

CABLE KURWITZ

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EDUCATION

TEXAS A&M UNIVERSITY – *Doctor of Philosophy, Nuclear Engineering 2009*
Dissertation Entitled “Probabilistic Prediction Using Embedded Random Projections of High Dimensional Data.”

TEXAS A&M UNIVERSITY - *Masters of Science, Nuclear Engineering 1997*
Thesis Entitled “Testing of a Loop Heat Pipe Apparatus Under Varied Acceleration.”

TEXAS A&M UNIVERSITY - *Bachelor of Science, Nuclear Engineering 1993*

EXPERIENCE

PROFESSIONAL ENGINEER – STATE OF TEXAS – LIC. # 93005

TEXAS A&M UNIVERSITY

Senior Research Engineer, May, 1998 – Current

I am the Laboratory Manager for the Interphase Transport Phenomena (ITP) and Reduced Gravity Thermal Sciences Laboratories at Texas A&M, specializing in heat transfer and fluid flow in space energy systems. We have experience in a number of research areas dealing with zero and reduced gravity two phase flow including flow regime investigations, manifold stability and phase separation. The lab makes use of extensive zero gravity flight-tested instrumentation to carry out research projects. My area of research interests includes Reduced Gravity Thermal Management, Modeling of High Dimensional Data, Data Classification, and Model Validation.

Responsible for the Daily Operation of Two Research Laboratories with \$500k in Annual Funding

- Oversee 3 Doctoral, 6 Masters, and a dozen Undergraduate Students
- Operation of Laboratory with over \$2M of Reduced Gravity Test Hardware
- Meeting Multiple, Simultaneous Project Goals

Brief Project Summary

Modeling and Model Validation

- Development of Validation Procedures for Engineering Prediction Models.
- Modeling and Classification of High Dimension Data

Heat Pipe Design and Modeling

- Design of Silicon Evaporators for Micro Loop Heat Pipe.
- Analysis and Modeling of Loop Heat Pipe Performance Under Variable Accelerations.
- Design and Testing of Sodium Boiler Heat Exchanger for Heat Pipe Cooled Lunar Reactor System.

Instrumentation Development and Validation

- Testing of Creare Void Fraction Sensors in Microgravity.
- Development of Gauging Technologies of Vortex Phase Separator.
- Acoustic Pulse-Echo, Differential Pressure, Densitometry, and Optical Techniques.

Two-Phase Flow Testing in Earth, Mars, and Zero Gravity.

- Directed Refurbishment of \$1M Two-Phase Test Package for Three Flight Campaigns.
- Incorporated State-of-the-Art Instrumentation for Research Under Varied Acceleration.
- Integrated Equipment with NASA and 0g Corp. Reduced Gravity Aircraft.
- Analysis and Modeling of Various Gravity Dependent Thermal-Hydraulic Phenomena.

Phase Separation

- Low Gravity Propellant Transfer System Development.
- Development of a Gas/Liquid Separator in Support of Immobilized Microbe Microgravity Wastewater Processing System in Support of Shuttle Flight Test. Project with NASA JSC.
- Integration of Phase Separator with PEM Fuel Cell for Microgravity.

COMMONWEALTH EDISON

System Engineer - Nuclear Group May, 1997 – May, 1998

- Responsible for Control Rod Drive System. (Engineer-in-Training)
- Operational Assessments and System Malfunctions Troubleshooting.
- Assisted in Revision of Special Nuclear Materials Procedures.
- Reactor Operators Fundamentals Requalification Training and PWR Systems Training.

TEXAS A&M UNIVERSITY

Graduate Research Assistant, January, 1994 - May, 1997

Loop Heat Pipe Flight Testing Project.

- Assisted in the Analysis of Test Data and Helped in Developing Models.
- Operated Thermacore Loop Heat Pipe Analysis Spreadsheet.
- Assisted in Preparation of Gravity Dependent Computer Models.
- Prepared Final Report for DTX and Center for Space Power.

KC-135 Flight Testing of Void Fraction Capacitance Probe for Micro gravity Two-phase Flow.

- Integrated Flow Regime in Microgravity Package (FRIM) with Current Hardware.
- Performed Ground Based Testing and Troubleshooting.
- Provided Ground Support at JSC during the Week Long Flight Series.

Water-Reactor Options for Disposition of Weapons Plutonium.

- Performed Preliminary Thermal Analysis of Fuel Casks for MOX Fuel Testing.
- Assisted in the Design of Liquid Metal Cooled Apparatus for MOX Fuel Thermal Testing.

PEER REVIEWED PUBLICATIONS

L. Valota, C. Kurwitz, A. Shephard, and F. Best, "Microgravity flow pattern identification using void fraction signals," International Journal of Multiphase Flow, Volume 33, Issue 11, November 2007, Pages 1172-1185.

M. Ghrist, M. Ellis, D. Bean, C. Kurwitz, and F. Best, "Microgravity Phase Separation for the Rankine Cycle," Accepted for publication, Nuclear Society Journal of Nuclear Technology, Dec., 2006.

A. Barbu, M. Ellis, C. Kurwitz, F. Best, "Acoustic Gauge Monitoring of Fluid Inventory in a Microgravity Vortex Separator," Measurement Science and Technology, 17, 403-410, Feb., 2006.

C. Kurwitz, K. Marsden, and F. Best, "Two-Phase Friction Pressure Drop Data and Models For Corrugated Tubes and Quick-Disconnect Attachments in Zero Gravity and Earth Gravity Conditions," AIAA Journal of Thermophysics and Heat Transfer Vol 19, num. 4, 2005.

K. Hurbert, L. Witte, F. Best, and C. Kurwitz, "Scaling Two-Phase Flows to Mars and Moon Gravity Conditions," International Journal of Multiphase Flow, Volume 30, Issue 4, April 2004, Pages 351-368.

CONFERENCE PROCEEDINGS

A. Creary, M. King, M. Langston, C. Kurwitz, P. Nelson, and F. Yilmaz, "Time Domain Analysis of the Temperatures in an Electrical Auxiliary Building Room," ICONE17-75720, Proceedings of the 17th International Conference on Nuclear Engineering ICONE17, Brussels, Belgium, 2009.

C. Kurwitz, M. Ellis, R. Oinuma, and F. Best, "Reduced Gravity Direct Contact Heat Exchanger for Cabin Air Dehumidification," Earth and Space Conference 2008, 11th ASCE Aerospace Division International Conference on Engineering, Construction and Operations in Challenging Environments, 2008.

M. Schuller, C. Kurwitz, and F. Best, "Demonstration of a Martian Surface Power System Sodium Boiler Heat Exchanger," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2008.

K. R. Supak, C. Kurwitz, R. Oinuma, F. Best, "Reduced Gravity Rankine Cycle System Simulation and Design with Passive Vortex Phase Separation," Proceedings of Space Nuclear Conference 2007, ANS Paper 1515, 2007.

F. Finodeyev, C. Kurwitz, and F. Best, "An Algorithm For Two Phase Flow Regime Identification From Digital Imagery," ASME IMECE 2005, Orlando, Fl., November 2005.

C. Kurwitz, M. Ellis, K. Marsden and F. Best, "Vortex Separator for Use in Microgravity Nuclear Power Systems," Proceedings of the Space Nuclear Conference 2005, Paper 1130, San Diego, California, June 5-9, 2005.

R. Oinuma, D. C. Bean, C. Neil, R. C. Kurwitz and F. R. Best, "Two-phase Flow Issues in Space Nuclear Reactor and Nuclear Propulsion Systems," Proceedings of the Space Nuclear Conference 2005, Paper 1135, San Diego, California, June 5-9, 2005.

C. Kurwitz, and F. Best, "A Statistical Comparison of Various Fluids for a Drift Flux Model in Reduced Gravity Two-Phase Slug Flow," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2005.

F. Finodeyev, M. Ghrist, and F. Best, "Development of a Passive Flow Coalescence Device for Two-Phase Phase Separation Under Microgravity," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2005.

J. Braisted, C. Kurwitz, and F. Best, "New Results in Two-Phase Pressure Drop Calculations at Reduced Gravity Conditions," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2004.

F. Finodeyev, D. Algama, P. Waghela, D. Bean, C. Kurwitz, and F. Best, "Gamma Densitometry Applications in Microgravity Two-Phase Flow Experiments," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2004.

P McIntyre, A. Sattarov, M. Adams, F. Best, C. Kurwitz, and Z. Wu, "Accelerator-Driven Thorium Cycle Power Reactor: Design and Performance Calculations" Global 2003, ANS/ENS International Winter Meeting, New Orleans, LA., November 2003.

D. Bean, C. Kurwitz, P. Waghela, and Dr. F. Best, "Vortex Necking Phenomena Under Microgravity," Proceedings of the Thermal Fluids Analysis Workshop 2002, NASA Johnson Space Center, August 2002.

C. Kurwitz, and F. Best, "New Results in Gravity Dependent Two-Phase Flow Regime Mapping," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2002.

T. Wong, B. Nguyen, F. Best, and C. Kurwitz, "Helium Evolution from Ullage Venting of Propellant Tank in Space," submitted for the 37th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit conference in Salt Lake City, UT., July 2001.

C. Kurwitz, and F. Best, "Modeling and Testing of Two-Phase Flow in Manifolds Under Microgravity Conditions," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, February 2001.

C. Kurwitz and F. Best, "Phase Separation By Passively Induced Centrifugal Forces," 4th International Conference on Life Support and Biosphere Science, Baltimore, MD. August, 2000.

C. Young, F. Best, and C. Kurwitz, "Modeling of Two-Phase Flow in Manifolds Under Microgravity Conditions," Proceedings of the Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics, Albuquerque, New Mexico, January 1999.

C. Kurwitz and F. Best, "The Design of Micro-Fabricated Evaporators in Multichip Modules," Proceedings of the International Conference on Integrated Nano/Microtechnology for Space Applications, Houston, TX. November, 1998.

F. Best, T. Hamm, and R. Kurwitz, "Design of a PbBi Cooled, Electrically Heated MOX Test Facility," K. L. Peddicord, Leonard Lazarev and Leslie J. Jardine eds., Nuclear Materials Safety Management, NATO ASI Series, Kluwer Publishing Company, 1997.

C. Kurwitz and F. Best, "Experimental Results of Loop Heat Pipe Startup in Microgravity," Proceedings of the 1st Conference on Applications of Thermophysics in Microgravity, Albuquerque, New Mexico, January 1997