RESUME OF TIMOTHY N. GOOD

Associate Professor, Department of Physics
Gettysburg College, October 2008

Date of Appointment ; Rank

September 1, 1990; Associate Professor of Physics

Committee Assignments

Environmental Studies Committee, 1992-1996
Teacher Education Committee,1992-1997
Faculty Representative to the Goldwater Scholarship Education Program, 1993-97
Academic Standing Committee, 1996-1999
Faculty Personnel Committee, 1999-2002
Honor Commission Advisor, 2002-2004
Faculty Governance Committee, 2007-
Faculty Council, 2007-

Departmental Service

Faculty Advisor to the Society of Physics Students, 1991-97
Departmental Librarian/ Liason to Musselman Library, 1993-2006
Physics Colloquium Coordinator, 2001-2008
Physics Department Chairman, 2006 -

Community Service

Vice Chairman of the Board of Directors of the Gettysburg Municipal Authority, 1998-
Little League and Babe Ruth League Baseball : manager, coach and board member 2000-2008

Research Appointments

- West Virginia University, Department of Physics : Visiting Research Associate, Summer 1999 – one month, Summer 1997 - ten weeks, Summer 1992- two weeks, Summer 1991- ten weeks.
- University of Maryland, College Park, Department of Physics : Visiting Associate Professor, Spring/Summer 1998 – ten weeks
- University of Innsbruck, Austria, Institute for Ion Physics : Guest Professor, Winter 1998 – six weeks.
- Centre de Recherches en Physique des Plasmas, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland : Research Physicist, 1986-1990.

Education

Ph.d. in Physics, University of California, Irvine, 1986.
Ph.d. Thesis :"An Optical Diagnostic Study of the Ion Dynamics in a Simple Axi-symmetric Magnetic Mirror - Stability, Heating, and Confinement"
MS in Physics, University of California, Irvine, 1981.
BS in Physics, Dickinson College, Carlisle, PA,1979.

Honorary and Professional Societies

American Physical Society (Division of Plasma Physics, and Laser Science Topical Group)
Association Vaudoise des Chercheurs en Physique
American Association of Physics Teachers
Sigma Pi Sigma, Physics Honorary Society

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Grants, Support, and Honors

Research Opportunity Award of the National Science Foundation,
an amount of $19,980 for salary while working at the University of Maryland, Institute of Plasma Research, and travel to APS meeting in November 1998.

Award from the Evangelical Lutheran Church of America,
an amount of $1000 for accommodations while in residence at WVU, summer 1997.

William and Flora Hewlett Foundation Award of the Research Corporation,
Cottrell College Science Grant Program
Project Title : "Studies of Plasma Wave Particle Interactions via Laser Induced Fluorescence Spectroscopy"; grant period : 1993-95, $45,000.

National Science Foundation Instrumentation for Laboratory Improvement Grant,
Project Title : "Experimental Atomic and Molecular Physics Via Laser-Induced Fluorescence and Laser OptogalvanicSpectroscopy"; grant period : 1992-1994, $16,600.

Partner in Science Award of the Research Corporation,
with Mr. Robert Lippy, Chemistry teacher at Mechanicsburg High School
Project Title : "Experimental Atomic, Molecular, and Plasma Physics via Laser-Induced Fluorescence and Laser Optogalvanic Spectroscopy", $14,000, 1993-94.

Undergraduate Research Support in Laser Science,
Provided by the Laser Science Topical Group of the American Physical Society,
Two $3,000 student stipends to work in the plasma laboratory in the summers of 1993 and 1995.

Undergraduate Summer Research Fellowship,
Provided by the Delaware Valley Space Grant Consortium and NASA
Two student stipends in the amount of $2800 to work in the plasma laboratory in the summers of 2001 and 2004.

Gettysburg College Research and Professional Development Grants
- Two student stipends for summer research in the laser/plasma laboratory of the Physics Department, 1993,1994, and 1995, $4,000 for each year.
- One student stipend awarded for 2000 and 2001, in the amount of approximately $2000 each.
- Sabbatical support, June 1997, in the amount of $1,500 in order to attend a conference workshop entitled the “Interrelationship Between Experiments in Laboratory and Space Plasmas “ (IPELS)

Corporate Donation from Coherent Inc.
Dye laser upgrade package from model #699-01 to model #699-05, for use in the optical diagnosis of plasmas in the Department of Physics at Gettysburg College, 1991, $33,000.

Energy Related Laboratory Equipment Grants,
Experimental vacuum chamber and supporting laboratory components for the study of plasma physics at Gettysburg College, acquired 1991-2000, $28,000.

University of California Regents Dissertation Fellowship, 1986.

Graduated Magna Cum Laude, with Honors in Physics from Dickinson College, 1979.

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Publications In Archival Journals

"Inhomogeneous Magnetic-Field-Aligned Ion Flow Measured in a Q-Machine", M.E. Koepke, M. W. Zintl, C. Teodorescu, E.W. Reynolds, G. Wang, and T.N. Good, published in *Physics of Plasmas*, Vol. 9, No. 8, p. 3225-3235, August 2002.

"An Effect of Neutral Collisions on the Excitation Threshold of Electrostatic Ion-Cyclotron Waves", M.E. Koepke, M.W. Zintl, and T.N. Good, Geophysical Research Letters, Vol. 25, No. 16, pages 3095-3098, August 15, 1998.

"Linear Kinetic Modes in Weakly Collisional Plasma", F. Skiff, S. De Souza-Machado, W.A. Noonan, A. Case, and T.N. Good, Physical Review Letters, Vol. 81, No. 26, pages 5820-5823, December 28, 1998.

"Measurement of Fokker-Planck Diffusion with Laser-Induced Fluorescence", with J.J. Curry, F. Skiff, and M. Sarfaty, Physical Review Letters, 74, 1767, (1995).

"Cross-field Diffusion Quenching by Neutral Gas Injection in a Magnetized Plasma," with A. Fasoli, F. Skiff, and P. J. Paris, Physical Review Letters, 68, 2925 (1992).

"Ion Cyclotron Wave Excitation by Double Resonance Coupling," with A. Fasoli, P. J. Paris, F. Skiff, and M. Q. Tran, Physics of Fluid B, 3, 1171 (1991).

"Study of Chaos and Optical Tagging Techniques," with F. Skiff, F. Anderegg, P. J. Paris, M. Q. Tran, N. Rynn, and R. A. Stern, Plasma Physics and Controlled Fusion, 31, 1569 (1989).

"Direct Measurement of Ion Phase Space Orbits in an Electrostatic Field," with A. Fasoli, F. Anderegg, F. Skiff, P. J. Paris, M. Q. Tran, M. Yamada, Physical Review Letters, 63, 2052 (1989).

"Plasma Diagnostics with Spin-Polarized Ions," with F. Skiff, F. Anderegg, and P. J. Paris, Physics Letters A, 137, 57 (1989).

"Conservation Laws and Transport in Hamiltonian Chaos," with F. Skiff, F. Anderegg, P. J. Paris, M. Q. Tran, N. Rynn, and R. A. Stern, Physical Review Letters, 61, 2034 (1988).

"Ion Confinement in a Simple Mirror Stabilized by Surface Line Tying," with H. R. Thompson, Jr., and N. Rynn, Physics of Fluids, 631 1237 (1988).

"Optical Carriage for Laser Induced Fluorescence Diagnostics in a Magnetized Plasma," with F. Anderegg, P. J. Paris, F. Skiff, M. Q. Tran, Review of Scientific Instruments, 59, 2306 (1988).

"Partial Line-Tying of the Flute Mode in Magnetic Mirror," with G. Vandergrift, Physics of Fluids, 29, 550 (1985).

Publications In Proceedings

"Counter-streaming Ion Beams with Inhomogeneous Density Profiles", M.E. Koepke, M. W. Zintl, E. M. Johnson, E.W. Reynolds, and T.N. Good, published in *Proceedings of the International Conference on Plasma Physics 2000*, Quebec, October 2000.

"Periodic Pulling in a Driven Relaxation Oscillator", with M. Koepke, C. Selcher, and T. Sheridan, in Proceedings of S.P.I.E.: Exploiting Chaos and Nonlinearities, (International Society of Optical Engineering), H.S. Wisniewshi, ed., Vol. 2039, (1993).

"Test-Ion Diffusion in a Magnetized Plasma", with A. Fasoli, F. Skiff, P.J. Paris, and M. Q. Tran, IEEE Transactions on Plasma Science, Vol. 20, 655, (1992).

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Publications In Proceedings

"Ion Wave Excitation for the Study of Wave-induced Transport," with A. Fasoli, F. Skiff, F. Anderegg, P. J. Paris, M. Q. Tran, N. Rynn, R. Stern, and M. Yamada, in Contributed Papers, of the 17th European Physical Society Conference on Controlled Fusion and Plasma Heating, Amsterdam (1990).

"Ion Cyclotron Wave Excitation by Double Resonance Parametric Coupling," with A. Fasoli, P. J. Paris, F. Skiff, and M. Q. Tran, in Contributed Papers, of the 17th European Physical Society Conference on Controlled Fusion and Plasma Heating, Amsterdam (1990).

"Kinetic Description of Ion Acoustic Wave-Particle Interactions," with A. Fasoli, F. Anderegg, P. J. Paris, F. Skiff, M. Q. Tran, and M. Yamada, in Contributed Papers to the XIX International Conference on Phenomena in Ionized Gases, Belgrade (July 1989).

"Upgraded Barium Plasma Q-device Suitable for Wave Studies," with P. J. Paris, F. Anderegg, A. Fasoli, N. Rynn, F. Skiff, R. A. Stern, and M. Q. Tran, in Contributed Papers to the XIX International Conference on Phenomena in Ionized Gasses, Belgrade (July 1989).

"Optical Diagnosis of Plasma Waves via the Ion Dielectric Response," with F. Skiff, F. Anderegg, P. J. Paris, M. Q. Tran, N. Rynn, and R. A. Stern, Proceedings of the International Workshop on "Nonlinear Phenomena in Vlasov Plasmas," Cargese, Corsica, France, F. Doveil Editor, 255-258 (July 1988).

"Nonlinear Response of Plasma Ions in Linear Electrostatic Waves," with F. Anderegg, F. Skiff, P. J. Paris, M. Q. Tran, N. Rynn, R. A. Stern, Proceedings of the International Workshop on "Nonlinear Phenomena in Vlasov Plasmas," Cargese, Corsica, France, F. Doveil Editor, 237-254 (July 1988).

"Intrinsic Stochasticity of Plasma Ions in Electrostatic Waves," with F. Skiff, F. Anderegg, M. Q. Tran, P. J. Paris, N. Rynn, R. A. Stern, Proceedings of the Invited Papers, 1987 International Conference on Plasma Physics, Kiev, USSR, April 1987, Vol. 1, 441-461 (1987).

"Finite Amplitude Electrostatic Waves," with F. Skiff, F. Anderegg, M. Q. Tran, P. J. Paris, R. A. Stern, and N. Rynn, Proceedings, 1987 International Conference on Plasma Physics, Kiev, USSR, Vol. 1, 55-58 (1987).

Co-authored Student Presentations to the Central Pennsylvania Section of the American Association of Physics Teachers

"Laser Optogalvanic Spectroscopy", with Craig Selcher, April 1992.

"Experimental Investigation of Zeeman Splitting in Barium II via Laser Optogalvanic Spectroscopy", with Chad Whelan, April 1994.

"Investigating ^{22}Ne-^{20}Ne Isotope Shifts via Intermodulated Laser Optogalvanic Spectroscopy", with Vikram Adige, April 1995.

"Methodology for Studying Plasma Physics via Laser Spectroscopic Techniques", with Mr. Robert Lippy of Mechanicsburg High School, presented at the 1994 Partners in Science Conference, in Tuscon, AZ.

Research Interests

Experimental research in basic plasma physics. In particular, application of laser-induced fluorescence (LIF) diagnostics to the study of linear and nonlinear ion wave-particle interactions. Wave-particle and field-particle interactions in space plasmas. Ion acceleration via intrinsic stochasticity, or deterministic chaos. Ion dielectric response to plasma waves. Extensions of optical tagging techniques applied to the study of plasma transport. Plasma heating by absorption of electromagnetic waves. Plasma processing of materials. Investigations of atomic physics by laser optogalvanic spectroscopy.

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Senior Thesis Reports, required paper for Physics 460 - Independent Research

"Laser Optogalvanic Spectroscopy", Craig Selcher, 1992.

"Experimental Investigation of Zeeman Splitting in Barium II via Laser Optogalvanic Spectroscopy", Chad Whelan, 1993.

"Hyperfine Studies in Niobium using Laser Optogalvanic Spectroscopy", Michael Bieda, 1994.

"An Optical Diffraction Experiment for the Advanced Laboratory", Porusp Marshall, 1994.

"Investigating ^{22}Ne-^{20}Ne Isotope Shifts via Intermodulated Laser Optogalvanic Spectroscopy", Vikram Adige, 1995.

"A Calibration System for Laser Diagnostics on the Pickets Charged Plasma Device", Jeremy Smith, 1996.

"Examination of Hyperfine Structure in Molecular Iodine, Atomic Sodium and Barium and Isotope Shifts in Neon via Doppler-Free Laser Saturated Absorption Spectroscopy", Christopher Wilks, 2005.

"Investigation of the Hyperfine Splitting of the Niobium Atom using Laser Optogalvanic Spectroscopy", Matthew Galante, 2008.

Faculty Sponsorship of Physics Internships, Internship Reports - PHY 474.

"Water Corrosion on Hygroscopic Alkali Borate Glasses", Emma Norbrothen, REU at Coe College, summer, 2006.

"The Effects of Lasing on the Population Distributions in Helium Neon Plasma", David Newcomer, summer internship at Gettysburg College, 2007.

"Vortex Switching between Defects in Nanomagnetic Structures", Sylvester Gyan, REU at Kansas State University, summer 2008.