

CURRICULUM VITAE

Thomas E. Skinner, Ph.D.

- ADDRESS:** Physics Department
Wright State University
Dayton, Ohio 45435
(W) (937) 775-4549
- BIRTH:** July 2, 1952
Frostburg, Maryland
- FAMILY:** Married, 4 children
- EDUCATION:**
- 1984 Ph.D., The Johns Hopkins University,
Major: Physics
Thesis: *Temporal and Spatial Variations in the Intensity of Ultraviolet Emissions from Jupiter and the Io Torus*
- 1976 M.A., The Johns Hopkins University,
Major: Physics
- 1974 B.A., The Johns Hopkins University,
Major: Natural Sciences

ACADEMIC HONORS AND AWARDS

- 1976 Departmental Merit Award, Physics, Johns Hopkins University
- 1974 Phi Beta Kappa, Johns Hopkins University
- 1969 National Merit Scholarship Semi-Finalist

EMPLOYMENT:

2003-present	Professor Department of Physics, Wright State University, Dayton, Ohio
1998 - 2003	Associate Professor Department of Physics, Wright State University, Dayton, Ohio
1993 - 1998	Assistant Professor Department of Physics, Wright State University, Dayton, Ohio
1990 - 1993	Research Scientist Department of Radiology, Ohio State University, Columbus, Ohio
1988 - 1990	Postdoctoral Fellow University of Colorado Health Sciences Center, University of Colorado, Denver, Colorado
1985 - 1988	Research Associate Laboratory for Atmospheric and Space Physics University of Colorado, Boulder, Colorado
1984 - 1985	Postdoctoral Fellow Department of Physics and Astronomy, The Johns Hopkins University, Baltimore, Maryland

PROPOSALS UNDER REVIEW

Principal Investigator: Revolutionizing the Scope and Impact of Magnetic Resonance Using Optimal Control Theory (NSF: \$428,000).

Co-Investigator: Incorporation of the Effects of Molecular Diffusion into Longitudinal Dispersion in Porous Media (NSF: \$32,013).

TOTAL MAJOR-AGENCY (NSF, NASA, NIH) FUNDED PROPOSALS (\$1,197,108)

(2008)

Co-Investigator: Dispersion in Heterogeneous Porous Media through Advection (NSF: \$52,000).

(2007)

Principal Investigator: A Revolution in NMR Applications Using Optimal Control Theory (NSF: \$315,000; 3rd of 3 years).

Co-Investigator: Predicting Hydraulic Properties from Pressure-Saturation Curves (NSF: \$60,000; 2nd of 2 years).

(2006)

Principal Investigator: A Revolution in NMR Applications Using Optimal Control Theory (NSF: \$315,000; 2nd of 3 years).

Co-Investigator: Predicting Hydraulic Properties from Pressure-Saturation Curves (NSF: \$60,000; 1st of 2 years).

2005

Principal Investigator: A Revolution in NMR Applications Using Optimal Control Theory (NSF: \$315,000; 1st of 3 years).

2000

Co-Investigator: Simulation of NMR Pulse Sequences in Real Time (National Institutes of Health Small Business Innovative Research Program \$100,000), Principal Investigator: M. Robin Bendall, SpinCity Technology.

1999

Co-Investigator: Model Studies of Excited States of N₂ and N₂⁺ in the Thermosphere/Ionosphere (NASA, renewed, 3rd year of 3-year award \$209,608), Principal Investigator: Jane Fox, Wright State University

1998

Co-Investigator: Model Studies of Excited States of N₂ and N₂⁺ in the Thermosphere/Ionosphere (NASA, renewed, 2nd year of 3-year award \$209,608), Principal Investigator: Jane Fox, Wright State University

1997

Co-Investigator: Model Studies of Excited States of N₂ and N₂⁺ in the Thermosphere/Ionosphere (NASA, 3-year award \$209,608)

1996

Principal Investigator: Magnetic Resonance Spectroscopy Study of Tissue Energetics in Response to Hyperbaric Oxygen Therapy (Air Force Office of Scientific Research Summer Faculty Program \$10,000)

Principal Investigator: Evaluation of Bone Density and Marrow (WSU Research Initiation Grant \$8,000)

1995

Co-Principal Investigator: Spatially Localized Nuclear Magnetic Resonance Spectroscopy in Support of Wound Infection Assessment for Hyperbaric Oxygen Therapy (Department of Defense, Air Force

Surgeon General's Office \$5,000)

TOTAL FUNDING PRIOR TO WRIGHT STATE EMPLOYMENT (\$455,500)

1992

Principal Investigator: 1H MRS Studies of the Effect of Neuroleptic Drugs on Brain Metabolism (National Alliance for Research on Schizophrenia and Depression \$30,000)

1990

Co-Principal Investigator: *In Vivo* Brain Chemistry of Schizophrenic and Healthy Subjects Using Magnetic Resonance Spectroscopy (OSU Interdisciplinary Research Grant \$10,000)

1988

Principal Investigator: Ultraviolet Observations of Pluto (NASA \$10,600).

Principal Investigator: IUE Observations of Triton in Support of Voyager (NASA \$8,200).

Principal Investigator: Detailed Modeling of the Jovian Aurora (NASA \$10,000).

Principal Investigator: The Influence of the Solar Wind on Outer Planet Aurorae (NASA Target-of-Opportunity \$3,800)

Co-Investigator: Plasma Sources, Transport and Heating in the Io Torus (NASA \$8,200).

Co-Investigator: Excitation Processes in the Upper Atmosphere of Jupiter (NASA \$61,400).

Co-Investigator: Upper Atmospheric Emissions from Saturn and Uranus (NASA \$22,000).

1987

Principal Investigator: Detailed Modeling of IUE Auroral Spectra (NASA \$30,000).

Principal Investigator: SO₂ on Venus (NASA \$14,300).

Principal Investigator: Solar Wind-Jovian Aurora (NASA Target-of-Opportunity \$3,400).

Co-Investigator: Theoretical Research Program in Physics of Planetary Atmospheres, Radiative Transfer Theory, and Data Interpretation (NASA \$45,400).

Co-Investigator: The Study of Solar O I 1304 A Line Profiles (NASA \$10,000).

Co-Investigator: Io and the Io Torus (NASA \$13,200).

Co-Investigator: Excitation of the Jovian Atmosphere (NASA \$12,400).

1986

Principal Investigator: Outer Planet Aurorae (NASA \$9,900).

Co-Investigator: Jovian Magnetospheric-Atmospheric Interactions (NASA \$14,300).

Co-Investigator: Variations in Saturn and Uranus (NASA \$18,500).

Co-Investigator: The Io Torus (NASA \$11,200).

Co-Investigator: Theoretical Research Program in Physics of Planetary Atmospheres, Radiative Transfer Theory and Data Interpretation (NASA \$45,000).

1985

Co-Investigator: The Stability and Longitudinal Homogeneity of the Io Torus (NASA \$10,400).

Co-Investigator: Ultraviolet Study of Uranus and Saturn (NASA \$15,500).

Co-Investigator: The Long-Term Interaction Between the Jovian Atmosphere and Magnetosphere (NASA \$14,900).

1984

Co-Investigator: The Interaction Between the Jovian Atmosphere and Magnetosphere (NASA \$12,700).

Co-Investigator: The Stability of the Io Torus (NASA \$10,200).

ADDITIONAL PROPOSALS SUBMITTED (not funded)

2007

Principal Investigator: Revolutionary Innovations in Magnetic Resonance Using Optimal Control Theory (NSF: \$428,000).

2004

Co-Investigator: Designing a Realistic Cell-Like Entity (DoD, Air Force Office of Scientific Research: \$596,105) submitted March, 2004.

2003

Principal Investigator: Improving NMR Applications Using Optimal Control Theory (NSF: \$421,958), submitted December, 2003.

2002

Principal Investigator: Comprehensive and Innovative Improvements to Broadband Excitation Pulses in NMR Using Optimal Control Theory (NSF: \$405,380), submitted December 3, 2002.

1996

Principal Investigator: Changes in Brain Energetics and Carbohydrate Metabolism due to Long-Term Administration of Anti-Psychotic Drugs (National Alliance for Research on Schizophrenia and Depression \$60,000)

Principal Investigator: ^{31}P Magnetic Resonance Spectroscopy Investigation of Changes in Tissue Energetics Resulting from Hyperbaric Oxygen Therapy (Summer Research Extension Program, Air Force Office of Scientific Research \$25,000)

Co-Investigator: Analysis of High Resolution UV Spectra of Jupiter's Airglow Using a Realistic Model (NASA 47,769)

1994

Principal Investigator: *In Vivo* MRS/PET Study of the Effect of Antipsychotic Drugs on Energy Metabolism in Brain Tissue (National Alliance for Research on Schizophrenia and Depression \$60,000)

REVIEWED PUBLICATIONS

48. Hunt, AG, and Skinner, TE, "Longitudinal Dispersion of Solutes in Porous Media Solely by Advection," *Phil. Mag.* **88** 2921–2944 (2008).

47. Gershenson, NI, Miller, DF, and Skinner, TE, The Design of Excitation Pulses for Spin Systems Using Optimal Control Theory: Application to NMR Spectroscopy, *Optim. Control Appl. Meth.*, (2008, in press).

46. Kobzar, K, Skinner, TE, Khaneja, N, Glaser, SJ, Luy, B, "Exploring the Limits of Broadband Excitation and Inversion: II. RF-Power Optimized Pulses, " *J. Magn. Reson.* **194**, 58-66 (2008).

45. Gershenson, NI, Skinner, TE, Brutscher, B, Khaneja, N, Nimbalkar, M, Luy, B, and Glaser, SJ, "Linear Phase Slope in Pulse Design: Application to Coherence Transfer," *J. Magn. Reson.* **192** (2008) 235–243.

44. Blank, LA, Hunt, AG, and Skinner, TE, "A Numerical Procedure to Calculate K for an Arbitrary Pore Size Distribution, *Vadose Zone Journal* **7**, 461–472, (2008).

43. Gershenson, NI, Kobzar, K, Luy, B, Glaser, SJ, and Skinner, TE, "Optimal Control Design of Excitation Pulses that Accommodate Relaxation," *J. Magn. Reson.* **188**, 330–336 (2007).

42. Hunt, AG, Blank, LA, and Skinner, TE, "Distributions of the Hydraulic Conductivity for Single-

- Scale Anisotropy," *Phil. Mag.* **86**(16), 2407–2428 (2006).
41. Skinner, TE, Kobzar, K, Luy, B, Bendall, MR, Bermel, W, Khaneja, N, and Glaser, SJ, "Optimal Control Design of Constant Amplitude Phase-Modulated Pulses: Application to Calibration-Free Broadband Excitation," *J. Magn. Reson.* **179**, 241–249 (2006).
 40. Luy, B, Kobzar, K, Skinner, TE, Khaneja, N, and Glaser, SJ, "Construction of Universal Rotations from Point to Point Transformations," *J. Magn. Reson.* **176**, 179–186 (2005).
 39. Hunt, AG, and Skinner, TE, "Hydraulic Conductivity Limited Equilibration: Effect on Water Retention Characteristics," *Vadose Zone Journal* **4**, 145-150 (2005).
 38. Skinner, TE, Reiss, TO, Luy, B, Khaneja, N, and Glaser, SJ, "Tailoring the Optimal Control Cost Function to a Desired Output: Application to Minimizing Phase Errors in Short Broadband Excitation Pulses," *J. Magn. Reson.* **172**, 17-23 (2005).
 37. Kobzar, K, Skinner, TE, Khaneja, N, Glaser, SJ, and LUY, B, "Exploring the Limits of Broadband Excitation and Inversion Pulses," *J. Magn. Reson.* **170**, 236-243 (2004).
 36. Skinner, TE, Reiss, TO, Luy, B, Khaneja, N, and Glaser, SJ, "Reducing the Duration of Broadband Excitation Pulses Using Optimal Control with Limited RF Amplitude" *J. Magn. Reson.* **167**, 68-74 (2004).
 35. Skinner, TE, Reiss, TO, Luy, B, Khaneja, N, and Glaser, SJ, "Application of Optimal Control Theory to the Design of Broadband Excitation Pulses for High Resolution NMR" *J. Magn. Reson.* **163** 8-15 (2003).
 34. Skinner, TE and Glaser SJ, "Representation of a Quantum Ensemble as a Minimal Set of Pure States," *Phys. Rev. A* **66** 032112(1-4) (2002).
 33. Skinner, TE, and Bendall, MR, "J-Coupling and Chemical-Shift Evolution During I-Spin Irradiation of $I_m S_n$ Systems: Product Operator Solutions and Applications," *Concepts Magn. Reson.* **14**, 287-307 (2002).
 32. Bendall, MR, and Skinner, TE, "Comparison and Use of Vector and Quantum Descriptions of J-Coupled Spin Evolution during RF Irradiation of One Spin in an IS Spin System," *J. Magn. Reson.* **143**, 329-351 (2000).
 31. Skinner, TE, and Bendall, MR, "Exact Product Operator Evolution of Weakly Coupled Spin-1/2 $I_m S_n$ Systems during Arbitrary RF irradiation of the I Spins," *J. Magn. Reson.* **141**, 271-285 (1999).
 30. Bendall, MR, and Skinner, TE, "J Pulses for Multiplet-Selective NMR," *J. Magn. Reson.* **141**, 261-270 (1999).
 29. Bendall, MR, and Skinner, TE, "Novel Methods for Characterizing a Decoupler Channel Using 'Undetectable' Quantum Coherences," *J. Magn. Reson.* **139**, 175-180 (1999).
 28. Bendall, MR, and Skinner, TE, "Calibration of STUD+ Parameters to Achieve Efficient Broadband Adiabatic Decoupling in a Single Transient," *J. Magn. Reson.* **134**, 331-349 (1998).
 27. Skinner, TE, and Bendall, MR, "A Vector Model of Adiabatic Decoupling," *J. Magn. Reson.* **134**, 315-330 (1998).
 26. Bendall, MR, and Skinner, TE, "Coherence Sidebands in Adiabatic Decoupling," *J. Magn. Reson.* **129**, 30-34 (1997).
 25. Skinner, TE, and Bendall, MR, "A Phase-Cycling Algorithm for Reducing Sidebands in Adiabatic Decoupling," *J. Magn. Reson.* **124**, 474-478 (1997).
 24. Skinner, TE, and Glover, GH, "An Extended Two-Point Dixon Algorithm for Calculating Separate Water, Fat, and B_0 Images," *Magn. Reson. Med.* **37**, 628-630 (1997).
 23. Skinner, TE, and Bendall, MR, "Peak Power and Efficiency in Hyperbolic Secant Decoupling," *J. Magn. Reson. A* **123**, 111-115 (1996).
 22. Bendall, MR, and Skinner, TE, "Calibration of STUD Broadband Decoupling to Obtain Selected Sideband Intensities," *J. Magn. Reson. A*, **120**, 77-87 (1996).
 21. Nasrallah, HA, Skinner, TE, Schmalbrock, P, and Robitaille, PML, "In Vivo 1H Nuclear Magnetic Resonance Spectroscopy of the Hippocampus/Amygdala Region in Schizophrenia," *Brit. Journ. Psychiatry*, **165**, 481-485 (1994).

20. Sun L, Aletras A, Schmalbrock P, Skinner TE, Chakeres D, Irsik R, and Robitaille P-ML, "Water and Fat MR Imaging with Chemical Shift Selective 3D Steady State Methods," *Magn. Reson. Med.*, **31**, 359-364 (1994).
19. Robitaille, PML, Rath, DP, Skinner, TE, Abduljalil, AM, and Hamlin, RL, "Transaminase Reaction Rates, Transport Activities, and TCA Cycle Analysis by Post-Steady State ¹³C NMR," *Magn. Reson. Med.*, **30**, 262-266 (1994).
18. Skinner TE, and Robitaille PML, "Adiabatic Excitation Using Sin² Amplitude and Cos² Frequency Modulation Functions," *J. Magn. Reson.* **A103**, 34-39 (1993).
17. Skinner TE, Pruski J, and Robitaille PML, "Solvent Suppression Using a Rise-Time Compensated High Pass Filter," *J. Magn. Reson.* **98**, 604-607 (1992).
16. Skinner TE, and Robitaille, PML, "General Solutions for Tailored Modulation Profiles in Adiabatic Excitation," *J. Magn. Reson.* **98**, 14-23 (1992).
15. Robitaille, PML, Abduljalil, AM, Skinner, TE, Jiang, Z, Rath, DP, and Pruski, J, "Adiabatic Proton-Observed Carbon-Edited Spectroscopy," *J. Magn. Reson.* **96**, 376-380 (1992).
14. Na CY, Esposito LW, and Skinner TE, "IUE Observations of Venus SO₂ and SO" *J. Geophys. Res.*, **95**, 7485-7491, 1990.
13. Stern SA, Skinner TE, Brosch N, van Santvoort J, and Trafton LM, "The UV Spectrum of Pluto-Charon: IUE Observations from 2600 to 3100A," *Ap.J.*, **342**, 533-538, 1989.
12. Stern SA, Skinner TE, Brosch N, van Santvoort J, and Trafton LM, "The First UV Spectrum of Triton: IUE Observations from 2600 to 3200A," *Ap.J. (Letters)*, **341**, L107-L110, 1989.
11. Gladstone GR, and Skinner TE, "Spectral Analysis of Jovian Auroral Emissions," *Time Variable Phenomena in the Jovian System*, NASA SP-494, Belton MJS, West RA and Rahe J (eds.), 221-220, 1989.
10. Clarke J, Caldwell J, Skinner T, and Yelle R, "The Aurora and Airglow of Jupiter", *Time Variable Phenomena in the Jovian System*, NASA SP-494, Belton MJS, West RA and Rahe J (eds.), 221-228, 1989.
9. Skinner TE, DeLand MT, Ballester GE, and Moos HW, "Temporal Variation of the Jovian H I Lyman-alpha Emission (1979-1986)," *J. Geophys. Res.*, **93**, 29-33, 1988.
8. Ballester GE, Moos HW, Feldman PD, Strobel DF, Summers ME, Bertaux JL, Skinner TE, Festou MC, and Lieske JH, Detection of Neutral Oxygen and Sulfur Near Io Using IUE, *Ap. J. (Letters)*, **319**, L33, 1987.
7. Skinner TE and Durrance ST, "Neutral Oxygen and Sulfur Densities in the Io Torus, " *Ap. J.*, **310**, 966-971, 1986.
6. Clarke J, Durrance S, Atreya S, Barnes A, Belcher J, Festou M, Imhoff C, Mihalov J, Moos W, Murthy J, Pradhan A, and Skinner T. "Continued Observations of the H Lyman-alpha Emission from Uranus," *J. Geophys. Res.*, **91**, 8771-8781, 1986.
5. Moos HW, Skinner TE, Durrance ST, Feldman PD, Festou MC, and Bertaux JL, "Long Term Stability of the Io High Temperature Plasma Torus," *Ap. J.*, **294**, 369-382, 1985.
4. Skinner TE and Moos HW, "Comparison of the Jovian North and South Pole Aurorae Using the IUE Observatory, " *Geophys. Res. Letters*, **11**, 1107-1110, 1984.
3. Skinner TE, Durrance ST, Feldman PD, and Moos HW, "IUE Observations of Longitudinal and Temporal Variations in the Jovian Auroral Emission," *Ap. J.*, **278**, 441-448, 1984.
2. Moos HW, Durrance ST, Skinner TE, Feldman PD, Bertaux JL, and Festou MC, "IUE Spectrum of the Io Torus: Identification of the 5S₂ - 3P_{2,1} Transition of S," *Ap. J. (Letters)*, **275**, L19-L23, 1983.
1. Skinner TE, Durrance ST, Feldman PD, and Moos HW, "Temporal Variation of the Jovian H I Lyman-alpha Emission (1979-1982)," *Ap.J. (Letters)*, **265**, L23-L27, 1983.

INVITED PRESENTATIONS

- "Optimal Control Design of Excitation Pulses with Specified Coupling Evolution during the Pulse," *48th Experimental NMR Conference (ENC)*, April, 2007, Daytona Beach, Florida.
- "BEBOP: Improving Performance in NMR Applications," *45th Experimental NMR Conference (ENC)*, April, 2004, Asilomar, California.
- "Methods for Reducing Sidebands and Improving Efficiency in Adiabatic Decoupling," XVIIth International Conference on Magnetic Resonance in Biological Systems, Keystone, Colorado, August, 1996.
- "Selected Topics in NMR Research: From Spectroscopy to Functional Imaging," Medical University of South Carolina, September 1, 1993, Charleston, South Carolina.
- "An NMR Sampler: Gradient-Enhanced HMQC, Adiabatic Pulses, and Filters for Water Suppression," Southwest Research Institute, June 30, 1992, San Antonio, Texas.
- "Adiabatic Excitation in NMR Using Sin² Amplitude and Cos² Frequency Modulation Functions," Department of Physics, Wright State University, April 14, 1992, Dayton, Ohio.
- "Jupiter: IUE to HST," The Hubble Space Science Institute, January 6, 1988, Baltimore, Maryland.
- "Spectral Analysis of Jovian Auroral Emissions," Department of Physics, The University of Wyoming, March 1, 1987, Laramie, Wyoming.
- "Planetary Auroral Observations," Fifth Scientific Assembly of the International Association of Geomagnetism and Aeronomy, August 5-17, 1985, Prague, Czechoslovakia.

ABSTRACTS AND PRESENTATIONS

- Skinner, TE and Hunt, AG, "Spatial distribution of solute particles in longitudinal dispersion due to advection," American Geophysical Union (AGU), December, 2008, San Francisco, California.
- Hunt, AG and Skinner, TE, "Generating hydraulic properties from non-equilibrium water-retention curves" American Geophysical Union (AGU), December, 2008, San Francisco, California.
- Gershenson, NI, Woelk, K, Glaser, SJ, and Skinner, TE, RF pulses with extreme tolerance to RF field inhomogeneity: Application to toroid cavity detectors, *49th Experimental NMR Conference (ENC)*, March, 2008, Asilomar, California.
- Skinner, TE, Gershenson, NI, Luy, B, and Glaser, SJ, "Optimal Control of Band-Selective Excitation Pulses to Accommodate Relaxation," *48th Experimental NMR Conference (ENC)*, April, 2007, Daytona Beach, Florida.
- Gershenson, NI, Glaser, SJ, and Skinner, TE, "Empirical Relations for the Design of Band-Selective Pulses using Optimal Control Theory," *48th Experimental NMR Conference (ENC)*, April, 2007, Daytona Beach, Florida.
- Glaser, SJ, Brutscher, B, Gershenson, NI, and Skinner, TE, "Optimal Control Design of Excitation Pulses with Specified Coupling Evolution during the Pulse," *48th Experimental NMR Conference (ENC)*, April, 2007, Daytona Beach, Florida.
- Hunt, AG and Skinner, TE "A New Theoretical Treatment of Dispersion (in absence of diffusion) using Percolation Theory," *American Geophysical Union (AGU)*, December, 2007, San Francisco, California.
- Hunt, AG and Skinner, TE, "Eliminating Kinetic Effects on the Pore Size Distribution as Determined from Water-Retention Curves," *American Geophysical Union (AGU)*, December, 2007, San Francisco, California.
- Blank, LA, Skinner, TE, and Hunt, AG, "Saturation-dependent Anisotropy in the Hanford Subsurface Hydraulic Conductivity," *American Geophysical Union (AGU)*, December, 2006, San Francisco, California.
- Gershenson, NI, Skinner, TE, Glaser, SJ, and Khaneja, N, "Optimal Control Design of Excitation Pulses

- to accommodate Relaxation," *47th Experimental NMR Conference (ENC)*, April, 2006, Asilomar, California.
- Luy, B, Kobzar, K, Skinner, TE, Khaneja, N, and Glaser, SJ, "A Simple Construction Scheme for Universal Rotations out of Point-to-Point Transformation Pulses," *47th Experimental NMR Conference (ENC)*, April, 2006, Asilomar, California.
- Skinner, TE, Reiss, TO, Luy, B, Khaneja, N, and Glaser, SJ, "BEBOP: Improving Performance in NMR Applications," *45th Experimental NMR Conference (ENC)*, April, 2004, Asilomar, California.
- Kobzar, K, Skinner, TE, Khaneja, N, Glaser, SJ, and LUY, B, "Exploring the Limits of Broadband Excitation and Inversion Pulses," *45th Experimental NMR Conference (ENC)*, April, 2004, Asilomar, California.
- Skinner, TE, Reiss, TO, Luy, B, Khaneja, N, and Glaser, SJ, "BEBOP: Broadband Excitation Which Provides a Significant Leap in Performance," *44th Experimental NMR Conference (ENC)*, April, 2003, Savannah, Georgia.
- Kobzar, K, Skinner, TE, Khaneja, N, Glaser, SJ, Luy, B, "The Limits of Broadband Excitation and Inversion Pulses Studied by Optimum Control Theory," Poster number TECH-7, *Annual Magnetic Resonance Meeting of the German Chemical Society (GDCh)*, Leipzig, Germany, September, 2003
- Khaneja, N, Reiss, T, Kehlet, C, Kramer, F, Skinner, TE, Brockett, R, and Glaser, SJ, "Time-Optimal Pulse Sequence Design: Coherence Transfer Based on Geodesic Pulses and Effective Soliton Operators," *43rd Experimental NMR Conference*, Pacific Grove, California, April, 2002.
- Fox, JL, and Skinner, TE, "Vibrational Distributions of the N_2^+ A and B States with Comparison to Atlas Data of the First Negative Bands," *American Geophysical Union (AGU)*, December, 2000, San Francisco, California.
- Fox, JL, and Skinner, TE, "Vibrational Distributions of the N_2^+ (A) and N_2^+ (B) States in the Terrestrial Midlatitude and Auroral Ionospheres" Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR), March, 2000, Boulder, Colorado.
- Skinner, TE, and Bendall, MR, "Exact Product Operator Evolution of a Weakly Coupled Spin-1/2 IS System during Arbitrary RF Irradiation of the I Spins in NMR," Ohio Section of the American Physical Society, October, 1999, Dayton, Ohio.
- Bendall, MR, and Skinner, TE, "90° Pulses: A New Type of Selective Excitation Pulse Applicable to Larger Molecules," *40th Experimental NMR Conference*, February, 1999, Orlando, Florida.
- Skinner, TE, and Bendall, MR, "Coherence Sideband NMR: Probe Characterization Using 'Undetectable' Quantum Coherences," *40th Experimental NMR Conference*, February, 1999, Orlando, Florida.
- Bendall, MR, and Skinner, TE, "Calibration of STUD+ Parameters to Achieve Optimally Efficient Broadband Adiabatic Decoupling in a Single Transient," *39th Experimental NMR Conference*, Pacific Grove, California, March, 1998.
- Skinner, TE, and Bendall, MR, "A Vector Model of Adiabatic Decoupling," *39th Experimental NMR Conference*, Pacific Grove, California, March, 1998.
- Bendall, MR, and Skinner, TE, "Most of What You Need to Know About Broadband Decoupling," Australia and New Zealand Magnetic Resonance Conference (ANZMAG97), Plenary Lecture, Fraser Island, Queensland, December, 1997.
- Skinner, T. E., and Bendall, M. R., "Master Curve for Optimal Implementation of Hyperbolic-Secant Decoupling," *38th Experimental NMR Conference*, March, 1997, Pacific Grove, California.
- Skinner, T. E., and Bendall, M. R., "Methods for Reducing Sidebands and Improving Efficiency in Adiabatic Decoupling," XVIIth International Conference on Magnetic Resonance in Biological Systems, August, 1996, Keystone, Colorado.
- Skinner, T. E., and Bendall, M. R., "STUD and WURST Broadband Decoupling: Dependence of Sidebands on Adiabaticity," *37th Experimental NMR Conference*, March, 1996, Pacific Grove, California.

- McQuiston, B., Geisen, G., Whitestone, J., Henderson, R., and Skinner, T., "Wound Healing: Clinical Evaluation of Wound Progression Based on Structured Light and Magnetic Resonance Imaging," *15th Southern Biomedical Engineering Conference*, March, 1996, University of Dayton, Dayton, Ohio.
- Skinner, T. E., O'Donnel, M., Robitaille, P.-M. L., and Nasrallah, H. A., "A Controlled 31P Magnetic Resonance Spectroscopy Study of the Effects of Haloperidol vs Clozapine on Brain Metabolism in Rats," in *The Annual Meeting of the American College of Psychoneuropharmacology*, December, 1994, San Juan, Puerto Rico.
- Skinner, TE and Robitaille, PML, "BIR-4 Using Sin² Amplitude and Cos² Frequency Modulation Functions," *Society for Magnetic Resonance in Medicine* (12th Annual Meeting), August 1993, New York, New York.
- Robitaille, PML, Rath, DP, Skinner, TE, Abduljalil, A, and Hamlin, RH, "Dynamic Analysis of the TCA Cycle in the Canine Myocardium with Post-Steady State 13C-NMR," *Society for Magnetic Resonance in Medicine* (12th Annual Meeting), August 1993, New York, New York.
- Skinner, TE and Robitaille, PML, "Water Suppression Using a Rise Time Compensated High Pass Filter," *Society for Magnetic Resonance in Medicine* (11th Annual Meeting), August 1992, Berlin, Germany.
- Skinner, TE, "Adiabatic Excitation Using Sin² Amplitude \ Cos² Frequency Modulation Functions," *Society for Magnetic Resonance in Medicine* (11th Annual Meeting), August 1992, Berlin, Germany.
- Skinner, TE, Pruski, J, and Robitaille, PML, "Water Suppression Using a Rise Time Compensated High Pass Filter," *Experimental Nuclear Magnetic Resonance Conference* (33rd Annual Meeting), March 1992, Pacific Grove, California.
- Nasrallah, HA, Skinner, TE, Schmalbrock, P, and Robitaille, PML, "In Vivo 1H NMR Spectroscopy of the Hippocampus in Schizophrenia," *American College of Neuropsychopharmacology* (30th Annual Meeting), December 1991, San Juan, Puerto Rico.
- Nasrallah, HA, Skinner, TE, Schmalbrock, P, Obringer, A, and Robitaille, PML, "In Vivo 1H Magnetic Resonance Spectroscopy of the Hippocampus/Amygdala Complex in Schizophrenia," *Society for Neuroscience* (21st Annual Meeting), August 1991, New Orleans, Louisiana.
- Skinner, TE, "Theoretical Analysis of Higher Order Steady State Sequences," *Society for Magnetic Resonance in Medicine* (10th Annual Meeting), August 1990, San Francisco, California.
- Stern SA, Skinner TE, Brosch N, Santvoort J Van and Trafton LM, "The UV Spectrum of Pluto," Division for Planetary Sciences Meeting, Oct. 1988, Austin, Texas
- Na CY, Esposito LW and Skinner TE, "IUE Observations of Venus S02," Division for Planetary Sciences Meeting, October 1988, Austin, Texas.
- Moos HW, Gallester GE, Strobel DF, Feldman PD, Festou MC, Bertaux JL and Skinner TE, "IUE Observations of Io: Neutral Oxygen and Sulfur Emissions," XXVII COSPAR Meeting, July 1988, Espoo, Finland.
- Skinner TE, and Gladstone GR, "Auroral Precipitation Energies in the Jovian Aurora as a Function of Magnetic Longitude," 5th Biannual IUE Symposium: A Decade of UV Astronomy With the IUE Satellite, April, 1988, Goddard Space Flight Center, Greenbelt, Maryland.
- Gladstone GR and Skinner TE, "Spectral Analysis of Jovian Auroral Emissions," Division for Planetary Sciences Meeting, November 1987, Pasadena, California.
- Ballester GE, Moos HW, Strobel DF, Feldman PD, Festou MC, Summers ME, Skinner TE, Bertaux JL and Lieske J, "1987 IUE Observations of Io: Neutral Oxygen and Sulfur Emissions," Division for Planetary Sciences Meeting, November 1987, Pasadena, California.
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- Variable Phenomena in the Jovian System, August 1987, Lowell Observatory, Flagstaff, Arizona.
- Skinner TE, Deland MT, Ballester GE, Coplin, Feldman PD and Moos HW, "Long-Term Temporal Behavior of the Jovian H I Lyman-Alpha Emission, Workshop on Time-Variable Phenomena in the Jovian System, August 1987, Lowell Observatory, Flagstaff, Arizona.
- Ballester GE, Moos HW and Skinner TE, "IUE Observations of Io and the Plasma Torus, Workshop on Time-Variable Phenomena in the Jovian System, August 1987, Lowell Observatory, Flagstaff, Arizona.
- Stern SA, McClintock WE and Skinner TE, "Obtaining Mercury's UV Spectrum From a Sounding Rocket Mission," Meeting on Planetary and Satellite Atmospheres, January 1987, Lunar and Planetary Laboratory, University of Arizona, Tucson, Arizona.
- Ballester GE, Moos HW, Strobel DF, Summers ME, Feldman PD, Skinner TE, Bertaux JL, Festou MC and Lieske J, "IUE Observations of the Neutral Oxygen and Sulfur Corona Around Io, Meeting on Planetary and Satellite Atmospheres, Lunar Planetary Laboratory, University of Arizona, Tucson, Arizona.
- Ballester GE, Moos HW, Strobel DF, Summers ME, Feldman PD, Skinner TE, Bertaux JL, Festou MC and Lieske J, "Detection of a Neutral Oxygen and Sulfur Corona Around Io Using IUE," Division for Planetary Sciences Meeting, October 1986, Paris, France.
- Ballester GE, Moos HW, Strobel DF, Summers ME, Feldman PD, Bertaux JL, Festou MC, Skinner TE and Lieske J, "Detection of Neutral Atomic Cloud Near Io Using IUE," Second Neil Brice Memorial Symposium, Magnetospheres of the Outer Planets, September 1986, Iowa City, Iowa.
- Deland MT, Moos HW, and Skinner TE, "Correlations Between Solar Lyman Alpha Flux and Jovian Lyman Alpha Emissions," Winter Meeting of the American Geophysical Union December 1985, San Francisco, California.
- Clarke JT, Durrance S, Moos W, Belcher J, Pradham A and Skinner T, "An Overview of Four Years of Observations of the H Ly α Emission from Uranus and Tests for Correlations With the Solar Wind Density," Division for Planetary Sciences, October 1985, Baltimore, Maryland.
- Skinner TE, and Durrance ST, "Modeling of Neutral Sulfur and Oxygen Densities in the Io Torus, Division for Planetary Sciences, October 1985, Baltimore, Maryland.
- Ballester GE, Feldman PD, Moos HW and Skinner TE, "IUE Observations of Auroral Emissions from Saturn," Division for Planetary Sciences, October 1985, Baltimore, Maryland.
- Skinner TE, "Planetary Auroral Observations," Transactions of the Fifth Scientific Assembly, IAGA Bulletin No. 51, August 1985, Prague, Czechoslovakia.
- Moos HW, Skinner TE, Durrance ST, Feldman PD, Festou MC and Bertaux JL, "Long Term Stability of the Io High-Temperature Plasma Torus," Division for Planetary Sciences, October 1984, Kona, Hawaii.
- Skinner TE and Moos HW, "Spatial Dependence of the Jovian North and South Pole Auroral Emissions," Division for Planetary Sciences, October 1984, Kona Hawaii.
- Moos HW, Skinner TE, Feldman PD and Durrance ST, "Long Term Variability of the Io Torus, Spring Meeting of the American Geophysical Union, June 1984, Baltimore, Maryland.
- Skinner TE, Moos HW, and Ballester GE, "Spatial Dependence of the North & South Pole Auroral Emissions from Jupiter," Spring Meeting of the American Geophysical Union, June 1984, Baltimore, Maryland.
- Skinner TE, Moos HW and Ballester GE, "The Spatial Dependence of the Jovian Auroral Emissions," 3rd Biannual IUE Symposium: Future of UV Astronomy Based on Six Years of IUE Research, April 1984, Goddard Space Flight Center, Greenbelt, Maryland.
- Moos HW, Skinner, TE, Feldman, and Durrance ST, "Long Term Variability of the Io Torus," 3rd Biannual IUE Symposium: The Future of UV Astronomy Based on Six years of IUE Research, April 1984, Goddard Space Flight Center, Greenbelt, Maryland.

- Moos HW, Skinner TE, Feldman PD and Durrance ST, "IUE Studies of the Outer Planets: Long Term Variability of the Io Torus, Working Group on Astronomy of the Outer Planets, January 1984, Yosemite, California.
- Skinner TE, Durrance ST, Feldman PD, Moos HW, "Spatial Distribution of the North and South Polar Aurorae on Jupiter," Division for Planetary Sciences Meeting, October 1983, Ithaca, New York.
- Skinner TE, Durrance ST, Feldman PD and Moos HW, "Spatial Distribution of the Jovian Auroral Emissions," Spring Meeting of the American Geophysical Union, June 1983, Baltimore, Maryland.
- Skinner TE, Durrance ST, Feldman PD, Bertaux JL and Festou MC, "IUE Spectra of the Io Torus," Division for Planetary Sciences Meeting, October 1982, Boulder, Colorado.
- Moos HW, Durrance ST, Feldman PD and Skinner TE, "Recent IUE Spectra of the Io Torus, 2nd Biannual IUE Symposium, July 1982, Goddard Space Flight Center, Greenbelt, Maryland.
- Durrance ST, Moos HW, Skinner TE and Feldman PD, "Ultraviolet Observations of Uranus," 2nd Biannual IUE Symposium, July 1982, Goddard Space Flight Center, Greenbelt, Maryland.
- Skinner TE, Durrance ST, Moos HW and Feldman PD, "Observations of the Jovian H I Lyman-Alpha Emission, 2nd Biannual IUE Symposium, July 1982, Goddard Space Flight Center, Greenbelt, Maryland.
- Skinner TE, Durrance ST, Moos HW and Feldman PD, "IUE Observations of Jupiter's H I Lyman-Alpha Emission, Spring Meeting of the American Geophysical Union, June 1982, Philadelphia, Pennsylvania.

DEPARTMENTAL SEMINARS

- "Perspectives on Computational Physics," Physics Department, Wright State University, February 10, 2005.
- "BEBOP: Improving NMR Applications," Physics Department, Wright State University, April 9, 2004.
- "Optimal Control Theory: Applications to Nuclear Magnetic Resonance," Physics Department, Wright State University, November 7, 2003.
- "Putting Pulses and Coupling Under the Umbrella of the Product Operator Formalism," Institut für Organische Chemie und Biochemie II, Technische Universität München, July 12, 2001.
- "Putting Pulses and Coupling Under the Umbrella of the Product Operator Formalism (Part II)," Institut für Organische Chemie und Biochemie II, Technische Universität München, July 19, 2001.
- "Putting Pulses and Coupling Under the Umbrella of the Product Operator Formalism (Part III)," Institut für Organische Chemie und Biochemie II, Technische Universität München, July 26, 2001.
- "Putting Pulses and Coupling Under the Umbrella of the Product Operator Formalism (Part IV)," Institut für Organische Chemie und Biochemie II, Technische Universität München, August 2, 2001.
- "Optimal Control Theory: Application to NMR of Single-Spin Systems Using the Bloch Equation," Institut für Organische Chemie und Biochemie II, Technische Universität München, December 14, 2001.
- "Optimization of Broadband RF Pulses Using Optimal Control Theory," Institut für Organische Chemie und Biochemie II, Technische Universität München, January 17, 2002.
- "Density Matrix Calculations Using Pure States," Institut für Organische Chemie und Biochemie II, Technische Universität München, June 6, 2002.
- "A Simple (and Exact!) Vector Model of Adiabatic Decoupling," Institut für Organische Chemie und Biochemie II, Technische Universität München, July 4, 2002.
- "A Vector Model of General Decoupling," Institut für Organische Chemie und Biochemie II, Technische Universität München, July 11, 2002.
- "Broadband Excitation Pulses: Results and Experimental Implementation," Institut für Organische Chemie und Biochemie II, Technische Universität München, July 18, 2002.

"Classical Rotations and Quantum Spin Dynamics in Nuclear Magnetic Resonance (NMR)," Applied Mathematics Seminar, Wright State University, February 7, 2000.

"Broadband Decoupling in NMR Using Adiabatic Pulses," Physics Department, Wright State University, February 28, 1997, Dayton, Ohio.

"Adiabatic Excitation in NMR Using Sin² Amplitude and Cos² Frequency Modulation Functions," Physics Department, Wright State University, April 14, 1992, Dayton, Ohio.

PROFESSIONAL ACTIVITIES

Member, Ultraviolet Spectroscopy team for the Galileo Mission to Jupiter, The Laboratory for Atmospheric and Space Physics, 1985-1988.