CURRICULUM VITAE

NAME

Larry C. Witte

BIRTHDATE

April 27, 1939

EDUCATION

Ph. D.	Oklahoma State University	1967	Mechanical Engineering
M. S.	Oklahoma State University	1965	Mechanical Engineering
B. S.	Arlington State College	1963	Mechanical Engineering

PROFESSIONAL EXPERIENCE

Sept., 2004 – 2008 Associate Dean/Graduate Programs
University of Houston

Sept., 1998 – Sept., 2004 Associate Dean/Undergraduate Programs
University of Houston

1973 - Present Professor, Mechanical Engineering Department
University of Houston, Houston, Texas

1972-76, and 1988-1993 Chairman, Mechanical Engineering Department
University of Houston, Houston, Texas

1989-90 Founder and Interim Director, UH Institute for Space Systems Operations

1969-73 Associate Professor, Mechanical Engineering Department
University of Houston, Houston, Texas

1967-69 Assistant Professor, Mechanical Engineering Department
University of Houston, Houston, Texas

1968 Technical Assistant
Houston Lighting and Power Company

1965-67 Assistant Mechanical Engineer
Argonne National Laboratory, Chicago, Illinois

1962-65 Associate Aerodynamics Engineer, Astronautics Division
Ling-Temco-Vought, Dallas, Texas

RECOGNITION OF TEACHING

College of Engineering Career Teaching Award. 2009.

Selected Outstanding Mechanical Engineering Professor by the ASME Student Section, 1979-80, 1995-96.

Listed as "Excellent" Rating in the 1977, 1978 and 1999 Kittinger Award Judging.

TEACHING (*Courses Originated or Modified)

MECE 2334	Thermodynamics I
MECE 3334	Thermodynamics II
MECE 3360	Experimental Methods (Lab)*
MECE 4364	Heat Transfer
MECE 4371	Thermal-Fluids Laboratory*
MECE 5364	Industrial Energy Conservation*
MECE 6333	Conduction/Radiation Heat Transfer
MECE 6334	Convection Heat Transfer
MECE 6337	Aerothermodynamics*
MECE 7397	Selected Topics: Boiling Heat Transfer*
MECE 7397	Selected Topics: Two-Phase Flows*

SUPERVISION OF RESEARCH

Arif Ozer, PhD, Heat Transfer in Narrow Channels, with D. K. Hollingsworth, December, 2010

Ahmet Oncel, PhD, Heat Transfer in Nano-Fluids, with D. K. Hollingsworth, April, 2011

Ashley Higgins, MS, Two Phase Heat Transfer in Micro Heat Exchangers, with D. K. Hollingsworth, 2008

Thomas Cognata, MS, 2008, Two Phase Flow and Heat Transfer in Micro Heat Exchangers, with D. K. Hollingsworth

Xin Li, An Experimental Study of the Microlayer Thickness and Kinematics of a Sliding Vapor Bubble, Ph.D. dissertation: August, 2005. Co-Advisor with D. K. Hollingsworth

Erik Daniel, Heat Transfer in Narrow Channels, MS, 2006, Co-Advisor with D. K. Hollingsworth

Marcelino Figueroa, Heat Transfer to Sliding Bubbles, MS, 2006, with D. K. Hollingsworth

Q. Lu, Single and Two-Phase Heat Transfer in a Microchannel, MS Thesis, August, 2001, with D. K. Hollingsworth

K. Hurlbert, Flow Dynamics of Two-Phase Flows in Partial Gravities, PhD Dissertation, December, 2000.

B. Bayazit, Heat Transfer Enhancement caused by Sliding Bubbles, MS, December, 2000, with D. K. Hollingsworth

M. Lakshminarasimhan, *Boiling Incipience in Thin Channels*, MS, August, 1999, with D. K. Hollingsworth

Y. Chin*, An Experimental Study of Flow Boiling in a Narrow Channel: From Convection to Nucleate Boiling,* PhD, Dec. 1997.

G. Warrier, *Flow Film and Transition Boiling to a Subcooled Liquid*, PhD, Dec. 1997.

H. Ayala, *Enhanced Boiling Heat Transfer: Manufacturing Artificial Nucleation Sites using Photolithographt,* Senior Honors Thesis, August, 1996.

W. Scott Bousman (ChE), *Two Phase Flow Dynamics in Microgravity* , Ph.D., December, 1994.

L. Huang, *Subcooled Flow Boiling across Horizontal Cylinders.,* Ph.D., December, 1994.

F. Hsu, *An Optical Method for Simultaneous Velocity and Diameter Measurement of Droplets in Sprays,* M.S., August, 1994.

M. Futschik, *Analysis of Effective Thermal Conductivity of Fibrous Materials,* M.S., May, 1993.

S. X. Chou, *Subcooled Flow Film Boiling across a Horizontal Cylinder,* Ph.D., December, 1992.

T. Man, *An Experimental Study of Spray Cooling of a Simulated Microelectronic Circuit*, M.S., January 1991.

C. Struble, *Measurement of Jet Nucleate Boiling on a Power Transistor,* M.S., December 1990.

V. Seshadri, *Design of Thermal Networks,* M.S., September 1990.

F. Reguillot, *Pool Boiling on a Large Horizontal Flat Resistance Heater,* M.S., August 1990.

S. Sankaran, *Highly Subcooled Flow Boiling From a Cylinder in Cross-Flow,* Ph.D., May 1990.

K.-H. Chang, *The Instability of Vapor Films in Flow Boiling From Cylinders,* Ph.D., December 1987.

D. File and D. Burkholder, *Second Law Optimization of Shell and Tube Heat Exchanger,* Senior Honors Thesis, December 1986.

R. Kaul, *Film Boiling Wakes Behind Cylinders,* M.S., May 1985.

J. Orozco, *Flow Film Boiling From Submerged Bodies*, Ph.D., December 1984.

S. Sankaran, *Quenching of a Hollow Sphere*, M.S., January 1985.

H. Phung, *Economic Comparison Between Heat Pipe and Rotary Regenerative Heat Exchangers*, M.S., May 1981.

L. Iyican, *Natural Convection Heat Transfer in Trapezoidal Enclosures*, Ph.D., December 1979.

B. Trivedi, *Characterization of Heat Transfer in Nutrient Materials with Forced Convection*, M.S., December 1976.

C. Chen, *Application of Inverse Problem Technique on Rapid Transient*, M.S., May 1974.

W. Hamilton, *Design of an Apparatus to Produce a Predictable Size Drop of Molten Metal*, M.S., December 1974.

J. Taskini, *Instability of Vapor Films Around a Sphere During Free Convection*, M.S., May 1974.

K.-H. Hsiao, *Molten Metal/Water Coolant Interactions Prior to Vapor Explolsions*, Ph.D., May 1974.

J. Stevens, *Film and Transition Boiling From Spheres*, Ph.D., May 1972.

R. Bradley, *Experimental Investigation of a Molten Metal Jet Emerging into Water*, Ph.D., May 1971.

T. Vyas, *A Photographic Study of Molten Metal Fragmentation*, M.S., May 1971.

W. Simon, *Analysis of the Heat Transfer Characteristics of an Emergent Jet*, Ph.D., August 1970.

W. Schmidt, *An Investigation of Film Boiling Heat Transfer From an Oscillating Sphere*, M.S., December 1970.

S. Shoor, *Subcooled Forced Convection Film Boiling Over Spheres and Cylinders*, M.S., December 1970.

J. Lin, *The Effect of Pressure on Vapor Growth Over a Horizontal Plate*, M.S., August 1970.

R. Agrawal, *Film Boiling Over Wedges, Cones and Spheres*, M.S., May 1970.

A. Gelabert, *An Investigation of the Fast Quenching of Molten Materials*, M.S., May 1970.

J. Bouvier, *Explosive Vapor Formation*, M.S., January 1970.

J. Stevens, *An Experimental Investigation of Transitional Boiling for Spherical Particles During Forced Convection*, M.S., August 1969.

P. Henningson, *Identification of Boiling Regimes by Force Measurements*, M.S., May 1969.

CONTINUING EDUCATION

Short Courses (Short Course Coordinator for the Dept. 1976-80)

Lecturer, *Industrial Energy Conservation,* summer, 1996

Lecturer, EIT Refresher Course: *Thermodynamics*, twice yearly, 1985-89

Director, Refresher Course, Part II: *Principles and Practice (ME) Professional Engineers' Registation Exam*, Conducted 12 times since September 1975.

Coordinator, *Strength of Materials/Design of Machine Parts*, one-day course, September 1977; May and October 1978; May and October 1979.

Lecturer, *Principles of Engineering Economics*, Victoria, Texas, January and September 1978 (Presented for DuPont, Union Carbide, Alcoa).

Organizer and Lecturer, *Gas Turbine Technology*, five-day course, June 1978.

Coordinator, *Fundamentals of Nondestructive Evaluation*, Spring 1976, 1977, 1978, and 1979.

Coordinator, *Design of Offshore Structures*, May 1977, May 1978, and January 1979.

Coordinator, *Geometric Tolerancing and True Position Dimensioning*, May 15-16, 1978.

Director and Lecturer, *Industrial Energy Auditing*, August 20-25, 1978; August 13-17, 1979; and August 5-8, 1980.

Coordinator, *Noise Control*, Victoria, Texas, April 1978 (Presented for DuPont, Union Carbide, and Alcoa).

SPECIAL HONORS

UH Engineering Career Teaching Award, 2009

UH Engineering Alumni Organization Roger Eichhorn Service Award, 2006

Flour-Daniel Award, UH Cullen College of Engineering, 2000

Member, Scientific Committee, Engineering Foundation Boiling 2000 Conference, Anchorage, AK, June, 2000

Member, Scientific Committee, Second International Conference on Heat Transfer and Transport Phenomena in Multiphase Systems (HEAT, 99), Kielce, Poland, May 18-22, 1999

UH Engineering Alumni Organization Distinguished Faculty Award, 1993

ASME South Texas Section Dean W. R. Woolrich Engineer of the Year Award, 1992

AIAA Associate Fellow, 1991

ASME Fellow, 1984.

ASME South Texas Section Herbert Allen Award, for outstanding technical achievement in high flux heat transfer (awarded to a person under age 35), 1975

Registered Professional Engineer (Texas, No. 29319).

JOURNAL EDITORSHIPS/REVIEW ACTIVITIES

Associate Technical Editor, ASME Journal of Heat Transfer, 1989-94.

Associate Editor, Energy Management Handbook, John Wiley & Sons, New York, NY, 1982; second edition, Fairmont Press/Prentice Hall, 1993.

Editor, *Journal of Engineering and Science Trivia (JEST).*

Referee for: *A.I.Ch.E. Journal, Journal of Fluid Mechanics, The International Journal of Heat and Mass Transfer, ASME Journal of Heat Transfer, Heat Transfer Engineering, Journal of Food Processing, AIAA Journal, Journal of Thermophysics and Heat Transfer, ASME Solar Energy and Heat Transfer Divisions, Experimental and Fluid Thermal Sciences, Solar Energy, Nuclear Engineering and Design, International Journal of Thermal Sciences.*

Proposal reviewer for: National Science Foundation, NASA, EPRI, U.S. Department of Energy, and Army Office of Research.

Book reviewer for: Harper & Row, Wm. C. Brown Co., McGraw-Hill, Hemisphere, and MacMillan.

PARTICIPATION IN NATIONAL REVIEW PANELS

NASA Division of Microgravity Sciences, NASA Glenn Res. Ctr. Chair, Review Panel for Research Project to be flown on Space Station, Microgravity Nucleate Boiling Experiment, Dec. 3-4, 2002.

National Science Foundation, Chemical and Transport Division, CAREER young investigator awards panel, Nov. 28, 2001

National Science Foundation, Chemical and Transport Division, CAREER young investigator awards panel, Jan. 20, 1997

National Science Foundation, Small Business Innovative Research Evaluation Panel, Washing ton, DC, Sept. 23, 1993.

ASME Design Engineering Division, Panel on The Role of Design Projects in Engineering Education, November, 1992, ASME Winter Annual Meeting.

Department of Energy Workshop on Energy Engineering Research, Co-Director, The Woodlands, Texas, December 5-6, 1985.

Conference on Industrial Energy Conservation Technology, Steering Committee Member, 1979-1983.

National Science Foundation Specialized Engineering Equipment, Heat Transfer Panel, Washington, D.C., April 11-12, 1978.

CHAIRMANSHIP OF TECHNICAL MEETING SESSIONS

Session Co-Organizer, Condensation Heat Transfer, ASME Summer Heat Transfer Conference, San Francisco, July, 2005.

Session Co-Organizer, Computational Two-Phase Flow, ASME International Congress, Anaheim, CA, July, 2004.

Session Organizer, Fundamentals of Boiling and Condensation, four sessions, ASME Summer Heat Transfer Conference, Las Vegas, NV, July, 2003.

Technical Program Representative, ASME Heat Transfer Division, 1999 International Mechanical Engineering Congress and Exposition, Nashville, TN, Nov. 1999

Nonlinear Two-Phase Flow/Surface Interactions, Chairman, AIAA-ASME Thermophysics and Heat Transfer Conference, June, 1998, Albuquerque, NM.

Interfacial Phenomena, Co-Chairman, ASME National Heat Transfer Conference, Houston, TX, Aug., 1996.

Basic Aspects of Two-Phase Flow: I, II, III, Co-Chairman, ASME National Heat Transfer Conference, Portland, OR, Aug., 1995.

Forced Convection Boiling I, Co-Chairman, ASME/JSME Thermal Engineering Conference, Maui, March, 1995.

Energy Storage Systems I, Co-Chairman, ASME/JSME Thermal Engineering Conference, Maui, March, 1995.

Engineering Foundation Conference on Pool and External Flow Boiling, Chairman, Film Boiling Session, Member, Coordinating Committee, Santa Barbara, California, March 22-26, 1992.

Fundamentals of Phase Change: Boiling and Condensation, Co-Chairman, Seattle, Washington, June 1990.

National Heat Transfer Conference, Co-Chairman, *Radiative Heat Transfer*, Denver, Colorado, 1985.

National Heat Transfer Conference, Co-Chairman, *Open Forum*, Denver, Colorado, 1985.
National Heat Transfer Conference, Co-Chairman, *Two Phase Flow and Heat Transfer*, Denver, Colorado, 1985.

National Heat Transfer Conference, Co-Chairman and Organizer, *Fundamentals of Natural Convection: Cooling of Electronic Equipment*, Niagara Falls, New York, 1984.

National Heat Transfer Conference, Co-Organizer and Co-Chairman, *Open Fourm*, Milwaukee, Wisconsin, 1983.

1982 Joint ASME/AIAA Conference, Chairman, *Convective Heat Transfer with Radiative Interactions*, St. Louis, Missouri, June 1982.

1980 Industrial Energy Conservation Technology Conference, Chairman, *Heat Recovery*, Houston, Texas, April 1980.

Industrial Energy Conservation Conference, Chairman, *Combustion Systems* , Houston, Texas, April 22, 1979.

A.I.Ch.E. Meeting, Co-Organizer and Co-Chairman, *Heat Exchangers & Energy Conservation*, Houston, Texas, February 1977.

ASME Winter-Annual Meeting, Chairman, *General Heat Transfer*, Houston, Texas, November 1975.

PUBLICATIONS (Journals and Proceedings)

63. Ozer, A., A. F. Oncel, D. K. Hollingsworth and L. C. Witte, "A Method of Concurrent Thermographic-Photographic Visualization of Flow Boiling in a Minichannel", submitted to Exp. Thermal and Fluid Sciences, Feb., 2011.

62. Ozer, A., A.F Oncel, D. K. Hollingsworth, and L. C. Witte, "The Effect of Sliding Bubbles on Nucleate Boiling of a Subcooled Liquid Flowing in a Narrow Channel." International Journal of Heat and Mass Transfer. Vol. 54, 2011, pp. 1930-1940.

61. Hollingsworth, D. K., L. C. Witte and M. Figueroa " Enhancement of Heat Transfer behind a Sliding Bubble, , *ASME J. of Heat Transfer, Special Issue on Molecular-to-Large Scale Heat Transfer with Multiphase Interfaces*, Vol. 131, No. 12, Feb., 2009, pp. 121005-1 to 9.

60. Li, Xin, D. K. Holllingsworth and L. C. Witte, "The Thickness of the Liquid Microlayer between a Sliding Bubble and a Heated Wall: Comparisons of Models to Experimental Data, *ASME Journal of Heat Transfer*, Vol. 130, No. 11, Nov., 2008, pp. 111501: 1-9.

59. Li , Xin, D. K. Hollingsworth and L. C. Witte, "Bubble rise under a heated inclined plate", Exp. Thermal and Fluid Science, 32, 2007, pp. 529-544.

58. Daniel E. , D. K. Hollingsworth and L. C. Witte, "Transition from Boiling Onset to Fully Developed Nucleate Boiling in a Narrow Vertical Channel", *Heat Transfer Engineering*, October, 2007, Vol. 28, No. 10, pp. 885-894.

57. Cognata, T., D. K. Hollingsworth and L. C. Witte, "High-Speed Visualization of Two-Phase Flow in a Micro-Scale Pin-Fin Heat Exchanger," *Heat Transfer Engineering*, October, 2007, Vol. 28, No. 10, pp. 861-869.

56. Li, X., D. K. Hollingsworth, and L. C. Witte, "The Thickness of the Liquid Microlayer between a Sliding Bubble and a Heated Wall: Experimental Measurements", ASME Journal of Heat Transfer, Vol. 128, Sept, 2006, pp. 934-944.

55. Hollingsworth, D. K., L. C. Witte, and J. Hinke, "Reduction in Emittance of Thermal Radiator Coatings cause by Accumulation of a Martian Dust Simulant", *Applied Thermal Engineering*, December 2006, Vol. 18, pp. 2383-2392.

54. Lakshminarasimhan, M. S., Lu, Q., Chin, Y., Hollingsworth, D. K., and Witte, L. C., "Fully-Developed Nucleate Boiling in Narrow Vertical Channels", Journal of Heat Transfer, Vol. 124 August, 2005, pp. 941-944.

53. Hurlbert, K., L. C. Witte, F. R. Best, and C. Kurwitz, 2004, "Scaling Two Phase Flow for Mars and Moon Gravity Conditions", *International Journal of Multiphase Flow,* Vol. 30, No. 4, pp. 351-368.

52. Bayazit, B., D. K. Hollingsworth and L. C. Witte, "Heat Transfer Enhancement caused by Sliding Bubbles, *Journal of Heat Transfer*, Vol. 125, No. 3, June, 2003, pp. 503-509.

51. Huang, L., and L. C. Witte, "Highly Subcooled Boiling in Crossflow", J. Heat Transfer, Vol. 123, No. 6, December, 2001, pp. 1080-85.

50. *On the Application of the Hyperbolic Heat Equation in Transient Heat Flux Estimation during Flow Film Boiling,* with G. Warrier, Proceedings of the AIAA/ASME Thermophysics and Heat Transfer Conference, Albuquerque, June, 1998, HTD 375-3, pp. 131-140, also *Numerical Heat Transfer*, part A, Vol. 35, pp. 343-359, 1999.

49. *Flow Pattern Transition Maps for Microgravity Two-Phase Flows,* with S. S. Jayawardena and V. Balakotaiah, *AIChE Journal,* Vol. 43, No. 6, June, 1997, pp. 1637-1640.

48. *The Role of Surface Tension in Microgravity Slug Flow,* with Y. Taitel, *Chemical Engineering Science,* Vol. 51, No. 5, 1996, pp. 695-700.

47. *Gas-Liquid Flow Patterns in Microgravity: Effects of Tube Diameter, Liquid Viscosity and Surface Tension*, with W. S. Bousman and J. McQuillen, *Int. Journ. of Multiphase Flow*, Vol. 22, No. 6, 1996, pp. 1035-1053.

46. *Heat Transfer to Annular Gas-Liquid Mixtures at Reduced Gravity*, with L. B. Fore and J.B. McQuillen, *Journal of Thermophysics and Heat Transfer*, Vol. 10, No. 4, Oct.- Dec., 1996, pp. 633-639.

45. *Heat Transfer to Two-Phase Slug Flows under Reduced-Gravity Condtions,* with L. B. Fore and J. B. McQuillen, *Int. Journal of Multiphase Flow*, Vol. 23, No. 2, 1997, pp. 301-311.

44. L. Huang and L. C. Witte, 1996, *"An Experimental Investigation of the Effects of Subcooling and Velocity on Boiling of Freon-113", Journal of Heat Transfer*, Vol. 118, No. 2, pp.436-441.

43. *Subcooled Flow Film Boiling Across a Horizontal Cylinder: Part I. Analytical Model,* with X.S. Chou, Journal of Heat Transfer, Vol. 117, Feb., 1995, pp. 167-174.

42. *Subcooled Flow Film Boiling Across a Horizontal Cylinder: Part II Comparison to Experimental Data,* with X.S. Chou, Journal of Heat Transfer, Vol. 117, Feb., 1995, pp. 175-178.

41. *An In Situ Technique for Measuring Heat Transfer from a Power Transistor to a Boiling Liquid,* with Chris Struble, Journal of Heat Transfer, May, 1994, Vol. 116, pp. 495-498.

40. *Liquid-Solid Contact and Effects of Surface Roughness and Wettability in Film and Transition Boiling on a Horizontal Large Surface*, with M. Shoji, S. Yokoya, and M. Ohshima, proceedings of the 9th International Heat Transfer Conference, Jerusalem, August 1990; G. Hetsroni, editor, Hemisphere Press, pp. 135-140.

39. *Liquid-Solid Contact During Flow Film Boiling of Subcooled Freon-11*, with K. Chang, Journal of Heat Transfer, May 1990, Vol. 112, pp. 465-471.

38. *Liquid-Solid Contact in Pool Film Boiling From a Cylinder*, with K. Chang, Journal of Heat Transfer, February 1990, Vol. 112, pp. 263-266.

37. *The Influence of Surface Conditions and Subcooling on Film/Transition Boiling*, with M. Shoji and S. Sankaran, Experimental Thermal and Fluid Sciences, 1990, Vol. 3, pp. 280-290.

36. *The Hydrodynamics of Film Boiling From a Cylinder in Crossflow*, with K. Chang, Journal of Thermophysics and Heat Transfer, July 1990, Vol. 4, No. 3, pp. 393-396.

35. *Characterization of Heat Exchangers Using Second Law Concepts*, presented at the London Symposium, Stanford University, Stanford, California, March 24, 1989; also appears in Compact Heat Exchangers, Hemisphere, 1990, pp. 381-396.

34. *The Influence of End Conditions on Minimum Film Boiling From a Cylinder*, with K. Chang and S. Sankaran, proceedings of the 1988 National Heat Transfer Conference, Houston, Texas, ASME-Heat Transfer Division Vol. 96, No. 2, pp. 385-388; also Journal of Heat Transfer, November 1989, Vol. 111, pp. 1123-1126.

33. *Liquid-Solid Contact During Flow Film Boiling of Freon-11*, with K. Chang, proceedings of the 1988 National Heat Transfer Conference, Houston, Texas, ASME-Heat Transfer Division Vol. 96, No. 2, pp. 659-665; also Journal of Heat Transfer, May 1990, Vol. 112, pp. 465-471.

32. *The Influence of Availability Costs on Optimal Heat Exchanger Design*, Journal of Heat Transfer, November 1988, Vol. 110, pp. 830-835.

31. *Prediction of Film Boiling Wakes Behind Cylinders in Crossflow*, with R. Kaul, Journal of Thermophysics and Heat Transfer, April 1987, Vol. 1, No. 2, pp. 186-189.

30. *Quenching of a Hollow Sphere*, with S. Sankaran, Journal of Heat Transfer, 1987, Vol. 109, No. 1, pp. 242-244.

29. *Flow Film Boiling From a Sphere to Subcooled Freon-11*, with J. Orozco, Journal of Heat Transfer, November 1986, Vol. 108, pp. 934-938.

28. *A Historical Review of the Hydrodynamic Theory of Boiling*, with J.H. Lienhard, Chemical Engineering Reviews, July-December 1985, Vol. 3, Nos. 3 & 4, pp. 187-280.

27. *Condensation Heat Transfer*, presented at the 1985 U.S.-Japan Heat Transfer Joint Seminar, San Diego, California, September 1985; published in Heat Transfer in High Technology and Power Engineering, W.J. Yang and Y. Mori, editors, Hemisphere, 1987, pp. 239-254.

26. *A Thermodynamic Efficiency Concept for Heat Exchange Devices*, with N. Shamsundar, Journal of Engineering for Power, January 1983, Vol. 105, No. 1, pp. 199-203.

25. *On the Existence of Two "Transition" Boiling Curves*, with J.H. Lienhard, International Journal of Heat and Mass Transfer, June 1982, Vol. 25, No. 6, pp. 771-780.

24. *Natural Convection and Sidewall Losses in Trapezoidal Groove Collectors*, with L. Iyican and Y. Bayazitoglu, Journal of Solar Energy Engineering, 1981, Vol. 103, pp. 167-172.

23. *An Analytical Study of Natural Convection Heat Transfer Within a Trapezoidal Enclosure*, with L. Iyican and Y. Bayazitoglu, Journal of Heat Transfer, 1980, Vol. 102, pp. 640-647.

22. *An Experimental Study of Natural Convection in Trapezoidal Enclosures*, with L. Iyican and Y. Bayazitoglu, Journal of Heat Transfer, 1980, Vol. 102, pp. 643-654.

21. *The Vapor Explosion - A Second Look*, with J. Cox, Journal of Metals, October 1978, Vol. 30, No. 10, pp. 29-35.

20. *Transient Film Boiling From a Moving Sphere*, with K.-H. Hsiao and J.E. Cox, International Journal of Heat and Mass Transfer, 1975, Vol. 18, pp. 1343-1350.

19. *Heat Transfer and Fragmentation During Molten-Metal/Water Interactions*, with T.J. Vyas and A. Gelabert, Journal of Heat Transfer, November 1973, Vol. 95, No. 4, pp. 521-527.

18. *Destabilization of Vapor Film Boiling Around Spheres*, with J. Stevens, International Journal of Heat and Mass Transfer, 1973, Vol. 16, pp. 669-678.

17. *Oscillation Effects Upon Film Boiling From a Sphere*, with W. Schmidt, Journal of Heat Transfer, November 1972, Vol. 94, No. 4, pp. 491-493.

16. *Explosive Interaction of Molten Jets and Water*, with R. Bradley, Nuclear Science and Engineering, August 1972, Vol. 48, No. 4, pp. 387-396.

15. *Fragmentation of Molten Jets*, with R. Bradley, Trans. American Nuclear Society, June 1972, Vol. 15, No. 1.

14. *Transient Vapor Film Behavior During Quenching*, with J. Stevens, Trans. American Nuclear Society, June 1972, Vol. 15, No. 1.

13. *Pressurization of a Solidifying Sphere*, with K.-H. Hsiao, J. Cox, and P. Hedgcoxe, Journal of Applied Mechanics, March 1972, Vol. 39, No. 1, pp. 71-77.

12. *Transient Film and Transition Boiling From Spheres*, with J. Stevens, International Journal of Heat and Mass Transfer, 1971, Vol. 14, pp. 443-450.

11. *Fracture of Solidifying Particles*, with K.-H. Hsiao and J. Cox, Trans. American Nuclear Society, November 1970, Vol. 13, No. 2, p. 678.

10. *Film and Transition Boiling Around Spheres*, with J. Stevens, Trans. American Nuclear Society, November 1970, Vol. 13, No. 2, p. 816.

9. *The Vapor Explosion*, with J. Cox and J. Bouvier, Journal of Metals, February 1970, pp. 39-44.

8. *Heat Transfer From High Temperature Spheres to Liquid Sodium*, with L. Baker and D. Haworth, Trans.American Nuclear Society, June 1967, Vol. 10, No. 1, p. 351.

7. *Identification of Boiling Regimes With a Reaction-Force Apparatus*, with P.J. Henningson, Journal of Scientific Instruments, November 1969, Series 2, Vol. 2, p. 306.

6. *Heat Transfer From Spheres into Subcooled Liquid Sodium During Forced Convection*, with L. Baker and D. Haworth, Journal of Heat Transfer, November 1968, Vol. 90, No. 4, pp. 394-398.

5. *Film Boiling From a Sphere*, Ind. and Engr. Chem. - Fundamentals, August 1968, Vol. 7, No. 3, p. 517.

4. *High Flux Energy Transfer Apparatus*, with M. Silverman, R. Ivins, and L. Baker, Journal of Scientific Instruments, June 1968, Series 2, Vol. 1, pp. 555-557.

3. *An Experimental Study of Forced Convectional Heat Transfer From a Sphere to Liquid Sodium*, Trans. ASME Series C., Journal of Heat Transfer, February 1968, Vol. 90, pp. 9-12.

2. *The Effect of Subcooling on the Onset of Transition Boiling*, with J. Stevens and P. Henningson, Trans. American Nuclear Society, November 1969, Vol. 12, No. 2, p. 806.

1. *Comment on "Film Boiling Heat Transfer From a Sphere in Forced Convection" by K. Kobayasi*, with J. Hesson, Journal of Nuclear Science and Technology, 1966, Vol. 3, No. 10, pp. 448-449.

Non-Refereed Journals, Presentations, and Reports

73. *The Onset of Nucleate Boiling of a Subcooled Liquid Flowing in a Narrow Channel,* A. B. Ozer, A. Oncel, D. K. Hollingsworth and L. C. Witte, Proceedings of the International Heat Transfer Conference, Washington, DC, Aug. 2010.

72. *A Method for Concurrent Thermographic-Photographic Visualization of Flow Boiling in a Mini-channel,* A. B. Ozer, A. Oncel, D. K. Hollingsworth and L. C. Witte, Proceedings of the International Heat Transfer Conference, Washington, DC, Aug. 2010.

71. *The Liquid Microlayer Between a Sliding Bubble and a Heated Wall: Comparisons of Models to Experimental Data*, X. Li, D. K. Hollingsworth and L. C. Witte, Proceedings of ASME Congress, Seattle, WA, Nov. 2007.

70. *Enhancement of Heat Transfer behind Sliding Bubbles,* M. Figureroa, D. K. Hollingsworth, and L. C. Witte, 2007 ASME-JSME Summer Heat Transfer Conference, Vancouver, July, 2007.

69. Li, Xin, D. K. Hollingsworth and L. C. Witte, "The Thickness of the Liquid Microlayer between a Sliding Bubble and a Heated Wall: Comparisons of Models to Experimental Data, presented at the ASME IMECE, Nov. 2007, Seattle, WA.

68. *The Effect of Martian Dust on Thermal Radiators,* D. K. Hollingsworth, L. C. Witte, J. Hinke, & K. Hurlbert, poster HLS46 at the Habitation 2004 National Conference, Orlando Florida, January 4-7, 2004.

67. Hollingsworth, D. K., Witte, L. C., Hinke, J., and Hurlbert, K., "The Effect of Martian Dust on Radiator Performance", presented at the ASME HT/FED Summer Conference, Charlotte, NC, July, 2004.

66. Li, X., D. K. Hollingsworth, and L. C. Witte, "The Thickness of the Liquid Microlayer between a Sliding Bubble and a Heated Wall: Experimental Measurements", 2005 ASME Summer Heat Transfer Conference, July, 2005. Paper HT 2005-73249

65. Witte, L. C., D. Keith Hollingsworth, and Hurlbert, K., "The Effect of Martian Dust on Thermal Radiators", presented at the Habitation Conference, Orlando, FL, Jan. 4-7-2004

64. Larry C. Witte, D. Keith Hollingsworth, Marcelino Figueroa , and Baris B. Bayazit, "Heat Transfer Between a Sliding Vapor Bubble and an Electrically Heated Surface", Presented at the Fifth International Conference on Boiling, Montego Bay, Jamaica, May 4-8, 2003.

63. Hurlbert, K. and L. C. Witte, 2001, "Two-Phase Flow Pressure Drop Data and Modeling for Mars and Moon Gravity Systems", Paper IAA-01-IAA.13.2.08, presented at the 52nd International Astronautical Congress, Toulouse, France, Oct 1-5, 2001.

62. *Scaling of Two-Phase Flows to Partial-Earth Gravity,* K. M. Hurlbert and L. C. Witte, NASA Tech Briefs, Vol. 27, No. 9, p. 74, Sept., 2003.

61. *Boiling Enhancement by Sliding Bubbles,* with Bayazit, B. and K. Hollingsworth, presented at the 2001 National Heat Transfer Conference, Anaheim, CA, June, 2001.

60. *Boiling Incipience in Narrow Channels*, with M. Lakshminarasimhan and D. K. Hollingsworth, Proceedings of ASME IMECE, Orlando, FL, HTD-Vol.366-4, November, 2000, pp. 53-62.

59. *Subcooled Flow Boiling Across Horizontal Tubes,* with LiDong Huang, Proc. of Engineering Foundation Boiling 2000 Conference, Fairbanks, Alaska, Oct., 2000, Vol. 1, pp. 468-489.

58. *A Study of Convection in an Asymmetrically Heated Duct using Liquid Crystal Thermography,* with Y. Chin and D. K. Hollingsworth, Proceedings of the AIAA/ASME Thermophysics and Heat Transfer Conference, Albuquerque, June, 1998, HTD 357-2, pp. 63-70.

57. *Investigation of Flow Boiling Incipience in a Narrow Rectangular Channel using Liquid Crystal Thermography,* with Y. Chin and D. K. Hollingsworth, Proceedings of the AIAA/ASME

Thermophysics and Heat Transfer Conference, Albuquerque, June, 1998, HTD 375-3, pp. 71-78.

56. *Burnout of Small-Jet, Large Heater Systems*, with M. Yesudas and J. Lienhard, presented at the 1996 National Heat Transfer Conference, Houston, TX, August, 1996. Published in ASME HTD-Vol. 330, pp 3-10.

55. *Microgravity Heat Transfer and Pressure Drop in Gas-Liquid Mixtures: Slug and Annular Flow*, with L. B. Fore and J. McQuillen, presented at the 1996 National Heat Transfer Conference, Houston, TX, August, 1996.

54. *Two-Phase Heat Transfer in Microgravity*, with L. B. Fore, Invited Paper, International Conference on Heat Transfer with Phase Change, Kielce, Poland, December, 1996, published in Proceedings, Part 1, pp. 185-194.

53. *Studies of Two-Phase Flow Dynamics and Heat Transfer at Reduced Gravity Conditions*, with W. S. Bousman and L. B. Fore, Final Report, NASA Grant NAG3-510, Jan. 2, 1996.

52, *Two-Phase Flow Dynamics and Heat Transfer in Microgravity,* with L. B. Fore and W. S. Bousman, Proc. of Energy Week Conference, Houston, TX, Jan. 1996, Book IV, pp. 40-47.

51. *Roll Wave Effects on the Heating of Viscous Liquid Films,* with L. Fore, presented at the National Heat Transfer Conference, Portland, OR, August, 1995. Published in ASME HTD Vol. 314, pp. 23-30.

50. *Forced Convective Film Boiling Heat Transfer Across Horizontal Cylinders in Highly Subcooled Freon-113,* with Lidong Huang, Proceedings of the 4th ASME/JSME Thermal Engineering Conference, Maui, Vol. 2, pp. 315-322, Mar. 1995.

49. *Effective Thermal Conductivity of Fibrous Materials,* with M. Futschik, AIAA paper presented at the Thermophysics and Heat Transfer Conference, Colorado Springs, June, 1994

48. Influences of Subcooling and Velocity on Boiling Heat Transfer across Horizontal Cylinders, with Lidong Huang, presented at the Thermophysics and Heat Transfer Conference , Colorado Springs, June, 1994, ASME HTD-Vol. 273, Fundamentals of Phase Change - Boiling and Condensation.

47. *Analysis of Effective Thermal Conductivity of Fibrous Materials,* with M. Futschik, NASA CR-193242, July, 1993.

46. *John Lienhard's Adventures in Boiling: Bubble, Bubble, Toil and (not much) Trouble*, presented at John Lienhard's 65th Birthday Celebration, Portland, OR, Aug., 1995.

45. *Experiment and Direct Simulation of Reacting Jets*, with F. Hussain and R. Metcalfe, 25th JANNAF

44. *Pool Boiling on a Large Horizontal Flat Resistance Heater,* with R. Reguillot, J.H. Lienhard, and M. Poniewski, AIAA Paper No. 92-4052, presented at the National Heat Transfer Conference, San Diego, August, 1992.

43. *A Theoretical Model for Flow Film Boiling Across Horizontal Cylinders*, with X.S. Chow, AIAA Paper No. 92-4051, presented at the National Heat Transfer Conference, San Diego, August 1992.

42. *A Complete Theoretical Model for Flow Film Boiling Across Horizontal Cylinders*, with X.S. Chow, Proceedings of the Engineering Foundation Conference on Pool and External Flow Boiling, Santa Barbara, California, March, 1992, pp. 325-330.

41. *Measurement of Liquid-Solid Contact Using Micro-Thermocouples in Pool Transition Boiling of Water on a Horizontal Copper Surface*, with M. Shoji, S. Yokoya, M. Kawakami, and H. Kuroki, Proceedings of the JSME/ASME Joint Thermal Engineering Conference, Reno, Nevada, March 1991, Vol. 2, pp. 333-340.

40. *Highly Subcooled Flow Boiling of Freon-113 and Water Over Cylinders*, with S. Sankaran, Proceedings of the JSME/ASME Joint Thermal Engineering Conference, Reno, Nevada, March 1991, Vol. 2, pp. 3-9.

39. *Jet Nucleate Boiling on Power Transistors in Dielectric Liquids Using Emitter-Base Voltage Measurement Technique*, with C. Struble, Proceedings of the JSME/ASME Joint Thermal Engineering Conference, Reno, Nevada, March 1991, Vol. 2, pp. 405-412.

38. Highly Subcooled Flow Boiling of Freon-113 Over Cylinders, with S. Sankaran, presented at the AIAA/ASME Heat Transfer and Thermophysics Conference, Seattle, Washington, June 1990; ASME Heat Transfer Division Vol. 136, pp. 29-34.

37. *The Effect of Liquid Subcooling and Surface Conditions on Film/Transition Boiling*, with M. Shoji, K. Chang, and S. Sankaran, Proceedings of the International Symposium on Phase Change Heat Transition, Chongqing, Peoples Republic of China, May 1988, pp. 117-122.

36. *The Effect of Liquid Subcooling and Surface Roughness of Film/Transition Boiling*, with M. Shoji and S. Sankaran, proceedings of the 1988 National Heat Transfer Conference, Houston, Texas; ASME-Heat Transfer Division Vol. 96, No. 2, pp. 667-673.
Combustion Meeting, NASA-Marshall, Huntsville, Alabama, October 24-28, 1988.

35. *The Influence of Availability Costs on Optimal Heat Exchanger Size*, proceedings of the Industrial Energy Technology Conference, Houston, Texas, May 1988, pp. 351-356.

34. *The Kalina Cycle: A Path to Cheaper Power*, University of Houston Energy Laboratory News Letter, 1986, No. 15, pp. 3-8, 14.

33. Film Boiling Wakes Behind a Cylinder in Crossflow, with R. Kaul, AIAA-85-1043, presented at the AIAA Thermophysics Conference, Williamsburg, Virginia, June 1985.

.

32. *Second Law Optimization of Heat Exchangers*, ASME Paper 87-HT-65, presented at the 1987 National Heat Transfer Conference, Pittsburgh, Pennsylvania.

31. *Heat Transfer Following Extrusion Process*, with W. Lee Guice, presented at the 1987 National Heat Transfer Conference, Pittsburgh, Pennsylvania; printed in ASME-Heat Transfer Division Vol. 69, Fundamentals of Conduction and Recent Developments in Contact Resistance, pp. 61-68.

30. *Quenching of a Hollow Sphere in Methanol*, with S. Sankaran, presented at the National Heat Transfer Conference, Denver, Colorado, August 1985; published in ASME-Heat Transfer Division Vol. 47, pp. 7-14.

29. *Film Boiling From a Sphere to Subcooled Freon-11*, with J. Orozco, ASME Winter/Annual Meeting, New Orleans, Louisiana, December 1984; printed in Fundamentals of Phase Change: Boiling and Condensation, ASME-Heat Transfer Division Vol. 38, pp. 35-42.

28. Fundamentals of Natural Convection: Electronic Equipment Cooling, edited with L.S. Saxena, 1984, ASME-Heat Transfer Division Vol. 32.

27. *Vapor Velocity Effects on Subcooled Flow Boiling From Submerged Bodies*, with J. Orozco, Journal of Heat Transfer, February 1984, Vol. 106, No. 1, pp. 191-197.

26. *The Hydrodynamics of Flow Film Boiling Around Submerged Bodies*, with R. Kaul and J. Orozco, Bulletin of the American Physical Society, November 1983, Vol. 28, No. 9, p. 1377.

25. *Flow Film Boiling From Submerged Bodies*, with J. Orozco, AIAA-83-1529, presented at the 18th Thermophysics Conference, Montreal, Canada, June 1, 1983.

24. *On the Role of Liquid-Solid Contact in Subcooled Flow Film Boiling From Submerged Bodies*, with K. Chang and J. Orozco, presented at the 1983 National Heat Transfer Conference, Seattle, Washington, July 1983; printed in Interfacial Transport Phenomena, ASME-Heat Transfer Division Vol. 23, pp. 67-74.

23. *Subcooled Flow Boiling From Submerged Spheres: Vapor Velocity Effects*, with J. Orozco, proceedings of the ASME/JSME Joint Thermal Engineering Conference, Honolulu, Hawaii, March 1983, Vol. 1, pp. 199-206.

22. *The Thermodynamics of Energy Conservation*, presented at the 8th Industrial Energy Conservation Technology Conference, Houston, Texas, June 17, 1986.

21. *Heat Exchangers and the Second Law*, University of Houston Energy Laboratory Newsletter, 1986, No. 14, pp. 10-14.

20 . *The Effect of Vapor Velocity on Film Boiling From Cylinders*, with J. Orozco, ASME Paper 28-HT-82, presented at the ASME/AIAA Joint Thermophysics, Heat Transfer and Fluid Mechanics Conference, St. Louis, Missouri, June 1982.

19. *New Directions in Heat Recovery*, Specifying Engineer, March 1986, pp. 93-95.

18. *Second Law Optimization of Heat Exchangers,* presented at the Industrial Energy Conservation Conference, Houston, Texas, May 1985.

17. Two-Phase Processes in Micro-g, Presented at the Micro-g Science Meeting, Johnson Space Center, June 28, 1984.

16. *More on Rapid Transients*, with J. Cox, Oil and Gas Equipment Journal, January 1969, Vol. 16, No. 1

15. *How to Measure Rapid Transients*, with J. Cox, Oil and Gas Equipment Journal, December 2-3, 1968, Vol. 15, No. 2.

14. *Heat Transfer Characteristics of an Emergent Strand*, with W. Simon and P. Hedgcoxe, NASA TND-7584, February 1974.

13. *The Vapor Explosion - Heat Transfer and Fragmentation - VI. Transient Film and Transition Boiling From a Sphere*, with J. Stevens and J. Cox, AEC Report No. ORO-3936-9, September 1972.

12. *The Vapor Explosion - Heat Transfer and Fragmentation*, Technical Progress Report ORO-3936-8, January 1972.

11. *Explosion Phenomenon Using Molten Metal Jet Injected Into Distilled Water*, with R. Bradley and J. Cox, AEC Report No. ORO-3936-7, October 1971.

10. *The Vapor Explosion - Heat Transfer and Fragmentation - V. Investigation of the Vapor Explosion Phenomenon Using Molten Metal Jet Injected Into Distilled Water*, with R. Bradley and J. Cox, AEC Report No. ORO-3936-7, October 1971.

9. *The Vapor Explosion - Heat Transfer and Fragmentation - IV. Rapid Quenching of Molten Metal*, with J. Cox, T. Vyas, and A. Gelabert, AEC Report No. ORO-3936-6, August 1971.

8. *The Vapor Explosion - Heat Transfer and Fragmentation*, Technical Progress Report ORO-3936-5, January 1971.

7. *The Vapor Explosion - Heat Transfer and Fragmentation - III. Pressurization of a Solidifying Sphere*. with K.-H. Hsiao, J. Cox, and P. Hedgcoxe, AEC Report No. ORO-3936-4, November 1970.

6. *The Vapor Explosion - Heat Transfer and Fragmentation*, with J. Cox, Technical Progress Report, ORO-3936-3, April 1970.

5. *Introduction to Explosive Vapor Formation*, with J. Bouvier and J. Cox, AEC Report ORO-3936-1, November 1969.

4. *Heat Transfer From a Sphere to Liquid Sodium During Forced Convection*, Argonne National Laboratory Report ANL-7296, 1967.

3. *Thermophysical Properties of Foodstuffs*, with J.Cox and Y. Cheng, ASME Paper 76-WA/HT-26, presented at Saint Louis, Missouri, August 1976.

2. *Non-Chemical Explosive Interaction of LNG and Water*, with J.Cox, ASME Paper 71-WA/HT-31.

1. *Measurements of Rapid Transient*, with J. Cox, ASME Paper No. 68-Pet-13, presented at ASME Petroleum Division Meeting, Dallas, Texas, September 25, 1968.

Books and Book Chapters

7. *External Flow Film Boiling*, Chapter 13 in the Handbook of Phase Change: Boiling and Condensation, Taylor and Francis, 1999, pp. 311-329.

6. *External Flow Film Boiling*, 1997 Annual Review of Heat Transfer, Begell House, New York, pp. 315-358.

5. Industrial Energy Utilization and Management, with Phillip S. Schmidt and David R. Brown, Hemisphere Publishing Company, 1988, 666 pages.

4. *Thermal Sciences Review*, Energy Management Handbook, John Wiley, New York, 1982, pp. 547-577.

3. Energy Management Handbook, Compiler - Appendix II, Property Tables, John Wiley, New York, 1982, pp. 578-658.

2. Energy Management Handbook, Associate Editor, John Wiley, New York, 1982.

1. *Thermal Explosion Hazards*, with J. Cox, Chapter in Advances in Nuclear Science and Technology, 1973, Vol. 7, pp. 329-364.

RESEARCH PRESENTATIONS

Papers at Technical Meetings

11. Cognata, T. J., D. K. Hollingsworth and L. C. Witte, "High Speed Visualization of Two-Phase Flow in a Microscale Heat Exchanger, Presented at the International Boiling Conference, Spoleto, Italy, May, 2006.

10. Daniel, E, D. K. Hollingsworth and L. C. Witte, "Transition from Boiling Onset to Fully-Developed Nucleate Boiling in a Narrow Vertical Channel", Presented at the International Boiling Conference, Spoleto, Italy, May, 2006.

9. *How Liquid-Solid Contact Affects Film-Transition Boiling,* presented at the Energy Week Conference, Houston, TX, Jan., 28, 1997.

8. *Optimal Heat Exchanger Design Based on Second Law Concepts,* presented at the AIChE Conference, Houston, TX , March, 1993.

7. *Heat Exchanger Characterization Using the Second Law*, presented at the 1992 Engineering Technology Conference and Exhibition, Houston, Texas, January 27, 1992; ASME Paper No. 92-Pet-2.

6. *Computer Aided Optimal Design of Heat Exchanger Networks,* with P. Seshadri, presented at the 1991 Computers in Engineering Conference, Santa Clara, Ca, August, 1991.

5. *Design and Heat Integration of a Power Plant using Multi-objective Optimization,* with P. Seshadri, presented at the 1991 Computers in Engineering Conference, Santa Clara, Ca, August, 1991.

4. *Thermodynamic Efficiency of Heat Exchange Devices*, with N. Shamsundar, proceedings of the 1982 Energy Conservation Technology Conference, Houston, Texas, April 1982, Vol. 1, pp. 308-313.

3. *Industrial Energy Auditing - A Short Course for Engineers*, presented at the Industrial Energy Conservation Conference and Exhibit, Houston, Texas, April 23, 1979.

2. *Rapid Growth & Collapse of Vapor Films Surrounding Spheres*, with K.-H. Hsiao and J. Cox, presented at the 14th Midwestern Mechanics Conference, Norman, Oklahoma, March 1975.

1. *Turbine-Condensor Performance Matching: A New Method of Predicting Steam Electric Generating Unit Performance*, with W. Menger, presented at the Southwestern IEEE Conference, San Antonio, Texas, April 24, 1969.

Invited Seminars

Engineering Graduate Study at the University of Houston, Istanbul Technical University, March 13, 2006; Bogacizi University, March 14, 2006; Istanbul Ticaret University, March 15; Fatih University, March 15, 2006; King Mong-Kut University, South, Bangkok, March 17, 2006; Chulalongkorn University, March 17, 2006; King Mong-Kut University, South, March 18, 2006; Asian Institute of Technology, March 19, 2006; Thammasat University, March 19, 2006; Ecole Polytechnic University, Tunis, January 20, 2007; Oak Academy, Pune, India, November 24, 2007;

The Effect of Martian Dust on Thermal Radiators, NASA-JSC Crew and Thermal Systems Division, Nov. 12, 2003

Fluid Dynamics and Heat Transfer in Falling Films, Texas A&M University, October 9, 1995.

Second Law Optimization of Heat Exchangers, Sixth Summer School of Thermodynamics, Kielce, Poland, Sept. 2, 1994

Highly Subcooled Flow Boiling, Rice University, March 20, 1992.

Highly Subcooled Flow Boiling, Texas A&M University, March 5, 1992.

Meso Heat Transfer: Heat transfer in miniature channels, UH Energy Laboratory, Houston, TX, November, 1991.

High Velocity, Highly Subcooled Film and Transition Boiling, University of Houston Energy Laboratory, Houston, Texas, April 1989.

Boiling Heat Transfer: Part 1, Fundamentals; Part II, Flow Film Boiling, University of Tokyo, May 1988.

Second Law Optimization of Heat Exchangers, University of Houston Energy Laboratory, Houston, Texas, October 1985.

Flow Film Boiling From Submerged Bodies, Rice University, Houston, Texas, March 1985.

Thermodynamic Laws, Gulf Coast Energy Conservation Society, Houston, Texas, November 1984 and June 1985.

Thermodynamics of Cogeneration, International Cogeneration Society, Houston, Texas, October 3, 1984.

Boiling and Condensation in Micro-g, Micro-g Society, NASA Johnson Space Center, Houston, Texas, September 1984.

Flow Film Boiling From Submerged Bodies, University of Houston, Houston, Texas, September 8, 1983.

Natural Convection in Irregular Enclosures, University of Houston, Houston, Texas, September 13, 1979.

Industrial Energy Auditing, Texas Industrial Commission, Austin, Texas, September 12, 1978.

Explosion Vapor Formation, The University of Texas, Austin, Texas, April 1974.

The Vapor Explosion, Houston Area Fluid Mechanics Seminar, April 1973.

The Vapor Explosion, University of California, Berkeley, California, April 27, 1972.

Explosive Vapor Formation, NASA-ASEE Summer Faculty Fellowship Research Program, Marshall Space Flight Center, August 11, 1970.

Graduate Education at the University of Houston: Presented at:

Ticaret University, Istanbul, Turkey, March 16, 2006
Istanbul Technical University, Instanbul, Turkey, March 16, 2006
Bogazici University, Istanbul, Turkey, March 17, 2006
Fatih University, Istanbul, Turkey, March 18, 2006
Chulalongkorn University, Bangkok, Thailand, March 20 , 2006
King Mongkut East University, Bangkok, March 20, 2006
King Mongkut West, Bangkok, March 21, 2006

Asian Institute of Technolgy, Bangkok, March 22, 2006
Thammasat University, Bangkok, March 22, 2006
Benaras Hindu University, Nov. 7, 2006
Rajiv Gandhi University, Bhopal, Nov. 8, 2006
Delhi College of Engineering, Nov. 9, 2006
Maharaja Agrasen University, Delhi, Nov. 10, 2006
IIT Dehli, Nov. 11, 2006

FUNDED RESEARCH (I have conducted over $2.4M of externally sponsored research during my tenure at the University of Houston.)

NSF, A Combined Thermographic-Photographic Study of Boiling in a Narrow Channel, Oct. 1, 2009-Sept. 30, 2011, $202,000. (Co-PI, with D. K. Hollingsworth).

Texas Advanced Research Project, Development of a Two-Phase Micro-scale Heat Exchanger, Jan. 1, 2004 – Dec. 31, 2006, $160,000. (Co-PI) with D. K. Holliingsworth.

NASA-JSC, Mars Radiator Characterization Experiment, $93,000, May 1, 2002-April 31, 2004.

NASA-JSC, Two-Phase Systems for Mars-g, $21,017, May 1, 1999-June 30, 2001.

NASA-JSC, Two-Phase Systems for Mars-g, $49,394, May 1, 1998-April 30, 1999.

Texas Advanced Research Project, ARP 003652-762, Sliding Bubbles: Using Liquid Crystal to Determine the Heat Transfer Enhancement Mechanism, $86,890. Jan. 1, 1998 – Nov. 30, 2000.

National Science Foundation CTS-9701556, Co-PI (with Hollingsworth), Convection and Boiling in Narrow Channels, $150,000, Sept., 1997- Aug., 2001.

UH Inst. for Space Systems Operations, PI, Two-Phase Heat Transfer and Pressure Drop at Normal and Microgravity Conditions, summer, 1996, $8694

UH Energy Laboratory, PI, Liquid-Solid Contact Effects on Film-Transition Boiling, summer, 1996, $8585

NASA-Lewis Research Center Grant NAG 3-510, Studies of Two-Phase Flow Dynamics and Heat Transfer at Reduced Gravity Conditions, Principal Investigator, Nov. 1, 1993-Oct. 31,1995, $170,000

University of Houston Institute for Space Systems Operations, Principal Investigator, Thermal Conductivity of Fibrous Materials, Summer, 1994, $8307

University of Houston Energy Laboratory, Principal Investigator, Summer, 1994, $8307

Texas Advanced Research Program, Co-Principal Investigator with K. Hollingsworth, January 1, 1994-August 31, 1995; $109, 443.

Kentex Corp, Redwood City, Ca., Principal Investigator, for support of PhD student, Sept., 1992-Jan., 1994, $21,000.

University of Houston Energy Laboratory, Principal Investigator, Summer 1993, with K. Hollingsworth, $8304.

Texas Advanced Research Program, Principal Investigator, January 1, 1992-August 31, 1993, $120,000, ($5000 undergraduate researcher supplement, Oct.,1992-Aug., 1993)

Texas Advanced Technology Program, Principal Investigator, January 1, 1992-August 31, 1993, $144,700.

NASA-JSC Grant NAG 9-532, Principal Investigator, July 1, 1991 - December 31, 1992, $30,333.

Igloo Corporation, Principal Investigator, 1990, $10,000.

NASA - JSC Grant NAG 9-546, Principal Investigator, September 1, 1991 - August 31, 1992, $5000.

NASA - JSC Grant NAG 9-389, Principal Investigator, 1989-1990, $20,365.

University of Houston Energy Laboratory, Principal Investigator, Summer 1991, $7844.

University of Houston Energy Laboratory, Principal Investigator, Summer 1988, $6,197.

NSF Grant CBT-8803569, Principal Investigator, July 15, 1988 - December 31, 1989, $41,219.

Texas Advanced Technology Program, Principal Investigator, June 1, 1988 - May 31, 1990, $205,150.

DOE Grant KC040101, Principal Investigator, November 15, 1990 - April 15, 1992, $36,000.

DOE Grant KC040101, Principal Investigator, April 15, 1988 - April 14, 1990, $153,000.

NASA Grant NAG9-197, Co-Principal Investigator, January 1987 - April 1988, $60,000.

University of Houston Energy Laboratory, Principal Investigator, Summer 1987, $5,914.

University of Houston Energy Laboratory, Principal Investigator, Summer 1986, $5,180.

DOE Scoping Workshop on Energy Engineering Research, Co-Director, University of Minnesota Subcontract, December 1985, $77,857.

NSF Grant CBT-8505341, Principal Investigator, April 1985 - November 1986, $96,000 ($48,000. plus $48,000. matching funds).

University of Houston Energy Laboratory, Principal Investigator, Summer 1985, $5,700.

NSF Grant MEA-8411894, Principal Investigator, November 1, 1984 - November 31, 1987, $143,412.

NSF Grant MEA-8218708, Co-Principal Investigator, July 1, 1983 - June 30, 1985, $80,000.

NSF Grant CME-8008036, Principal Investigator, November 1, 1980 - October 31, 1983, $173,026.

NASA Contract NAS 911676, Director, May 1971 - December 31, 1984, $110,000.

University of Houston Solar Energy Laboratory, Principal Investigator, Summer 1975, $12,000.

University of Houston Solar Energy Laboratory, Principal Investigator, Summer 1974, $7,760.

University of Houston Research Initiation Grant, FRSPP (RIG) 69-4, Director, Summer 1969, $2,500.

NSF Equipment Grant, Co-director, 1968-1969, $6,000.

USAEC Contract, ORO-(49-1)-3936, Principal Investigator, May 1969 - May 1973, $121,780.

SERVICE ACTIVITIES

University of Houston

2005-2008	University Graduate and Professional Studies Council
2002-04	University Academic Fee Committee
2000-04	University Task Force on Recruiting Highly-Qualified Students
1998-04	University Recruiting Committee
1997-98	University Task Force on Undergraduate Education
1997-2004	University Scholarship Committee
1988-96	Institutional Representative, Texas Space Grant Consortium
1994	Committee for Evaluation of Dean of Engineering
1993-1995	Athletic Advisory Board
1989-1990	Interim Director, Institute for Space Systems Operations
1988-1990	Farfel Award Committee
1988	Space Research Task Group, Chairman
1986-1988	University Promotion and Tenure Committee, Chairman 1987-1988
1979-1980	NROP Committee, Chairman
1978-1981	Faculty Development Leave Committee
1977-1980	University Research Committee
1977-1978	Faculty Senate
1975	Ad Hoc Advisory Group on Energy
1971-1972	Graduate Student Teaching Award Committee
1970-1971	University Graduate Council

College of Engineering

2008-2009	College Promotion and Tenure Committee
2007-present	Department Post-Tenure Review Committee
1997-2008	College Executive Committee,
1993	Dean Evaluation Committee
1990-present	Engineering Golf Tournament Organizing Committee
1987-1988, 94-95	Promotion and Tenure Committee
1986-1987	Subcommittee for Promotion and Tenure, Chairman
1986-1987	Committee of Full Professors, Chairman
1981-1983	Grievance Committee
1981	Dean Evaluation Committee, Chairman
1978-1979	Committee of Full Professors, Chairman
1977-1978	Graduate Faculty Board
1977-1978	College Governance Committee
1972-1976	Executive Committee
1972-1976	All Department Committees, Ex-officio Member
1969-1972	Graduate Standards Committee, Chairman 1969-1971
1969-1972	Co-op Liaison Committee

Professional Organizations

2002-2006	Member, ASME Basic Engineering Group, Thurston Lecture Selection Comm.
1996-2002	Member, ASME Heat Transfer Division Executive Committee, Chair, 2001.
1993-1995	Fourth ASME/JSME Thermal Engineering Joint Conference, Organizing Committee
1993-96	ASME Heat Transfer Division K-2 Long Range Directions and Issues Committee, Chairman, 1994-96.
1993-96	ASME Heat Transfer Division Liaison with Energy Technology Conference and Exhibition
1992-present	ASME Heat Transfer Division K-13, Heat Transfer in Multiphase Flows Committee
1992-1995	ASME Heat Transfer Division K-3, Honors and Awards Committee
1989-1992	ASME Heat Transfer Division Liaison with Applied Mechanics Reviews
1989-1991	Selection Committee for Outstanding University of Houston Engineering Alumni
1986-1987	Texas Society of Professional Engineers Committee on Electrical Energy Needs for Texas
1985-1987	American Institute for Aeronautics and Astronautics, Committee on Terrestrial Energy Systems (National)
1980-1992	American Society of Mechanical Engineers Heat Transfer Division K-8 Committee (National), Standing Committee on Theory and Fundamental Research; Vice Chairman, 1988-1989, Chairman, 1989-1992
1980-1983	Industrial Energy Conservation Technology Conference, Steering Committee
1976-1979	American Institute for Aeronautics and Astronautics, Thermophysics Committee (National).
1978-1983	Texas Industrial Commission, Energy Auditing Committee
1977-1979	American Nuclear Society, South Texas Section, Education Committee Chairman
1976-1977	American Nuclear Society, South Texas Section, Program Committee
1975-1976	American Society of Mechanical Engineers Region X Department Heads Committee, Vice Chairman
1974-1977	American Nuclear Society, South Texas Section, Nominating Committee
1973-1978	American Institute of Chemical Engineers Heat Transfer and Energy Conversion Division, Equipment Subcommittee (National)

1972-1973 Southwest Symposium on Heat Transfer, Steering Committee Chairman

1969-1970 American Society of Mechanical Engineers, South Texas Section, Membership Development Committee

Consulting Activities

Kirox, Inc: Design of Steam Reheater, 1987-1988

Rasback Building Technologies: Testing of Latent Heat Subcooler for Refrigeration Systems, 1986-1987

Ministry of Education, Tunisia (National Engineering University, Gabes): Evaluation of Engineering Curriculum and Lectures in Chemical Engineering, May - June 1985

Pravel, Gambrell, Hewitt and Kimball: Patent Infringement, Expert Testimony, Thermostat Design, 1984

Ratliff & Associates: Glass Breakage Analysis, 1981 - 1982

Honeywell Process Instruments Division: Heat Transfer Analysis of Sampling System, 1980

Gregory & Landis: Explosion tests, Beverage Bottles, 1978, 1979, 1983

Baker World Trade: Liquid/Vapor Separator Design, August - September 1979

Texas Industrial Commission: Heat Exchangers, April 1978

Brown & Root: Specialized Instruction Program, 1977

Aetna Casualty Co.: Natural Gas Explosion, 1977

CRC Automatic Welding: Prediction of Pipe Temperatures for North Sea Welding Barge, 1977

Stubbs, Overbeck Corporation: High Speed Movie Measurements, 1974

Exxon Research and Development: Temperature Measurements in Non-Newtonian Flows, 1974, 1975

Technology, Inc.: Pressure Measurements in Physiological Experiments, 1971

Branch and Stilwell: Civil Litigation, Gas Explosion, 1970

Brown, Kronzer, Abraham, Watkins and Steely: Civil Litigation, Expert Witness Concerning Motel Fire, 1970; Gas Explosion, 1974; Accidential Electrocution, 1975, 1976.

Other Activities

Letter to the Editor, Houston Chronicle, Don't Overlook Nuclear Energy, Nov. 14, 2008.

Radio Interview, KTRH Radio, Houston, April 26, 1996, Safety of Nuclear Power Reactors, with Robert Hensley, Reporter