic, Spherically Symmetric Star Clusters. I. Stability Theory for Radial Perturbations" (with K.S. Thorne), *Ap. J.*, **154**, 251 (1968).
4. "Relativistic, Spherically Symmetric Star Clusters. II. Sufficient Conditions for Stability against Radial Perturbations", *Ap. J.*, **156**, 509 (1969).
5. "Relativistic, Spherically Symmetric Star Clusters. III. Stability of Compact Isotropic Models", *Ap. J.*, **158**, 17 (1969).
6. "Relativistic Star Clusters" (with E.D. Fackerell and K.S. Thorne), *Comments on Astrophysics and Space Physics*, **1**, 134 (1969).
7. "The Stability of Relativistic Spherically Symmetric Star Clusters", Ph.D. thesis, California Institute of Technology (1969).
8. "On the Stability of Ultrarelativistic Stars", *Astrophysics and Space Science*, **7**, 361 (1970).
9. "On the Study by Podurets of the Stability of Relativistic Star Clusters", *Astronomicheskee Zhurnal*, **47**, 452 (1970).
10. "Gravitational Radiation from Slowly Rotating, Fully Relativistic Stars", *Ap. J.*, **166**, 175 (1971).
11. "Relativistic Star Clusters", *Proceedings of Course 47 of Intl. School of Physics Enrico Fermi* (Academic Press, 1971).
12. "Electromagnetic Test Fields around a Kerr-Metric Black Hole", *Phys. Rev. Letters*, **27**, 529 (1971).
13. "Electromagnetic Test Fields around a Rotating Black Hole" (with E.D. Fackerell), *Phys. Rev. D.*, **5**, 2455 (1972).
14. "Solution of the Scalar Wave Equation in a Kerr Background by Separation of Variables" (with D.R. Brill, P.L. Chrzanowski, C.M. Pereira and E.D. Fackerell), *Phys. Rev. D*, **5**, 1913 (1972).
15. "Nonradial Pulsation of General-Relativistic Stellar Models. VI. Corrections" (with K.S. Thorne), *Ap. J.*, **181**, 181 (1973).
16. "The Stability of Scalar Perturbations of a Kerr-Metric Black Hole" (with S.L. Detweiler), *Ap. J.*, **185**, 675 (1973).
17. "A Variational Principle and a Stability Criterion for the Nonradial Modes of Pulsation of Stellar Models in General Relativity" (with S.L. Detweiler), *Ap. J.*, **185**, 685 (1973).
18. "On Using Entropy Arguments to Study the Evolution and Secular Stability of Spherical Stellar-Dynamical Systems", *Ap. J.*, **193**, 463 (1974).
19. "On the Implications of the Nonexistence of Unstable Normal Modes for the Stability of Spherical Stellar Models to Nonradial Perturbations in General Relativity", *Ap. J.*, **199**, 220 (1975).
20. "Dynamics of Relativistic Stellar Systems", *Proceedings of International Astronomical Union Symposium No. 69* (Reidel, 1975).
21. "Rapidly Rotating Fluid Bodies in General Relativity" (with E.M. Butterworth), *Ap. J. Letters*, **200**, L103 (1975).

22. "Quark-Bag Equation of State and a Possible Third Regime of Stable Cold Stars" (with M.B. Kislinger and P.D. Morley), *Enrico Fermi Institute Report* NO. 75-38 (1975).
23. "On the Structure and Stability of Rapidly Rotating Fluid Bodies in General Relativity. I. The Numerical Method of Computing Structure and its Application to Uniformly Rotating Homogeneous Bodies" (with E.M. Butterworth), *Ap. J.*, **204**, 224 (1976).
24. "Accretion onto Pregalactic Black Holes" (with R.H. Price), *Ap. J.*, **216**, 578 (1977).
25. "A Numerical Method for Integrating the Stellar-Dynamical Fokker-Planck Equation in a Fixed Inhomogeneous Gravitational Background", *Ap. J.*, **218**, 846 (1977).
26. "The Distribution of Stars around a Massive Central Black Hole in a Spherical Stellar System. I. Results for Test Stars with a Unique Mass and Radius", *Ap. J.*, **222**, 976 (1978).
27. "A Connection between Stability and the Nonexistence of Unstable Proper Normal Modes for Certain Classes of Perturbations of Gravitating Systems" (with R. Semenzato), *Ap. J.*, **227**, 590 (1979).
28. "A Variational Principle for the Even-Parity Perturbations of Spherically Symmetric Star Clusters in General Relativity" (with R. Semenzato), *Ap. J.*, **229**, 1098 (1979).
29. "The Problem of Maximizing Functionals in Newtonian Stellar Dynamics, and Its Relation to Thermodynamic and Dynamical Stability" (with G. Horwitz), *Ap. J.*, **232**, 863 (1979).
30. "A Binding-Energy Criterion for the Dynamical Stability of Spherical Stellar Systems in General Relativity", *Ap. J.*, **238**, 1101 (1980).
31. "Stability Theory of the Orbit-Averaged Boltzmann Equation" (with H. Kandrup), *Ap. J.*, **241**, 1141 (1980).
32. "Odd-Parity Perturbations of Spherically Symmetric Star Clusters in General Relativity" (with R. Semenzato), *Ap. J.*, **250**, 362 (1981).
33. "On the Existence and Structure of Inhomogeneous Analogs of the Dedekind and Jacobi Ellipsoids" (with R. Managan), *Ap. J.*, **247**, 671 (1981).
34. "Synchrotron Radiation from Spherically Accreting Black Holes" (with R. Price), *Ap. J.*, **225**, 654 (1982).
35. "The Effect of Gravitational Radiation on the Secular Stability of a Rotating, Axisymmetric Galaxy" (with P. Vandervoort), *Ap. J.*, **256**, 497 (1982).
36. "Can Galactic Halos be Made of Axions?" (with P. Sikivie), *Phy. Rev. Lett.*, **50**, 925 (1983).
37. "Comptonization Effects in Spherical Accretion onto Black Holes" (with R. Price), *Ap. J.*, **67**, 371 (1983).
38. "On the Effects of Strong Encounters in Stellar Systems. I. A Basis for Treating Anisotropic Systems" (with R. Semenzato), *Ap. J.*, **271**, 294 (1983).
39. "On the Emission of Gravitational Radiation from Inhomogeneous Jacobi Configurations" (with R. Managan), *Ap. J.*, **282**, 287 (1984).
40. "Gravitationally Repulsive Domain Wall" (with P. Sikivie), *Phy. Rev. D*, **30**, 712 (1984).

41. "Models of Rapidly Rotating Neutron Stars" (with J. Friedman and L. Parker), *Nature*, **312**, 255 (1984).
42. "Repulsive and Attractive Planar Walls in General Relativity", *Phys. Rev. D*, **30**, 2452 (1984).
43. "An Eulerian Variational Principle and a Criterion for the Occurrence of Nonaxisymmetrical Neutral Modes Along Rotating Axisymmetric Sequences" (with R. Managan), *Ap. J.*, **292**, 517 (1985).
44. "Effects of Encounters between Disk Stars and a Galactic-halo Population" (with R. Semenzato), *Astron. Astrophys.*, **149**, 408 (1985).
45. "Rapidly Rotating Neutron Star Models" (with J. Friedman and L. Parker), *Ap. J.*, **304**, 115 (1986).
46. "On the Maximum Mass of a Uniformly Rotating Neutron Star" (with J. Friedman), *Ap. J.*, **314**, 594 (1987).
47. "Estimates of the Density of Dark Matter Near the Center of the Galaxy" (with P. Sikivie), *Phys. Rev. D*, **35**, 3695 (1987).
48. "Double-Bubble Spacetimes", *Phys. Rev. D*, **36**, 1933 (1987).
49. "Turning-Point Method for Axisymmetric Stability of Rotating Relativistic Stars" (with J. Friedman and R. Sorkin), *Ap. J.*, **325**, 722 (1988).
50. "Repulsive and Attractive Double-Bubble Spacetimes", *Ann. New York Acad. Sci.*, 536, 77 (1988).
51. "Oscillations and Stability of Rapidly Rotating Neutron Stars" (with L. Lindblom), *Phys. Rev. Lett.*, **62**, 2777 (1989).
52. "Implications of a Half-Millisecond Pulsar" (with J. Friedman and L. Parker), *Phys. Rev. Lett.*, **62**, 3015 (1989).
53. "The Oscillations of Rapidly Rotating Newtonian Stellar Models" (with L. Lindblom), *Ap. J.*, **355**, 226 (1990).
54. "Rapidly Rotating Neutron Stars: Implications of Half-Millisecond Periods", *Ann. New York Acad. Sci.*, **617**, 138 (1990).
55. "Scattering of Ground Based Lasers by Aerosols in an Atmosphere with Enhanced Particle Content" (with L. Rosen), *Atmos. Environ.*, **25A**, 2643 (1991).
56. "The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects" (with L. Lindblom), *Ap. J.*, **373**, 213 (1991).
57. "Nonradial Pulsations of Stellar Models in General Relativity" (with R. Price), *Phys. Rev. D*, **43**, 1768 (1991).
58. "Relation of Gauge Formalisms for Pulsations of General-Relativistic Stellar Models" (with R. Price), *Phys. Rev. D*, **44**, 307 (1991).
59. "On the Adiabatic Pulsations of Accretion Disks and Rotating Stars" (with L. Lindblom), *Ap. J.*, **379**, 285 (1991).
60. "A New Method for Treating Nonradial Pulsations in General Relativity", *Ann. New York Acad. Sci.*, **631**, 110 (1991).
61. "On the Pulsations of Relativistic Accretion Disks and Rotating Stars: The Cowling Approximation" (with L. Lindblom), *Ap. J.*, **389**, 392 (1992).
62. "Rapidly Rotating Relativistic Stars" (with J. Friedman), *Phil. Trans. R. Soc. Lond. A*, **340**, 391 (1992).

63. "Phase-Space Structure of Cold Dark Matter Halos" (with P. Sikivie), *Physics Lett. B*, **291**, 288 (1992).
64. "The Oscillations and Stability of Rotating Fluids: The Two-Potential Formalism" (with L. Lindblom), *Ann. New York Acad. Sci.*, **675**, 84 (1992).
65. "Rapidly Rotating Relativistic Stars" (with J. Friedman), in *Classical General Relativity*, Oxford Univ. Press, (ed. S. Chandrasekhar) (1993).
66. "Low-Frequency Modes and Nonbarotropic Effects in Pseudo-Newtonian Accretion Disks", *Ap. J.*, **435**, 767 (1994).
67. "Low-Frequency Modes of Pulsation of Relativistic Accretion Disks", *Ann. New York Acad. Sci.*, **773**, 256 (1995).
68. "Relativistic Accretion Disks: Low-Frequency Modes and Frame Dragging", *Ap. J.*, **458**, 508 (1996).
69. "Low-Frequency Modes of Pulsation and QPO's", in *Proceedings of 7th M. Grossman Meeting on General Relativity*, World Scientific (1996).
70. "Relativistic Stellar Pulsations with Near-Zone Boundary Conditions" (with L. Lindblom and G. Mendell), *Phys. Rev. D*, **56**, 2118 (1997).
71. "Low-Frequency Oscillations of Relativistic Accretion Disks", in *Relativistic Astrophysics*, Viewig, (ed. H. Riffert et al.) (1998).
72. "The R-Modes of the Maclaurin Spheroids" (with L. Lindblom), *Phys. Rev. D*, **59**, 044009-1 (1999).
73 "On the Maximum Mass of Neutron Stars" (with C. Vuille), in *General Relativity and Relativistic Astrophysics*, (ed. C. Burgess and R. Myers) (2000).
74 "Einstein-Proca Theory and Naked Singularities" (with C. Vuille), in *General Relativity and Gravitation*, in press (2002).