

## Curriculum Vitae

### David Leslie Miller

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#### BUSINESS ADDRESS

Department of Mechanical  
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#### PERSONAL

Date of Birth: 1954 October 26

Marital Status: Married, 1 child

#### EDUCATION

Bachelor of Science in Mechanical Engineering from Louisiana State University, Baton Rouge, LA, May 1976.

Master of Science in Mechanical Engineering from Louisiana State University, Baton Rouge, LA, May 1979. Thesis title: An Experimental and Mechanistic Study of the High Temperature Thermal Decomposition of Methanol.

Doctor of Philosophy in Mechanical Engineering from Louisiana State University, Baton Rouge, LA, December 1984. Dissertation title: The High Temperature Combustion of Selected Chlorinated Hydrocarbons.

#### PRINCIPAL FIELDS OF INTEREST

- o Combustion Chemistry as it pertains to efficiency and emissions
- o Modeling of Complex Phenomena Using Response Surface Techniques

#### EXPERIENCE

July 2012 to July 2013 – Interim Department Head Mechanical Engineering and Mechanics

October 2002 to June 2012; Aug 2013 to present – Associate Department Head for Undergraduate Affairs in Mechanical Engineering and Mechanics

September 2006 to present – Professor, Department of Mechanical Engineering and Mechanics; Drexel University

July 1995 to December 2001 - Responsible for the administration of the Drexel Engineering Core Curriculum overseeing the first and second years of the engineering program

September 1991 to August 2006 - Associate Professor; Department of Mechanical Engineering and Mechanics; Drexel University

September 1985 to August 1991 - Assistant Professor; Department of Mechanical Engineering and Mechanics; Drexel University

January 1985 - September 1985 - Post-Doctoral Research Associate; College of Engineering; Louisiana State University; Supervisor: Dr. R. A. Matula

1980-1981 - One-eighth time Teaching Assistant in the Department of Mechanical Engineering; Louisiana State University; Taught undergraduate survey course in thermodynamics for non-Mechanical Engineering students (three semesters)

1976 - 1984 - Full-time Research Assistant on various research projects; Major Professor: Dr. R. A. Matula

## RESEARCH PROFILE

My research activities at Drexel University have been in the area of combustion chemistry. I have been involved in investigating problems of fundamental chemical kinetics, engine combustion problems such as knock and cold start, hazardous waste incineration, municipal waste incineration, and novel combustion systems for incineration applications. I have participated in the development of two engine research facilities, a flow reactor facility to study reactions at elevated pressures, a flat flame reactor facility to study hydrocarbon oxidation in flame environments, and in-situ diagnostics for measurement of species concentration using Fourier Transform Infrared Spectrometry and non-linear laser spectroscopy. From our spectroscopic work, we have submitted a patent on Cavity Enhanced Magneto-optic Rotation as a sensitive and selectable tool for measuring paramagnetic species in the gas phase.

A combination of bench scale reactor facilities have been used to study the chemical kinetic pathways that control the energy release and emissions from the combustion process with the support of the Department of Energy, Army Research Office, Air Force Office of Scientific Research and National Science Foundation. The range of experimental conditions achievable ( $0.1 \text{ atm} < P < 20 \text{ atm.}$ ;  $600 \text{ K} < T < 1100 \text{ K}$ ) in these systems coupled with gas chromatographic analysis of the composition of the reaction gases, sampled at various stages of the combustion process, provide insight into the chemistry which controls such important engine performance characteristics as cold start in spark ignition and diesel engines, knock in spark ignition engines, and emissions. This work, supported by a mix of agencies including the National Science Foundation, Army Research Office, and Department of Energy, has resulted in the development of detailed chemical kinetic models describing the combustion process that may be used in engine design. Recent work has explored the use of the broad specification fuel JP-8 in compression ignition engines and the development of surrogates for petroleum and non-petroleum derived JP-8. This research will continue to be important as modern society faces the challenge of a changing fuel supply and increased concern about emissions and efficiency.

Under the auspices of the National Aeronautics and Space Administration, I have studied propane oxidation at non-stoichiometric conditions with application to the new gas turbine engines that may use staged combustion. With a combination of careful measurement and modeling we have identified a possible new path that may be significant in the formation of NO<sub>x</sub>. This reaction system has also been used to develop a degenerate four wave mixing diagnostic for in situ measurements of combustion gases using a combination of NSF, DOE and ARO funding. This project has proven the first measurement of CN radical using mixing and developed a modification to the technique which increases its signal to noise ratio by an order of magnitude. In another program from NASA, we have examined cool flame chemistry in microgravity. Over the past few years my work has been funded by the AFOSR and the ARO to study the combustion kinetics of fuels derived from non-petroleum sources in gas turbine (AFOSR) and compression ignition (ARO) engines and by NSF to study plasma assisted ignition and laser based combustion diagnostics.

I have been assisted by a number of undergraduate and graduate students and colleagues in these research activities. I have supervised sixteen Ph. D. students to completion and five are in progress. Thirty students have completed the Master's degree under my direction. While staying within the general area combustion, my research activities are broad based and of continuing interest to government funding agencies and impact society in general. I intend to continue my activities in these areas and work to sustain a vigorous research program.

## RECORD OF SCHOLARLY ACTIVITY

## A. Archival Papers

- R 1. Miller, D. L., M. Frenklach, "Sensitivity Analysis and Parameter Estimation in Dynamic Modeling of Chemical Kinetics," *Int. J. Chem. Kinetics*, 15:677-696, 1983
- R 2. Miller, D. L., M. Frenklach, P. J. Laughlin, D. W. Clary, "Transferring Data from a Nicolet Digital Oscilloscope to an IBM Mainframe Using an APPLE II+. Part I," *Computer Application in the Laboratory*, 2:184-189, 1984
- R 3. Miller, D. L., M. Frenklach, P. J. Laughlin, D. W. Clary, "Transferring Data from a Nicolet Digital Oscilloscope to an IBM Mainframe Using an APPLE II+. Part II," *Computer Application in the Laboratory*, 2:260-269, 1984
- R 4. Miller, D. L., D. W. Senser, V. A. Cundy, R. A. Matula, "Chemical Considerations in the Incineration of Chlorinated Methanes. I-Methyl Chloride," *Hazardous Waste*, 1:1-17, 1984
- R 5. Frenklach, M., D. L. Miller, "Statistically Rigorous Parameter Estimation in Dynamic Modeling using Approximate Empirical Models," *AIChE Journal*, 31:498-500, 1985
- R 6. Clary, D. W., M. Frenklach, D. L. Miller, "Philosophy of Laboratory Automation," *American Laboratory*, 17:60-64, 1985
- R 7. Miller, D. L., M. Frenklach, P. J. Laughlin, D. W. Clary, "Der APPLE II als Hilfsmittel bei der Dateneübertragung von einem Digital-Speicheroszilloskop auf einen IBM-Mainframe-Rechner, Teil I & II," *Computer-Anwendung im Labor*, 2:98-104 & 105-115, 1985
- R 8. Frenklach, M., J. P. Hsu, D. L. Miller, R. A. Matula, "Shock Tube Pyrolysis of Chlorinated Hydrocarbons," *Comb. and Flame*, 64:141-155, 1986
- R 9. Henig, Y., S. Addagarla, D. L. Miller, R. D. Wilk, N. P. Cernansky, "Autoignition of N-Butane/Isobutane Blends In a Knock Research Engine," SAE Paper No. 890157, *SAE Transactions*, 1989
- R 10. Addagarla, S., Y. Henig, R. D. Wilk, D. L. Miller, Cernansky, N. P., "Effect of Fuel Air Mixture Stressing on Preignition Heat Release In a Knock Research Engine," SAE Paper No. 892082, *SAE Transactions*, 1989
- R 11. Wilk, R. D., S. Addagarla, D. L. Miller, N. P. Cernansky, W. J. Pitz, C. K. Westbrook, R. E. Green, "An Experimental and Kinetic Modeling Study of the Combustion of N-Butane and Iso-Butane in an Internal Combustion Engine," SAE Paper No. 900028, *SAE Transactions*, 1990
- R 12. Wilk, R. D., S. Addagarla, D. L. Miller, N. P. Cernansky, W. J. Pitz, C. K. Westbrook, R. M. Green, "An Experimental and Kinetic Modeling Study of the Combustion of N-Butane and Iso-Butane in an Internal Combustion Engine," *Proc. Combust. Inst.*, 23:1047-1053, 1991
- R 13. Addagarla, S., D. J. Filipe, D. L. Miller, N. P. Cernansky, R. M. Green, "The Effects of Speed and Manifold Pressure on Autoignition in a Motored Engine," SAE Paper No. 910566, *SAE Transactions*, Section 4, 1991
- R 14. Koert, D. N., D. L. Miller, N. P. Cernansky, "Results of Reactivity Mapping Studies Through the Negative Temperature Coefficient Region for Propane at Pressures from 5 to 15 Atmospheres," *Energy and Fuel*, 6: 485-493, 1992
- R 15. Bloomer, J. J., D. L. Miller, "A Study of Fluidized Bed Combustion of Propane and Methyl Chloride Mixtures," *Proc. Combust. Inst.*, 24: 1101-1108, 1992
- R 16. Matthews, R. D., M. Sarwar, M. J. Hall, D. J. Filipe, D. L. Miller, N. P. Cernansky, "Predictions of Cycle Variability in an Engine Using a Fractal Engine Model," SAE Paper No. 912345, *SAE Transactions*, Section 3, 1992
- R 17. Ahuja, S., D. L. Miller, "An Improved Thermocouple for Studies in Flat Flames," *Rev. Sci. Instrum.* 64 (5):1358-1359, 1993

## A. Archival Papers (cont.)

- R 18. Li, H., D. L. Miller, N. P. Cernansky, "A Study on the Application of a Reduced Chemical Kinetic Model to Motored Engines for Heat Release Prediction," SAE Paper No. 922328, *SAE Transactions*, Section 5, 1993
- R 19. Koert, D. N., D. L. Miller, N. P. Cernansky, "Experimental Studies of Propane Oxidation through the Negative Temperature Coefficient Region at 10 and 15 Atmospheres," *Comb. and Flame*, 96:34-49, 1994
- R 20. Fritsky, K.J., D. L. Miller, N. P. Cernansky, "A Methodology for Modeling the Devolatilization of Refuse Derived Fuel from Thermogravimetric Analysis of Municipal Solid Waste Components," *Air & Waste Management*, 44:116-1124, 1994
- R 21. McCormick, T. W., D. L. Miller, N. P. Cernansky, "The Analysis of Isobutane Oxidation Using Fourier Transform Infrared Spectroscopy," *Spectroscopy*, 10 (3):26-31 1995
- R 22. Tsay, S. J., K. G. Owens, K. W. Aniolek, D. L. Miller, N. P. Cernansky, "Detection of CN Using Degenerate Four-Wave Mixing," *Optical Letters*, 20:1725-1727 1995
- R 23. Li, H., S. K. Prabhu, D. L. Miller, N. P. Cernansky, "Autoignition Chemistry Studies on Primary Reference Fuels in a Motored Engine," SAE Paper No. 942062, *SAE Transactions*, 1995
- R 24. Li, H., S. K. Prabhu, D. L. Miller, N. P. Cernansky, "The Effects of Methanol and Ethanol on the Oxidation of a Primary Reference Fuel Blend in a Motored Engine," Paper No. 950682, *SAE Transactions*, 1995
- R 25. Prabhu, S. K., R. K. Bhat, D. L. Miller, N. P. Cernansky, "1-Pentene Oxidation and Its Interaction with Nitric Oxide in the Low and Negative Temperature Coefficient Regions," *Comb. and Flame*, 104(4):377-390, 1996
- R 26. Gaffuri, P., T. Faravelli, E. Ranzi, N. P. Cernansky, Miller, D., A. d'Anna, A. Cjajolo, "Comprehensive Kinetic Model for the Low-Temperature Oxidation of Hydrocarbons," *AIChE Journal*, 43 (5):1278-1286, 1997
- R 27. Aniolek, K.W., D. L. Miller, N. P. Cernansky, K. G. Owens, "Generation of 1.30-1.55 mm Tunable Radiation from First Stokes Raman Shifting in Hydrogen," *Applied Spectroscopy*, 51 (6):820-826, 1997
- R 28. Wang, S., D. L. Miller, N. P. Cernansky, H. J. Curran, W. J. Pitz, C. K. Westbrook, "A Flow Reactor Study of Neopentane Oxidation at 8 Atmospheres: Experiments and Modeling," *Comb. and Flame*, 118 (3): 415-430, 1999
- R 29. Prabhu, S., X. Bian, D. L. Miller, N. P. Cernansky, "Post Combustion Hydrocarbon Oxidation and Exhaust Emissions - Neat Fuel and Fuel Blend Studies," *SAE Trans. - J. Fuels and Lubricants*, 1999; also SAE Paper No. 981456
- R 30. Prabhu, S., X. Bian, D. L. Miller, N. P. Cernansky, "Time Resolved Exhaust Port Sampling Related to Hydrocarbon Emissions from SI Engines," *SAE Trans. - J. Fuels and Lubricants*, 1999; also SAE Paper No. 982558
- R 31. Bian, X., S. Prabhu, W. Yang, D. L. Miller, N. P. Cernansky, "Tracer Fuel Injection Studies on Exhaust Port Hydrocarbon Oxidation," *SAE Trans. - J. Fuels and Lubricants*, 1999; also SAE Paper No. 982559
- R 32. Yang, W., X. Bian, S. K. Prabhu, Cernansky, N. P., D. L. Miller, "Post Combustion Hydrocarbon Oxidation in an SI Engine," *Proc. Combust. Inst.*, 28:1233-1239, 2000
- R 33. Yang, W., J. Zheng, D. L. Miller, N. P. Cernansky, "Tracer Fuel Injection Studies on Exhaust Port Hydrocarbon Oxidation, Part II," *SAE Trans. - J. Fuels and Lubricants*, 2000; also SAE Paper No. 2000-01-1945, 2000
- R 34. Zheng, J., W. Yang, D. L. Miller, N. P. Cernansky, "Prediction of Pre-Ignition Reactivity and Ignition Delay for HCCI Using a Reduced Chemical Kinetic Model," *SAE Trans. - J. Fuels and Lubricants*, 2001; also SAE Paper No. 2001-01-1025
- R 35. Emig, M., R. I. Billmers, K. G. Owens, N. P. Cernansky, D. L. Miller, F. A. Narducci, "Sensitive and Selective Detection of Paramagnetic Species Using Cavity Enhanced Magneto-optic Rotation," *Applied Spectroscopy*, 56(7), 863-868, 2002

## A. Archival Papers (cont.)

- R 36. Zheng, J., W. Yang, D. L. Miller, N. P. Cernansky, "A Skeletal Chemical Kinetic Model for the HCCI Combustion Process," *SAE Trans. – J. of Engines*, 2002; also SAE Paper No. 2002-01-0423
- R 37. Zheng, J., D. L. Miller, N. P. Cernansky, Liu, D. and Zhang, M., "The Effect of Active Species in Internal EGR on Preignition Reactivity and on Reducing UHC and CO Emissions in Homogeneous Charge Engines," *SAE Trans. – J. of Fuels and Lubricants*, 2003. also SAE Paper No 2003-01-1831 (and JSAE 20030281)
- R 38. Agosta, A., N. P. Cernansky, D. L. Miller, T. Faravelli, E. Ranzi, "Reference Components of Jet Fuels: Kinetic Modeling and Experimental Results," *Experimental Thermal and Fluid Sciences*, 28(7), 701-708, 2004
- R 39. Zheng, J., D. L. Miller, N. P. Cernansky, "A Global Reaction Model for the HCCI Combustion Process," *SAE Trans. – J. of Engines*, 2004, also SAE Paper No. 2004-01-2950
- R 40. Lenhert, D. B., D. L. Miller, N. P. Cernansky, "The Oxidation of JP-8 and JP-8 Surrogates in the Negative Temperature Coefficient Region," *Combustion Science and Technology*, 179(5), 845-861, 2007
- R 41. Natelson, R. H., M. S. Kurman, N. P. Cernansky, D. L. Miller, "Experimental Investigation of Surrogates for Jet and Diesel Fuels," *Fuel*, 87:2339-2342, 2008 (doi: 10.1016/j.fuel.2007.11.009)
- R 42. Mehl, M., T. Faravelli, E. Ranzi, D. L. Miller, N. Cernansky, "Experimental and Kinetic Modeling Study of the Effect of Fuel Composition in HCCI Engines," *Proc. Combust. Inst.*, 32:2843-2850, 2009
- R 43. Lenhert, D. B., D. L. Miller, N. P. Cernansky, K. G. Owens, "The Oxidation of a Gasoline Surrogate in the Negative Temperature Coefficient Region," *Combustion and Flame*, 146:549-564, 2009.
- R 44. Natelson, R. H., R. O. Johnson, M. S. Kurman, N. P. Cernansky, D. L. Miller, "Comparison of Reactivity in a Flow Reactor and a Single-Cylinder Engine," 2010, *Experimental Thermal and Fluid Sciences*, 34:928-932, doi:10.1016/j.expthermflusci.2010.02.009
- R 45. Kurman, M. S., R. H. Natelson, N. P. Cernansky, D. L. Miller, "Speciation of the Reaction Intermediates from n-dodecane Oxidation in the Low Temperature Regime," *Proc. Combust. Inst.*, 33:159-166, 2011 (doi: 10.1016/j.proci.201005.038)
- R 46. Wu, L., J. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Y. Starikovskiy, "Plasma-Assisted Ignition Kinetics below Self-Ignition Threshold in Methane, Ethane, Propane and Butane-Air Mixtures," *Proc. Combust. Inst.*, 33:3219-3224, 2011 (doi:10.1016/j.proci.2010.06.003)
- R 47. Natelson, R. H., M. S. Kurman, R. O. Johnson, N. P. Cernansky, D. L. Miller, "Preignition and Autoignition of the Xylene Isomers," *Combustion Science and Technology* 183:897-914, 2011 (doi: 10.1080/00102202.2011559952)
- R 48. Natelson, R. H., M. S. Kurman, N. P. Cernansky, D. L. Miller, "Low and Intermediate Temperature Oxidation of n-butylcyclohexane," *Combustion and Flame*, 158:2325-2337, 2011 (doi: 10.1016/j.combustflame.2011.05.004)
- S/R 49. Wu, L., J. Lane, N. Cernansky, D. Miller, A. Fridman, A. Starikovskiy, "Time Resolved PLIF Imaging of OH Radicals in the Afterglow of Nanosecond Pulsed Discharge in Combustible Mixtures," *IEEE Trans on Plasma Science*, 39(11), 2604-2605, 2011 (doi: 10.1109/TPS2011.2160739)
- S/R 50. Wu, L., J. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Y. Starikovskiy, "Plasma-Assisted Ignition Kinetics Below Self-Ignition Threshold in Hydrocarbon-Air and Hydrocarbon-Air Mixtures," under review for *IEEE Trans on Plasma Science*
- S/R 51. Lane, J., Stichter, M., N. Cernansky, D. Miller, "Cavity Enhanced Magneto-optic Rotation (CEMOR) of OH Radicals in a Premixed Atmospheric Pressure Flame," in preparation

## B. Refereed Publications

- C/R 1. Arnas, O. A., D. L. Miller, "An Irreversible Thermodynamic Analysis of a Thermoelectric Generator," Paper included in the Proceedings of the Second International Conference on Thermoelectric Energy Conversion, Arlington, TX, March 1978, also IEEE catalog No. 78CH1313-6, Reg. 5
- C/R 2. Miller, D. L., V. A. Cundy, R. A. Matula, "Incinerability Characteristics of Selected Chlorinated Hydrocarbons," Proceedings of the Ninth Annual Research Symposium of the Solid and Hazardous Waste Research Division, United States Environmental Protection Agency, EPA-600/9-84-015 1983
- C/R 3. Brinckman, G. A., D. L. Miller, "The Characterization of a Rijke Type Pulsating Combustor," Proceedings of the 26th National Heat Transfer Conference sponsored by ASME/AIChE, HTD 106, 487-492, 1989
- C/R 4. Bloomer, J. J., D. L. Miller, "Characterization of Methyl Chloride/Propane Combustion in a Fluidized Bed Combustor," Proceedings of the Eleventh International Conference on Fluidized Bed Combustion, 11, 1133-1137, 1991
- C/R 5. Filipe, D. J., H. Li, D. L. Miller, N. P. Cernansky, "The Autoignition Behavior of n-Heptane and Isooctane Blends in a Motored Knock Research Engine," SAE Paper No. 920807, SAE International Congress and Exposition, Detroit, MI, February 1992
- C/R 6. Bloomer, J. J., D. L. Miller, "Practical Aspects of Utilizing Fluidized Bed Combustors for Toxic Waste Incineration," Paper presented at the Air Toxic Emissions from Waste Incinerators" session of the International Joint Power Generation Conference, Atlanta, GA, October 1992
- C/R 7. Prabhu, S. K., H. Li, D. L. Miller, N. P. Cernansky, "The Effect of Nitric Oxide on Autoignition of a Primary Reference Fuel Blend in a Motored Engine," SAE Paper No. 932757, SAE Fuels and Lubricants International Congress, Philadelphia, PA, October 1993
- C/R 8. Cernansky, N. P., D. L. Miller, S. Addagarla, "The Autoignition of n-Pentane in a Non-Fired Single Cylinder Engine," SAE Paper No. 932756, SAE Fuels and Lubricants International Congress, Philadelphia, PA, October 1993
- C/R 9. Li, H., S. K. Prabhu, D. L. Miller, N. P. Cernansky, "The Effects of Octane Enhancing Ethers on n-Heptane and Iso-octane Blend Reactivity in a Motored Engine," SAE Paper No. 940478, SAE International Congress and Exposition, Detroit, MI, March 1994
- C/R 10. Prabhu, S., D. L. Miller, N. P. Cernansky, "Effect of Fuel Structure and Engine Operating Conditions on Exhaust Emissions," Paper No. F145 presented at the Third Asian-Pacific International Symposium on Combustion and Energy Utilization, Hong Kong, December 1995
- C/R 11. Li, H., D. L. Miller, N. P. Cernansky, "Development of a Reduced Chemical Kinetic Model For Prediction of Preignition Reactivity and Autoignition of Primary Reference Fuels," SAE Paper No. 960498, SAE International Congress and Exposition, Detroit, MI, March 1996
- C/R 12. Wang, S., D. L. Miller, N. P. Cernansky, "Prediction of Preignition Reactivity for n-Butane and iso-Butane Blends Using a Reduced Chemical Kinetic Model," SAE Paper No. 961154 SAE International Spring Fuels and Lubricants Meeting and Exposition, Dearborn, MI, May 1996
- C/R 13. Wang, S., D. L. Miller, N. P. Cernansky, "A Reduced Chemical Kinetic Model for Autoignition of Butanes," SAE Paper No. 962106, SAE International Fall Fuels and Lubricants Meeting and Exposition, San Antonio, TX, October 1996
- C/R 14. Zheng, J., D. L. Miller, N. P. Cernansky, D. Liu, X. Zhao, M. Zhang, "Some Observations of the Effects of EGR, Oxygen Concentration, and Engine Speed on the Homogeneous Charge Combustion of n-Heptane," Paper No. 2004-01-1905, Joint GFC/SAE Spring Fuels and Lubricants Meeting, Toulouse, France, 8-10 June 2004
- C/R 15. Zheng, J., D. L. Miller, N. P. Cernansky, D. Liu, Y. Li, X. Shang, M. Zhang, "Two Types of Autoignition and Their Engine Applications," Paper No. 2005-01-0178, SAE World Congress and Exposition, Detroit, MI, April 2005

## C. Conference Presentations

- C/R 16. Gong, X., R. O. Johnson, D. L. Miller, N. P. Cernansky, "Effects of DTBP on the HCCI Combustion Characteristics of SI Primary Reference Fuels," Paper No. 2005-01-3740 presented at the SAE 2005 Powertrain and Fluid Systems Conference, San Antonio, TX, October 2005
- C/R 17. Gupta, A., X. Gong, D. L. Miller, N. P. Cernansky, "A Detailed Kinetic Study on the Effect of DTBP on PRF Combustion in HCCI Engines," Paper No. 2007-01-2002 and JSAE 20077273 for inclusion at the 2007 Power Train and Fluid Systems Conference, Kyoto, Japan, July 2007
- C/R 18. Mehl, M., A. Trardani, T. Faravelli, T., E. D. Ranzi, G. Errico, T. Lucchini, A. Onorati, D. Miller, N. Cernansky, "A Multizone Approach to the Detailed Kinetic Modeling of HCCI Combustion," Paper No. 2007-24-0086 presented at the SAE 2007 Mediterranean Conference, Capri, July 2007.
- C 1. Miller, D. L., R. A. Matula, "Ignition Delay Measurements of Ethanol Oxidation," Paper No. CSSCI 80-08 presented at the Spring Technical Meeting of the Central States Section of the Combustion Institute, Baton Rouge, LA, March 1980
- C 2. Miller, D. L., R. A. Matula, R. C. Farmer, "The High Temperature Thermal Decomposition of Methanol," Paper No. WSSCI 79-15 presented at the Spring Technical Meeting of the Western States Section of the Combustion Institute, Provo, UT, April 1980
- C 3. Miller, D. L., M. Frenklach, "A New Look at Sensitivity Analysis and Parameter Estimation in Detailed Modeling of Chemical Kinetics," Poster presented at the Physical Chemistry Division, 183rd National Meeting of the American Chemical Society, Las Vegas, NV, March 1982
- C 4. Frenklach, M., D. L. Miller, "Computer Modeling of Complex Phenomena," Poster presented at the session "Computer Experiments in Chemical Engineering Science" of the National Meeting of the American Institute of Chemical Engineering, Houston, TX, March 1983
- I 5. Miller, D. L., Cundy, V. A. R. A. Matula, "Chemical and Physical Considerations in the Incineration of Chlorinated Hydrocarbons," Invited presentation included in the proceedings of the Hazardous Waste Materials Conference, Philadelphia, PA, p. 241-251, June 1984
- C 6. Miller, D. L., D. W. Clary, M. Frenklach, "Developing an Oscilloscope/ Microcomputer/ Mainframe Communication System," Paper MD 14.1 of the Joint Meeting of the Operations Research Society of America and the Institute of Management Science, Dallas, TX, November 1984
- C 7. Miller, D. L., R. A. Matula, "A Shock Tube Study of the Pyrolysis and Oxidation of Dichloromethane," Paper No. ESSCI 84-87 presented at the Fall Technical Meeting of the Eastern State Section of the Combustion Institute, Clearwater, FL, December 1984
- C 8. Miller, D. L., M. Frenklach, R. A. Matula, "Chemical Kinetics Modeling of Ignition of Methyl Chloride and Dichloromethane," Paper No. CSSCI 85-4-3B presented at the Joint Technical Meeting of the Western/Central States Sections of the Combustion Institute, San Antonio, TX, April 1985
- C 9. Frenklach, M., J.P. Hsu, D. L. Miller, R. A. Matula, "Pyrolysis of Chlorinated Hydrocarbons," Paper No. CSSCI 85-2-3B presented at the Joint Technical Meeting of the Western/Central States Sections of the Combustion Institute, San Antonio, TX, April 1985
- C 10. Clary, D. W., M. Frenklach, D. L. Miller, "Philosophy of Laboratory Automation," Paper presented at the 188th American Chemical Society National Meeting, Miami, FL, May 1985
- C 11. Miller, D. L., M. Frenklach, R. A. Matula, "Chemical Kinetic Mechanisms for Oxidation of Chlorinated Methanes," Paper presented at the International Conference of Chemical Kinetics, sponsored by the National Bureau of Standards, Gaithersburg, MD, June 1985
- C 12. Rabinowitz, M. J., S. M. Hwang, W. C. Gardiner, Jr., D. L. Miller, M. Frenklach, "Direct Observation of Methyl Radical as a Probe of Shock-Initiated Methane Ignition," Paper presented at the Tenth International Colloquium on Dynamics of Explosions and Reactive Systems, Berkeley, CA, August 1985
- C 13. Gardiner, W. C., Jr., S. M. Hwang, M. J. Rabinowitz, M. Frenklach, D. W. Clary, D. L. Miller, "Experimental and Modeling Study of Methane Combustion," Paper presented at the 190th National Meeting of the American Chemical Society, Chicago, IL, September 1985

## C. Conference Presentations (cont.)

- C 14. Wilk, R. D., D. L. Miller, N. P. Cernansky, "Intermediate Temperature Oxidation of Alkenes: Reaction of Alkenyl Radicals," Paper No. WSSCI 86-6 presented at the Joint Spring Technical Meeting of the Western States/Canada Section of the Combustion Institute, Banff, Alberta, Canada, April 1986
- C 15. Cheng, M. T., D. L. Miller, R. A. Matula, "Single-Pulse Shock Tube Studies of Pyrolysis and Oxidation of Chloroform," Paper No. CSSCI 86-45 presented at the Spring Technical Meeting of the Central States Section of the Combustion Institute, Cleveland, OH, May 1986
- C 16. Rabinowitz, M. J., S. Addagarla, D. L. Miller, "Hydrocarbon Mixture Ignition and Reaction Zone Widths: Modeling Investigation of Concentration, Dilution and Equivalence Ratio Effects," Poster presented at the Twenty-First Symposium (Int.) on Combustion, Munich, Germany, August 1986
- C 17. Wilk, R. D., D. L. Miller, N. P. Cernansky, "An Experimental Study of Isobutane Oxidation at Transition Temperatures," Paper No. WSSCI 86-32 presented at the Western States Section of the Combustion Institute, Fall Technical Meeting, Tempe, AZ, October 1986
- C 18. Rabinowitz, M. J., S. Addagarla, D. L. Miller, "Two-Zone Modeling of Hydrocarbon Combustion," Paper No. ESSCI 86-45 presented at the Eastern States Section of the Combustion Institute, Fall Technical Meeting, San Juan, Puerto Rico, December 1986
- C 19. Wilk, R. D., D. L. Miller, N. P. Cernansky, "An Experimental Study of the Oxidation of Propene Oxide," Paper No. ESSCI 86-61 presented at the Eastern States Section of the Combustion Institute, Fall Technical Meeting, San Juan, Puerto Rico, December 1986
- C 20. Addagarla, S., R. D. Wilk, D. L. Miller, N. P. Cernansky, "Temperature and Stoichiometric Effects on Isobutane Oxidation," Paper No. WSSCI 87-2A-023 presented at the Joint Western States/Japanese Section Fall Technical Meeting, Honolulu, HA, November 1987
- C 21. Henig, Y., S. Addagarla, D. L. Miller, R. D. Wilk, N. P. Cernansky, "Investigation of Fuel Structure and Blending Effects on Autoignition Using a Knock Research Engine," Paper No. WSSCI 88-100 presented at the Western States Section Fall Technical Meeting, Dana Point, CA, October 1988
- C 22. Brinckman, G., I. Namer, D. L. Miller, "The Characterization of a Rijke-Type Pulsating Combustor," Paper No. ESSCI 88-44 presented at the Eastern States Section of the Combustion Institute, Fall Technical Meeting, Clearwater Beach, FL, December 1988
- C 23. Addagarla, S., D. L. Miller, N. P. Cernansky, R. M. Green, "Investigation of the Effects of Inlet Conditions on Autoignition In a Motored Knock Research Engine," Paper No. WSSCI 89-72 presented at the Western States Section of the Combustion Institute 1989 Fall Meeting, Livermore, CA, October 1989
- C 24. Wilk, R. D., S. Addagarla, D. L. Miller, N. P. Cernansky, R. M. Green, W. J. Pitz, C. K. Westbrook, "An Experimental and Kinetic Modeling Study of the Combustion of N-Butane and IsoButane in an Internal Combustion Engine," Paper No. WSSCI 89-70 presented at the Western States Section of the Combustion Institute 1989 Fall Meeting, Livermore, CA, October 1989
- C 25. Brinckman, G. A., D. L. Miller, "The Effect of Gaseous Fuel Flow Rate on Sound Level and Temperature in a Self-Aspirating Rijke Pulsating Combustor," Paper No. ESSCI 89-76 presented at the Eastern States Section of the Combustion Institute 1989 Fall Meeting, Albany, NY, November 1989
- C 26. Gupta, A. V., D. N. Koert, D. L. Miller, "Investigation of the Relationship Between Octane Number and Low Temperature Reactivity for Primary Reference Fuel Blends," Paper No. CSSCI 90-34 presented at the Central States Section of the Combustion Institute Spring Meeting, Cincinnati, OH, May 1990
- C 27. Bloomer, J. J., D. L. Miller, "Fluidized Bed Combustion of Propane," Paper No. WSSCI 90-77 presented at the Western States Section of the Combustion Institute Spring Meeting, Banff, Alberta, April 1990
- C 28. Koert, D. N., R. D. Wilk, D. L. Miller, N. P. Cernansky, "A Pressurized Flow Reactor Study of Low and Intermediate Temperature Ethane and Propane Oxidation," Poster No. P266 presented at the Twenty-Third Symposium (Int'l.) on Combustion, Orleans, France, July 1990
- C 29. Bloomer, J. J., D. L. Miller, "Methyl Chloride/Propane Combustion in a Fluidized Bed Combustor," Paper No. ESSCI 90-11 presented at the Eastern States Section of the Combustion Institute Fall Meeting, Orlando, FL, December 1990

## C. Conference Presentations (cont.)

- C 30. Koert, D. N., D. L. Miller, N. P. Cernansky, "Propane Oxidation through the NTC Region: A Comparison of Results at 10 and 15 Atmospheres," Paper No. ESSCI 90-8 presented at the Eastern States Section of the Combustion Institute 1990 Fall Meeting, Orlando, FL, December 1990
- C 31. Fritsky, K. J., D. L. Miller, N. P. Cernansky, "Kinetics of Refuse Derived Fuel Devolatilization Using Thermogravimetric Data," Paper No. WSSCI 91-46 presented at the Western State Section of the Combustion Institute 1991 Spring Meeting, Boulder, CO, March 1991
- C 32. Koert, D. N., K. Jaouabi, D. L. Miller, N. P. Cernansky, W. J. Pitz, C. K. Westbrook, "Propane Oxidation through the Negative Temperature Coefficient Region at 10 and 15 Atmospheres: Results of Experimental and Modeling Studies," Poster No. 187 presented at the Twenty-Fourth Symposium (Int'l) on Combustion, Sydney, Australia, July 1992
- C 33. Ahuja, S., D. L. Miller, "Low Temperature, Lean Propane-Air-Helium Flames," Poster No. 199 presented at the Twenty-Fourth Symposium (Int'l) on Combustion, Sydney, Australia, July 1992
- C 34. Ahuja, S., D. L. Miller, "Non-Stoichiometric Propane-Air Flames," Paper No. ESSCI 93-43 presented at the Joint Technical Meeting of the Eastern States and Central States Sections of the Combustion Institute, New Orleans, LA, May 1993
- C 35. McCormick, T. W., M. Hori, D. N. Koert, D. L. Miller, N. P. Cernansky, "Analysis of the Room Temperature Photolysis of Azomethane Using FTIR Spectroscopy," Paper No. WSSCI 93-012 presented at the Western State Section of the Combustion Institute 1993 Spring Meeting, Salt Lake City, UT, March 1993
- C 36. Prabhu, S. K., H. Li, D. L. Miller, N. P. Cernansky, "The Effect of Nitric Oxide on Autoignition of a Primary Reference Fuel Blend in a Motored Engine," DOE Workshop on Diesel Engine Emissions, La Jolla, CA, July 1993
- C 37. Anand, A., T. W. McCormick, C. H. Wood, D. N. Koert, D. L. Miller, N. P. Cernansky, "Oxidation of n-Butane at Elevated Pressures," Paper No. WSSCI 94-013, presented at the Western State Section of the Combustion Institute 1994 Spring Meeting, Davis, CA, March 1994
- C 38. Bloomer, J. J., D. L. Miller, "Negative Temperature Coefficient Behavior of Chlorinated Hydrocarbons," Paper No. ESSCI C5-2 presented at the Eastern States Section of the Combustion Institute Fall Meeting, Clearwater Beach, FL, December 1994
- C 39. Prabhu, S., C. H. Wood, D. L. Miller, N. P. Cernansky, "Effect of Nitric Oxide on 1-Pentene Oxidation in the Low and Negative Temperature Coefficient Regimes (600-800 K)," Paper No. 95S-050 presented at the Joint Technical Meeting of the CS/WS/MSCI and AFRC, San Antonio, TX, April 1995
- C 40. Tsay, S. J., K. G. Owens, K. W. Aniolek, D. L. Miller, N. P. Cernansky, "Detection of CN in an Atmospheric Flame Using Tilted Backward Pump Degenerate Four Wave Mixing," Paper No. 95S-067 presented at the Joint Technical Meeting of the CS/WS/MNSCI and AFRC, San Antonio, TX, April 1995
- C 41. Gaffuri, P., T. Faravelli, E. Ranzi, N. P. Cernansky, D. L. Miller, A. d Anna, A. Ciajolo, "A Comprehensive Kinetic Model for the Low Temperature Oxidation of Hydrocarbons," Poster presented at the Twenty-Sixth (Int'l) Combustion Symposium, Naples, Italy, July 1996
- C 42. Tsay, S. J., K. G. Owens, K. W. Aniolek, D. L. Miller, N. P. Cernansky, "Investigations of the Signal Intensity and Background Noise in Tilted Backward Pump Degenerate Four-Wave Mixing," Paper No. B-2 presented at the Eastern States Section of the Combustion Institute Technical Meeting Hilton Head, SC, December 1996
- C 43. Tsay, S. J., K. G. Owens, K. W. Aniolek, D. L. Miller, N. P. Cernansky, "A Study of CN Formation Dependence on Equivalence Ratio and Temperature in Fuel-Rich Propane/Air Flames Doped with NO Using Degenerate Four-Wave Mixing," Paper No. C-2 presented at the Eastern States Section of the Combustion Institute Technical Meeting Hilton Head, SC, December 1996
- C 44. Wang, S., A. R. Khan, D. L. Miller, N. P. Cernansky, "Neopentane Oxidation in the Low and Intermediate Temperature Regime and at Elevated Pressure (8 atm)," Paper No. WSSCI 98S-61 presented at the Fall Technical Meeting of the Western States Section of the Combustion Institute, Berkeley, CA, March 1998

## C. Conference Presentations (cont.)

- C 45. Billmers, R. I., K. W. Aniolek, D. L. Miller, N. P. Cernansky, "Detection of Polyatomic Molecules and Radicals in Combustion Environments Using Cavity Ringdown Laser Absorption Spectroscopy," Paper No. 1075 presented at The Pittsburgh Conference, Orlando, FL, March 1999
- C 46. Lenhert, D. B., R. I. Billmers, N. P. Cernansky, D. L. Miller, "Determination of the Partial Oxidation Products in a Pressurized Flow Reactor System using FT-IR Spectroscopy with Chemometrics," Paper No. 708 presented at The Pittsburgh Conference 2000, New Orleans, LA, March 2000
- C 47. Billmers, R. I., M. F. Emig, N. P. Cernansky, D. L. Miller, "Cavity Enhanced Magneto-Optic Rotation: A Very Sensitive and Selective Method of Detecting Paramagnetic Species," presented at the Conference on Lasers and Electro-Optics (CLEO) 2001, Optical Society of America, Baltimore, MD, May 2001.
- C 48. Faravelli, T., E. Ranzi, M. Perotti, W. Yang, D. Miller, N. Cernansky, "Prediction of Ignition Delay for HCCI Using Semi-Detailed Kinetic Models," presented at the Combustion Symposium of the Italian Section, S. Margherita, September 19, 2001
- C 49. Zheng, J., D. L. Miller, N. P. Cernansky, "Predicting Preignition Reactivity of Real Fuels using Skeletal Kinetic Models," prepared for the NSF Workshop "New Combustion Models with Real Fuels," S. Margherita, 20 September, 2001; also, Paper No. ESSCI 2001-061, presented at the Eastern States Section Combustion Institute Meeting, Hilton Head, South Carolina, December 3-5, 2001.
- C 50. Emig, M., D. L. Miller, R. I. Billmers, N. P. Cernansky, K. G. Owens, "Cavity Enhanced Magneto-Optic Rotation: A Sensitive and Selective Technique for Detection of Paramagnetic Species," Paper No. ESSCI 2001-101, presented at the Eastern States Section Combustion Institute Meeting, Hilton Head, South Carolina, December 3-5, 2001.
- C 51. Zheng, J., W. Yang, D. L. Miller, N. P. Cernansky, "A Global Chemical Model for the HCCI Combustion Process," Paper No. WSSCI 02S-64, presented at the Western States Section of the Combustion Institute Spring Meeting, San Diego, California, March 25-27, 2002.
- C 52. Billmers, R. I., M. F. Emig, N. P. Cernansky, D. L. Miller, "Cavity Enhanced Magneto-Optic Rotation: A Sensitive and Selective Technique for Detection of Paramagnetic Species," presented at the Conference on Lasers and Electro-Optics (CLEO) 2002, Optical Society of America, Baltimore, MD, May 20-24, 2002
- C 53. Zheng, J., D. L. Miller, N. P. Cernansky, "Development of a Skeletal Kinetic Model for Prediction of Preignition Reactivity of Hydrocarbons," WIP Poster 18 – 1388, presented at the Twenty-Ninth Symposium (Int'l) on Combustion, Sapporo, Japan, July 2002
- C 54. Zheng, J., D. L. Miller, N. P. Cernansky, "The Effect of Preignition Reactivity on Flame Stability, UHC, and CO Emissions in Homogeneous Charge Engines," Paper No. B-09, presented at the Third Joint Meeting of the U.S. Sections of The Combustion Institute, Chicago, Illinois, USA, March 16-19, 2003
- C 55. Agosta, A., D. B. Lenhert, D. L. Miller, N. P. Cernansky, "Development and Evaluation of a JP-8 Surrogate that Models Preignition Behavior in a Pressurized Flow Reactor," Paper No. E-02, presented at the Third Joint Meeting of the U.S. Sections of The Combustion Institute, Chicago, Illinois, USA, March 16-19, 2003
- C 56. Lenhert, D. B., R. Khan, N. P. Cernansky, D. L. Miller, K. G. Owens, "The Oxidation of an ISF Surrogate and its Components in the Negative Temperature Coefficient Region," Paper No. E-05, presented at the Third Joint Meeting of the U.S. Sections of The Combustion Institute, Chicago, Illinois, USA, March 16-19, 2003
- C 57. Zheng, J., D. L. Miller, N. P. Cernansky, "A New Skeletal Kinetic Model for Describing the Preignition Reactivity of PRF's," Paper No. PM--04, presented at the Third Joint Meeting of the U.S. Sections of The Combustion Institute, Chicago, Illinois, USA, March 16-19, 2003
- C 58. Agosta, A., N. P. Cernansky, D. L. Miller, T. Faravelli, E. Ranzi, "Reference Components of Jet Propeller Fuels: Kinetic Modeling and Experimental Results," presented at the Joint Italian and Moroccan Combustion Symposium, Marrakesh, Morocco, June 8-13, 2003
- C 59. Zheng, J., D. L. Miller, N. P. Cernansky, "Effect of Pre-First-Stage Ignition Chemistry on Ignition and Emissions," Paper No. ESSCI B-56, presented at the Eastern States Section of the Combustion Institute Meeting, State College, PA, October 28-30, 2003

## C. Conference Presentations (cont.)

- C 60. Lenhert, D. B., D. L. Miller, N. P. Cernansky, "Oxidation of JP-8 and Jet-A in the Low and Intermediate Temperature Regime," Paper No. CSSCI-C4-3, presented at the Central States Section Combustion Institute Meeting, Austin, TX, 22-23 March 2004
- C 61. Zheng, J., D. L. Miller, N. P. Cernansky, "A Global Reaction Model for the HCCI Combustion Process," WIP 4F1-18, poster presented at the Thirtieth International Combustion Symposium, Chicago, Illinois, USA, July 2004
- C 62. Lenhert, D. B., N. P. Cernansky, D. L. Miller, K. G. Owens, "The Oxidation and Interaction of a Gasoline Surrogate and Its Components in the Low and Intermediate Temperature Regime," WIP 4F1-06, poster presented at the Thirtieth International Combustion Symposium, Chicago, Illinois, USA, July 2004
- C 63. Zheng, J., X. Gong, D. B. Lenhert, D. L. Miller, N. P. Cernansky, "Preignition Behavior of n-Heptane, iso-Octane, and Propionaldehyde Blends in a Pressurized Flow Reactor," Paper USSCI-P04 presented at the Fourth Joint Meeting of the U.S. Sections of the Combustion Institute, Philadelphia, PA, March 2005
- C 64. Gong, X., J. Zheng, D. B. Lenhert, D. L. Miller, N. P. Cernansky, "The Effect of DTBP Additive on the Oxidation of Gasoline Primary Reference Fuels in a Pressurized Flow Reactor," Paper USSCI-C03 presented at the Fourth Joint Meeting of the U.S. Sections of the Combustion Institute, Philadelphia, PA, March 2005
- C 65. Johnson, R. O., J. Zheng, X. Gong, D. L. Miller, N. P. Cernansky, "The Effect of Formaldehyde Addition on Two-Stage Ignition of Hydrocarbon Fuels," Paper USSCI-P44 presented at the Fourth Joint Meeting of the U.S. Sections of the Combustion Institute, Philadelphia, PA, March 2005
- C 66. Gupta, A., D. L. Miller, H. Pearlman, N. P. Cernansky, "A Global Model for the Autoignition of Propane," Paper USSCI-C11 presented at the Fourth Joint Meeting of the U.S. Sections of the Combustion Institute, Philadelphia, PA, March 2005
- C 67. Lenhert, D. B., N. P. Cernansky, D. L. Miller, "The Oxidation of Large Molecular Weight Hydrocarbons in a Pressurized Flow Reactor," Paper USSCI-A22 presented at the Fourth Joint Meeting of the U.S. Sections of the Combustion Institute, Philadelphia, PA, March 2005.
- C 68. Gong, X., D. L. Miller, N. P. Cernansky, "Experimental and Computational Study on Preignition Chemistry of SI Primary Reference Fuels in a Pressurized Flow Reactor," Paper No. 773 presented at the 37th Middle Atlantic Regional Meeting of the American Chemical Society, Piscataway, NJ, May 2005
- C 69. Johnson, R., D. L. Miller, N. P. Cernansky, "The Autoignition of JP-8, Jet-A, and Selected Reference Components in a Single-Cylinder Engine," Paper No. WSSC I- 05F-55 presented at the Fall Technical Meeting of the Western States Section of the Combustion Institute, Stanford, CA, October 2005
- C 70. Johnson, R., X. Gong, N. P. Cernansky, D. L. Miller, "The Effect of DTBP on Gasoline and SI Primary Reference Fuels," Paper presented at the Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Orlando, FL, November 2005
- C 71. Kurman, M. S., R. H. Natelson, N. P. Cernansky, D. L. Miller, "Oxidation of Fischer-Tropsch JP-8 in the Low and Intermediate Temperature Regimes," Paper CSSCI-21 presented at the 2006 Technical Meeting of the Central States Section of the Combustion Institute, Cleveland, OH, May 2006
- C 72. Gupta, A., D. L. Miller, N. P. Cernansky, "Effect of DTBP on PRF Combustion in HCCI Engines," Paper CSSCI-43 presented at the 2006 Technical Meeting of the Central States Section of the Combustion Institute, Cleveland, OH, May 2006
- C 73. Gupta, A., N. P. Cernansky, H. Pearlman, D. L. Miller, "A Numerical Study of the Influence of DTBP Addition on PRF Combustion in HCCI Engines," Poster WIPP 4E22 presented at the 31<sup>st</sup> Symposium (Intl) of the Combustion Institute, Heidelberg, GDF, August 10, 2006
- C 74. Lenhert, D. B., N. P. Cernansky, D. L. Miller, "N-Dodecane/Methylcyclohexane Oxidation in the Low and Intermediate Temperature Regime," Poster WIPP 2D28 presented at the 31<sup>st</sup> Symposium (Intl) of the Combustion Institute, Heidelberg, GDF, August 8, 2006

## C. Conference Presentations (cont.)

- C 75. Colket, M., T. Edwards, T., S. Williams, N. P. Cernansky, D. L. Miller, F. Egolfopoulos, P. Lindstedt, K. Seshadri, F. L. Dryer, C. K. Law, D. Friend, D. B. Lenhart, H. Pitsch, A. Sarofim, M. Smooke, W. Tsang, (2007): "Development of an Experimental Database and Kinetic Models for Surrogate Jet Fuels," AIAA Paper No. 2007-770 presented at the AIAA Meeting January 2007
- C 76. Johnson, R., N. P. Cernansky, D. L. Miller, "The Effect of Compression Ratio on Engine Performance and Exhaust Emissions Using DTBP/n-Heptane Blends," Paper USC E-25 presented at the 5<sup>th</sup> U.S. Combustion Meeting, San Diego, CA, March 2007
- C 77. Natelson, R., R. Johnson, M. Kurman, N. Cernansky, D. Miller, "Low Temperature Oxidation of Selected Jet Fuel and Diesel Fuel Components at Elevated Pressure," Paper USC D-15 presented at the 5<sup>th</sup> U.S. Combustion Meeting, San Diego, CA, March 2007
- C 78. Kurman, M. S., R.H. Natelson, N. P. Cernansky, D. L. Miller, "Intermediate Species Analysis of Fischer-Tropsch JP-8 Surrogate Components in the Low and Intermediate Temperature Reaction Regime," Paper USC D-16 presented at the 5<sup>th</sup> U.S. Combustion Meeting, San Diego, CA, March 2007
- C 79. Gupta, A., M. Foster, H. Pearlman, D. L. Miller, N. P. Cernansky, "Cool Flames at Microgravity: A Skeletal Kinetic Mechanism for Propane Oxidation," Paper USC C-32 presented at the 5<sup>th</sup> U.S. Combustion Meeting, San Diego, CA, March 2007
- C 80. Kurman, M. S., R. H. Natelson, N. P. Cernansky, D. L. Miller, "Preignition Oxidation of Chemistry of n-Decane," Paper ESSCI-A-06 presented at the 2007 Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Charlottesville, VA, October 2007
- C 81. Natelson, R. H., M. S. Kurman, D. L. Miller, N. P. Cernansky. "Oxidation of Alternative Jet Fuels and their Surrogate Components." Paper No. AIAA-2008-970, 46<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, January 7-10, 2008
- C 82. Colket, M., T Edwards, S. Williams, N. P. Cernansky, D. L. Miller, F. Egolfopoulos, F. L. Dryer, J. Bellan, P. Lindstedt, K. Seshadri, H. Pitsch, A. Sarofim, M. Smooke, W. Tsang, "Identification of Target Validation Data for Development of Surrogate Jet Fuels," Paper No. AIAA-2008-0972, 46<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, January 7-10, 2008
- C 83. Natelson, R.H., R.O. Johnson, M.S. Kurman, N. P. Cernansky, D.L. Miller, "Preignition and Autoignition Behavior of the Xylene Isomers." Paper No. WSSCI-08S-12, Spring Technical Meeting of the Western States Section of the Combustion Institute, Los Angeles, California, March 17-18, 2008.
- C 84. Cernansky, N. P., D. L. Miller, R. H. Natelson, M. S. Kurman, "Preignition Oxidation Chemistry of Xylene." A tribute book for Professor Eliseo Ranzi, Italian Chemical Engineering Society, June 2008
- C 85. Kurman, M. S., R. H. Natelson, N. P. Cernansky, D. L. Miller, "Preignition Oxidation Chemistry of the Major JP-8 Surrogate Component: n-Dodecane," AIAA Paper No. 2009-1526, 47<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, January 5-8, 2009
- C 86. Kurman, M. S., R. H. Natelson, N. P. Cernansky, D. L. Miller, "New Methodology for Jet Fuel Surrogate Oxidation and Intermediate Speciation in the Low Temperature Regime," Paper USC 23G2 presented at the 6<sup>th</sup> U.S. Combustion Meeting, Ann Arbor, MI, May 21-25, 2009
- C 87. Nikipelov, A., L. Wu, J. Lane, I. N. Ciobanescu-Husanu, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Y. Starikovskiy, "Kinetics of OH Radicals below Self-Ignition Threshold in Plasma Enhanced Combustion," Paper C-22 presented at the Fall Technical Meeting of the Eastern States Section of the Combustion Institute, College Park, MD, October 18-21, 2009
- C 88. Natelson, R. H., M. S. Kurman, N. P. Cernansky, D. L. Miller, "Low Temperature Oxidation of n-Butylcyclohexane," Paper A-26 presented at the 2009 Fall Technical Meeting of the Eastern States Section of the Combustion Institute, College Park, MD, October 18-21, 2009
- C 89. Lane, J. L., N. P. Cernansky, D. L. Miller, "A Stabilized Cool Flame Reactor for Laser Diagnostic Studies of HO<sub>2</sub> and OH radicals at Pre-Ignition Reaction Conditions," Paper B-24 presented at the 2009 Fall Technical Meeting of the Eastern States Section of the Combustion Institute, College Park, MD, October 18-21, 2009

## C. Conference Presentations (cont.)

- C. 90. Wu, L., A. Nikipelov, J. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Y. Starikovskiy, "Kinetics of OH Radicals below Self-Ignition Threshold in Plasma Enhanced Combustion," 2009 Aerospace Thematic Workshop "Fundamentals of Aerodynamic Flow and Combustion Control by Plasmas" October 11-16, Les Houches Physics School, France
- C. 91. Wu, L., J. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Y. Starikovskiy, "Kinetics of Plasma Assisted Combustion at Low Reduced Electric Fields," AIAA Paper No. 2010-1593, 48<sup>th</sup> AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition, Orlando, FL, January 4-7, 2010
- C. 92. Lane, J. L., N. P. Cernansky, D. L. Miller, "Cavity Enhanced Magneto-optic Rotation (CEMOR) Spectroscopy: A Prospective Technique for Concentration Measurements of HO<sub>2</sub> Radicals in a Stabilized Cool Flame Reactor," Paper 10S-40 presented at the 2010 Spring Technical Meeting of the Western States Section of the Combustion Institute, Boulder, CO, March 22-23, 2010
- C. 93. Wu, L., J. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Y. Starikovskii, "Kinetics of OH radicals below Self-Ignition Threshold in Plasma Enhanced Combustion," Paper 10S-53 presented at the 2010 Spring Technical Meeting of the Western States Section of the Combustion Institute, Boulder, CO, March 22-23, 2010
- C. 94. Starikovskiy, A., L. Wu, J. Lane, N. P. Cernansky, D. Miller, A. Fridman, "Plasma Enhanced Combustion of Methane-, Ethane-, Propane-, and Butane-Air Mixtures Below Self-Ignition Threshold," Paper No. 7B-8 presented at the 37<sup>th</sup> IEEE International Conference on Plasma Science, Norfolk, VA, June 20-24, 2010
- C. 95. Wu, L., J. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Yu. Starikovskiy, "Plasma-Assisted Ignition Kinetics Below Self-Ignition Threshold in Hydrogen and Hydrocarbon-Air Mixtures," 20<sup>th</sup> European Conference on the Atomic and Molecular Physics of Ionized Gases, Novi Sad, Serbia, July 13-17, 2010
- C. 96. Wu, L., J. L. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Yu. Starikovskiy, "Plasma-enhanced Combustion in Methane, Ethane, Propane and Butane-Air Mixtures below Self-Ignition Threshold," *XVIII International Conference on Gas Discharges and Their Applications (GD 2010)*, Greifswald, Germany, September 5-10, 2010
- C. 97. Wu, L., J. Lane, N. Cernansky, D. Miller, A. Fridman, A. Starikovskiy, "Plasma Assisted Ignition below Self-Ignition Threshold in Hydrogen, Hydrogen-CO and Hydrocarbon-Air Mixtures," *63rd Annual Gaseous Electronics Conference and 7th International Conference on Reactive Plasmas*, Paris, France, October 4-8, 2010
- C. 98. Wu, L., J. L. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Yu. Starikovskiy, "Plasma-Assisted Ignition below Self-Ignition Threshold in Methane, Ethane, Propane and Butane-Air Mixtures," *49th AIAA Aerospace Sciences Meeting*, Orlando, Florida, USA, January 4-7, 2011
- C. 99. Corrubia, J. A., F. Farid, N. P. Cernansky, D. L. Miller, "The Low to Intermediate Temperature Oxidation of n-Propyl-cyclohexane in a Pressurized Flow Reactor," Paper No. 2A12 presented at the 7<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Atlanta, GA, March 20-23, 2011
- C. 100. Liang, W., J. Lane, N. P. Cernansky, D. Miller, A. Fridman, A. Starikovskiy, "Time Resolved PLIF and CRD Diagnostics of OH Radicals in the Afterglow of Plasma Discharge in Hydrocarbon Mixtures," Paper No. 2H15 presented at the 7<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Atlanta, GA, March 20-23, 2011
- C. 101. Lane, J., N. Cernansky, D. Miller, "Cavity Enhanced Magneto-optic Rotation (CEMOR) of OH Radicals in a Methane/Air Flame," Paper No. 2E17 presented at the 7<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Atlanta, GA, March 20-23, 2011
- C. 102. Gupta, A., D. L. Miller, N. P. Cernansky, "Development of a Low-Temperature Hydrocarbon Kinetic Mechanism which forms Non-Alkylated Lactones," Paper No. 1A08 presented at the 7<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Atlanta, GA, March 20-23, 2011
- C. 103. Wu, L., J. L. Lane, N. P. Cernansky, D. L. Miller, A. A. Fridman, A. Yu. Starikovskiy, "Time Resolved PLIF and CRD Diagnostics of OH Radicals in the Afterglow of Plasma Discharge in Hydrocarbon Mixtures," 20<sup>th</sup> International Symposium on Plasma Chemistry (ISPC), Philadelphia, PA, July 24-29, 2011

- C. 104. Lane, J., M. Stichter, N. Cernansky, D. Miller, "Selective Observation of the Anomalous Zeeman Effect," Paper No. ESSCI-B-35 presented at the Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CN, Oct 9-12, 2011
- C. 105. Wu, L., Lane, J., M. Stichter, N. Cernansky, D. Miller, Fridman, A., "Effects of  $N_2(v)$  and NO in plasma-assisted oxidation and ignition below auto-ignition threshold," *51st AIAA Aerospace Sciences Meeting*, Dallas, TX, USA, January 7-10, 2013
- C. 106. Farid, F, J. Corrubia, N. Cernansky, D. Miller, "Oxidation of 2,7-dimethyloctane and n-propylcyclohexane in the low to intermediate temperature regime with a pressurized flow reactor," Paper No. 1A15 presented at the 8<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Park City, UT May 19-22, 2013
- C. 107. Lane, J. L., M.A. Stichter, N. P. Cernansky, D. L. Miller, "Development of a Sensitive and Selective Laser Diagnostic Technique for Measuring Paramagnetic Species," Paper No. 3C07 presented at the 8<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Park City, UT May 19-22, 2013
- C. 108. Lane, J. L., M. A. Stichter, N. P. Cernansky, D. L. Miller, "A Flash Photolysis Facility for Fundamental  $HO_2$  Studies," Paper No. 3C08 presented at the 8<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Park City, UT May 19-22, 2013 presented at the 8<sup>th</sup> U.S. National Technical Meeting of the Combustion Institute, Park City, UT May 19-22, 2013
- D. Seminars
1. Wilk, R. D., D. L. Miller, N. P. Cernansky, "Chemistry of Alkanes and Alkenes at Transition Temperature," Discussion presented to the Fuel Combustion Interactions Working Group of the Department of Energy held at the General Motors Research Laboratories, Warren, MI, May 1986
  2. Wilk, R. D., D. L. Miller, N. P. Cernansky, "Low and Intermediate Temperature Hydrocarbon Oxidation," Discussion presented to the Fuel Combustion Interactions Working Group of the Department of Energy hosted at Sandia National Laboratories, Livermore, CA, November 1986
  - I 3. Miller, D. L., "Development and Analysis of a Detailed Chemical Kinetic Mechanism," Invited seminar at Purdue University, West Lafayette, IN, April 1987
  4. Addagarla, S., Y. Henig, D. L. Miller, R. D. Wilk, N. P. Cernansky, "Autoignition of N-Butane/Isobutane Blends In a Knock Research Engine," Discussion presented to the 11th Knock Working Group Meeting of the Department of Energy held at the Sandia National Laboratories, Livermore, CA, November 1988
  5. Addagarla, S., Y. Henig, D. L. Miller, "Effect of Fuel-Air Mixture Stressing on Preignition Heat Release in Knock Research Engine," Discussion presented to the 12th Knock Working Group Meeting of the Department of Energy held at Princeton University, Princeton, N.J., May 1989
  6. Miller, D. L., "The Role of Olefins on Autoignition Chemistry," Discussion presented to the 13th Knock Working Group Meeting of the Department of Energy held at UNOCAL Science and Technology Division, Brea, CA, November 1989
  7. Miller, D. L., A. V. Gupta, D. N. Koert, P. Partridge, "Flow Reactors in Knock Chemistry," Discussion presented to the 14th Knock Working Group Meeting of the Department of Energy held at General Motors Research Institute, Warren, MI, May 1990
  8. Cernansky, N. P., D. L. Miller, D. N. Koert, "High Pressure Preignition Chemistry of Hydrocarbon and Hydrocarbon Mixtures," 9th ARO Engine/Fuels Workshop hosted by the University of Wisconsin-Madison, Madison, WI, June 1990
  9. Filipe, D. J., S. Addagarla, D. L. Miller, N. P. Cernansky, "Studies of Autoignition and Scavenging in a Motored Knock Research Engine," 15th Knock Working Group Meeting of the Department of Energy held at Sandia National Laboratories, Livermore, CA, November 1990
  10. Koert, D. N., A. V. Gupta, D. L. Miller, N. P. Cernansky, "Current Research with the Drexel Flow Reactors," 15th Knock Working Group Meeting of the Department of Energy held at Sandia National Laboratories, Livermore, CA, November 1990
  11. Gupta, A. V., D. L. Miller, "Recent Thoughts on CO/Octane Number Correlations with PRF's," 16th Knock Working Group Meeting of the Department of Energy held at Drexel University, Philadelphia, PA, May 1991

## D. Seminars (cont.)

12. Filipe, D. J., D. L. Miller, N. P. Cernansky, "Primary Reference Fuel Reactivity Studies in Engine Knock," 17th Knock Working Group Meeting of the Department of Energy held at UNOCAL Science and Technology Center, Brea, CA, November 1991
13. Li, H., D. J. Filipe, D. L. Miller, N. P. Cernansky, "Incorporation of Low Temperature Chemistry into a Heat Release Code," 17th Knock Working Group Meeting of the Department of Energy held at UNOCAL Science and Technology Center, Brea, CA, November 1991
14. Li, H., D. J. Filipe, D. L. Miller, N. P. Cernansky, "Current Research Using the Drexel/Sandia Engine System," 18th Knock Working Group Meeting of the Department of Energy held at Princeton University, Princeton, NJ, May 1992
15. Prabhu, S., M. J. Ramotowski, D. N. Koert, D. L. Miller, N. P. Cernansky, "Current Research with the Drexel Reactor Systems," 18th Knock Working Group Meeting of the Department of Energy held at Princeton University, Princeton, NJ, May 1992
16. Pitz, W. J., D. N. Koert, C. K. Westbrook, D. L. Miller, N. P. Cernansky, "Modeling of Propane Oxidation through the Negative Temperature Coefficient Region at 10 and 15 Atmospheres," 18th Knock Working Group Meeting of the Department of Energy held at Princeton University, Princeton, NJ, May 1992
17. Cernansky, N. P., D. L. Miller, D. N. Koert, "High Pressure Preignition Chemistry of Hydrocarbons and Hydrocarbon Mixtures," United States Army Research Office 10th Engine/Fuels Workshop held at University of Wisconsin-Madison, Madison, WI, June 1992
18. Li, H., D. L. Miller, N. P. Cernansky, "Current Research Using the Drexel/Sandia Engine System," Fuels Combustion/Emissions Interaction Department of Energy Working Group Meeting at Sandia National Laboratories, Livermore, CA, October 1992
19. Prabhu, S. K., M. J. Ramotowski, D. N. Koert, D. L. Miller, N. P. Cernansky, "Current Research on the Drexel Reactor Systems," Fuels Combustion/Emissions Interaction Department of Energy Working Group Meeting at Sandia National Laboratories, Livermore, CA, October 1992
20. Cernansky, N. P., D. N. Koert, A. Anand, S. K. Prabhu, S.-J. Tsay, D. L. Miller, T. W. McCormick, "Current Research on the Drexel Reactor Systems," Combined Fuels Combustion/Emissions Interaction and Discrete Homogeneous Charge Department of Energy Working Group Meeting at Chrysler Technology Center, Auburn Hills, MI, May 1993
21. Li, H., S. K. Prabhu, D. L. Miller, N. P. Cernansky, "Current Research Using the Drexel/Sandia Engine System," Combined Fuels Combustion/Emissions Interaction and Discrete Homogeneous Charge Department of Energy Working Group Meeting at Chrysler Technology Center, Auburn Hills, MI, May 1993
22. Prabhu, S. K., H. Li, D. L. Miller, N. P. Cernansky, "The Effect of Nitric Oxide on Autoignition of a Primary Reference Fuel Blend in a Motored Engine," Presented at the 1993 Diesel Engine Emission Reduction Workshop, conducted by the United States Department of Energy at the University of California, San Diego, La Jolla, CA, July 1993
23. Cernansky, N. P., D. L. Miller, "An Overview of Research Using the Drexel/Sandia Engine System," U.S. Department of Energy Joint Working Group Meeting, Dearborn, MI, October 1993
24. Miller, D. L., N. P. Cernansky, "High Pressure Preignition Chemistry of Hydrocarbons and Hydrocarbon Mixtures," 11th ARO Engine Workshop, Princeton University, Princeton, NJ, March 1994
- I 25. Miller, D. L., "Use of Refuse Derived Fuels as an Energy Source," Invited Seminar to the Drexel University Environmental Studies Institute, Philadelphia, PA, March 1994
26. Cernansky, N. P., D. L. Miller, "Hydrocarbon Emissions Research at Drexel University," Hydrocarbons Emission Working Group Meeting, U.S. Department of Energy Office of Transportation Technologies, Dearborn, MI, April 1994

## D. Seminars (cont.)

27. Cernansky, N. P., D. L. Miller, "Recent Engine Combustion Research at Drexel University," U.S. Department of Energy Office of Transportation Technologies Hydrocarbons Emissions Working Group Meeting, Dearborn, MI, October 1994
28. Cernansky, N. P., D. L. Miller, "Recent Engine Combustion Research at Drexel University," U.S. Department of Energy Office of Transportation Technologies Hydrocarbons Emissions Working Group Meeting, Princeton, NJ, March 1995
29. Cernansky, N. P., D. L. Miller, "Recent Engine Combustion Research at Drexel University," U.S. Department of Energy Office of Transportation Technologies Hydrocarbons Emissions Working Group Meeting, Dearborn, MI, October 1995
30. Cernansky, N. P., D. L. Miller, "Pre- and Post Combustion Hydrocarbon Oxidation," U.S. Department of Energy Office of Transportation Technologies Joint Working Group Meeting, Livermore, CA, April 1996
31. Cernansky, N. P., D. L. Miller, "Post Combustion Oxidation of Hydrocarbons," Workshop on "Fuel Preparation and Combustion" with U.S. Department of Energy Office of Transportation Technologies Funded Universities, Detroit, MI, May 1996
32. Cernansky, N. P., D. L. Miller, "Experimental Studies on Post Combustion Hydrocarbon Oxidation in Engines," Hydrocarbons Emission Working Group Meeting, U.S. Department of Energy Office of Transportation Technologies, Philadelphia, PA; May 1997
33. Cernansky, N. P., D. L. Miller, "Experimental Studies on Post Combustion Hydrocarbon Oxidation in Engines," Contractor's Meeting on Propulsion Research sponsored by the Army Research Office and the Air Force Office of Scientific Research; Cleveland, OH; June 1997
34. Cernansky, N. P., D. L. Miller, "High Pressure Preignition Chemistry of Hydrocarbons and Hydrocarbon Mixtures," Hydrocarbon Emission Working Group Meeting, U.S. Department of Energy Office of Transportation Technologies, Dearborn, MI, October 1997
35. Cernansky, N. P., D. L. Miller, "Post Combustion Hydrocarbon Oxidation," U.S. Department of Energy Office of Transportation Technologies Joint Working Group Meeting, Boston, MA, April 1998
36. Cernansky, N. P., D. L. Miller, "The Chemistry Controlling Ignition of Hydrocarbons and Their Mixtures at High Pressures," Contractor's Meeting on Propulsion Research sponsored by the Army Research Office and the Air Force Office of Scientific Research; Long Beach, CA, June 1998
37. Cernansky, N. P., D. L. Miller, "Post Combustion Hydrocarbon Oxidation," U.S. Department of Energy Office of Transportation Technologies Joint Working Group Meeting, Dearborn, MI, October 1998
38. Cernansky, N. P., D. L. Miller, "The Chemistry Controlling Ignition of Hydrocarbons and Their Mixtures at High Pressures," Contractor's Meeting on Propulsion Research sponsored by the Army Research Office and the Air Force Office of Scientific Research; Madison, WI, June 2000
39. Cernansky, N. P., D. L. Miller, "The Chemistry Controlling Ignition of Hydrocarbons and Their Mixtures at High Pressures," Contractor's Meeting on Propulsion Research sponsored by the Army Research Office and the Air Force Office of Scientific Research; Dayton, OH, June 2002
40. Lenhart, D. B., N. P. Cernansky, D. L. Miller, "Development and Evaluation of Fuel Surrogates in the Low and Intermediate Temperature Regime," NIST Workshop: Combustion Simulation Databases for Real Transportation Fuels, Gaithersburg, MD, September 2003.
41. Cernansky, N. P., D. L. Miller, "The Low Temperature Oxidation Chemistry of JP-8 and its Surrogates at High Pressures," Contractor's Meeting on Propulsion Research sponsored by the Army Research Office and the Air Force Office of Scientific Research; Tucson, AZ, June 2004
42. Cernansky, N. P., D. L. Miller, "The Low Temperature Oxidation Chemistry of JP-8 and its Surrogates at High Pressures," Contractor's Meeting on Propulsion Research sponsored by the Army Research Office and the Air Force Office of Scientific Research; Indianapolis, IN, June 2005

43. Cernansky, N. P., D. L. Miller, "Preignition Chemistry of Xylenes and Their Effect on JP-8 Surrogates," MACCCR Fuels Summit; Gaithersburg, MD, September 2008
44. Miller, D. L., N. P. Cernansky, Kurman, R. H. Natelson, "Development of Reduced Kinetic Mechanisms for Surrogates of Petroleum Derived and Synthetic Jet Fuels: Drexel Flow Reactor Studies at Low and Intermediate Temperatures," MACCCR Fuels Summit; Gaithersburg, MD, September 2008
45. Miller, D. L., N. P. Cernansky, Kurman, R. H. Natelson, "Development of Reduced Kinetic Mechanisms for Surrogates of Petroleum Derived and Synthetic Jet Fuels: Drexel Flow Reactor Studies at Low and Intermediate Temperatures," MACCCR Fuels Summit; Univ. Southern California, Los Angeles, CA, September 2009
46. Miller, D. L., N. P. Cernansky, M. S. Kurman, R. H. Natelson, F. Farid, J. Corrubia, "Development of Reduced Kinetic Mechanisms for Surrogates of Petroleum Derived and Synthetic Jet Fuels: Drexel Flow Reactor Studies at Low and Intermediate Temperatures," MACCCR Fuels Summit; Princeton, NJ, September 2010
47. Miller, D. L., N. P. Cernansky, F. Farid, J. Corrubia, "Development of Reduced Kinetic Mechanisms for Surrogates of Petroleum Derived and Synthetic Jet Fuels: Drexel Flow Reactor Studies at Low and Intermediate Temperatures," MACCCR Fuels Summit; Argonne National Laboratory, Chicago, IL, September 2011

#### E. Patents

1. Bilmers, R. I., M. F. Emig, N. P. Cernansky, D. L. Miller, K. G. Owens, F. A. Narducci, "Cavity Enhanced Magneto-Optic Rotation Spectroscopy and Uses Thereof," U.S. Provisional Patent Application, Serial No: 60/379,334, filed 9 May 2002.

#### RECORD OF SPONSORED RESEARCH ACTIVITIES

##### A. Research Proposals - Funded

1. Faculty Associate (N. P. Cernansky, Principal Investigator) in a Department of Energy Research Proposal, "Fuel Property Effects on Engine Combustion Processes," submitted to the Energy Conversion and Utilization Technology Program. 10/87 to 9/90. \$ 516,000. Submitted 4/86; Revised 2/87; Funded 10/87.
2. Co-Principal Investigator (with I. Namer and N. P. Cernansky) in a proposal to the Mick A. Naulin Foundation, "The Effects of Oxygen Enrichment on the Combustion of Toxic Wastes in a Fluidized Bed," 4/88 to 3/89. \$ 25,000. Submitted 8/87; Funded 4/88.
3. Co-Principal Investigator (with J. Friend and H. Allen) in a Ben Franklin Partnership Proposal, "Flue Gas Pollution Control," in co-operation with Enertec, Inc., submitted to the Commonwealth of Pennsylvania. 9/88 to 8/89. \$ 148,382. Submitted 4/88; Funded 9/88.
4. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Research Instrumentation Proposal, "Fourier Transform Infrared Analysis System," submitted to the Chemical and Thermal Engineering Unit. 7/89 to 6/90. \$ 156,700 ( 50% Drexel University Cost Share). Submitted 2/88; Funded 6/89.
5. Principal Investigator in a National Science Foundation Research Initiation Proposal, "Oxidation of Chlorinated Hydrocarbons," submitted to the Chemical and Thermal Engineering Unit. 10/89 to 9/91. \$ 70,000 (\$ 10,000 Drexel University Cost Share). Submitted 1/89; Funded 10/89.
6. Principal Investigator in a Drexel Research Scholar Award, "Oxidation of Chlorinated Ethenes." 10/89 to 9/91. \$ 5,000-cash; 50% AY release, 100% Drexel Research Assistant. Submitted 1/89; Funded 10/89.
7. Co-Principal Investigator (with N. P. Cernansky) in a Pennsylvania Energy Development Authority Proposal, "RDF Combustion and Pilot Plant Program." 1/90 to 12/90. \$ 171,780 (\$ 45,250 Drexel University Cost Share; \$ 10,000 Bechtel Corporation; \$107,054 PEDAs). Submitted 3/89; Funded 12/89.
8. Co-Principal Investigator (with J. Friend and A. Smith) in a Ben Franklin Partnership Proposal, "Instrumentation Package for an Infectious Waste Incinerator," in co-operation with Enertec, Inc., submitted to the Commonwealth of Pennsylvania. 9/89 to 8/90. \$ 228,369. Submitted 4/89; Funded 9/89.

## A. Research Proposals - Funded (cont.)

NOTE: This project was cancelled because one of the corporate partners had equipment failure and could not participate.

9. Principal Investigator in a National Aeronautics and Space Administration Research Proposal, "Propane Combustion Near the Lean Flammability Limit and the Sooting Limit," submitted to the Internal Fluid Mechanics Division, Lewis Research Center. 1/90 to 12/90. \$ 49,902. Submitted 8/89; Funded 12/89.
10. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "High Pressure Preignition Chemistry of Hydrocarbons and Hydrocarbon Mixtures." 10/89 to 9/92. \$ 287,000. Submitted 5/89, Funded 12/89.
11. Faculty Associate (N. P. Cernansky, Principal Investigator) in a National Science Foundation Research Proposal, "The Effect of Pressure on Low and Intermediate Temperature Hydrocarbon Oxidation," submitted to the Chemical and Thermal Systems Engineering Unit. 10/89 to 9/91. \$ 149,537. Funded 12/89.
12. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Research Instrumentation Proposal, "Advanced Gas Chromatography Systems with Multidimensional Capabilities," submitted to the Chemical and Thermal Engineering Unit. 7/90 to 6/91. \$ 25,185 (50% Drexel University Cost Share). Submitted 12/89; Funded 3/90.
13. Co-Principal Investigator (with N. P. Cernansky) in a Department of Energy Research Proposal, "The Role of Autoignition in Engine Knock," submitted to the Advanced Industrial Concepts Program, Division of Conservation and Renewable Energy. 1/91 to 12/93. \$ 575,196. Submitted 7/90; Funded 12/90.
14. Principal Investigator in a National Aeronautics and Space Administration research proposal, "Propane Combustion Near the Lean Flammability Limit and the Sooting Limit," submitted to the Internal Fluid Mechanics Division, Lewis Research Center. 1/91 to 12/91. \$ 59,998. Submitted 9/90; Funded 12/90.
15. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "Research Equipment: Dye Laser System for Combustion Diagnostics," 6/91 to 9/91. \$ 64,000. (\$15,000 Drexel University Cost Share). Submitted 5/91, Funded 6/91.
16. Principal Investigator in a National Aeronautics and Space Administration research proposal, "Propane Combustion Near the Lean Flammability Limit," submitted to the Internal Fluid Mechanics Division, Lewis Research Center. 1/92 to 12/92. \$ 49,998. Submitted 9/91; Funded 12/91.
17. Co-Principal Investigator (with N. P. Cernansky) in a Philadelphia Solid Waste Consortium Proposal, "Effects of Recycling on Combustion and Combustion Products." 4/92 to 3/93. \$ 47,885. Agency Request \$ 30,500; Drexel Provides Balance. Submitted 12/91; Funded 3/92.
18. Co-Principal Investigator (with R. S. Cohen (Temple University) and D. N. Koert) in a Philadelphia Solid Waste Consortium Proposal, "Reclamation of Scrap Tires by Pyrolytic Decomposition." 4/92 to 3/93. \$ 72,914. Agency Request \$ 43,580; Drexel Provides Balance. Submitted 12/91. Funded 3/92.
19. Co-Principal Investigator (with K. S. Owens) in a National Science Foundation Proposal, "Small Grant for Exploratory Research: Development of a New Diagnostic for Hydroperoxy Radical Measurement." 4/92 to 4/94. \$ 58,751. NSF Request \$ 50,000. Drexel Provides Balance. Submitted 2/92. Funded 5/92.
20. Principal Investigator in a Benjamin Franklin Partnership Engineering School Equipment Grant, "Computer Networking the Drexel University College of Engineering." 5/92 to 4/93. \$ 8,562. BFP Request \$ 2,750. Mobil Foundation Match \$ 3,000. Air Products Foundation Match \$ 2,500. Submitted 4/92. Funded 5/92.
21. Co-Principal Investigator (with K. S. Owens) in a National Science Foundation Proposal, "Engineering Research Equipment: High Speed Data Acquisition/Analysis System." 6/92 to 5/93. \$ 37,800. NSF Request \$ 18,900; Drexel Provides Balance. Submitted 1/92. Funded 6/92.
22. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "Engineering Research Equipment: Multidimensional Gas Chromatography System." 6/92 to 5/93. \$ 27,456. NSF Request \$ 13,728; Drexel Provides Balance. Submitted 1/92. Funded 6/92.
23. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "The Effect of Pressure on Hydrocarbon Oxidation Through the Negative Temperature Coefficient Regime." 6/92 to 5/95. \$ 249,998. NSF Request \$ 220,000. Drexel Provides Balance. Funded 12/92.

## A. Research Proposals - Funded (cont.)

24. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "High Pressure Preignition Chemistry of Hydrocarbons and Hydrocarbon Mixtures." 1/93 to 12/96. \$ 304,916. ARO Request \$ 239,000. Drexel Provides Balance. Funded 12/92.
25. Principal Investigator in a National Aeronautics and Space Administration research proposal, "Propane Combustion Near the Lean Flammability Limit," submitted to the Internal Fluid Mechanics Division, Lewis Research Center. 1/93 to 12/93. \$ 40,001. Submitted 9/92. Funded 1/93.
26. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, AASERT Program Proposal, "Non-Intrusive Chemical Species Measurements During Preignition Reaction Processes." 7/93 to 6/96. \$ 144,858. DOD Request \$ 130,128; Drexel Provides Balance. Submitted 12/92.
27. Principal Investigator in a National Science Foundation Research Experience for Undergraduates Supplement to NSF Grant: "Small Grant for Exploratory Research: Development of a New Diagnostic for Hydroperoxy Radical Measurement." 4/94-9/93. \$ 10,000. Submitted 2/93. Funded 5/93.
28. Co-Principal Investigator (with N. Bilgutay, W. Hill, J. Morris, and O. Tretiak) in a PEW Grant Proposal: "An Advanced Networked Multimedia Presentation Laboratory." 3/94-12/94. \$ 130,000. PEW Request \$ 40,000. ATC Request \$ 20,000. Drexel College of Engineering Provides Balance. Submitted 1/94; Funded 3/94.
29. Co-Principal Investigator (with N. P. Cernansky) in an industrial grant from the Powertrain Research Division of Ford Motor Company, to study "The Autoignition Behavior of Industry Standard Fuels." 5/95-12/95. \$ 40,000.
30. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Energy Research Proposal, "Post-Combustion Oxidation of Hydrocarbons." 2/96-1/99. \$ 328,700. DOE Request \$ 300,080; Drexel Provides Balance. Submitted 10/95; Funded 3/96.
31. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, AASERT Program Proposal, "Non-Intrusive Species Diagnostics for Preignition Reaction Processes." 5/97-4/00. \$ 139,492. DOD Request \$ 130,128; Drexel Provides Balance. Submitted 11/96; Funded 2/97.
32. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "The Chemistry Controlling Ignition of Hydrocarbons and Their Mixtures at High Pressures." 5/98-4/01. \$ 284,114. ARO Request \$ 263,500. Drexel Provides Balance. Submitted 7/97; Funded 3/98.
33. Co-Principal Investigator (with N. P. Cernansky) in a proposal to Ford Motor Company, "The Chemistry Controlling HCCI Combustion." 6/99-12/00. \$ 80,000. Ford Request \$ 80,000. Submitted 3/99; Funded 6/99.
34. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "The Chemistry Controlling the HCCI Combustion Process." 7/00 to 6/03. \$ 248,000. NSF Request \$ 233,000; Drexel Provides Balance. Submitted 6/99, Funded 6/00.
35. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "An Optical Parametric Oscillator for a Laser-Based Instrument to Measure Highly Reactive Radicals in Combustion Systems." 3/01 to 2/02. \$ 166,800. DOD Request \$ 166,800. Submitted 8/14/00. Funded 3/01.
36. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "The Chemistry Controlling Ignition of Hydrocarbons and Their Mixtures at High Pressure." 4/01-4/02. \$ 100,550. ARO Request \$ 94,000. Drexel Provides Balance. Submitted 7/10/00. Funded 4/01.
37. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Research Experience for Undergraduates Proposal to supplement NSF Program "The Chemistry Controlling the HCCI Combustion Process." 6/01 to 5/02. \$ 10,000. Submitted 4/01. Funded 6/01.
38. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Research Equipment Grant, "Acquisition of a Gas Chromatograph with Mass Selective Detector." 7/01 to 6/02. \$ 91,468. NSF Request \$ 60,980. Drexel Provides Balance. Submitted 1/02. Funded 7/02.
39. Co-Principal Investigator (with N. P. Cernansky and H. Pearlman (DU); J. Koenig and H. Rath (ZARM Inst)) in a National Aeronautics and Space Administration Proposal, "High Pressure Cool Flames and Autoignition at Microgravity." 9/02 to 8/06. \$ 915,000. NASA Request \$ 498,000; DLR Request \$ 407,000. Submitted 3/21/02. Selected for funding 9/02.

## A. Research Proposals - Funded (cont.)

40. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal "The Low Temperature Oxidation Chemistry of JP-8 and its Surrogates at High Pressures." 10/02-9/05. \$ 360,995. ARO Request \$ 306,995. Drexel Provides Balance. Submitted 7/19/02. Funded 6/03.
41. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "Support for the Fourth Joint Meeting of the United States Sections of the Combustion Institute" submitted to the Combustion and Plasma Systems Division of the Engineering Directorate. 2/05 to 12/05. \$ 10,500. NSF Request \$ 10,500. Submitted 10/04. Funded 2/05.
42. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "Partial Support for the Fourth Joint Meeting of the United States Sections of the Combustion Institute." 2/05 to 12/05. \$ 10,500. ARO Request \$ 8,000. Submitted 11/04. Funded 2/05.
43. Co-Principal Investigator (with N. P. Cernansky, A. Fridman, A. Gutsol, K. G. Owens) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "Laser-Based Optical System for Reactive Radical Concentration Measurements in Plasmas and Flames," 3/05 to 2/06. \$ 132,000. DOD Request \$ 132,000. Submitted 8/04. Funded 2/05.
44. Co-Principal Investigator (with N. P. Cernansky) in a Army Research Office STIR Proposal, "Preignition Chemistry of Xylenes and Their Effect on JP-8 Surrogates," 8/07 to 5/08. \$ 50,000. ARO Request \$ 50,000. Submitted 5/07. Funded 8/07
45. Co-Principal Investigator (with Nicholas P. Cernansky) in an AFOSR Proposal with Subcontract from University of Southern California, "Development of Detailed and Reduced Kinetic Mechanisms for Surrogates of Petroleum-Derived and Synthetic Jet Fuels," 10/07-9/12. Drexel Sub: \$ 750,000. AFOSR Request \$ 650,000. Drexel Provides Balance. Submitted 7/07. Funded 3/08.
46. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "Injection Seeded Single Mode Q-Switched Nd:YAG Laser System for Combustion Research," 3/08 to 2/09. \$ 106,497. DOD Request \$ 106,497. Submitted 8/07.
47. Co-Principal Investigator (with N. P. Cernansky, A. Fridman) in a National Science Foundation Proposal, "Role of Excited Species in Plasma Enhanced Combustion " 9/08 to 8/11. \$ 535,013. NSF Request \$ 412,200. Submitted 9/07, Funded 10/08.
48. Co-Principal Investigator (with J. Spanier, A. Lowman, J. Baxter, C. Nwankpa, M.S. Olsen, F. Reisman, S. Cox) in a U.S. Dept. of Education GANN Award, "Renewable Energy Technologies and Infrastructure Networks (RETAIN). 6/10 to 5/13. DOE Request \$ 525,030. Submitted 3/10. Funded 5/10.
49. Co-Principal Investigator (with Nicholas P. Cernansky) in an NSF EAGER Proposal, "Quantitative Measurement of HO<sub>2</sub> and RO<sub>2</sub> at Preignition Reaction Conditions," 7/11 to 6/12. NSF Request \$ 60,018. Submitted 5/11. Funded 6/11.
50. Co-Principal Investigator (with Nicholas P. Cernansky) in an AFOSR Proposal with Subcontract from University of Southern California, "Development of Detailed and Reduced Kinetic Mechanisms for Surrogates of Petroleum-Derived and Synthetic Jet Fuels," 9/11-8/14. Drexel Sub: \$ 481,086. AFOSR Request \$ 381,086. Drexel Provides Balance. Submitted 4/10. Funded 10/11.
51. Co-Principal Investigator (with Nicholas P. Cernansky) in an ARO Proposal, "Autoignition Chemistry of Surrogate Fuel Components in an Engine Environment," 10/11-9/14. ARO Request: \$ 348,128. Submitted 8/10. Funded 10/11.
52. Co-Principal Investigator (with Peter Decarlo, Michael Waring, Igor Burstyn, David Velinsky) in an NSF MRI Proposal, "Acquisition of a Soot-Particle Aerosol Mass Spectrometer, for the Measurement of submicron Particulate Chemical Composition," 9/12-8/13. NSF Request \$ 465,314; Drexel Cost-share \$199,594. Submitted 1/12. Funded 7/12.
53. Co-Principal Investigator (with Nicholas P. Cernansky) in an NSF Proposal, "Quantitative Measurement of HO<sub>2</sub> and RO<sub>2</sub> at Preignition Reaction Conditions," 9/13-8/16. NSF Request: \$ 374,250. Submitted 2/13. Funded 7/13 at \$285,000.

## B. Research Proposals – Pending

1. Co-Principal Investigator (with Nicholas P. Cernansky, Alexander Fridman, Danil Dobrynin) in an NSF Proposal, “The Mechanism of Plasma Enhanced Autoignition of Hydrocarbons Below the Thermal Ignition Threshold,” 9/14-8/17. NSF Request: \$ 362,200. Submitted 10/13.

## C. Research Proposals - Declined

1. Principal Investigator in a United States Environmental Protection Agency Proposal, “Oxidation of Chlorinated Ethenes,” submitted to the Chemical Biological and Thermal Engineering Unit. 8/86 to 6/88. \$ 145,500. Submitted 3/86; Declined 8/86.
2. Principal Investigator in a National Science Foundation Proposal, “Oxidation of Chlorinated Ethenes,” submitted to the Chemical, Biological and Thermal Engineering Unit. 4/88 to 3/90. \$ 134,911. Submitted 9/87; Declined 4/88.
3. Principal Investigator in a Drexel University Research Scholar Award, “Hazardous Waste Combustion Using Oxygen Enrichment in a Laboratory Fluidized Bed Combustor” 7/88 to 6/89. \$ 5,000. Submitted 1/88; Declined 5/88.
4. Co-Principal Investigator (with I. Namer) in a National Science Foundation Proposal, “Hazardous Waste Combustion Using Oxygen Enrichment in a Laboratory Fluidized Bed Combustor,” submitted to the Chemical, Biological and Thermal Engineering Unit. 10/88 to 9/90. \$ 141,400. Submitted 2/88; Declined 7/88.
5. Principal Investigator in a NASA Research Proposal, “Combustion of Propane at Non-Stoichiometric Conditions,” submitted to the Internal Fluid Mechanics Division, NASA Lewis Research Center. 7/89 to 6/90. \$ 42,902. Submitted 3/89; Declined 6/89.
6. Principal Investigator in a National Institute for Standards and Technology Proposal, “Chemical Kinetics of Fire Suppressants in the Nonflame Reaction Zone,” submitted to the Halon Replacement Consortium. 1/90 to 12/89. \$ 100,030. Submitted 7/89; Program cancelled.
7. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Energy, University Research Instrumentation Program Proposal, “Pulsed Nd:YAG tunable Dye Laser System for Combustion Diagnostics.” 10/90 to 9/91. \$ 356,875. DOE Request \$ 173,700; Drexel Provides Balance. Submitted 11/89; Declined 7/90.
8. Principal Investigator in a American Chemical Society/Petroleum Relief Fund research proposal, “Effect of Oxygenated Hydrocarbons on Autoignition in Spark Ignition Engines.” 9/91 to 8/94. \$ 60,000. Submitted 12/90; Declined 6/91.
9. Principal Investigator in a National Science Foundation Research Instrumentation Proposal, “Multidimensional Gas Chromatography System,” submitted to the Chemical and Thermal Engineering Unit. 7/91 to 6/92. \$ 27,456 (50% Drexel University Cost Share). Submitted 12/90; Declined 7/91.
10. Co-Principal Investigator (with N. P. Cernansky, K. G. Owens, A. L. Smith) in a U. S. Department of Energy, University Research Instrumentation Program Proposal, “Non-Linear Optical Diagnostic for Combustion Studies.” 10/91 to 9/92. \$ 302,650. DOE Request \$ 224,650; Drexel Provides Balance. Submitted 12/90; Declined 7/91.
11. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, AASERT Program Proposal, “Non-Intrusive Chemical Species Measurements During Preignition Reaction Processes.” 7/92 to 6/95. \$ 144,858. DOD Request \$ 130,128; Drexel Provides Balance. Submitted 12/91; Declined 4/92.
12. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Energy, University Research Instrumentation Program Proposal, “Non-Linear Optical Diagnostic for Combustion Studies.” 10/92 to 9/93. \$ 244,276. DOE Request \$ 224,650; Drexel Provides Balance. Submitted 12/91; Declined 6/92.
13. Co-Principal Investigator (with N. P. Cernansky and K.G. Owens) in a U. S. Department of Energy, University Research Instrumentation Program Proposal, “Optical Parametric Oscillator for Near Infrared Measurements in Combustion Systems.” 7/93 to 6/94. \$ 151,705. DOE Request \$ 113,800; Drexel Provides Balance. Submitted 12/92, Declined 6/93.

## C. Research Proposals - Declined (cont.)

14. Co-Principal Investigator (with N. P. Cernansky) in an industrial grant from the Powertrain Research Division of Ford Motor Company, to study "Modeling the Formation of Oxides of Nitrogen in Spark Ignition Engines," 10/97-9/98. Ford Request \$ 35,000. Submitted 8/97, Declined 10/97.
15. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "An Optical Parametric Oscillator for Infrared Species Concentration Measurements in Combustion Systems." 2/98 to 1/99. \$ 181,608. DOE Request \$ 145,608; Drexel Provides Balance. Submitted 8/97, Declined 12/97.
16. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "An Optical Parametric Oscillator for a Laser-Based Instrument to Measure Highly Reactive Radicals in Combustion Systems." 3/99 to 2/00. \$ 135,495. DOE Request \$ 99,495; Drexel Provides Balance. Submitted 8/98. Declined 12/98.
17. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Energy Proposal, "The Chemistry Controlling HCCI Engine Operation." 4/99 to 4/02. \$ 398,900. DOE Request \$ 375,000; Drexel Provides Balance. Submitted 1/99. Declined 4/99.
18. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "An Optical Parametric Oscillator for a Laser-Based Instrument to Measure Highly Reactive Radicals in Combustion Systems." 3/99 to 2/00. \$ 135,495. DOE Request \$ 99,495; Drexel Provides Balance. Submitted 8/99. Declined 10/99.
19. Co-Principal Investigator (with I. M. Cohen and P. S. Ayyaswamy of University of Pennsylvania) in a National Aeronautics and Space Administration research proposal, "Electric Field Induced Convection Effects on Flames." 10/00 to 9/03. \$ 510,089. Drexel University portion of NASA funding \$ 228,293. Submitted 2/01/00. Declined 10/00.
20. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Research Equipment Grant, "Acquisition of a Gas Chromatograph with Mass Selective Detector." 7/01 to 6/02. \$ 73,800. NSF Request \$ 48,886. Submitted 1/15/01. Declined 5/01.
21. Principal Investigator in an Industrial Proposal to Air Liquide, "Cool Flame Oxidation of Methane at Elevated Pressures" 9/01 to 5/02. \$102,300. Submitted 5/01. Declined 7/01.
22. Co-Principal Investigator (with N. P. Cernansky) in a U. S. Department of Energy Proposal, "Ignition Assistance for Pre-Mixed Homogeneous Charge Compression Ignition Engines," 10/01-9/04. \$ 560,000. DOE Request \$ 420,000. Drexel Provides Balance. Submitted 2/14/01. Declined 7/01.
23. Co-Principal Investigator (with N. P. Cernansky and H. Pearlman (DU); D. Dietrich (NASA GRC)) in a National Aeronautics and Space Administration Proposal "Fuel Spray Auto-ignition at Microgravity." 10/03-9/06. \$ 468,735. NASA Request \$ 408,735. Drexel Provides Balance. Submitted 3/26/03. Declined 7/03.
24. Co-Principal Investigator (with B. Farouk, N. P. Cernansky, H. Pearlman, M. Y. Choi, F. Reissman) in a United States Department of Education Proposal for a GAANN Fellowship in Combustion and Fire Dynamics. 9/04 to 8/07. \$ 1,347,300; US DoED Request \$ 820,000. Submitted 11/03. Declined 7/04.
25. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "The Effect of Pre-First-Stage Ignition Chemistry on Engine Combustion Processes," submitted to the Chemical and Thermal Engineering Division. 4/04 to 3/07. \$ 452,766. NSF Request \$ 384,168. Drexel Provides Balance. Submitted 11/03. Declined 7/04.
26. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "The Effect of Pre-First-Stage Ignition Chemistry on Engine Combustion Processes," submitted to the Chemical and Thermal Engineering Division. 1/05 to 12/07. \$ 452,766. NSF Request \$ 384,168. Drexel Provides Balance. Submitted 9/04. Declined 2/05.
27. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "The Low and Intermediate Temperature Oxidation of Selected Real Fuel Components," submitted to the Chemical and Thermal Engineering Division. 7/05 to 6/08. \$ 452,766. NSF Request \$ 384,168. Drexel Provides Balance. Submitted 1/05. Declined 7/05.

## C. Research Proposals - Declined (cont.)

28. Co-Principal Investigator (with Nicholas P. Cernansky and Howard Pearlman) in a United States Department of Energy Proposal, "The Chemistry and Control of Low Temperature Combustion in Advanced Engine Systems." 9/05 to 8/08. \$ 989,300 DOE Request \$783,900; Drexel Provides Balance. Submitted 3/05. Declined 9/05.
29. Co-Principal Investigator (with Alexander Fridman, Alexander Gutsol, and Nicholas P. Cernansky) in a United States Department of Energy Proposal, "Development and Evaluation of the Tornado Plasma Converter for Liquid Fuels and Fuel Blends." 9/05 to 8/08. \$ 1,626,800 DOE Request \$1,448,200; Drexel Provides Balance. Submitted 3/05. Declined 9/05.
30. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "The Low and Intermediate Temperature Oxidation of Selected Real Fuel Components," submitted to the Chemical and Thermal Engineering Division. 7/06 to 6/09. \$475,300. NSF Request \$ 404,000. Drexel Provides Balance. Submitted 9/05. Declined 3/06.
31. Principal Investigator in a National Science Foundation Proposal, "A Novel Laser Diagnostic for In-Situ Measurement of Combustion Radicals," submitted to the Chemical and Thermal Engineering Division. 7/06 to 6/09. \$454,464. NSF Request \$ 380,000. Drexel Provides Balance. Submitted 9/05. Declined 3/06.
32. Co-Principal Investigator (with Nicholas P. Cernansky and Howard Pearlman) in a National Science Foundation Proposal, "The Chemistry and Control of Low Temperature Combustion in Advanced Engine Systems," submitted to the Chemical and Thermal Engineering Division. 7/06 to 6/09. \$ 475,300. NSF Request \$ 404,000. Drexel Provides Balance. Submitted 9/05. Declined 3/06.
33. Principal Investigator in an American Chemical Society/Petroleum Relief Fund AC research proposal, "Developing an In-Situ Laser Diagnostic for Measurement of Combustion Generated Hydro- and Alkyl-Peroxy Radicals," 9/06 to 8/08. \$ 80,000. Submitted 9/05. Declined 4/06.
34. Co-Principal Investigator (with Nicholas P. Cernansky) in an Army Research Office Proposal, "Autoignition and Oxidation Chemistry of JP-8 and Its Surrogates at Elevated Pressures." 6/07 to 5/10. \$ 525,000. ARO Request \$ 475,000. Drexel Provides Balance. Submitted 10/05. Declined 4/07.
35. Principal Investigator in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "Multipurpose Diagnostic System," 3/06 to 2/07. \$ 85,000. DOD Request \$ 85,000. Submitted 8/05. Declined 7/06.
36. Co-Principal Investigator (with Nicholas P. Cernansky and Howard Pearlman) in a National Science Foundation Proposal, "Low Temperature Combustion Chemistry in Advanced Engine Systems," submitted to the Chemical and Thermal Engineering Division. 10/06 to 9/09. \$ 602,913. NSF Request \$ 528,513. Drexel Provides Balance. Submitted 3/06. Declined 8/06.
37. Co-Principal Investigator (with Nicholas P. Cernansky) in a National Science Foundation Proposal, "Low and Intermediate Temperature Oxidation of Selected Real Fuel Components," submitted to the Chemical and Thermal Engineering Division. 10/06 to 9/09. \$ 469,108. NSF Request \$ 394,708. Drexel Provides Balance. Submitted 3/06. Declined 8/06.
38. Co-Principal Investigator (with Nicholas P. Cernansky, Howard Pearlman) in a National Science Foundation Proposal, "Low Temperature Combustion Chemistry in Advanced Engine Systems," submitted to the Chemical and Thermal Engineering Division. 1/07 to 12/09. \$ 552,856. NSF Request \$ 463,136. Drexel Provides Balance. Submitted 9/06. Declined 4/07.
39. Co-Principal Investigator (with Alexander Fridman, Nicholas P. Cernansky, Alexander Gutsol) in a National Science Foundation Proposal, "The Role of Excited Species in Plasma Enhanced Combustion," submitted to the Chemical and Thermal Engineering Division. 1/07 to 12/09. \$ 568,027. NSF Request \$ 489,719. Drexel Provides Balance. Submitted 9/06. Declined 4/07.
40. Co-Principal Investigator (with Nicholas P. Cernansky) in a DOD Multiple University Research Initiative Proposal Subcontract to University of Southern California in a proposal, "Development of Detailed and Reduced Kinetic Mechanisms for Surrogates of Petroleum-Derived and Synthetic Jet Fuels," submitted to AFOSR, 5/07-4/12. Drexel Sub: \$ 1,369,652. AFOSR Request \$ 1,226,254. Drexel Provides Balance. Submitted 11/06. Declined 4/07.

## C. Research Proposals - Declined (cont.)

41. Co-Principal Investigator (with N. P. Cernansky, H. Pearlman) in a National Science Foundation Proposal, "The Chemistry of Low Temperature Combustion Processes in Engine Systems," 1/08 to 12/10. \$ 550,349, NSF Request \$ 468,604. Submitted 9/07. Declined 4/08
42. Co-Principal Investigator (with A. Gutsol, N. P. Cernansky, A. Fridman) in a U. S. Department of Defense, Defense University Research Instrumentation Program Proposal, "CCD Camera System for Combustion Research," 3/08 to 2/09. \$ 83,050. DOD Request \$ 83,050. Submitted 8/07. Declined 6/08.
43. Co-Principal Investigator (with N. P. Cernansky) in an Army Research Office Proposal, "Preignition Oxidation Chemistry of JP-8 Surrogates," 3/08 to 2/11. \$ 444,350. ARO Request \$ 384,000. Submitted 10/07. Declined 4/09.
44. Co-Principal Investigator (with N. P. Cernansky) in a DOE-EFRC Proposal as Subcontract from North Carolina State University, "Basic Enabling Science and Technology for Revolutionary Propulsion Systems," 9/09 to 8/14. \$ 1,220,560, DOE Request \$ 900,000. Submitted 9/08. Declined 4/09
45. Co-Principal Investigator (with N. P. Cernansky) in a DOE Proposal as Subcontract from University of Texas, "Low Temperature Combustion of Highly Dilute Gasoline and Ethanol-EG-Air Mixtures in a Port Injected Diesel Engine with Pilot Injection," 9/09 to 8/12. \$ 467,573, DOE Request \$ 374,927. Declined 5/09
46. Co-Principal Investigator (with N. P. Cernansky, P. Joseph (UPenn)) in an American Asthma Society Strategic Program for Asthma Research Proposal, "An Evaluation of the Presence of Methyl Nitrite in the Exhaust of Engines with Certain Fuels," 7/09 – 6/12. Submitted 2/09. Declined 6/09
47. Co-Principal Investigator (with N. P. Cernansky) in a National Science Foundation Proposal, "Quantitative Measurement of HO<sub>2</sub> and RO<sub>2</sub> at Preignition Reaction Conditions," 4/10 to 3/13. \$ 434,350. NSF Request \$ 350,000. Submitted 9/09, Declined 3/10.
48. Co-Principal Investigator (with N. P. Cernansky) in a in a Army Research Office STIR Proposal, "Evaluation of the Preignition Reactivity of Surrogate Fuels in an Engine Environment," 9/09 to 5/10. \$ 50,000. ARO Request \$ 50,000. Submitted 6/09. Declined 4/10.
49. Co-Principal Investigator (with Nicholas P. Cernansky) in an NSF Proposal, "Quantitative Measurement of HO<sub>2</sub> and RO<sub>2</sub> at Preignition Reaction Conditions," 4/11 to 3/14. NSF Request \$ 350,000. Submitted 9/10. Declined 5/11.
50. Co-Principal Investigator (with Nicholas P. Cernansky, Alexander Fridman, Danil Dobrynin) in an NSF Proposal, "The Mechanism of Plasma Enhanced Autoignition of Hydrocarbons Below the Thermal Ignition Threshold," 9/12-8/15. NSF Request: \$ 441,250. Submitted 2/12. Declined 7/12.
51. Co-Principal Investigator (with Nicholas P. Cernansky, Alexander Fridman, Danil Dobrynin) in an NSF Proposal, "The Mechanism of Plasma Enhanced Autoignition of Hydrocarbons Below the Thermal Ignition Threshold," 9/13-8/16. NSF Request: \$ 441,250. Submitted 2/13. Declined 7/13.

## COURSEWORK ACTIVITIES

## A. Undergraduate Courses

## College of Engineering Core Curriculum Courses

ENGR 100 (2 credits)	University Seminar F 91-92; F 98-99; F 99-00
ENGR 101 (2 credits)	Freshman Design F 06-07; F 07-08; F 08-09
ENGR 102 (2 credits)	Freshman Design W 06-07; W 07-08
ENGR 103 (2 credits)	Freshman Design III Sp 06-07; Sp 07-08
ENGR 201 (3 credits)	Evaluation and Presentation of Experimental Data F 07-08 (NEW COURSE); Sp 07-08; F 08-09; Sp 08-09; F 09-10 (REVISED COURSE); Sp 09-10; F 10-11; Sp 10-11; F 11-12
ENGR 202 (3 credits)	Evaluation and Presentation of Experimental Data II W 09-10 (REVISED COURSE)
ENGR 210 (3 credits)	Introduction to Thermodynamics W 07-08 (NEW COURSE) W 08-09; W 09-10; W 10-11
TDEC 133 (4 credits)	Engineering Design and Laboratory for Transfer Students F 00-01; Sp 00-01; F 01-02
TDEC 201 (3 credits)	Energy I Recitation Instructor: Sp 95-96; Sp 01-02; F 02-03; Sp 03-04; (2 sections) F 04-05; (2 sections) Sp 04-05; Fa 05-06 ( 2 sections); Sp 05-06
TDEC 202 (3 credits)	Energy II Course coordinator: Su 95-96 (Two lectures, 1 recitation and all organization); W 05-06 (Two lectures (340 students), organization of 10 recitation sections) Recitation Instructor: (2 sections) W 98-99; Su 98-99; W 99-00; Su 01-02; W 02-03; Su 02-03; (2 sections) W 03-04; (2 sections) W 04-05
TDEC 232 (4 credits)	Evaluation and Presentation of Experimental Data Thermodynamics laboratory component Su 95-96
Freshman Design	Advisor: One team in each of 95-96, 96-97, 2 teams 98-99, 2 teams 99-00, 4 teams 01-02; 2 teams 02-03; 1 team 03-04; 2 teams 04-05; 2 teams 05-06

## Mechanical Engineering Courses

## Thermodynamics Sequence

MEM210 (4 credits)	Basic Thermodynamics W/Sp 88-89; W 91-92. Course coordinator for Su 87-88; F/W/Sp/Su 88-89; F/W/Sp 89-90; F/W/Sp/Su 90-91; F/W/Sp 91-92; F/W/Sp/Su 92-93; F/W 93-94.
MEM310 (4 credits)	Thermodynamic Analysis I F/W 85-86; F/W 86-87; F/W 87-88; F 88-89; F 89-90; F 90-91; F/Sp 91-92; F/Sp 92-93; F/Sp 93-94; F/Sp 94-95; F/W/Sp 01-02.
MEM410 (3 credits)*	Thermodynamic Analysis II Sp/Su 85-86; Sp/Su 86-87; Sp 87-88; W 88-89; W 89-90; W 90-91; W 91-92; W 92-93; W 93-94; W/Su 94-95; Su 95-96; Su 96-97; F 97-98; W 01-02.

- \*(1) Revised the course outline to reduce duplication of material allowing inclusion of advanced topics in the junior elective MEM 410
- (2) Converted a computer program for the computation of chemical equilibrium from FORTRAN for an IBM PC to FORTRAN for the Macintosh. The program is used to allow students to develop insight into the effect of fuel/air ratio on maximum combustion temperature subject to various physical constraints.

## Senior Design Sequence - MEM491/492/493

Two groups 88-89  
 Three groups 89-90  
 Two groups 90-91  
 One group 91-92; 92-93; 93-94; 96-97; 00-01; 03-04; 04-05; 05-06

## Independent Study - MEM399

One student, (3 credits) Sp 87-88 and (3 credits) F 88-89  
 Three students (3 credits) F/W/Sp 89-90  
 Three students (3 credits) F/W/Sp/Su 90-91  
 Two students (3 credits) F/W/Sp/Su 92-93  
 Three students (3 credits) F/W/Sp/Su 93-94

## Senior Elective

MEM 320 (3 credits) Fluid Dynamics I: F 09-10; Sp 09-10

MEM380/52 (3 credits)	Fundamentals of Combustion I: F 89-90
MEM380/53 (3 credits)	Fundamentals of Combustion II: W 89-90
MEM405 (3 credits)	Fundamentals of Combustion I: F 93-94
MEM400 (3 credits)	Internal Combustion Engines: W 03-04; W 04-05; W 05-06; W 06-07; W 07-08; W 08-09

## B. Graduate Courses

MEM601/MEM602 (3/3 credits)	Advanced Thermodynamics I & II F/W 86-87; F/W 87-88; F/W 88-89; F 90-91; F/W 92-93; F/W 94-95
MEM603 (3 credits)	Advanced Thermodynamics III Sp 86-87; Sp 87-88*
	*Taught with a new syllabus as Advanced Processes in Thermodynamics (Combustion)
MEM701 (3 credits)	Physical Gas Dynamics Sp 88-89; Sp 90-91
MEM705 (3 credits)	Fundamentals of Combustion I F 89-90; F 93-94
MEM706 (3 credits)	Fundamentals of Combustion II W 89-90; W 93-94

## C. Special Assignments

Member of the Gateway Drexel Committee to develop a new upperclass curriculum for engineering as supported by an NSF Grant to the Gateway Coalition

## STUDENT SUPERVISION ACTIVITIES

## A. Cooperative Experience

Keith Fritsky.	Su 1988	Project: Fluidized Bed Combustion of Hazardous Wastes
Christopher Marlowe	Su 1993	Project: Non-Stoichiometric Oxidation of Propane
Mary Emig	F 2001	Project: Cavity Enhanced Magneto-optical Rotation Spectroscopy
Hoi-Lam Leung	W 2002	Project: Engine Controller/Quantitative Generation of HO <sub>2</sub> radicals
George Hochman	Su 2002	Project: Optical Spectroscopy

## B. Undergraduate Honors Program

Keith Fritsky	(1988-89)	Fluidized Bed Combustion of Hazardous Waste
Stephen Kowalski	(1989-90)	Combustion of Refuse Derived Fuel
Michael Ramotowski	(1989-90)	Propane Combustion at Non-Stoichiometric Conditions
Michael Fick	(1989-90)	Flue Gas Analysis Package for Infectious Waste Incinerators
	(1990-91)	Thermogravimetric Analysis of Peat
Rabon Cahoon	(1990-91)	Oxygen Enrichment in a Fluidized Bed Combustor
David Hurst	(1990-91)	Studies of Autoignition in Spark Ignition Engines
Joseph Fielding	(1992-93)	Propane Oxidation at Lean Conditions in a Flat Flame
Christopher Marlowe	(1992-93)	Propane Oxidation at Rich Conditions in a Flat Flame

## C. Master of Science

Sumanth Addagarla	(1986-1987)	Low and Intermediate Oxidation of N- Butane and Isobutane; Completed: June 1987
Byung-Seok Hwang	(1988-1989)	Implementation of Chemical Kinetic Computer Codes; Completed: June 1989
Glenn Brinckman	(1988-1989)	Investigations of the Characteristics of a Rijke Pulsating Combustor Which Burns Gaseous and Liquid Fuels; Completed: August 1989
Alok Gupta	(1989-1991)	Correlations of Octane Rating and Carbon Monoxide Over the Low and Intermediate Temperature Reaction Regimes; Completed: June 1991
Keith Fritsky	(1989-1991)	Devolatilization Characteristics of Refuse Derived Fuel and Selected Municipal Solid Waste; Completed: August 1991
Kahled Jaouabi	(1990-1991)	Modeling Pressure Effects on Hydrocarbon Oxidation Completed: June 1991
John Bloomer	(1989-1991)	An Investigation of the Characteristics of Fluidized Bed Combustion of Propane and Methyl Chloride; Completed: August 1991
Sandeep Ahuja	(1989-1992)	Non-Stoichiometric Oxidation of Propane Completed: July 1992
Ajay Anand	(1991-1994)	An Experimental Study of n-Butane Oxidation at Elevated Pressures in the Low and Intermediate Temperature Regimes; Completed: April 1994
Srinivasa K. Prabhu	(1990-1994)	The Oxidation of n-Pentane in the Low and Intermediate and Negative Temperature Coefficient Regions; Completed: April 1994
V.C. Arun Kumar	(1991-1994)	The Oxidation of 1-Pentene and a n-Pentane-1-Pentene Blend in the Low and Intermediate Temperature Regions; Completed: June 1994
Christopher H. Wood	(1992-1994)	The Oxidation of n-Pentane and 1-Pentene in the Low Temperature and Negative Temperature Coefficient Regions; Completed: October 1994
Thomas McCormick	(1992-1994)	A Study of C4 Oxidation Chemistry Using FTIR Spectroscopy; Completed: December 1994

- Rohit K. Bhat (1993-1998) The Effect of Nitric Oxide on the Oxidation of n-Pentane and Pressurized Flow Reactor Facility Upgrade; Completed: June 1998
- Xiaoming Bian (1996-1998) Post Combustion Hydrocarbon Oxidation and Exhaust Emissions-Exhaust Port Tracer Studies; Completed: June 1998
- A. Rafey Khan (1996-1998) Oxidation of Industry Standard Fuels and Blends of Primary Reference Fuels in the Low Temperature and Negative Temperature Oxidation Regions; Completed: July 1998
- Allessandro Agosta (2000-2002) Development of a Chemical Surrogate for JP-8 Aviation Fuel Using a Pressurized Flow Reactor; Completed: May 2002
- David B. Lenhert (2000-2004) The Oxidation of a Gasoline Fuel Surrogate in the Negative Temperature Coefficient Region; Completed: July 2004
- Rodney O. Johnson (2004-2007) A Fundamental Study of the Autoignition Behavior of SI Primary Reference Fuels with Propionaldehyde and DTBP as an Additive; Completed: August 2007
- Matthew S. Kurman (2004-2009) The Preignition and Autoignition Oxidation of Alternatives to Petroleum Derived JP-8 and their Surrogate Components in a Pressurized Flow Reactor and Single Cylinder Research Engine; Completed: September 2009
- Robert H. Natelson (2004-2009) Preignition and Autoignition Behavior of the Xylene Isomers; Completed: November 2009.
- D. Doctor of Philosophy
- Sumanth Addagarla (1987-1991) Preignition Chemical Reactions Leading to Autoignition and Knock in Spark-Ignition Engines; Completed: June 1991
- Stephen V. Smith (1990-1992) A Combustion Kinetic Model for Refuse Derived Fuel in Fluid Bed Boilers; Completed: November 1992
- Sandeep Ahuja (1992-1994) Chemical Structure of Non-Stoichiometric Propane-Air Flames; Completed: September 1994
- John J. Bloomer (1991-1995) Low Temperature Oxidation of Chlorinated Hydrocarbons; Completed: March 1995
- Shang-Jin Tsay (1992-1996) Developing and Using Degenerate Four-Wave Mixing Techniques as a Diagnostic Tool in Discharge and Combustion Research; Completed: March 1996
- Kenneth Aniolek (1993-1998) Development of Absorption-Based Spectroscopic Techniques for Detection of Diatomic and Polyatomic Radicals in Flames; Completed: January 1998
- Suqing Wang (1994-1999) Experimental and Modeling Study of Preignition Chemistry of Hydrocarbons; Completed: February 1999
- Weiyang Yang (1997-2002) The Chemistry Controlling Post Combustion Hydrocarbon Oxidation and Homogeneous Charge Compression Ignition; Completed: September 2002
- David B. Lenhert (2000-2004) The Oxidation of JP-8 and its Surrogates in the Low and Intermediate Regime; Completed: December 2004
- Jincai Zheng (1998-2005) A Study of Homogeneous Ignition and Combustion Processes in CI, SI, and HCCI Engine Systems; Completed: August 2005
- Xiaohui Gong (2002-2005) The Effects of DTBP on the Oxidation of SI Primary Reference Fuels - A Study in an HCCI Engine and in a Pressurized Flow Reactor; Completed: August 2005
- Rodney O. Johnson (2004-2008) A Fundamental Study of the Oxidation Behavior of SI Primary Reference Fuels with Propionaldehyde and DTBP as an Additive; Completed: June 2008
- Mathew S. Kurman (2005-2010) Preignition Oxidation Chemistry of n-Decane and n-Dodecane in a Pressurized Flow Reactor and Their Use as Jet Fuel Surrogate Components; Completed: June 2010
- Robert H. Natelson (2005-2010) Oxidation of n-Butylcyclohexane in the Low Temperature Regime; Completed: June 2010
- Ashutosh Gupta (2004-2011) Development of Detailed, Reduced and Skeletal Kinetic Mechanisms for Hydrocarbon Oxidation at Low and Intermediate Temperatures; Completed: June 2011
- E. Thesis Committee Service for Master of Science and Doctor of Philosophy
- |                      |                             |                 |                  |
|----------------------|-----------------------------|-----------------|------------------|
| Ph.D..               |                             | David N. Koert  | 1990             |
| Richard D. Wilk      | 1986                        | Richard King    | 1994 (Chemistry) |
| Vulcan Otugen        | 1986                        | Kevin V. Tallio | 1998             |
| Kenneth S. Ball      | 1987                        | Kalol Bera      | 1999             |
| Kishenkumar T. Reddy | 1987                        | Murat Aktas     | 2004             |
| Allen M. Danis       | 1987                        | Michael Foster  | 2007             |
| Toru Fusegi          | 1988                        | Yi Ma           | 2009             |
| Daniel L. Dietrich   | 1990                        | Ersin Sayar     | 2012             |
| Russell Anderson     | 1990 (Chemical Engineering) |                 |                  |

M.S		Michael Ramotowski	1992
Steven Marokovits	1987	David J. Filipe	1992
Kevin V. Tallio	1987	Khawar Kalim	1994
Yitzak Henig	1989	Sachin Shetty (Temple)	1995
Manjunath Somashekara	1990	Kumar Cheruparambil	2000
F. Ph.D. Candidacy Committee			
David N. Koert	1986	Ashu Gupta	2005
Sumanth Addagarla	1988	Matthew Kurman	2006
Hasmet Torkoglu	1988	Rodney O. Johnson	2006
John S. Lai	1988	Robert Natelson	2006
Zev Ritmann	1991	Jamie Lane	2006
Richard King	1991 (Chemistry)	Michael Gallagher	2006
Houliang Li	1992	Michael Foster	2006
Narayanaswamy Sankagiri	1993	S. Park	2007
Srinivasa Prabhu	1994		

#### AWARDS

Drexel University Research Scholar Award for the proposal "Oxidation of Chlorinated Ethenes" 1989-90

Ralph R. Teetor Educational Award for 1990 from SAE

International Gas Turbine Institute Undergraduate Scholarship Sponsor; 1988, 1989, and 1990

ASME Solid Waste Management Research Award Sponsor, 1990-91

College of Engineering Outstanding Service Award, 2002

#### UNIVERSITY SERVICE ACTIVITIES

Member of the Department of Mechanical Engineering and Mechanics Undergraduate Curriculum Committee, 1986 and '87; Chair – 2003, 2004, 2005, 2006, 2007

Member of the Department of Mechanical Engineering and Mechanics Computer Committee, 1986-89

Department representative to the ad-hoc Committee of Network Managers, 1989 and 1990

Chairman of the Department of Mechanical Engineering and Mechanics Computer Committee, 1990-93

Department representative and Chairman to the College of Engineering Computer Committee that developed the college's computer network 1991-93

Faculty Advisor to the Student Chapter of the American Society of Mechanical Engineers, 1987, '88 and '89

Host of the ASME Regional Student Conference for all undergraduate sections in ASME Region III, a total of 33 schools, in May 1988

Sponsor of the Region III Charles T. Main Section Service Award (\$ 100 cash, Certificate announced at the ASME Winter Annual Meeting) to Drexel Student Anthony J. Lorusso, 1988

Participant in several Drexel University sponsored Sunday Forums for high school seniors and their parents

Safety Officer within the Department of Mechanical Engineering and Mechanics as Faculty Member of the Departmental Safety Committee during installation of a safety program in 1987-93

Author of the Department of Mechanical Engineering and Mechanics Ph. D. Qualifying Examination in Thermodynamics 1988

Author of the courses outlines and student material for the undergraduate thermodynamics sequence: MEM210, MEM310 and MEM410 supplied to ABET for the accreditation review in Fall 1989

Chairman of College of Engineering Safety Committee, 1990-93

Member of the Board of Directors for National Science Foundation sponsored Drexel University Gateway Coalition, 1992-93

Chairman of the College of Engineering Undergraduate Program Committee, 1995-2001

Member of the Faculty Senate Committee on Academic Affairs, 1995-2000

Member of the Drexel Engineering Curriculum Administrative Council appointed by the Provost, 1996-2003

Chairman of the Faculty Senate Committee on Academic Affairs, 1997-1999

Responsible for tDEC participation in the Recruiting and Admission events: 2 Fall Open Houses, Drexel Scholar Day, Sneak Preview, Spring Open House, Transfer Open House, 1995-2003

Member of the Faculty Senate, 1997-2003

Member of the Thermal Science Faculty Search Committee in Mechanical Engineering and Mechanics, 1997-2003

Member of the MEM Department Chair Search Committee, 2008-2009

## PROFESSIONAL ACTIVITIES

Expert witness at a meeting of Plymouth Meeting Township Council to discuss a Municipal Solid Waste Incinerator, September 1985

Served as a member on the Incineration and Air Pollution Panel of a National Science Foundation Workshop entitled "Hazardous Waste Treatment and Disposal" hosted by Drexel University, June 1986

Served on National Science Foundation Committee to review SBIR proposals, September 1987

Invited participant in a National Science Foundation Workshop to identify research areas in support of incineration technologies for municipal, toxic and hospital wastes, April 1988

Invited participant in a National Science Foundation Workshop to identify research areas in support of chlorinated hazardous waste incineration technologies, March 1989

Reviewer for National Science Foundation and Army Research Office Proposals, Combustion Science and Technology and Combustion and Flame papers

SAE Philadelphia Section Governing Board Member, 1989

SAE Philadelphia Section Governing Board Vice-Chairman for Mathematics and Science, K-12, 1990. Began implementation of the local activity with the new SAE program A World In Motion which will be a joint business, industry and education effort to bring practicing engineers into the elementary school science program.

Session Chairman for Eastern States Section of the Combustion Institute Fall Technical Meeting in Orlando, Florida 3-6 December 1990.

Session Chairman for Session FL-9 of the SAE Fuels and Lubricants Meeting, Toronto CN, October 1991

Session Organizer for SAE International Congress Meeting and Exhibition, Detroit, MI, February 1992

Session co-Organizer for the Third International Congress on Toxic Combustion By-Products, Boston, MA, 13-16 June 1992

Served on National Science Foundation Committee to review Instrumentation proposals, May 1993

Served on Department of Energy Committee to review SBIR proposals, June 1993

Served on a special Program Assessment Committee for the Department of Energy to review the combustion related programs in the DOE Basic Energy Office, June 1994

Member of Local Arrangements Committee for the SAE Fuels & Lubricants Meeting and Exhibition, Philadelphia, PA, October 1993

Board of Directors of Eastern States Section of the Combustion Institute, 2004 - present

Chairman of Local Arrangements Committee for the Fourth Joint Meeting of the United States Sections of the Combustion Institute, Philadelphia, PA, March 2005.

Session Chair at the Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Orlando, FL, November 2005.

Arrangements Chair of the Board of Directors of the Eastern States Section of the Combustion Institute, Fall 2005 - 2006

## CURRENT SOCIETY AFFILIATIONS

Sigma Xi, 1986-present

American Society of Mechanical Engineers, 1974-present

American Institute of Aeronautics and Astronautics, 1977-81

Combustion Institute, 1980-present

American Association for the Advancement of Science, 1987-present

Air and Waste Management Association (new name for Air Pollution Control Association), 1985-2000

American Society of Engineering Education, 1986-present

SAE, 1989-present

Tau Beta Pi, 1975-present; President of Louisiana Alpha Chapter 1976

Pi Tau Sigma, 1975-present; Vice-President of Louisiana Gamma Chapter 1976