

CURRICULUM VITAE

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EDUCATION

Ph. D. in Mechanical Engineering, Rice University, 1968
M. S. in Mechanical Engineering, Rice University, 1965
B. A. in Mechanical Engineering, Rice University, 1963

HONORS

Career Teaching Award, Cullen College of Engineering, University of Houston, May, 2006.
Best Paper Award (2nd place), Annual Meeting of the Gulf Southwest Section of ASEE: March 23-25, 2005, Texas A&M University-Corpus Christi, Corpus Christi, TX. (94 papers)
One of the three best papers (more than 75 papers presented) in the Design in Engineering Education Division at the 2004 ASEE Annual Conference and Exhibition, June 20-23, 2004, Salt Lake City, Utah.
Claude Wilson Award for Life Time Achievement as an Engineering Educator, South Texas Section of ASME, April 17, 2003.
An Outstanding Teaching Award in the Cullen College of Engineering, 2002-2003.
Best Paper Award (2nd place), Annual Meeting of the Gulf Southwest Section of ASEE: March, 2003. (85 papers)
Meritorious Service Award, South Texas Section of ASME: April, 2001.
Best Paper Award (1st place), Annual Meeting of the Gulf Southwest Section of ASEE: March, 2001. (76 papers)
“Outstanding ME Professor”, given annually by ASME Student Section and Pi Tau Sigma since 1990: Dec., 1990; Dec., 1992; Dec., 2000; Dec., 2006.
Outstanding Teaching Award, Gulf Southwest Section of ASEE: March, 1998.
Phi Kappa Phi: January, 1997.
Meritorious Service Award, South Texas Section of ASME: April, 1996.
Fellow, ASME: December, 1984.
W. T. Kittinger-Halliburton Cullen College of Engineering Outstanding Teaching Award: May, 1981.
Ralph Budd Award, Outstanding Engineering Thesis at Rice University: May, 1965.

PROFESSIONAL REGISTRATION

Professional Engineer, Texas no. 64622

PROFESSIONAL EXPERIENCE

1993-2000	Chairman, Department of Mechanical Engineering, University of Houston
1986-2002	Director, NASA-JSC Summer Faculty Fellowship Program, Summers of 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002.
1983-1988	Associate Chairman, Dept. of ME, UH
1982 - present	Professor, Dept. of ME, UH
1976-1978	Program Manager for Heating and Cooling, Solar Energy Laboratory, UH
1974-1982	Associate Professor, Dept. of ME, UH
1968-1974	Assistant Professor, Dept. of ME, UH

1970	Fellow, Summer Faculty Fellowship Program, NASA-MSC, Houston (Structures and Mechanics Division)
1968	Fellow, Summer Faculty Fellowship Program, NASA-MSC, Houston (Crew Systems Division)
1965-1968	NASA Research Trainee, Rice University
1965	Summer Intern, NASA-MSC, Houston
1963-1965	Teaching Assistant, Rice University
1964	Assistant Engineer, General Dynamics Corp., Ft. Worth, Texas (Summer only)
1963	Assistant Engineer, Shell Pipeline Corp., Houston (Summer only)
1962	Data Processing Machine Operator, Shell Oil Co., Houston (Summer only)
1960, 1961	Laboratory Assistant, Shell Development Co., Houston (Summers only)

TEACHING

RECOGNITION OF TEACHING

Career Teaching Award, Cullen College of Engineering, University of Houston, May, 2006.
 Claude Wilson Award for Life Time Achievement as an Engineering Educator, South Texas Section of ASME, April 17, 2003
 An Outstanding Teaching Award in the Cullen College of Engineering, 2002-2003
 Outstanding Teaching Award, Gulf Southwest Section of ASEE, March, 1998
 Pi Tau Sigma/ASME Outstanding Professor Award, 1990, 1992, 2000, 2006
 W. T. Kittinger-Halliburton College Outstanding Teacher Award, 1981
 Recognition as one of the outstanding teachers in the Cullen College of Engineering: nine times

COURSES TAUGHT: (*courses originated) (**provided significant course development)

ENGI/MECE 2334:	Thermodynamics I
ENGI 3331:	Transport
ENGI 3363:	Fluid Mechanics
ENGI 5397:*	Introduction to Solar Energy
MECE 1100*	Introduction to Mechanical Engineering
MECE 2361:*	Design I
MECE 3334:	Thermodynamics II
MECE 3360:	Experimental Methods
MECE 4334:**	Multidisciplinary Capstone Design (ME, IE and ECE Departments)
MECE 4363:	Fluid Mechanics
MECE 4364:	Heat Transfer
MECE 4371:	Thermal/ Fluids Laboratory
MECE 5337:**	Applications of Thermodynamics
MECE 5350:*	Utilization of Solar Energy
MECE 5350:*	Design of Thermal Systems
MECE 5360:*	Applications of Heat Transfer
MECE 5361:**	Gas Dynamics
MECE 5362:*	Applications of Fluid Mechanics
MECE 5397:*	The Energy Crisis
MECE 6330:**	Radiation Heat Transfer (graduate)
MECE 6331:**	Classical Thermodynamics (graduate)
MECE 6334:**	Convection Heat Transfer (graduate)
MECE 7333:*	Advanced Gas Dynamics (graduate)
MECE 7397:*	Introduction to Finite Element Analysis (graduate)
MECH 576	Propulsion (Spring, 1987, at Rice)

DISSERTATIONS/THESIS COMPLETED

Oscar E. Alvarez, "Comparison of Piecewise Ritz and Weighted-Residual Methods," MSME, 1971.

- Grover D. Fulkerson, "An Approximation for Combined Mode Radiation Heat Transfer," Ph.D., 1972.
- Kanti K. Mahajan, "Sizing Multipass Heat Exchangers with Non-Uniform Heat Transfer Coefficients," MSME, 1972.
- Michael R. Mathias, "A Study of the Effects of Cyclic (On-Off) Heat Fluxes on Canned Food Heating Times During Skylab Flights," MSME, 1972.
- Marian Barash, "Modifications to Straight-Walled Trapezoidal Groove Solar Energy Collectors," MSME, 1975.
- Arthur C. Ratzel, "Design of Flat Plate Solar Energy Collectors for Space Cooling Applications Utilizing Commercially Available Materials," MSME, 1976.
- Hassan Nabavi, "Natural Convection in Groove-Like Geometries: The Overall Heat Transfer Coefficient," MSME, 1978.
- Alfredo Olvera, "The Design, Evaluation and Testing of a Moderately Concentrating, Non-Tracking Solar Energy Collector," MSME, 1979.
- Mohan Goil, "Evaluation of the Optical Characteristics of Groove-Like, Non-Tracking, Moderately Concentrating Solar Collectors Utilizing a Symmetric, Two-Facet Reflector," MSME, 1979.
- Heng Cheng, "Evaluation of the Optical Degradation of Thin Plastic Films," MSME, 1979.
- Yi-Wey Tu, "Design and Testing of a Method for the Evaluation of a Thermosyphon Solar Water Heater," MSME, 1979.
- Michael Burkett, "Evaluation of Thermal Monitoring Systems," MSME, 1980.
- Yvette Loh, "On the Mechanical Degradation of Thin Plastic Films for Solar Applications," Senior Honors Thesis, 1981.
- Gary Kwan, "Improved Optical Design of Non-Tracking Concentrators," MSME, 1983.
- Halil Guven, "A Comprehensive Method for Computer-Aided Design of Practical Energy Systems," Ph. D., 1983. (with Mistree)
- L-Y. Wu, "An Experimental Investigation of the Effect of Water Removal and Replacement on the Thermal Stratification in a Horizontal Water Storage Tank," MSME, 1984.
- Juzar Lokhandwala, "Improving Extraction Efficiency of a Horizontal Tank Thermal Storage System," MSME, 1986.
- Christian Struble, "Computer-Aided Selection and Design of Spacecraft Thermal Control Systems, Senior Honors Thesis, 1988.
- Eduardo Bascaran, "A Model for the Conceptual Design of Thermal Systems: Concurrent Decisions in Designing for Concept," Ph. D., 1990. (with Mistree)
- Chia-Hsien Chang, "Transient Thermal Performance of a Solar Pond with Salinity and Temperature Dependent Properties," MSME, 1991.
- Vincent Bricout, "A Three Dimensional Transient Model of a Energy Storage and withdrawal from a Horizontal Liquid Storage Tank," MSME, 1992.
- Yiahua Yang, "Transient Thermal Model for a Swallow Pond for Aquaculture," MSME, 1992.
- Michael Gapinski, "Effects of an Evaporative Cooler External Spray System on Combustion Gas Turbine Engine Performance," Senior Honors Thesis, 1994.

CONTINUING EDUCATION

Lecturer in short courses:

- New Horizons in Solar Heating and Cooling, Solar Energy Laboratory, University of Houston. Topic: "Active Solar Systems," Dec. 13-15, 1975.
- The Utilization of Solar Energy, Penrod Education Services. Topic: "Non-Tracking, Concentrating Solar Collectors," Nov. 10, 1976.
- The Utilization of Solar Energy for Heating and Cooling, Solar Energy Laboratory, University of Houston. Topics: "Insolation," "Collectors," and "Design," June 21-23, 1976.
- Energy Conscious Design in the Built Environment, The Energy Institute, University of Houston. Topic: "Active Solar Heating and Cooling Systems," Jan. 10-12, 1977.
- The Utilization of Solar Energy for Heating and Cooling, Solar Energy Laboratory, University of Houston. Topic: One-half of the course, May 9-11, 1977.
- The Utilization of Solar Energy and Energy Conscious Design, Solar Energy Laboratory, University of Houston. Topic: One-half of the course, Sept. 12-14, 1977.
- Solar Day, Solar Energy Laboratory, The Energy Institute and the Houston Solar Energy Society. Topic: "Active Solar Systems," June 4, 1977.

EIT Refresher Course, Cullen College of Engineering, University of Houston: "Thermodynamics and Heat Transfer," (3 times): March, 1989; October, 1989; March, 1990.

Mechanical Engineering Professional Engineers Exam Preparation Course, Cullen College of Engineering, University of Houston: "Thermodynamics, Heat Transfer, and Thermal Systems" (18 times): March-April, 1990; March, 1991; September, 1993; February, 1994; September, 1994; February, 1995; September, 1995; February, 1996; October, 1996; February-April, 1997; October, 1997; February-March, 1998; September-October, 1998; February-April, 1999; September-October, 1999; February-April, 2000; September-October, 2000, February, 2001 (heat transfer only).

Director of short courses:

The Utilization of Solar Energy for Heating and Cooling, Solar Energy Laboratory, University of Houston: June 21-23, 1976; May 9-11, 1977.

The Utilization of Solar Energy and Energy Conscious Design, Solar Energy Laboratory, University of Houston: Sept. 12-14, 1977.

Mechanical Engineering Professional Engineers Exam Preparation Course, Cullen College of Engineering, University of Houston (16 times): March-April, 1990; September-October, 1993; February-April, 1994; September-October, 1994; February-April, 1995, September-October, 1995; February-April, 1996, September-October, 1996; February-April, 1997, September-October, 1997; February-April, 1998; September-October, 1998; February-April, 1999; September-October, 1999; February-April, 2000; September-October, 2000.

RESEARCH

PUBLICATIONS: BOOKS

John R. Howell, Richard B. Bannerot and Gary C. Vliet, Solar Thermal Energy Systems: Analysis and Design, McGraw-Hill, Feb., 1982, 406 pages.

Richard B. Bannerot, "Solar Energy," Chapter 30, 35 pages, Mechanical and Electrical Systems for Buildings, H. E. Bovay, ed., McGraw-Hill, Feb., 1981.

Halil M. Guven and Richard B. Bannerot, "A Comprehensive Method for Analysis and Design of Parabolic Trough Collectors for Solar Energy Applications in India," pp. 221-255, Progress in Solar Engineering, Ed. D. Yogi Goswami, Hemisphere Publishing Corp. New York, 1987.

Angela H. Patton and Richard Bannerot, "A Theoretical Basis for Integrating Rational and Intuitive Processing in Engineering Curricula through Art." Chapter 5 of Innovations 2003: World Innovations in Engineering Education and Research, Edited by Win Aung, et altera, published by iNEER (International Network for Engineering Education and Research), Arlington, VA. (One of 35 papers published in bound volume from 484 submitted abstracts and 395 accepted papers to 2003 International Conference on Engineering Education.)

Richard Bannerot, "Design Team Performance as a Function of Its Female Membership" Chapter 42 of Innovations 2007: World Innovations in Engineering Education and Research, Edited by Win Aung, et altera, published by iNEER (International Network for Engineering Education and Research), Arlington, VA .

PUBLICATIONS: BOOK REVIEWS

Solar Energy by Donald Rapp in ASME Journal of Solar Energy Engineering, p. 75, Feb., 1981.

Fundamentals of Solar Heating by R. C. Schubert and L. D. Ryan in ASME Journal of Solar Energy Engineering, p. 279, Aug., 1982.

Reviews of Renewable Energy Resources, Vol. 1, by Sodha, Mathur and Malik in ASME Journal of Solar Energy Engineering, p. 468, Nov., 1983.

Treatise on Solar Energy, Vol. 1: Fundamentals of Solar Energy by Garg in ASME Journal of Solar Energy Engineering, p. 469, Nov., 1983.

EDITORSHIPS:

Frank Kreith, Robert Boehm, John Mitchell and Richard B. Bannerot, Thermal Storage and Heat Transfer in Solar Energy Systems, ASME, 1978.

- Associate Editor, ASME Journal of Solar Energy Engineering, 1981-1983, 1995-1998
- Richard B. Bannerot, Solar Engineering - 1985, Proceedings of the ASME-ASES Solar Energy Conference, Knoxville, March 25-28, 1985.
- Richard B. Bannerot, Proceedings 1997 ASEE Gulf-Southwest Annual Conference, Houston, March 23-25, 1997, 648 pages

ARTICLES IN REFEREED JOURNALS:

- Richard B. Bannerot and F. A. Wierum, "Approximate Configuration Factors for a Gray Nonisothermal Gas-Filled Conical Enclosures," Thermophysics and Spacecraft Thermal Control, AIAA Progress in Astronautics and Aeronautics, 35 pp. 41-64, 1974.
- Richard B. Bannerot, J. E. Cox, N. D. Heidlebaugh and C. K. Chen, "The Thermal Preparation of Foods in Space Vehicle Environments," Aerospace Medicine, pp. 263-268, March, 1974.
- John R. Howell and Richard B. Bannerot, "Trapezoidal Grooves as Moderately Concentrating Solar Energy Collectors," Radiative Transfer and Thermal Control, AIAA Progress in Astronautics and Aeronautics, 49, pp. 277-289, 1976.
- Richard B. Bannerot and John R. Howell, "The Effect of Non-Direct Insolation on the Radiative Performance of Trapezoidal Grooves used as Solar Energy Collectors," Solar Energy, 19, pp. 549-553, 1977.
- John R. Howell and Richard B. Bannerot, "Optimum Solar Collector Operation for Maximizing Cycle Work Output," Solar Energy, 19, pp. 149-153, 1977.
- Arthur C. Ratzel and Richard B. Bannerot, "Optimal Material Selection for Flat Plate Solar Energy Collectors Utilizing Commercially Available Materials," AICHE Symposium Series, 73, No. 164, pp. 186-203, 1977.
- John R. Howell, Richard B. Bannerot, D. Elliot and J. Reber, "Performance Comparison Between Flat Plate and Moderately Concentrating Solar Energy Collectors," AIAA Journal of Energy, 1, No. 4, pp. 1-2, 1977.
- Richard B. Bannerot and K. K. Mahajan, "The Caloric Temperature Factor for a 1-2 Heat Exchanger with an Overall Heat Transfer Coefficient Varying Linearly with Tube Side Temperature," Heat Transfer: Research and Application: AICHE Symposium Series, 74, No. 174, pp. 61-66, 1978.
- K. D. Mannan and Richard B. Bannerot, "Optimal Geometries for One- and Two-Facet Symmetric Side-Wall Booster Mirrors," Solar Energy, 21.5, pp. 385-391, 1978.
- Hassan Nabavi and Richard B. Bannerot, "Heat Transfer Considerations in Groove-Like Solar Collectors," AIAA Progress Series Astronautics and Aeronautics, Thermal Control Systems, 1978.
- Richard B. Bannerot and John R. Howell, "Predicted Daily and Yearly Average Radiative Performance of Optimal Trapezoidal Groove Solar Energy Collectors," Solar Energy, 22.3, pp. 229-234, 1979.
- Stanley J. Kleis, R. T. Chen and Richard B. Bannerot, "Instantaneous Thermal Efficiency in Less Time," Solar Energy, 24.1, pp. 111-112, 1980.
- Richard B. Bannerot and Clifford L. Laurence, "A Design Method for Optimizing Collector Systems for Small Central Receivers," ASME Journal of Solar Energy Engineering, 102, pp. 240-247, Nov., 1980.
- Alfredo Olvera and Richard B. Bannerot, "The Design, Evaluation and Testing of a Moderately Concentrating, Non-Tracking Solar Energy Collector," ASME Journal of Solar Energy Engineering, 103, pp. 34-41, Feb., 1981.
- Heng Cheng and Richard B. Bannerot, "On the Weathering of Thin Plastic Films," ASME Journal of Solar Energy Engineering, 105, pp. 149-156, May, 1983.
- Bing Man Kwan and Richard B. Bannerot, "Improved Optical Design of Non-Tracking Concentrators," ASME Journal of Solar Energy Engineering, 106, pp. 271-8, August, 1984.
- Halil M. Guven, Farrokh Mistree and Richard B. Bannerot, "Design Synthesis of Parabolic Trough Solar Collectors for Developing Countries," Engineering Optimizations, 7, pp. 173-194, 1984.
- Halil M. Guven, Farrokh Mistree and Richard B. Bannerot, "A Conceptual Basis for the Design of Parabolic Troughs for Different Design Environments," ASME Journal of Solar Energy Engineering, 108, pp. 60-66, February, 1986.
- Halil M. Guven and Richard B. Bannerot, "Determination of Error Tolerances for Optical Design of Parabolic Troughs for Developing Countries," Solar Energy, 36.6, pp. 535-550, 1986.

- Halil M. Guven and Richard B. Bannerot, "Derivation of Universal Error Parameters for Comprehensive Analysis of Parabolic Troughs," ASME Journal of Solar Energy Engineering, 108, pp. 275-281, November, 1986.
- Eduardo Bascaran, Farrokh Mistree and Richard B. Bannerot, "Compromise: An Effective Approach for Solving Multiobjective Thermal Design Problems," Engineering Optimization, 12.3, pp. 175-189, 1987.
- Juzar A. Lokhandwala and Richard B. Bannerot, "Improving Extraction Efficiency of a Horizontal Tank Thermal Storage System," Heat Transfer - Pittsburgh 1987, AICHE Symposium Series, 83, No. 257, pp. 171-176, 1987.
- Li-Yun Wu and Richard B. Bannerot, "The Effect of Periodic Withdrawal on Thermal Stratification in a Simulated Thermosyphon System," Heat Transfer - Pittsburgh 1987, AICHE Symposium Series, 83, No. 257, pp. 183-188, 1987.
- Eduardo Bascaran, Richard B. Bannerot, and Farrokh Mistree, "Hierarchical Selection Decision Support in Conceptual Design," Engineering Optimization, 14, pp. 207-238, 1989.
- Richard B. Bannerot, "On the Determination of the Average Temperature in a Horizontal Storage Tank and Its Use in Monitoring System Performance," ASME Journal of Solar Energy Engineering, 114, August, 1992, pp. 182-187.
- Richard B. Bannerot, et altera, "A Simple Device for Monitoring Flow Rates in Thermosyphon Water Heaters," ASME Journal of Solar Energy Engineering, 114, February, 1992, pp. 47-52.
- Jack Shi, Robert Hart, Stanley Kleis and Richard B. Bannerot, "Gradient Zone Erosion in Seawater Solar Ponds," ASME Journal of Solar Energy Engineering, February, 1997, pp. 2-7.
- R. Bannerot and G. Song, "Development of an Interactive MR Fluid Experiment for Smart Material Curricula" International Journal of Modern Physics B, 19 (7-9): 1478-1484 Part 2 Sp. Iss. SI April 10, 2005.

REFEREED PROCEEDINGS AND OTHER REFEREED PAPERS:

- Richard B. Bannerot and Alan J. Chapman, "Solar Heating of a Spherical Shell in a Near Planetary Environment," ASME-70-HT/SPT-22, 1970.
- Grover D. Fulkerson and Richard B. Bannerot, "An Approximation for Combined Heat Transfer in a Radiatively Absorbing And Emitting Gas," AIAA 73-752, 1973.
- Richard B. Bannerot and Fredrick A. Wierum, "Approximate Configuration Factors for a Gray Nonisothermal Gas-Filled Conical Enclosure," AIAA 73-755, 1973.
- Richard B. Bannerot, Jimmy E. Cox, Normal D. Heidelbaugh and C. K. Chen, "Heating of Foods in Space Vehicle Environments," ASME 73-WA/HT-15, 1973.
- John R. Howell and Richard B. Bannerot, "Trapezoidal Grooves as Moderately Concentrating Solar Energy Collectors," AIAA 75-738, 1975.
- Richard B. Bannerot and John R. Howell, "Moderately Concentrating Flat-Plate Solar Collectors," ASME 75-HT-54, 1975.
- Richard B. Bannerot and K. K. Majahan, "The Caloric Temperature Factor for a 1-2 Heat Exchanger with an Overall Heat Transfer Coefficient Varying Linearly with Tube-Side Temperature," Proceedings of AIChE-10, National Heat Transfer Conference, San Francisco, August, 1975.
- John R. Howell, Richard B. Bannerot, Douglas G. Elliot and Jack Reber, "Performance Comparison Between Flat-Plate and Moderately Concentrating Solar Energy Collectors," AIAA 76-447, 1976.
- Richard B. Bannerot and John R. Howell, "Predicted Daily and Yearly Average Radiative Performance of Optimal Trapezoidal Groove Solar Energy Collectors," Sharing the Sun!, Proceedings of Annual Meeting of the American Section of ISES, 4, pp. 111-124, August, 1976.
- Richard B. Bannerot and K. D. Mannan, "Optimal Geometries for One- and Two- Faceted Symmetric Booster Mirrors," Proceedings of the ERDA Flat-Plate Collector Conference, Feb., 1977.
- Arthur C. Ratzel and Richard B. Bannerot, "Commercially Available Materials Suitable for Use in Flat-Plate Solar Energy Collectors," Proceedings of the ERDA Flat-Plate Collector Conference, Feb., 1977.
- John R. Howell and Richard B. Bannerot, "Solar Process Heat Economic and Technical Constraints," Paper 73, Proceedings of the AIChE National Meeting, March, 1977.

- John R. Howell and Richard B. Bannerot, "Review of the Development of Moderately Concentrating Solar Energy Devices," Proceedings of the Third Symposium on Heat Transfer and Fluid Mechanics, Rio de Janeiro, Brazil, May, 1977.
- Richard B. Bannerot, "The Radiative Characteristics of Non-Tracking, Moderately Concentrating Solar Energy Collectors," Proceedings of the ERDA Concentrating Solar Collector Conference, September, 1977.
- Alfredo Olvera and Richard B. Bannerot, "The Design, Evaluation and Testing of Moderately Concentrating, Non-Tracking Solar Energy Collectors," ASME 79-WA/Sol-3, 1979.
- Richard B. Bannerot and Clifford L. Laurence, "A Design Method for Optimizing Collector Systems for Small Solar Central Receivers," ASME 79-WA/Sol-24, 1979.
- Heng Cheng and Richard B. Bannerot, "On the Weathering of Thin Plastic Films," ASME 81-WA/Sol-6, 1981.
- Bing Man Kwan and Richard B. Bannerot, "Improved Optical Design of Non-Tracking Concentrators," Solar Engineering - 1983, Proceedings of the ASME Solar Energy Division Fifth Annual Conference, pp. 81-89, Orlando, April, 1983.
- Halil M. Guven, Farrokh Mistree and Richard B. Bannerot, "Determination of Error Tolerance for Optical Design of Parabolic Troughs," ASME 83-WA/Sol-1, 1983.
- Richard B. Bannerot, Y-W Tu, Allan Scott, George Placke and Tom Poche, "A Simple Device for Monitoring Flow Rates in Thermo-Syphon Solar Water Heaters," Proceedings of the 1984 ASES Annual Meeting, pp. 173-178, Anaheim, June, 1984.
- Yvette Loh and Richard B. Bannerot, "On the Mechanical Degradation of Thin Plastic Films," Proceedings of the 1984 ASES Annual Meeting, pp. 161-166, Anaheim, June, 1984.
- Halil M. Guven and Richard B. Bannerot, "Derivation of Universal Error Parameters for Comprehensive Optical Analysis of Parabolic Troughs," Solar Engineering - 1985, Proceedings of the Joint ASME-ASES Solar Energy Conference, pp. 168-174, Knoxville, March, 1985.
- Halil M. Guven, Farrokh Mistree and Richard B. Bannerot, "A Conceptual Basis for the Design of Parabolic Troughs for Different Design Environments," Solar Engineering - 1985, Proceedings of the Joint ASME-ASEE Solar Energy Conference, pp. 317-323, Knoxville, March, 1985.
- Halil M. Guven and Richard B. Bannerot, "A Comprehensive Methodology for the Analysis and Design of Parabolic Trough Collectors for Solar Energy Applications in India," Proceedings of the U. S.-Indian Binational Symposium-Workshop on Solar Energy Research and Applications, Roorkee, India, August 5-8, 1985.
- A. Thomas, M. Ramakrishna Rao, J. Nagaraju, Halil M. Guven and Richard B. Bannerot, "Solar Steam Generating System for Agro Based Industries," Proceedings of the Fourth International Conference on Energy for Rural and Island Communities, Glasgow, Scotland, September 16-20, 1985.
- Li-Yun Wu and Richard B. Bannerot, "An Experimental Study of Water Extraction on Thermal Stratification in Storage," Solar Engineering-1987, Proceedings of the Joint ASME-JSME-JSES Meeting, Honolulu, March, 1987.
- Richard B. Bannerot, "Universal Error Analysis for the Optical Design of Parabolic Trough Solar Collectors," Proceedings of the 1987 American Control Conference, Minneapolis, MN, June, 1987.
- Eduardo Bascaran, Richard B. Bannerot, and Farrokh Mistree, "The Conceptual Development of a Methodology for Solving Multi-Objective Hierarchical Thermal Design Problems," ASME Paper 87-HT-62.
- Juzar A. Lokhandwala and Richard B. Bannerot, "Effect of Distributors and Withdrawal Pattern on Thermal Stratification in a Horizontal Storage Tank," ASME Paper 88-WA/Sol-9.
- Richard B. Bannerot, "On the Determination of the Average Temperature in a Horizontal Storage Tank," Solar Engineering-1989, Proceedings of the ASME Solar Energy Division Conference, San Diego, April, 1989.
- Christian L. Struble, Eduardo Bascaran, Richard B. Bannerot, and Farrokh Mistree, "Computer-Based Multiobjective Hierarchical Design of Spacecraft Thermal Control Systems," Proceedings of the 19th Intersociety Conference on Environmental Systems, San Diego, July 24-27, 1989, pp. 465-490.
- Christian L. Struble, Eduardo Bascaran, Richard B. Bannerot, and Farrokh Mistree, "Compromise: A Multiobjective, Hierarchical Approach to the Design of Spacecraft Thermal Control Systems,"

- Proceedings of the 1989 ASME International Computers in Engineering Conference and Exposition, Anaheim, July 30-August 2, 1989.
- Chia-Hsien Chang and Richard B. Bannerot, "Effect of Indirect Insolation, Turbidity and Bottom Reflectance on Transmittance in a Solar Pond," Solar Engineering-1992, Proceedings of the ASME Solar Energy Division Conference, Maui, Hawaii, April, 1992.
- Chia-Hsien Chang and Richard B. Bannerot, "Transient Thermal Performance of a Solar Pond with Salinity and Temperature Dependent Properties," Solar Engineering-1993, Proceedings of the ASME Solar Energy Division Conference, Washington, D.C. April, 1993.
- Jack Shi, Robert Hart, Stanley Kleis, and Richard Bannerot, "Sea Water Solar Ponds-A Low Cost Energy Source for Mariculture," Proceedings of the 1994 ASES Conference, San Jose, CA, June 25-30, 1994.
- Jack Shi, Robert Hart, Stanley Kleis and Richard B. Bannerot, "Gradient Zone Erosion in Seawater Solar Ponds," Solar Engineering-1995, Proceedings of the 1995 ASES Conference, Maui, Hawaii, March 19-24, 1995, pp. 1011-1018.
- Jean-Luc Herbeaux and Richard Bannerot, "Experiences in Team Teaching Design," Proceedings of 1996 Annual Conference of ASEE Gulf Southwest Section, March 27-29, 1996, San Antonio, Texas, pp 150-153.
- Jean-Luc Herbeaux and Richard Bannerot, "Developing Major Projects for Introductory Design Courses," Proceedings of 1996 Annual Conference of ASEE Gulf Southwest Section, March 27-29, 1996, San Antonio, Texas, pp 183-187.
- Jean-Luc Herbeaux and Richard Bannerot, "Sophomore Level Design Projects and Exercises at the University of Houston," Proceedings of 1997 Annual Conference of ASEE Gulf Southwest Section, March 23-25, 1997, Houston, Texas, pp. 602-607.
- Richard Bannerot, "Identifying Psychological Diversity - The Use of a Myer-Briggs Type Indicator in Promoting Better Group Function," Proceedings of 1997 Annual Conference of ASEE Gulf Southwest Section, March 23-25, 1997, Houston, Texas, pp. 87-90.
- Jean-Luc Herbeaux, Richard Bannerot, et altera, "Results from a Short Design Project Conducted Concurrently in Japan and the USA," Proceedings of the 1998 Annual Conference of the ASEE Gulf Southwest Section, March 25-27, 1998, New Orleans, pp. 523-528.
- Richard Bannerot, "Specifications for Open-Ended Problems," Proceedings of the 2001 Annual Conference of the ASEE Gulf Southwest Section, March 28-30, 2001, College Station, Texas, on CD. Received the Conference's "Best Paper Award"
- Richard Bannerot, "Evaluation of Design, Build and Compete Projects," Proceedings of the 2001 Annual Conference of the ASEE Gulf Southwest Section, March 28-30, 2001, College Station, Texas, on CD
- Angela Patton and Richard Bannerot, "Chindogu: A Problem Solving Strategy for Transforming Uselessness into Fearlessness," Proceedings of the 2002 Annual Conference of the ASEE Gulf Southwest Section, March 20-22, 2002, Lafayette, LA, paper IA2 on CD and at <http://engr.louisiana.edu/asee/asee.cfm>.
- Richard Bannerot and Angela Patton, "Studio Design Experiences", Proceedings of the 2002 Annual Conference of the ASEE Gulf Southwest Section, March 20-22, 2002, Lafayette, LA, paper IIIC2 on CD and at <http://engr.louisiana.edu/asee/asee.cfm>.
- Angela Patton and Richard Bannerot, "Synthesizing Creative Processing in Engineering Curricula through Art", Proceedings of the 2002 ASEE Annual Conference and Exposition, June 16-20, 2002, Montreal, Quebec, Canada. Available on Conference CD and posted at http://www.aswee.org/acPapers/2002-551_Final.pdf. Search at <http://www.asee.org/about/events/conferences/search.cfm>.
- Richard Bannerot, "The DO's and DO NOT's for Major Projects in an Introductory Design Course", Proceedings of the 2002 ASEE Annual Conference and Exposition, June 16-20, 2002, Montreal, Quebec, Canada. . Available on Conference CD and posted at http://www.aswee.org/acPapers/2002-370_Final.pdf. Search at <http://www.asee.org/about/events/conferences/search.cfm> .
- Angela Patton and Richard Bannerot, "Art for Engineers: How Design and Visual Processing Enhance Problem Solving Skills in Engineering," Proceedings for the International Conference of Engineering Education (ICEE 2002), August 18-22, 2002, UMIST, Manchester, UK. Posted on the Conference Website.

- Angela Patton and Richard Bannerot, "The Artful Entrepreneur: How Art and Engineering Inspire Passion and Risk-taking", Proceedings of the 2002 ASEE/SEFI/TUB Colloquium, (ASEE jointly sponsored meeting on engineering education. This paper was one of only two selected for a plenary session from among the over 100 accepted, unsolicited papers. The rest of the unsolicited papers were in a poster session.); the other 25 plenary papers were all invited.) Berlin, Germany, October 1-4, 2002. Posted on the Conference Website.
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- ASME Space Technology and Heat Transfer Conference, Los Angeles, June, 1970: "Solar Heating of a Spherical Shell in a Near Planetary Environment."
- Aerospace Medical Association, Las Vegas, May, 1973: "The Thermal Preparation of Foods in Space Vehicle Environments."
- AIAA 8th Thermophysics Conference, Palm Springs, July, 1973: "Approximate Configuration Factors for a Gray Nonisothermal Gas-Filled Conical Enclosure."
- ASME Winter Annual Meeting, Detroit, November, 1973: "Heating of Foods in Space Vehicle Environments."
- NSF/RANN Workshop on Heating and Cooling of Buildings, Washington, D. C., November, 1974: "Moderately Concentrating Solar Energy Collectors."
- ISES 1975 International Meeting, Los Angeles, July, 1975: "The Effect of Non-Direct Insolation on the Radiative Performance of Trapezoidal Grooves Used as Solar Energy Collectors."
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- "Sharing the Sun!", Joint Meeting of the American and Canadian Sections of ISES, Winnipeg, August, 1976: "Predicted Daily and Yearly Average Radiative Performance of Optimal Trapezoidal Groove Solar Energy Collectors."
- ERDA Plate-Plate Collector Conference, Orlando, March, 1977: "Optimal Geometries for One- and Two-Faceted Symmetric Side-Wall Booster Mirrors."
- ERDA Contractor's Meeting, Washington, D.C., August, 1977: "The Fabrication and Testing of Moderately Concentrating Solar Collectors."
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- The Renewable Challenge, the Annual Meeting of American Section of ISES, Houston, June, 1982: "SOLSIM: An Active Solar Conversion Simulation Program for Classroom Use."
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- 1996 Annual Conference of the Gulf Southwest Section of the ASEE, San Antonio, TX, March 27-29, 1996, "Developing Major Projects for Introductory Design Courses."
- 1997 Annual Conference of the Gulf Southwest Section of the ASEE, Houston, TX, March 23-25, 1997, "Sophomore Level Design Projects and Exercises at the University of Houston."
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- 2003 ASEE Annual Conference and Exposition, June 22-25, 2003, Nashville, Tennessee, "Cultural Influences in Design." Session 2560.
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- 2004 Annual Conference of the ASEE Gulf Southwest Section, March 10-12, 2004, Texas Tech University, Lubbock, TX, "One Semester Capstone Design Courses: Issues, Problems and Solutions."
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- 2004 ASEE Annual Conference and Exposition, June 20-23, 2004, Salt Lake City, Utah, "A Just-in-Time Model for Teaching Technical Communications and the Use of Grading Rubrics in a Multidisciplinary Capstone Design Course." Session 2661.
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- 2006 ASEE Annual Conference and Exposition, June 17-20, 2006, Chicago, IL. Paper 2006-832, "How Women Perform on Individual Design Projects Compared to Men".
- 2006 ASEE Annual Conference and Exposition, June 17-20, 2006, Chicago, IL. Paper 2006-833, "How the Presence of Women Affects the Performance of Design Teams in a Predominately Male Environment".
- 2006 ASEE Annual Conference and Exposition, June 17-20, 2006, Chicago, IL. Paper 2006-1978, "Creating a Comprehensive Communications Communications-Across-the-Curriculum Program in the Cullen College of Engineering".
- SOLAR 2006: National Conference and Exhibition, July 8-13, 2006, Denver, CO. Paper 43, "A Sun Clock Project,"
- ICEE 2006 (Ninth International Conference on Engineering Education), San Juan, Puerto Rico, July 22-29, 2006, Paper M3-3 "Design Team Performance as a function of Its Female Membership,"
- 2006 ASME IMECE, Chicago, IL, November 5-10, 2006. Paper IMECE2006-13877, "A Successful Format for Semester-Long, Design, Build, and Test Early Design Projects,"
- 2006 ASME IMECE, Chicago, IL, November 5-10, 2006. Paper IMECE2006-13881, "Assessment of Myers-Briggs Temperament Indicator Based Team Formation Strategies for One- Semester Design Projects,"
- 2007 Capstone Design Course Conference, June 13-15, 2007, Boulder, CO. "Interdisciplinary Capstone Design at the University of Houston"
- 2007 ASEE Annual Conference and Exhibition. June 24-27, 2007 Honolulu, HI. Paper 2007-964: "Development of an Interactive Shape Memory Alloy Experiment for Smart Materials Curricula"
- 2007 Frontiers in Education Conference, October 10-13, 2007, Milwaukee, WI. "Who Graduates in Mechanical Engineering?"
- 2007 ASME IMECE November 11-16, 2007, Seattle, WA., Paper IMECE2007-43346: "Improving Student Understanding of the Impact of Engineering Solutions in a Global and Societal Context."
- 2008 On Being an Engineer: Cognitive Underpinnings of Engineering Education Conference, February 1-2, 2008, Texas Tech University, Lubbock, TX "Graduation Success as a Function of Student (and Possibly Faculty) Myers-Briggs Type Indicators,." (Poster Presentation)

INVITED SEMINARS AND TALKS:

- Department of Mechanical Engineering, University of Waterloo, Waterloo, Ontario, Canada, May, 1975: "Trapezoidal Grooved Collectors."
- Solar Energy Laboratory, University of Houston, February, 1976: "Moderately Concentrating Solar Energy Collectors."
- Air Conditioning Council of Greater Houston, Houston, February, 1976: "Review of Solar Energy Utilization in Heating and Cooling."
- Houston Chamber of Commerce, Houston, October, 1976: "Status of Solar Energy Utilization in Houston."
- Houston Solar Energy Society, Houston, October, 1976: "Solar Energy Review."
- Heat Exchanger Society of Houston, Houston, January, 1977: "The Potential for Solar Energy for Industrial Process Heat."
- Houston Solar Energy Society, Houston, February, 1977: "The Practicality of Solar Energy."
- Sierra Club, Galveston, April, 1977: "Solar Energy Overview."
- Construction Specification Institute, Houston, May, 1977: "The Utilization of Solar Energy."
- Houston Solar Energy Society, Houston, September, 1977: "Report on the Texas Solar Energy Society and the SEIA Meeting."
- Solar Energy Laboratory, University of Houston, October, 1977: "Solar Heating and Cooling Update."
- League of Women Voters, Baytown, Texas, October, 1977: "The National Energy Picture"
- Indian Institute of Science, Bangalore, India, January, 1978: "Solar Energy Overview."
- Punjab Agricultural University, Ludhiana, India, January, 1978: "Non-Tracking Solar Concentrators."
- Solar Energy Laboratory, University of Houston, February, 1978: "The 1977 ISES Meeting in New Dehli."
- Houston Solar Energy Society, Houston, February, 1979: "Houston Insolation."

Southwest Symposium on Thermal Sciences, Louisiana Technological University, Ruston, LA, March, 1979: "Review of Heat Transfer in Solar Energy Systems."

26th Annual Technical Meeting of the South East Texas Section of AIChE and the Sabine-Neches Section of the ACS, Port Arthur, Texas, March, 1979: "The Status of Solar Energy in the Process Industry."

The Energy Laboratory, University of Houston, April, 1979: "Houston Insolation."

Society of Women Engineers, Texas State Meeting, Houston, September, 1979: "The Energy Picture."

Texas Solar Energy Society Workshop, Houston, October, 1979: "Houston Insolation."

Texas Solar Energy Society Workshop, Houston, October, 1979: "Solar Research at the University of Houston."

Department of Mechanical Engineering, University of Houston, October, 1980: "Research and Engineering Problems in the Development of Solar Energy."

The Energy Laboratory, University of Houston, February, 1981: "Monitoring Solar Energy Systems."

Indian Institute of Science, Bangalore, India, May, 1981: "The Status of Solar Technology in the United States."

Indian Institute of Technology, Madras, India, May, 1981: "An Overview of Solar/Thermal Applications in the United States."

Bharat Heavy Electric Limited (Research Laboratory), Hyderabad, India, June, 1981: "The Status of Solar Technology in the United States."

Bharat Heavy Electric Limited (Research Laboratory), Hyderabad, India, June, 1981: "The Design of Solar Central Receivers."

Bharat Heavy Electric Limited (Research Laboratory), Hyderabad, India, June, 1981: "Non-Tracking, Concentrating Solar Collector Systems."

Indian Institute of Technology, Bombay, India, June, 1981: "The Status of Solar Technology in the United States."

Bharat Heavy Electric Limited (Research Laboratory), Hyderabad, India, August, 1983: "Advanced Topics in Non-Tracking Concentrators."

Nagarajuno University, Guntur, India, August, 1983: "Non-Tracking Concentrators."

Texas Solar Energy Realities '83, Dallas, October, 1983: "Solar Thermal Research at the University of Houston."

Energy Laboratory, University of Houston, March, 1985: "Decision Support Techniques Applied to Thermal Problems."

Energy Laboratory, University of Houston, March 31, 1986: "Design of Small Solar Thermal Power Systems."

Energy Laboratory, University of Houston, October 6, 1986: "A New Methodology for Thermal Design."

Energy Laboratory, University of Houston, October 12, 1987: "Thermal Control in Spacecraft and Planetary Habitats."

Energy Laboratory, University of Houston, September 25, 1989: "Sea Water Solar Ponds for Mariculture/Aquaculture."

Department of Mechanical Engineering, Texas A&M University, March, 1991: "Solar Ponds."

Energy Laboratory, University of Houston, February 24, 1992: "Sea Water Solar Ponds for Mariculture/Aquaculture - An Update."

OTHER RESEARCH RELATED ACTIVITY:

Reviewer for the ASME Journal of Heat Transfer; ASME Journal of Solar Energy Engineering; AIAA Journal of Energy; AIAA Journal, AIAA Progress in Aeronautics and Astronautics; Solar Energy; International Journal of Heat and Mass Transfer; the National Science Foundation; Journal for Engineering Education; ASME Conferences; AIAA Conferences; ASES Conferences; ASEE Conferences; FIE Conferences; and the Department of Energy.

Associate Editor of the ASME Journal of Solar Energy Engineering, 1981-1983, 1995-1998.

Technical Review Coordinator, ASME Solar Energy Division, Review of ERDA 76-144, Interim Report: National Plan for Research and Development of Solar Heating and Cooling, 1977.

Member, Sub-Committee on Heating and Cooling, ASME Ad Hoc Codes and Standards Committee for Solar Energy, 1977-1978.

Session Chairman: "Econometric Studies," Flat Plate Collector Workshop, Orlando, Florida, February 28-March 2, 1977.

Session Chairman: "Applications of Solar Energy," ASME-AIAA Thermophysics and Heat Transfer Conference, Palo Alto, California, May 22-24, 1978.

Session Chairman: "Heat Transfer in Solar Energy Systems," ASME Winter Annual Meeting, San Francisco, December 6-10, 1978.

Session Chairman: "Advances in Solar Technology," ASME Winter Annual Meeting, New York, NY, December 2-8, 1979.

Session Chairman: "Solar Fundamentals," Solar Energy Conference, ASME Century Meeting, San Francisco, CA, August, 1980.

Session Chairman: "Solar Radiation," ASME Winter Annual Meeting, Chicago, IL, December, 1980.

General Program Chairman, Solar Energy Division Program at the ASME Winter Annual Meeting, Washington, D. C., November, 1981.

General Program Chairman, Solar Energy Division Conference, Albuquerque, New Mexico, April, 1982.

Session Chairman: "Flat Plate Collector Design, Testing and Rating," The Renewable Challenge, Solar Technologies Conference and International Exposition, American Section of the International Solar Energy Society, June 1-5, 1982, Houston, Texas.

Technical Chairman, Joint ASME Solar Energy Division and American Solar Energy Society Engineering Division Meeting, Knoxville, Tennessee, March, 1985.

Session Co-Chairman: "Solar Ponds," Solar 90, the Annual Meeting of the American Solar Energy Society, Austin, TX, March, 1990.

Session Chairman: "Active Systems," The Blue Planet, the Annual Meeting of the American Solar Energy Society, Cocoa Beach, FL, June, 1992.

Session Chairman: "Research - II," 1996 Annual Meeting of the Gulf Southwest Section of ASEE, San Antonio, TX, March 27-29, 1996.

Session Chairman: "New Topics & Curriculum Innovation - I," 1996 Annual Meeting of the Gulf Southwest Section of ASEE, San Antonio, TX, March 27-29, 1996.

Program Chairman, 1997 Annual Meeting of the Gulf Southwest Section of ASEE, Houston, TX, March 23-25, 1997. (150 papers)

Plenary Session Chairman and Organizer: "Interdisciplinary Design", 1997 Annual Meeting of the Gulf Southwest Section of ASEE, Houston, TX, March 23-25, 1997.

Chairman, Paper Awards Committee: 1997 Annual Meeting of the Gulf Southwest Section of ASEE, Houston, TX, March 23-25, 1997.

Session Chairman: "Engineering Curriculum," 1998 Annual Meeting of the Gulf Southwest Section of ASEE, New Orleans, LA, March 25-27, 1998.

Session Chairman: "Teaching Engineering Design," 2001 Annual Meeting of the Gulf Southwest Section of the ASEE, College Station, TX, March 28-30, 2001.

Session Chairman: "Modeling of Systems," 2001 Annual Meeting of the Gulf Southwest Section of the ASEE, College Station, TX, March 28-30, 2001.

Session Chairman: "Design," 2002 Annual Meeting of the Gulf Southwest Section of the ASEE, Lafayette, LA, March 20-22, 2002.

Session Chairman: "Capstone Design," 2004 Annual Meeting of the Gulf Southwest Section of the ASEE, Lubbock, TX, March 10-12, 2004.

Session Co-Chairman, "TIME-3: Thermal Systems", 2004 ASEE Annual Conference and Exposition, Salt Lake City, Utah, June 20-23, 2004.

Session Chairman, "Design at the Lower levels," International Conference on Engineering Education 2004: Global Excellence in Engineering Education, Gainesville, FL, October 16-21, 2004.

Session Chairman, Session F1A, 2005 Annual Conference of the ASEE Gulf Southwest Section, Texas A&M University-Corpus Christi, Corpus Christi, TX, March 23-25, 2005.

Session Chairman, Session T1D, "Assessment Issues," 2006 Annual Conference of the ASEE Gulf Southwest Section, Baton Rouge, LA, March 15-17, 2006.

Session Chairman, Session 2266, "Meeting ABET Requirements", 2006 ASEE Annual Conference and Exposition, Chicago, IL, June 18-21, 2006.

Session Chairman, Session 2425, "Teams and Teamwork in Design", 2006 ASEE Annual Conference and Exposition, Chicago, IL, June 18-21, 2006.

Session Chairman, Session 7-10-1, "ABET Issues in ME and MET Programs," ASME IMECE, Seattle, WA, November 11-16, 2007.

FUNDED ACTIVITIES:

- "Application of the Hybrid Computing to Radiative Heat Transfer Analysis," Cullen College of Engineering, 1969, \$2,000.
- "The Finite Element Method in Thermal Science," University of Houston Research Initiation Grant, 1971, \$4,000.
- "The Evaluation of Surface Geometry Modifications to Improve the Directional Selectivity of Solar Energy Collectors," with John R. Howell, National Science Foundation/RANN, 1973-76, \$54,000.
- "Hydrogen Production Econometric Studies," with John R. Howell, National Aeronautics and Space Administration, 1974-75, \$20,000.
- "Solar Heating and Cooling of Buildings," with Larry C. Witte, University of Houston Solar Energy Laboratory, 1975, \$8,000.
- "Testing Solar Collector Components," with Kamel Salama and Jimmy E. Cox, University of Houston Solar Energy Laboratory, 1976, \$13,600.
- "Non-LTE Radiative Energy Exchange in a Bound Region," University of Houston Energy Institute, 1976, \$2,800.
- "Cover Plate Degradation in Solar Energy Collectors," with Kamel Salama and Jimmy E. Cox, University of Houston Solar Energy Laboratory, 1977-78, \$17,131.
- "An Accelerated Collector Evaluation Technique," with Stanley J. Kleis, University of Houston Solar Energy Laboratory, 1976, \$8,100.
- "Analysis, Design, Fabrication and Testing of Moderately Concentrating Solar Energy Collectors," with John R. Howell, U. S. Dept. of Energy, 1976-78, \$94,000.
- "Houston Insolation Measurement," with Stanley J. Kleis, Exxon Corporation, 1977-79, \$3,000.
- "Medium Temperature, High Efficiency, Tracking and Non-Tracking Solar Energy Collectors for Rural and Industrial Applications," with Stanley J. Kleis, University of Houston Solar Energy Laboratory, 1978, \$8,200.
- "Concentrator Field Optimization and Layout for a Small Solar Power System Experiment," McDonnell Douglas Astronautics, 1978-79, \$23,000.
- "Monitoring Solar Energy Systems," Texas Energy Advisory Council and the University of Houston Energy Laboratory, 1979-80, \$32,000.
- "Houston Insolation Measurements," U. S. Department of Energy, 1980-81, \$11,460.
- "Medium-Temperature, High-Efficiency, Solar Energy Collectors for Rural and Industrial Applications," U. S. Agency for International Development, 1981-84, \$400,000.
- "Forced Convection from Irregularly Oriented Finite Plane Surfaces," with Stanley J. Kleis, University of Houston Energy Laboratory, 1982-83, \$7,433.
- "Collaborative Solar Demonstration Project," University of Houston Energy Laboratory, 1984-85, \$6,822.
- "An Improved Thermal Design Methodology," University of Houston Energy Laboratory, 1985-86, \$8,311.
- "Extension of the Decision Support Problem Technique to Solar Thermal Applications," Department of Energy through the Solar Thermal Advanced Research Center, University of Houston, 1985-86, \$13,562.
- "A Technology Development Plan to Meet Thermal Control System Requirements in Advanced Manned Space Missions," NASA Johnson Space Center, 1987-88, \$60,000.
- "An Improved Thermal Design Methodology: A Continuation," University of Houston Energy Laboratory, 1986-87, \$9,858.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 1987-89, \$321,078.
- "Research Instrumentation and Laboratory Improvement," (with W. VanArsdale and F. Mistree) NSF Equipment Grant, 1988-89, \$80,000.
- "Introduction of Decision Support Problem Technique into the Thermal Science Curriculum," University of Houston, Energy Laboratory, 1988-89, \$5,975.

- "Solar Pond Consortium," the Texas Energy Research in Applications Program, (with S. Kleis) with the University of Texas - El Paso and Texas A&M University, 1989-93, \$890,000. (\$140,000 to University of Houston)
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 1990-92, \$410,000.
- "A Software Environment for Design," (with W. VanArsdale and F. Mistree) Apple Computer, Inc. \$40,000 (equipment), March, 1990.
- "Sea Water Solar Pond - A Low Cost Energy Source for Mariculture," University of Houston Energy Laboratory, 1990-91, \$5,811.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 1992-94, \$414,000.
- "Sea Water Solar Ponds -- A Low Cost Energy Source for Mariculture," (with S. Kleis) Texas Higher Education Coordinating Board - Advanced Technology Program, 1992-94, \$178,000.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 1994-96, \$474,000.
- "Sea Water Solar Ponds - Transfer to the Mariculture Industry," (with S. Kleis) Texas Higher Education Coordinating Board - Advanced Technology Development Program, 1994-96, \$91,000.
- "Using Geothermal Well Water for Winter Survival in the Texas Mariculture Industry," (with S. Kleis) Texas Higher Education Coordinating Board - Advanced Technology Program, 1994-96, \$132,291.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 1996-98, \$473,000.
- "Department Computational Upgrade," University of Houston Computer Use Committee, February, 1996, \$10,000.
- "The UH Design Center - An Interdisciplinary Approach to Teaching Design," Provost's 1996-7 Interdisciplinary Initiative Program, April, 1996, \$60,000
- "Software Purchase," ASME Petroleum Division, May, 1996, \$15,000
- "Endowed Assistant Professorships," \$500,000 endowment to provide \$15,000 annually for five years to each of two newly appointed assistant professors in the Department (total \$30,000 a year), 1997.
- "Graduate Fellowships": Two \$5,000 Annual Fellowships for graduate students in ME. Funded by local industry, 1998-2000.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 1998-2000, \$385,000.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 2000-02, \$350,000.
- "NASA-ASEE Summer Faculty Fellowship Program," NASA, 2002-04, \$380,000.
- "Development of Interactive Teaching Methods for Materials Science Courses Using Tablet PCs" L. Sun, K. White, R. Bannerot, FDIP-B 2007, \$25,000, 2007-8.

SERVICE

UNIVERSITY:

- Student Life (1970-71)
- Undergraduate Council (1980-82), (1986-87)
 - Curriculum Committee (1980-81, 1986-87)
 - Academic Standards Committee (1981-82)
- Task Force on University of Houston-Central Campus Admission Policies (1981-82)
- Core Advisory Committee (1982-85), responsible for instituting the University's new core curriculum:
 - Cultural Heritage Subcommittee (1982-84)
 - Curriculum Subcommittee (1984-85)
- Research Council (1984-87):
 - Vice Chairman (1985-86)
 - Chairman (1986-87)
- Chairman, Committee for Evaluation of Internal Grant Support (1985-86)
- University Research Excellence Award Committee (1986-88)
 - Chairman (1986-87)
- Farfel Award Committee (1986-87)
- Program Manager for Heating and Cooling, UH Solar Energy Laboratory (1976-78)
- University Admissions Review Committee (1988-90)
 - Chairman (1989-90)
- University Grievance Committee (1989-92): (2004-07)

Chairman (1990-91)
 Subcommittee Chair (2007)
 Faculty Senate (1991-93):
 Academic Affairs Committee (1991-93)
 Search Committee for UH Assistant Vice President for Extended Learning/ Dean of Continuing Education (1991-92)
 Search Committee for UH Vice President, Student Affairs, 1991
 Graduate and Professional Studies Council (1991-93):
 Academic Program Evaluation Committee (1991-92)
 Academic Policies Committee (1992-93)
 Search Committee for UH Associate Vice President for Plant and Operations, 1991
 University Planning and Policy Council, (1992-94):
 Chairman, Committee C (1992-93)
 Committee of Structural Issues (1993-94)
 University Scholarship Committee (2003-05)
 Transportation and Parking Advisor Committee (2002-08), Chairman (2004-05 and 2007-08)
 University Fringe Benefits Committee (2003-06)
 University Writing Committee (2004-2005)
 Chairman of the Committee to Review the Performance of the Dean of Architecture (2004)

COLLEGE:

Undergraduate Course Evaluation Committee (1968-70)
 Biomedical Engineering Committee (1970-72):
 Secretary (1970-72)
 Undergraduate Recruiting Committee (1971-72)
 Undergraduate Curriculum Committee (1970-72, 1980-83)
 Chairman, Engineering Alumni Orientation, 1971
 High School Orientation Committee (1971-74)
 Fluid Mechanic Course Committee (1972-75)
 Scholarship Committee (1973-75)
 Thermodynamics Course Committee (1971-74):
 Chairman (1971-72)
 Election Committee (1977-78)
 Co-operative Education Liaison (1979-81)
 College Grievance Committee (1988-91)
 College Undergraduate Recruiting Committee (1988-89)
 Chairman, Committee of Full Professors (1989-90)
 Chairman, College Promotion and Tenure Committee (1989-90)
 Graduate Standards Committee (1991-93)
 College Academic Hearing Officer (1991-93)
 College ABET Committee (1991-93)
 College Executive Committee (1993-2000)
 College Recruiting Committee (2000-02)
 College ABET Committee (2002-present)
 College Technical Communications Committee (2004-2006)

DEPARTMENT

Undergraduate Affairs Committee (1969-75, 1979-89)
 Faculty Advisor to the student chapter of the American Society of Mechanical Engineers (1970-74)
 UH Society for Engineers, Dept. Rep. (1970-74)
 Director of Undergraduate Counseling (1972-75, 1979-82)
 Director of Undergraduate Affairs (1982-83)
 Dept. Rep. to the Southwest Symposium on Heat Transfer (1972-78)
 Steering Committee (1974-76)
 Chairman of the Steering Committee (1975-76)
 Laboratory and Shop Liaison (1974-76)
 Undergraduate Advisor, Freshman and Transfer Students (1978-79)

Faculty Advisor to student chapter of National Society of Black Engineers (1980-85)
 Associate Dept. Chairman (1983-88)
 Dept. Executive Committee (1983-88)
 Graduate Affairs Committee (1983-1986, 1990-93)
 Chairman (1990-93)
 Computer Committee (1984-86)
 Department ABET Committee (1984-87)
 Faculty Advisor to Pi Tau Sigma (1988-94)
 Director of Undergraduate Recruiting (1988-89)
 Minority Student Coordinator and Advisor (1989-93)
 Department Personnel Committee (1989-91)
 Director of Graduate Studies (1990-93)
 Department Chairman (1993-2000)
 Faculty Advisor to student chapter of the Society for Hispanic Professional Engineers (1999-2005)
 Chairman, Department Undergraduate Academic Affairs Committee (2003-present)
 ME Department ABET Coordinator (2003-present)
 Faculty Advisor to student chapter of Society of Automotive Engineers (2003-present)
 Faculty co-Advisor to student chapter of Engineers without Borders (2006-present)

PROFESSIONAL ORGANIZATIONS

American Society of Mechanical Engineers (1961-present)
 Fellow (1984)
 Solar Energy Division:
 Fundamentals Technical Committee (1975-96)
 Secretary (1975-78)
 Computer Technology Committee (1975-79)
 Chairman (1975-79)
 Components Technical Committee (1975-77)
 Testing and Measurements Technical Committee (1989-96)
 Solar Pond and OTEC Technical Committee (1990-99)
 Ad Hoc Codes and Standard Committee, Subcommittee on Heating and Cooling (1977-78)
 Standards Committee (1977-78)
 Associate Editor, Journal of Solar Energy Eng'g (1981-83), (1995-99)
 Division Executive Committee (1979-84)
 Division Secretary (1980-81)
 Division Vice Chairman and Program Chairman (1981-82)
 Division Chairman (1982-83)
 Division Rep on Energy Resources Operating Board (1982-84)
 Division Rep for Member Interest (1983-84)
 Division Honors Committee (1983-87)
 Chairman (1983-86)
 Chairman, Long Range Planning Committee (1989-92)
 Chairman, Long Range Planning, By-Laws and Operating Guide Committee (1992-94)
 Ad Hoc Committee to Revise Division By-Laws and Operating Guide (1990-91)
 Liaison for Publications with ASME Headquarters (1988-92)
 Exhibition Booth Coordinator - "Solar 90," March, 1990
 Chairman, Division Operations Committee (1994-99)

South Texas Section
 Executive Committee, (1996-present)
 Fellows Award Committee, Chair (1996-present)
 Program Committee Chairman, (1999-2002)
 Arrangements Committee Chairman (2001-02)

American Institute of Aeronautics and Astronautics (1961-71)
 American Society for Engineering Education (1971-78), (1993-present)
 Editor, ASEE Gulf-Southwest Section Newsletter (1972-75)
 Technical Program Chairman, 1997 Annual Conference of Gulf Southwest Section of ASEE,
 Houston, TX, March 23-25, 1997 (150 papers)

Chairman, Best Paper Awards Committee, 1997 Annual Conference of Gulf Southwest Section of ASEE, Houston, TX, March 23-25, 1997 (150 papers)
Member, Best Paper Awards Committee, 2003 Annual Conference of Gulf Southwest Section of ASEE, Lubbock, TX, March 10-12, 2003
Institutional Representative for UH to ASEE, (1996-present)
Member, Committee to Select Ralph Coats Roe Award Winner (2006-present)
Sigma Xi (1965-77)
Pi Tau Sigma (1968-present)
Faculty Advisor, Houston Sigma Zeta Chapter (1988-94)
Sigma Tau (1962-present)
International Solar Energy Society (1977-85, 1989-present)
American Section (currently American Solar Energy Society) (1977-85, 89-present)
Local Organizing Committee - "Solar - 90" (1990 Annual Meeting of ASES)
Texas Solar Energy Society (1976-85, 89-present)
Houston Solar Energy Society (1976-83)
Co-Founder and Vice President (1976-77)
President (1977-78)
Program Chairman (1976-78)
Chairman of the Technical Committee (1978-80)
Coordinator to Select Houston Site for ERDA/NASA Commercial Solar Demonstration (1977)
Coordinator for the Energy Information Booth, Houston Home Show (1977)
Pi Kappa Pi (1997- present)

CONSULTING:

Hudson Engineering Corporation (1975-78)
Mischer Corporation (1975)
Penrod Educational Services (1976)
Solar Energy Laboratory, University of Houston (1975-78)
Solar Heating, Inc. (1977)
Kaiser-Hof, Inc. (1977)
Scientific-Atlanta (1977)
Houston Lighting and Power (1977)
Bonanza Chemical, Inc. (1979)
S. I. Morris, Inc. (1979)
Eikenburg and Stiles (1982)
Strasburger and Price (1985)
Finance America (1986)
West Publishing Co. (1989)
Cullen College of Engineering (1989-2000)