Peter E. Jenkins, Ph.D., P.E.

Professor, Mechanical Engineering Department
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University of Colorado Denver

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Summary

Have extensive experience serving in administrative and management positions in both industrial and academic institutions. Served as an officer of the University of Colorado Denver (Dean) and of an advanced technology and manufacturing company (Exec. V.P.) including strategic and financial planning and administration. Held academic and industry positions as Dean, Associate Dean of Research, Department Chair, Associate Department Chair, Executive Vice President, and Director of Engineering. Directed two Research Centers and have had contracts with NSF, ONR, DARPA, and AFOSR along with several industrial contracts. Have over forty years teaching experience in all phases of mechanical engineering specializing in thermal sciences, energy conversion, turbomachinery, and engine technology.

Education

Ph.D.	Purdue University, W. Lafayette, IN, 1974
M.S.	Southern Methodist University, Dallas, TX, 1969
B.S.	University of Kansas, Lawrence, KS, 1963-65
	U.S. Naval Academy, Annapolis, MD, 1961-63
I.E.M.	Harvard University, Cambridge, MA, 1994
M.B.A.	Pepperdine University, Malibu, CA, 1986

Military Experience

United States Marine Corps

Academic Experience

University of Colorado Denver, Denver, CO

- Director, Sports Engineering Program, College of Engineering, 2018-present
- Associate Dean of Research, College of Engineering, 2016-2018
- Special Assistant to the Vice Chancellor for Academic Affairs, Jan-July 2002
- **Dean, College of Engineering & Applied Science, 1992-2002**
- Professor of Mechanical Engineering, 1992-present

- Director, EAS PhD Program, 2011-2015
- Deputy Director, CSIS Center, 2012-2013
- Director, International Technology Transfer Program, 1993-2002
- Director, Energy R&D Program, 1992-2002.

University of Nebraska-Lincoln, Mechanical Engineering Department, Lincoln, NE
- **Professor and Dept. Chair, 1986-1992**
- Director, Center for Engine Technology, 1986-1992

Texas A&M University, Mechanical Engineering Department, College Station, TX
- **Assoc. Dept. Head, l980-l984**
- Professor, 1982-1984
- Associate Professor, 1978-1982
- Assistant Professor, 1975-1978
- Director, Turbomachinery Laboratory, 1978-1984

Northern Arizona University, Flagstaff, AZ
- Assistant Professor, 1974-1975

United States Naval Academy, Annapolis, MD
- Visiting Professor, Mechanical Engineering Dept., July 2007-August 2008
- Director, ONR Fuels Research Group

United States Air Force Academy, Colorado Springs, CO
- Distinguished Visiting Professor, Engineering Mechanics Dept., July 2004-May 2006
- Director, Energy Research Center
- Member of UAV Research Program

United States Military Academy, West Point, NY
- Distinguished Visiting Professor, Civil & Mechanical Engineering Dept.,
- Director, Energy Research Program
- July 2002-June 2003

Professional Experience

Engine Corporation of America, Fullerton, CA
- Executive Vice President and Director of Engineering, 1984-1986

Texas Instruments, Inc., Dallas, TX
- Senior Design Engineer, 1966-1970

L.T.V. Vought Aeronautics, Dallas, TX
- Design Engineer, l965-66

Registration

Professional Engineer, Texas (39287)

Patents

Received six patents

Latest patent: Multiple-Blade Wind Machine with Shrouded Rotors, No. US 10,066,597B2, September 4, 2018

Professional and Service Memberships

Navajo Transitional Energy Company

Member, Advisory Committee, 2013-present

Chair, Technology Committee, 2013-present

Colorado Society of Professional Engineers
President, Metro Chapter, 1996-1997
Member, Board of Directors, 1996-1998

American Society of Mechanical Engineering (ASME), 1964-present
Fellow, since 1984
Member, Energy Committee, 1987-1988
Member, National Nominating Committee, 1981-1984
Member-at-large, Energy Resources Group, 1981-1986
Chairman, Technical Division, 1980-1981
Program Chairman, ASME Winter Annual Meeting, 1979
Member, Executive Committee, 1978-1982
Vice-chairman, Fluid Mechanics Section, 1975
Member, Gas Turbine Division, 1978-1982

American Institute of Aeronautics and Astronautics (AIAA), 1974-present
Terrestrial Energy Systems Technical Committee, 1978-1979

Society of Automotive Engineering (SAE), 1978-present
Chairman, National NGV Conference, 1991
Advisor, Univ. of Nebraska Student Chapter, 1987-1992
SAE Research Committee, 1993-1999
SAE ABET Committee, 1993-1999

National Society of Professional Engineers (NSPE), 1975-present
Education Committee Chairman, 1991

American Society of Engineering Educators (ASEE), 1974-present
Member, Energy Division
Associate Chairman, Summer Annual Conference, 1989

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), 1976-present
Education and Research Committee, 1976-1978

Boy Scouts of America, 1976-1986
Scoutmaster, Woodbadge Instructor, and Commissioner

Honors and Awards

2018 Awarded Patent: Multiple-Blade Wind Machine with Shrouded Rotors, No. US 10,066,597B2, September 4, 2018
2013 Selected for the Coors Endowed Chair position at the US Air Force Academy
2012 Received both the Outstanding Research and Outstanding Service Awards from the ME Department.
2008 Received Letter of Commendation for teaching at the three military academies from the Deputy Secretary of Defense, Gordon England.
2007 Appointed Visiting Professor, U.S. Naval Academy, Annapolis, MD.
2007 Selected as a Distinguished Alumni, University of Kansas.
2004 Selected as a Distinguished Visiting Professor at the U.S. Air Force Academy.
2003 Received the U.S. Army's "Commander's Award for Outstanding Public Service" from the United States Military Academy, West Point, NY, May, 2003.
2002 Completed "ASCE EXCEED" Teaching Program at the U.S. Military Academy.
2002 Selected as a Distinguished Visiting Professor at the US Military Academy, West Point, NY.
2000 Selected as one of 50 participants in the Leadership Denver by the Denver Metro Chamber of Commerce.
1996 Elected President, Metro Chapter, Professional Engineers of Colorado.
1994 Selected to attend the IEM program at Harvard University.

1992 Elected to Tau Beta Pi Engineering Honorary Society.
` 1991 Elected to the New York Academy of Sciences.
1990 Invited to White House in Washington, DC to brief President Bush's staff on alternative fuels and engine technology.
1990 Recipient of the University Outstanding Teaching Award, University of Nebraska-Lincoln.
1989 Hosted President Bush and three Cabinet members at the Center for Engine Technology at UNL; Made technical presentation and gave tour of test facilities.
1987 SAE Senior Teetor Award Winner.
1985, 1988-1999 - Who's Who in America.
1984 Fellow, American Society of Mechanical Engineers.
1984 Received the National NUCEA Conferences and Institute Faculty Service Award.
1983-1984 Appointed as a member of the Propulsion Committee for the National Research Council of the National Academy of Engineering.
1983 Texas A&M University Faculty Distinguished Achievement Award.
Member: Pi Tau Sigma, Tau Beta Pi, Sigma Pi Sigma Outstanding Academic Societies.

Selected Journal Publications

1. "Simulink/MATLAB Model for Assessing the Use of a Centrifugal Pump as a Hydraulic Turbine," Jenkins, P.E. and Kuryachy, A., *World Journal of Mechanics*, Vol. 8, p. 253-271, 2018, https://doi.org/10.4236/wjm.2018.87021.

2. "Drag Coefficients of Golf Balls," Jenkins, P., Arellano, J., Ross, M., and Snell, M., *World Journal of Mechanics*, Vol. 8, p. 236-241, 2018, https://doi.org/10.4236/wjm.2018.86019.

3. "Design and Analysis of a Dual Rotor Turbine with a Shroud Using Flow Simulations," Jenkins, P.E., Younis, A., and Chen, Y.X., *Journal of Power and Energy Engineering*, Vol. 5, p. 25-40, 2017, https://doi.org/10.4236/jpee.2017.54004.

4."Flow Simulation to Determine the Effects of Shrouds on the Performance of Wind Turbines," Jenkins, P. E. and Younis, A., *Journal of Power and Energy Engineering*, Vol. 4, p. 79-93, 2016, http://dx.doi.org/10.4236/jpee.2016.48008.

5. "Analysis of Using the M-Cycle Regenerative-Humidification Process on a Gas Turbine," Jenkins, P., Cerza, M., and Al Saaid, M., *Journal of Power and Energy Engineering*, Vol. 8, No. 11, November 2014, p. 1824-1837.

6. "Biochar as a Sustainable Electrode Material for Electricity Production in Microbial Fuel Cells," Huggins, T., Wang, H., Kearns, J., Jenkins, P., and Ren, Z., *Bioresource Technology*, Vol. 157, April 2014, p. 114-119, http://dx.doi.org/10.1016/j.biortech.2014.01.058 (5 year Impact Factor 5.3.)

7. "Microbial Desalination Cell with Capacitive Adsorption for Ion Migration Control," Forrestal, C., Xu, P., Jenkins, P.E., and Ren, Z., *Bioresource Technology*, Vol. 120, Sept. 2012, p. 332-336, http://dx.doi.org/10.1016/j.biortech.2012.06.044 (Highlights: Leading journal in biotechnology,with Impact Factor 5.3. The article reported that the capacitive adsorption solved the salt management problem in MDCs.)

8. "Microbial Desalination Cells for Improved Performance in Wastewater Treatment, Electricity Production, and Desalination," Luo, H., Xu, P., Roane, T.M., Jenkins, P.E., and Ren, Z., *Bioresource Technology*, Vol. 105, 2012, p. 60-66. (Highlights: Leading journal in biotechnology with Impact Factor 5.3. The article reported that electricity production from wastewater and desalination can be mutually beneficial in MDCs. It has been cited 4 times within 7 months.)

9. "Ionic Composition and Transport Mechanisms in Microbial Desalination Cells," Luo, H., Xu, P., Jenkins, P.E., and Ren, Z., *Journal of Membrane Science*, 2012, 409-410, 16-23. (Highlights: Leading journal in membrane science with Impact Factor 4.3. The article reported the characterization results and membrane scaling mechanisms in MDCs. It has been cited 2 times within 4 months.)

10. "Long-term Performance and Characterization of Microbial Desalination Cells in Treating Domestic Wastewater," Luo, H., Xu, P., Jenkins, P.E., and Ren, Z., *Bioresource Technology*, 2012, 120:187-93. (5 year Impact Factor 5.3.)

11. "Electrochemical Corrosion of Carbon Steel Exposed to Biodiesel/Simulated Seawater Mixture," Wang, W., Jenkins, P.E., and Ren, Z., *Corrosion Science*, 2012, 57, 215-219. (Highlights: No.1 journal in corrosion science with Impact Factor 3.7. The article reported the unique corrosion behavior of carbon steel in seawater and biodiesel interface.)

12. "Concurrent Desalination and Hydrogen Generation Using Microbial Electrolysis and Desalination Cells," Luo, H., Jenkins, P.E., and Ren, Z., *Environmental Science & Technology*, 2011, 45(1), 340-344. (Highlights: No.1 journal in environmental science and engineering with Impact Factor 5.8. The article reported the first system for simultaneous desalination, H_2 production, and wastewater treatment. The article was featured by *ES&T Water-Energy* Virtual Issue as a promising technology for solving energy water problems. The findings were reported by more than 100 science news releases including *Science Daily*, *Scientific American*, *NASA Technical Review*, C&EN News, ABC 7News, *Desalination Report*, *Membrane Technology*, *UC Denver News*, *CU Faculty Newsletter*, etc. Received numerous interview requests from USA, UK, Brazil, China, etc. It has been cited 20 times within 19 months.)

13. "Carbon Nanotube Modified Air-Cathodes for Electricity Production in Microbial Fuel Cells," Wang, H., Wu, Z., Jenkins, P., Plaseied, A., Simpson, L., Engtrakul, C., and Ren, Z., *Journal of Power Sources* 2011, 196(18), 7465-7469. (Highlights: No.1 journal in power production with Impact Factor 5.0. The article reported the improved performance of MFC systems by using electrodes modified by carbon nanotubes. It has been cited 8 times within 2 years.)

14. "Heterogeneous Corrosion Behaviour of Carbon Steel in Water Contaminated Biodiesel," Wang, W., Jenkins, P.E., and Ren, Z., *Corrosion* Science 2011, 53(2), 845-849. (Highlights: No.1 Journal in corrosion science with Impact Factor 3.7. The article reported the unique corrosion behavior of carbon steel in water contaminated biodiesel. It has been cited 7 times within 2 years.)

15. "Effect of CNF/CNT Surface Treatment on the Performance of Air-Cathodes in Microbial Fuel Cells," Wang, H., Hakimelahi, N., Wu, Z., Jenkins, P., Plaseied, A., Simpson, L., and Ren, Z., 2012, submitted to *Journal of Power Sources*. (Impact factor 4.6.)

16. *Insulating Techniques and Radiation Characteristics of Materials in Advanced Engine Designs*, Jenkins, P.E., for EPA, Ann Arbor, MI, June 3, 1997, 41 pages.

17. *High Temperature Materials Study for Advanced Engine Designs*, Jenkins, P.E., for EPA, March 25, 1997, Ann Arbor, MI, 47 pages.

18. "Performance Characteristics of a Multiple-Disk Centrifugal Pump," Roddy, R., Morrison, G., and Jenkins, P.E., Paper No. 1949-WT, ASME Transaction, *Journal of Fluids Engineering*, Vol. 109, pp. 51-57, March 1987.

19. "Flowfield and Performance Measurements in a Vaned Radial Diffuser," Dutton, J.C., Piemsombon, P., and Jenkins, P.E., Paper No. 84-WA/FM-7, ASME Transaction, *Journal of Fluids Engineering*, Vol. 108, pp. 141-147, June 1986.

20. "Comparison of the HTTT Reheat Gas Turbine Combined Cycle with the HTTT Non-Reheat Gas Turbine Combined Cycle," Rice, I.G. and Jenkins, P.E., Paper No. 81-GT-69, ASME Transaction, *Journal of Engineering for Power*, 1981, Vol. 194, pp. 129-142.

21. "Test Report of the Wind Baron (Multi-blade) High Performance Windmill," Jenkins, P.E., tested at the Navajo Nation Master Test Site, Window Rock, AZ, *Texas A&M Turbomachinery Laboratories Report*, February 26, 1981.

Conference Presentations and Proceedings

1. "Ultra-Dissipative Foams and Liners to Prevent Concussions Using Liquid-Crystal Elastomers," Jenkins, P.E., Yakacki, C.M., and Torbali, A.H., Pacific Operational Science and Technology Conference, Honolulu HI, March 5-9, 2018.

2. "Analysis of Using the M-Cycle on a Gas Turbine," Jenkins, P.E., Al Saaid, M.M., and Cerza, M., ASME Turbo Expo, June 16-20, 2014, Dusseldorf, Germany. Published in *Proceedings of the ASME Turbo Expo 2014*, Vol 3A, Paper No. GT2014-25178.

3. "Studies on Corrosion and Fouling Detection and Prevention Using Micro Electrode Arrays," Ren, Z. and Jenkins, P.E., US National Institute of Standards and Technology, July 23-24, CO, 2013.

4. "Understanding and Solving the Key Challenges in Microbial Desalination Systems," Forrestal, C., Luo, H., Xu, P., Jenkins, P., and Ren, Z., NA-ISMET meeting, Cornell University, October 8-10, 2012.

5. "The Effects of the M-Cycle on the Performance of a Gas Turbine," Jenkins, P.E. and Carty, J., 9th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, Malta, July 16-18, 2012. Published in *Proceedings of HEFAT 2012.*

6. "Aerodynamic Bicycle Helmet Design Using a Truncated Airfoil with Trailing Edge Modifications," Jenkins, P.E., and Sims, B.W., IMECE, Denver, CO, November 11-17, 2011. Published in *IMECE 2011 Proceedings*, Paper No. IMECE2011-65411.

7. "Exploring New Electrode Materials for Sustainable Electricity Production in Microbial Fuel Cells," Wang, H., Wu, Z., Jenkins, P., and Ren, Z., 242nd American Chemical Society (ACS) National Meeting, Denver, CO, August 28 - September 1, 2011.

8. "Corrosion Mechanism of Carbon Steel in Seawater Contaminated Biodiesel," Wang, W., Wang, H., Jenkins, P., and Ren, Z., 242nd ACS National Meeting, Denver, CO, August 28 - September 1, 2011.

9. "Improved Performance of Bioelectrochemical Systems by Integrating Energy Production with Water Desalination," Luo, H., Forrestal, C., Jenkins, P.E., and Ren, Z., 3rd International Microbial Fuel Cell Conference, Wetsus, The Netherlands, June 6-8, 2011.

10. "Simultaneous Energy Production and Desalination in Microbial Electrochemical Systems," Luo, H., Xu, P., Jenkins, P.E., and Ren, Z., 241st American Chemical Society (ACS) National Meeting, Anaheim, CA, March 27-31, 2011.

11. "Concurrent Desalination and H2 Generation Using an Integrated Bioelectric System," Luo, H., Jenkins, P.E., and Ren, Z., 1st North American BioElectric Systems Meeting, UMass, October 11-13, 2010.

12. "UCD Sports Engineering Program," Jenkins, P.E., Plaseied, A., and Khodaee, M., 8th Conference of the International Sports Engineering Association, Vienna, Austria, July12-16, 2010. Published in *Procedia Engineering*, Vol. 2, Issue 2, July 2010, pp.2757-2762.

13. "It's Not About the Bike," Plaseied, A., Khodaee, M., Jenkins, P.E., et.al., 8th Conference of the International Sports Engineering Association, Vienna, Austria, July 12-16, 2010. Published in *Procedia Engineering*, Vol. 2, Issue 2, July 2010.

14. "An Experimental Study of Synthetic Fuel Blends Injected into a Rolls-Royce Model 250-C20B Turboshaft Gas Turbine," Cerza, M. and Jenkins, P.E., ASME Turbo Expo, Glasgow, Scotland, June 14-18, 2010. Published in *Proceedings of the ASME Turbo Expo 2010*, Paper No. GT2010-22436, p. 353-361.

15. "Carbon Nanofiber Modified Air Cathodes for Improving Electricity Production in Microbial Fuel Cells," Wang, H., Wu, Z., Jenkins, P., Plaseied, A., Simpson, L., Engtrakul, C., and Ren, Z., 239th American Chemical Society (ACS) National Meeting, San Francisco, CA, March 21-25, 2010.

16. "An Experimental Study on the Effects of Fisher-Tropsch (FT) Blends with Diesel #2 and JP-5 on the Performance of a Rolls-Royce Model 250-C20B Gas Turbine Engine," Cerza, M. and Jenkins, P., ASME Turbo Expo, Orlando, FL, June 8-12, 2009.

17. "Turbine Fuel Testing with Boron Nano-Particles," Jenkins, P.E., Naval Research Lab (NRL) Alternative Fuel Workshop, Washington, DC, July 19-20, 2007.

18. "The Impact of Sulfur Free Diesel Fuel on Lubricity and Contamination," Jenkins, P.E. and Tal, M., British Institution for Mechanical Engineers (with Honors), Sussex, England, April 26-28, 2004. Published in *Total Vehicle Technology Conference 2004.*

19. "Reversed Brayton Cycle Gas Turbine," Jenkins, P.E., 2nd International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, Victoria Falls, Zambia, Africa, June 23-26, 2003. Published in *Proceedings of HEFAT 2000.*

20. "Conversion/Training of High Tech Labor Resources," Ferrigno, D. and Jenkins, P., 2nd European Systems Engineering Conference," Munich, Germany, September 13-15, 2000. 30. "A New Micro-Gas Turbine Engine," Jenkins, P.E., ASME Gas Turbine Conference, Munich, Germany, May 8-11, 2000.

21. "A New Micro-Gas Turbine Engine," Jenkins, P.E., ASME Turbo Expo, Munich, Germany, May 8-11, 2000.

22. "International Technology Transfer Programs," Jenkins, P.E., U.S. Dept. of Energy Conference on Environmental Opportunities in Mexico and the Border Countries, Washington, DC, June 20-21, 1994. Published in *Proceedings*, pp. 131-146.

23. "Derivation of a Tumble Number for Accidents Involving Pedestrians," Szydlowski, W.M. and Jenkins, P.E., 1993 SAE International Congress & Exposition, Detroit, MI, March 1-5, 1993. Published as *SAE Technical Paper No. 933660.*

24. "Performance Analysis of SI Engines with Ethyl Tertiary Butyl Ethers (ETBE) as a Blending Component in Motor Gasoline and Comparison with other Blending Components," Baur, C., Kim, B., Jenkins, P.E., and Cho, Y.S., Intersociety Energy Conversion Conference, Reno, NV, August 12-17, 1990. Published in *Proceedings 1990 Intersociety Energy Conversion Conference*, Vol. 4, pp. 337-342.

25. "Performance Analysis of a Spark Ignited Engine with ETBE as a Blending Agent," Jenkins, P.E., Cho, Y.S. and Kim, B., Future Transportation Technology Conference, San Diego, CA., August 14-16, 1989. Published as *SAE Technical Paper No. 901520.*

26. "Analysis of Component Power Losses in Centrifugal Pumps," Peng, W.W. and Jenkins, P.E., Symposium on the Performance Characteristics of Hydraulic Turbines and Pumps, ASME Winter Annual Meeting, Boston, MA, November 1983. Published in ASME *Journal of Fluids*, 1983.

27. "Heat Transfer and Film Cooling with Steam Injection through an Inclined Hole over a Flat Plate," Han, J., Chan, H., and Jenkins, P.E., ASME-AICHE National Heat Transfer Conference, Seattle, WA, July 1983. Published in *Proceedings*, Paper No. 83-HT-9.

28. "Film Cooling with Steam Injection through Three Staggered Rows of Inclined Holes over a Straight Airfoil," Conklin, G., Han, J., and Jenkins, P.E., ASME International Gas Turbine Conference, March 1983. Published in *Proceedings*, Paper No. 83-GT-30.

29. "A Fluidized-bed Combustion Heat Transfer Model using Finite Elements," Jenkins, P.E. and Richardson, T.W., ASME International Gas Turbine Conference, 1982. Published in *Proceedings*, Paper No. 82-GT-169.

30. "The Prediction of Film Cooling Effectiveness of Steam," Han, J. and Jenkins, P.E., ASME International Gas Turbine Conference, 1982. Published in *Proceedings*, Paper No. 82-GT-100.

Research Projects

(Funded, unless indicated otherwise)

- 2018 Creating Ultra-Dissipative Helmet Liners Using Liquid Crystalline Elastomers Foams, State of Colorado Advanced Industries Accelerator, 18 months, Co-PI, $165,000
- 2018 Ultra-Dissipative Padding Made from Liquid Crystal Elastomers, Head Health TECH Challenge III: NFL, Football Research, Inc., and Duke CTSI, l year, Co-PI, $121,949
- 2016 Integrated Electrochemical Processes for Synergistic Wastewater Treatment, ONR, 3 years, Co-PI, $566,721.
- 2012 Multi-electrode Array for Electrochemical Corrosion Control and Biofouling Prevention, ONR, 3 years, PI, $270,000
- 2011 Wire Beam Electrode for Corrosion and Biofouling Control, ONR, PI, $65,000
- 2010 Efficient Energy Production, Desalination, and Waste Treatment in Bioelectrochemical Systems, ONR, 2 years, PI, $250,000
- 2010 Low-Energy Desalination and Electricity Generation in Bioelectrical Systems, ONR, 2 years, PI, $99,433
- 2010 USNA-ONR Alternative Fuel Testing, ONR, 1 year, PI, $44,000
- 2009 MFC Fuel Cell Program, ONR, 3 years, PI, $450,000
- 2009 USNA-ONR JP5/FT Engine Alternative Fuel Testing Program, Phase 1&2, ONR, co-PI, $49,000
- 2008 USNA Alternative Fuel Gas Turbine Testing Program, ONR, co-PI, $209,800
- 2007 USNA Synthetic Fuel Development and Testing Program, ONR, co-PI, $179,900

2005/6 Cadet Energy Research Training Program, US Air Force, $5,300,000 (Proposed)
2005/6 Heavy-Fuel Engine for Small UAV Initiative, US Air Force, $532,000 (Proposed)
2005/6 IED Detection: Acoustic Imaging, DoD, co-PI, $2,200,000
2005/6 Technology Impact Analysis, DoD IED Program, co-PI, $350,000
2005 Director, US Air Force Academy Energy Research Center, PI, $48,731 (Proposed)
2004 US Air Force Academy, Colorado Springs, CO, IPA, PI, $146,000
2004 Clean Diesel Training Program, FEV Engine Technology Corp., Auburn Hills, MI, co-PI, $10,000
2002 US Military Academy, West Point, NY, PI, $142,000
2000 Retraining Instruction for Telecommunications & Computer Science, Raytheon Company, PI, $450,000
1999 Retraining Instruction for Telecommunications & Computer Science, US WEST, PI, $2,185,000
1999 Lowry Engineering Program, Colorado Commission on Higher Education, PI, $125,000
1999 Tetherless T3 and Beyond Workshop, National Science Foundation, PI, $50,000
1997 Applying Educational Technologies to Undergraduate Engineering Programs, Colorado Commission on Higher Education, PI, $169,000
1996 Lowry Engineering Program, Colorado Commission on Higher Education, 2 years, PI, $259,000
1996 Distance Learning Course Development, Colorado Commission on Higher Education, PI, $169,000
1995 Electronic Delivery Program, US GSA, co-PI, $159,000
1995 Distance Learning Program, Colorado Commission on Higher Education, PI, $29,000
1994 Project Colorado – Service to the Citizen, US Postal Service, PI, $39,400
1992/3 International Technology Transfer Program, University of Colorado, PI, $30,000
1990/1 Alternative Fuel Research Program, Nebraska Energy Office with several industries, PI, $856,740
1989/90 Small Cogeneration System Development, Tahoe/Cogentech Corp., Phase II, PI, $498,000
1989/90 Rotary Engine Development for RPV, US Navy/CSA Corp., Phase I, PI, $50,000
1988/9 Small Engine Development/Demonstration Program, JKR Technology Company/Ssangyong Motor Company, Phase I, PI, $350,000
1988/9 Small Cogeneration System Development Program, Tahoe/Cogentech Corp., Phase I, PI, $250,000
1988/9 Metal Vapor Turbine-Alternator Development Program, Space Power, Inc./US Department of Defense, Phase I, PI, $55,000
1987/8 Packaged Rotary Cogeneration Development Program, Power Systems Corporation/John Deere Inc., PI, $220,000/yr
1987 Hydrogen Injection Studies in a Cummins Diesel Engine, Dual-Dynamics Corporation, PI, $15,000
1986/7 Diesel Roto-Compound Engine Demonstration Program, Engine Corporation of America/General Motors, Phase I, PI, $39,000