1.   Name: Eugene R. Tracy
        Office Address: Small 175
        Office Phone: (757) 221-3527
        Home Address: 610 Pollard Park, Williamsburg, VA 23187-8975

2.   Position: Professor of Physics

EDUCATION

3.   B.S., Johns Hopkins University, 1980;
        M.S., University of Maryland, 1981;
        Ph.D., University of Maryland, 1984.

ACADEMIC POSITIONS

4.   Undergraduate work study - Johns Hopkins University- 1979-1980; Scientific Technician - Lawrence Livermore National Laboratory - summer 1980; Teaching Assistant - University of Maryland - 1980-1982; Research Assistant - University of Maryland - 1982-1984; Instructor - College of William and Mary - 1984-1985; Assistant Professor - 1985-1990; Associate Professor - 1990-1996; Professor - 1997-present; Director of the Graduate Program, Physics Department - College of William and Mary - 1990-1992; Director of Graduate House - College of William and Mary – 1998-present.

HONORS, PRIZES AND AWARDS

5.   William and Mary Alumni Teaching Fellow, Fall 1990

COURSES TAUGHT

6.   PHYS 101-102 Problem Sessions in general physics
        PHYS 121 Physics of Music
        PHYS 150 Freshman Seminar: Time
        PHYS 175 Cosmology
        PHYS 176 Astronomy
        PHYS 208 Classical Mechanics of Particles and Waves I
        PHYS 267 The Strategic Arms Race: The Scientific Viewpoint
        PHYS 276 Modern Astronomy and Astrophysics
        PHYS 475 Mathematical methods for undergraduates
        PHYS 601 Mechanics for graduates
        PHYS 621 Mathematical physics for graduates
        PHYS 682 Special topics: Introduction to Turbulence Theory
        PHYS 790 Nonlinear Dynamics
        PHYS 790 Geometry and groups in classical and semi-classical physics

FELLOWSHIPS AND GRANTS

7.   **a) Fellowships, grants, contracts, etc. awarded by outside agencies:**

Air Force Office of Scientific Research, "Modeling and diagnosing nonlinear systems",
   With Reggie Brown
   $80,000/year, January 1, 1998-present (3 year grant)

Lawrence Berkeley National Laboratory, "Topics in the basic theory of wave phenomena,"
   subcontract from Accelerator and Fusion Research Division.
   $38,000, August 1, 1997-July 31, 1998.

DOE (w/G. Vahala), November 1, 1996-present, my share $20-25,000/year. This has been
   continued for another three years starting on November 1, 1998.

DOE, both the Fusion Energy, and Basic Energy Sciences directorates. I receive travel monies
   and some salary (approximately 1 month summer salary the last few years) to support my
   collaboration with Professor Alan Kaufman of UC Berkeley in the field of RF heating of
   fusion plasmas.

Air Force Office of Scientific Research, "Improved techniques for modeling and controlling
   nonlinear systems with few degrees of freedom," with Reggie Brown.
   $87,000, April 1, 1995-March 31, 1996
   $93,000, April 1, 1996-March 31, 1997
   $107,000, April 1, 1997-December 31, 1997.

Laser Plasma Branch of the US Naval Research Laboratory, "Investigation of the Effects of
   Induced Spatial Incoherence on the Filamentation Instability," $25,000/year,
   January 1, 1989-July 31, 1992.

DOE, "Theory of Fusion Plasmas," $75,000/year, (with A. Boozer and   G. Vahala) January 1,
   1988. With Allen Boozer's leaving, this grant was reduced to $47,000 (no summer
   support and minimal support for travel and incidental expenses).

Allied Signal/Aerospace Technology Center in Columbia, Maryland, Consultant, $2,000/year.
   (This funding has been dormant for several years.)

Institute for Cosmo-geophysics in Torino, Italy. During the summers of 1986 and 1987 I
   received both travel monies and summer salary (1 month each year).

b) Summer grants and Faculty Research Assignments from W&M:

Faculty research leave for 1992-93 academic year

Received a summer research grant in summer 1993

RESEARCH

8.   **a) Refereed journal publications:**

A Study of Quasiperiodic Solutions of the Nonlinear Schrödinger Equation.
    E. R. Tracy, H. H. Chen and Y. C. Lee
    Phys. Rev. Lett. **53**, 218-221 (1984).

On the Reality Constraints for the Periodic Sine-Gordon Equation.
    A. C. Ting, E. R. Tracy, H. H. Chen and Y. C. Lee
    Phys. Rev. A, Rapid Communications, **30**, 3355-3358 (1984).

Real Periodic Solutions of the Liouville Equation
    E. R. Tracy, H. H. Chen and C. H. Chin
    Physica D **23**, 91-101 (1986).

Application of Kraichnan's Decimated Amplitude Scheme to the Betchov Model of
        Turbulence
    Timothy Williams, E. R. Tracy and George Vahala
    Phys. Rev. Lett. **59**, 1922-1925 (1987).

Nonlinear Self-modulation: An Exactly Solvable Model
    E. R. Tracy and H. H. Chen
    Phys. Rev. A **37** (1988) 815-839.

On the Nonlinear Schrödinger Limit of the Korteweg-deVries Equation
    E. R. Tracy, J. W. Larson, A. R. Osborne and L. Bergamasco
    Physica D **32** (1988) 83-106.

Spectral Averaging of Small Amplitude sine-Gordon Wave Trains
    J. W. Larson and E. R. Tracy
    Phys. Rev. A **38** (1988) 4419-4430.

Strong Decimation of the Betchov Model of Turbulence
    Tim Williams, E. R. Tracy and George Vahala
    Physica D **37** (1989) 200-205.

A Self-consistent Kinetic Quasiparticle Model for Wave Plasma Interactions
    E. R. Tracy and A. H. Boozer
    Phys. Lett. A **139** (1989) 318-326.

Decimation of a Turbulence Model Under Statistical Constraints
    Tim Williams, E. R. Tracy and George Vahala
    Phys. Rev. A **40** (1989) 3272-3291.

Wave-Kinetic Formulation of Incoherent Linear Mode Conversion
    E. R. Tracy and A. N. Kaufman
    Phys. Rev. Lett. **64**, (1990) 1621-1624.

On the Relationship Between the Spectral Theories for the Periodic Korteweg-deVries and
Nonlinear Schrödinger Equations
E. R. Tracy, J. W. Larson, A. R. Osborne and L. Bergamasco
in *Nonlinear Topics in Ocean Physics,* A. R. Osborne and L. Bergamasco eds. (Elsevier, Amsterdam, 1989).

Metaplectic Formulation of Linear Mode Conversion
E. R. Tracy and Allan N. Kaufman
Phys. Rev. E **48** (1993) 2196-2211.

Collective-wave spin-off and the gyroballistic continuum in gryoresonant absorption
Daniel. R. Cook, Allan N. Kaufman, E. R. Tracy, T. Fl
Phys. Lett. A **175** (1993) 326-333.

Two-dimensional Reflection of Magnetosonic Radiation by Gyroballistic Waves: an Analytic
Theory
D. R. Cook, A. N. Kaufman, A. J. Brizard, H. Ye and E. R. Tracy
Phys. Lett. A **178** (1993) 413-418.

Integrability Properties of Charged Particle Motion in Reconnection Regions
Jay W. Larson and E. R. Tracy
Phys. Lett. A **182** (1993) 249-254.

Modeling and Synchronizing Chaotic Signals from Time Series Data
Reggie Brown, Nikolai F. Rulkov and E. R. Tracy
Phys. Rev. E **49** (1994) 3784-3800.

Reconstruction of Chaotic Signals Using Symbolic Data
X. Z. Tang, E. R. Tracy, A. D. Boozer, A. deBrauw and Reggie Brown
Phys. Lett. A **190** (1994) 393-398.

Modeling and synchronizing chaotic systems from experimental data
R. Brown, N. Rulkov and E. R. Tracy
Phys. Lett. A 194 (1994) 71-76.

Symbol sequence statistics in noisy chaotic signal reconstruction
X. Z. Tang, E. R. Tracy, A. D. Boozer, A. deBrauw and R. Brown
Phys. Rev. E **51** (1995) 3871-3889.

Wave emission by resonance crossing
E. R. Tracy, Allan N. Kaufman and Y.-M. Liang
Phys. of Plasmas **2** (1995) 4413-4419.

Generalized Case-van Kampen modes in multi-dimensional non-uniform plasma with

application of gyroresonance heating
E. R. Tracy, A J. Brizard and A. N. Kaufman
J. Plasma Phys. **55** (1996) 449-486.

Double-cross Instability: An Absolute Instability caused by Counter-Propagating Positive-
and Negative-Energy Waves
A. J. Brizard, J. J. Morehead, A. N. Kaufman and E. R. Tracy
Phys. Rev. Lett. **77** (1996) 1500-1503.

Symbol Statistics and Spatio-Temporal Systems
X.-Z. Tang, E. R. Tracy and R. Brown
Physica **102**D (1997) 253-261.

Parameter Uncertainties in Models of Equivariant Dynamical Systems
R. Brown, V. In and E. R. Tracy
Physica **102**D (1997) 208-226.

Double-Crossing Mode Conversion in Non-Uniform Media
A. J. Brizard, J. J. Morehead, A. N. Kaufman and E. R. Tracy
Phys. Plasmas **5** (1998) 45.

Anomalous scaling in Takens-Bogdanov bifurcations
E. R. Tracy and X. Z. Tang
Phys. Lett. A **242** (1998) 239-244.

Takens-Bogdanov random walks
E. R. Tracy, X. Z. Tang and C.Kulp
Phys. Rev. E 57 (1998) 3749-3756.

Data compression and information retrieval via symbolization
X. Z. Tang and E. R. Tracy
Chaos 8 (1998) 688-696.

Wave emission from within mode conversion regions: a new diagnostic probe for non-uniform
media
Yu. Krasniak and E. R. Tracy
Phys. Lett. A **248** (1998) 235-241.

The dissipative Budden problem: Effect of converted-wave damping on primary-wave reflection
A.N. Kaufman, E. R. Tracy, J. J. Morehead and A. J. Brizard
Phys. Lett. A **252** (1999) 43-48.

Mode conversion in the ocean
A. N. Kaufman, E. R. Tracy, J. J. Morehead and A. J. Brizard

To appear in J. Fluid Mech.

Conference proceedings:

Integrable Nonlinear Waves as Hamiltonian Systems
E. R. Tracy and H. H. Chen
Proceedings of the Thirteenth International Colloquium on Group
Theoretical Methods in Physics, W. W. Zachary, ed. (World Scientific, 1984)79-82.

A Study of Nonlinear Modulations
E. R. Tracy, H. H. Chen and Y. C. Lee
Physica **18**D, 481-482(1986).

Investigation of the Periodic Liouville Equation
E. R. Tracy, A. J. Neil, H. H. Chen and C. H. Chin
Proceedings of the Conference on Nonlinear Waves and Integrable
Systems, held in Oberwolfach, Germany, B. Fuchssteiner, ed. (World
Scientific, 1987)263-276.

On the Nonlinear Schrödinger Equation as an Averaging Theory
E. R. Tracy, J. W. Larson, A. R. Osborne and L. Bergamasco
In *Nonlinear Evolutions,* Prodeedings of the Fourth International Conference on
Nonlinear Evolution Equations and Dynamical Systems (World Scientific, 1988)593-602.

Self-consistent Wave Kinetics and the Ray Oscillation Center Transformation
E. R. Tracy and A. J. Neil
In *Nonlinear and Chaotic Phenomena is Plasmas, Solids and Fluids*
(World Scientific, 1991).

Minority Gyroresonant Reflection and Transmission of a Magnetosonic Wave in Tokamak
Geometry
Allan N. Kaufman, Alain J. Brizard, Daniel R. Cook, E. R. Tracy, and
Huanchun Ye
In the Proceedings of the 9th Topical Conference on Radio Frequency
Power in Plasmas, Charleston, South Carolina, August, 1991.

Explicit Expressions for Conversion Coefficient and Absorption Profile in Minority-Ion
Gyroresonant Heating
D. R. Cook, A. N. Kaufman, E. R. Tracy and T. Fl,
in the Proceedings of the 9th Topical Conference on Radio Frequency Power in
Plasmas, Charleston, South Carolina, August, 1991.

The separation of Ion Bernstein Waves and Incoherent Ion Gyroresonant Ballistic Waves in a
Dispersive, Spatially Varying Medium
T. Fl, , D. R. Cook, E. R. Tracy and A. N. Kaufman,

Proc. International Conf. for Plasma Physics, Innsbruck, Austria, 1992.

Kinetic analysis of minority gyroresonant heating: conversion fields in tokamak geometry
    E. R. Tracy, A. J. Brizard, D. R. Cook and Allan N. Kaufman,
    in the Proceedings of the 10th Topical Conference on Radio Frequency Power in
        Plasmas, Boston, MA, March, 1993.

Negative-energy energetic-ion Bernstein-wave propagation in a nonuniform magnetic field:
    two linear-conversion phenomena
    A. N. Kaufman, A. J. Brizard and E. R. Tracy
    in the Proceedings of the 11th Topical Conference on Radio Frequency Power in
    Plasmas, Palm Springs, CA, March 1995.

Wave emission from mode conversion regions
    Yu. Krasniak and E. R. Tracy
    in the Proceedings of the 12th Topical Conference on Radio Frequency Power in
    Plasmas, Savannah, GA, April 1997.

Modular approach for conversion to the ion-hybrid wave and a gyroresonance
    A. N. Kaufman, J. J. Morehead, A. J. Brizard and E. R. Tracy
    in the Proceedings of the 12th Topical Conference on Radio Frequency Power in
    Plasmas, Savannah, GA, April 1997.

RF heating in a tokamak cavity
    E. R. Tracy and A. N. Kaufman
    in the Proceedings of the 13th Topical Conference on Radio Frequency Power in
    Plasmas, Annapolis, MD, April 1999.

e) Invited talks:

Integrable Nonlinear Waves as Hamiltonian Systems
    Thirteenth International Colloquium on Group Theoretical Methods in
    Physics, College Park, MD, May 21-25, 1984.

A Study of the Nonlinear Modulational Instability
    Sherwood (Fusion Theory) Meeting, Lake Tahoe, NV, April 10-13, 1984.

A Study of Nonlinear Modulations
    Conference on Solitons and Coherent Structures in Physics, held at
    UC Santa Barbara, January 11-16, 1985.

A Study of Nonlinear Modulations Using an Exactly Solvable Model
    Third International Workshop on Nonlinear Evolution Equations and
    Dynamical Systems, Baia Verde, Gallipoli (Italy), July 3, 1985.

The Hamiltonian Structure of Periodic Soliton Systems
    Third International Workshop on Nonlinear Evolution Equations and
    Dynamical Systems, Baia Verde, Gallipoli (Italy), July 3, 1985.

Exact Periodic Solutions of the Liouville Equation
    International Conference on Solitons and Integrable Systems,
    Oberwolfach, Germany, July, 1986.

Periodic Nonlinear Waves in Plasma Physics
    American Physical Society/Division of Plasma Physics Annual Meeting,
    Baltimore, MD, November 7, 1986.

On the Nonlinear Schrödinger Limit of the Korteweg-deVries Equation
    Fourth International Workshop on Nonlinear Evolution Equations and
    Dynamical Systems, Montpellier (France), June 14, 1987.

Application of Kraichnan's Decimated Amplitude Scheme to the Betchov Model of Fluid
            Turbulence
    Joint U. S./Japan Workshop on Fluid and Plasma Turbulence, Austin, TX,
    December 8, 1987.

Recent Developments in Periodic Nonlinear Schrödinger Theory
    Society for Industrial and Applied Mathematics (SIAM) Annual Conference
    San Diego, CA, July 21, 1989.

Wave Kinetics and Incoherent Linear Mode Conversion
    Joint US/Japan Workshop on Nonlinear Dynamics in Plasma Physics
    Boulder, CO, July 26, 1989.

Self-consistent Wave Kinetics and the Ray Oscillation Center Transformation
    NEEDS '90 (6th International Workshop on Nonlinear Evolution Equations and
    Dynamical Systems); held in Dubna, USSR, July 17, 1990.

Self-consistent Wave Kinetics and the Ray Oscillation Center Transformation
    Conference on Nonlinear and Chaotic Phenomena in Plasmas, Solids and
    Fluids, held in Edmonton, Canada, July 24, 1990.

Chaotic signal analysis using symbol sequence statistics
    European Geophysical Society, Annual Conference
    Grenoble, France, April, 1994.

Invited colloquia and seminars:

A Study of Nonlinear Modulation in Wave Propagation
    George Mason University, Fairfax, VA, March 1, 1985.

A Study of Nonlinear Modulations
        University of Arizona, Tucson, AZ, March 7, 1985.

A Study of Nonlinear Modulations Using an Exactly Solvable Model
        Center for Nonlinear Studies, Los Alamos National Laboratory, August 5, 1985.

Exact Periodic Solutions of the Liouville Equation
        Duke University, Chapel Hill, NC, December 8, 1986.

Application of Kraichnan's Decimated Amplitude Scheme to the Betchov Model of Fluid
            Turbulence
        NASA/Langley Research Center, Hampton, VA, January 19, 1988.

A Self-consistent Wave-Kinetic Model for Laser Plasma Interactions
        Lawrence Livermore National Laboratory, Livermore, CA, December 20, 1988.

Wave-Kinetics: When Waves Act Like Particles
        Hampton University, Hampton, VA, April 27, 1989.

Self-consistent Wave Kinetics and the Filamentation Instability
        Naval Research Laboratory, Washington, DC Laser Plasma Branch Seminar,
        October 29, 1990.

Wave Kinetics and the Ray Oscillation Center Transformation
        University of Maryland Plasma Theory Seminar, October 29, 1990.

What's all this noise about chaos?
        Physics Department seminar, University of Richmond, November 16, 1995.

An introduction to symbolic time series analysis
        Oak Ridge National Laboratory, Oak Ridge TN, October 1997.

Symbolic time series analysis
        Physics department seminar, Georgia Tech, February 1998.

n) Work in progress or submitted:

Semi-classical analysis of RF heating in a tokamak cavity
        E.R. Tracy and A. N. Kaufman, in progress.

Wave emission from mode coversion regions: a numerical demonstration
        Yu. Krasniak and E. R. Tracy, in progress.

Symbolic precursors of noisy sub-critical Hopf bifurcations
        E. R. Tracy and D. M. Weaver, in progress.

9.   **a) College committee service:**

 i) Department -
Member, Physics Department Graduate Committee, 1987-90.
Search Committee, Plasma Physics position, 1986.
Director of the Graduate Program in Physics, Fall 1990-1992.
Physics Undergraduate Committee, Fall 1993-96 (Chair 1994).
Search Committee, Computational/Nonlinear Physics position, Fall 1995-96.
Ad Hoc Physics Undergraduate Recruitment Committee, 1996-.
Steering committee, Fall 1998-.

ii) University -
Educational Policy Committee Fall 1993-1996 (Chair, Fall 1994-95).
Faculty Research Committee Fall 1993-94.
Physics Department Steering Committee Fall 1994-95.
Subcommittee on General Education, Fall 1994-1997.
Assessment Steering Committee, Fall 1994-1997.
Ad hoc review committee for graduate program in physics, appointed Fall 1995-96
Member, Evaluation Committee for University Registrar, Fall 1996.
Procedural Review Committee, Fall 1997-.
Dean's Ad Hoc Committee on Science Education, 1997-1998.
Nominations Committee for A&S, Chair, 1998-1999.
Applied Science Dept. Internal Review Committee, Chair, Spring 1999.

b) Other:
Program committee for American Physical Society, Division of Plasma Physics   (1994).
Executive Committee, International Sherwood (Fusion Theory) Conference, 1991-93,
  1995-97.
Local Organizing Committee (Chair) for Sherwood Meeting in Williamsburg, April 1990
Program Committee, Sherwood Meeting 1992

Reviewer for:
Proposals - Air Force Office of Scientific Research, National Science Foundation, Department of Energy.
Journals - Physical Review Letters, Physical Review A (General Physics), Physica D (Nonlinear Physics), Journal of Physics A (Mathematical and General), Journal of Plasma Physics.