

# *Instructor Resumé*

## **JOHN D. BERNARDIN**

Consultant and Lecturer in  
Mechanical Engineering and Thermal Sciences to  
**Technology Training, Inc.**

John Bernardin's professional interests cover basic and applied research integrated with practical engineering design related to thermal sciences, energy conversion, and manufacturing. His teaching experience includes assistant teaching while a postgraduate and teaching courses for the University of New Mexico.

### **EXPERIENCE**

- 2004–Present LOS ALAMOS NATIONAL LABORATORY, Space and Atmospheric Sciences Group, Los Alamos, NM. *Lead Design Engineer and Instrument Manager*. Project responsibilities include serving as lead engineer and instrument manager for a number of spacecraft instruments, including Gamma Ray and Neutron Detector for the Dawn Spacecraft, Neutral Particle Detector for the IBEX Spacecraft, Laser-Induced Breakdown Spectroscopy instrument for the Mars Science Lab Rover, X-Ray telescope for XNAV program and Atmospheric gas collection system for the Mars SCIM mission. Engineering tasks include engineering analyses, hardware design and fabrication, and numerous types of experimental testing (thermal, vacuum, RF, mechanical, etc).
- 1999–Present UNIVERSITY OF NEW MEXICO, Los Alamos. *Part-time Professor*. Taught senior-level heat transfer and thermodynamic classes and currently teaching a vacuum technology course.
- 1998–2003 LOS ALAMOS NATIONAL LABORATORY, Spallation Neutron Source Division, Los Alamos, NM. *Lead Design Engineer and Deputy Group Leader*. Project responsibilities included serving as Lead Engineer and Deputy Group Leader for the design of water cooling/resonance control and vacuum systems for the Drift Tube and Coupled Cavity linear accelerator systems, for the High Energy Beam Transport, for the Linac quadrupole magnets and for the prototype CCL. Technical work involved directing design teams to perform engineering analyses, conduct R&D experiments, produce engineering designs of all hardware and controls systems, develop control system software routines, and participate in assembly, testing, and certification of hardware and control systems. Project tasks included leading several engineering design teams to design, fabricate, assemble, install, test, and operate full-scale systems.
- 1996–1998 LOS ALAMOS NATIONAL LABORATORY, Engineering Sciences & Applications Division, Los Alamos, NM. *Research/Design Engineer*. Performed lead engineering roles on structural, thermal/fluid, and vacuum analyses of components for a variety of systems including the LANL Nuclear Materials Storage Facility, the National Ignition Laser Facility, the LANSCE Isotope Production Facility, the BNL PHOENIX experiment, and the LANSCE, APTILEDA, and SNS particle accelerators.
- 1995–1996 PURDUE UNIVERSITY, School of Mechanical Engineering. *Teaching Assistant*. Instructed senior-level heat transfer and fluid mechanics laboratories
- 1991–1996 PURDUE UNIVERSITY, School of Mechanical Engineering. *Graduate Research Assistant*. Research focused on high temperature spray heat transfer and material aspects associated with intelligent heat treating of aluminum alloys. Designed, fabricated, assembled, and tested complex experimental hardware, instrumentation, and data acquisition software to support research. Developed statistical software and data analysis routines to correlate experimental data.
- 1989-1991 UNIVERSITY OF WISCONSIN, Milwaukee *Undergraduate Research Assistant*. Investigated magnetic field effects pertaining to prevention of scale buildup in heat exchangers. Developed experimental apparatus to investigate diffusion and transport of radon gas through concrete.

### **EDUCATION**

Bachelor of Science in Mechanical Engineering, UNIVERSITY OF WISCONSIN, Milwaukee, WI, 1991.

Master of Science in Mechanical Engineering. PURDUE UNIVERSITY, Indiana, 1993. Thesis: "Intelligent Heat Treatment of Aluminum Alloys: Material, Surface Roughness, and Droplet-Surface Interaction Characteristics."

Doctor of Philosophy, PURDUE UNIVERSITY, Indiana, 1996. Thesis: "Leidenfrost Point and Film Boiling Heat Transfer of Single Drops and Sprays."



## ENGINEERING SOFTWARE

Solidworks, COSMOSworks, FloWorks, Pro/E Wildfire, Pro Mechanical, CFX, SINDA/FLUINT, Mathematica

## SOCIETIES

Society of Automotive Engineers  
American Society of Mechanical Engineers  
American Institution of Aeronautics and Astronautics  
Tau Beta Pi (honorary engineering society)  
Pi Tau Sigma (honorary mechanical engineering society)  
Session Chair for numerous ASME Conferences  
Mentor for "Minority Students' Young Scholars Program"

## AWARDS

Los Alamos National Laboratory LAAP Award, 2005  
Los Alamos National Laboratory Distinguished Performance Award, 2004  
Magoon Award for outstanding teaching in the School of Mechanical Engineering at Purdue University, 1995-1996  
Purdue Research Foundation Summer Research Grant, 1996  
Honorary Undergraduate Research Assistantship, Mechanical Engineering Department, UW Milwaukee  
Science and Engineering Research Semester Grant, U.S. Department of Energy, Los Alamos National Laboratory, 1989  
Recipient of the "Carl Romer Memorial Scholarship," Mechanical Engineering Department, UW Milwaukee

## PUBLICATIONS (partial list—complete list is available on request)

- Bernardin, J.D. and Mudawar, I., 2006, "Transition Boiling Heat Transfer of Droplet Streams and Sprays," *ASME Journal of Heat Transfer*, (Submitted for Review).
- Jones, D.C and Bernardin, J.D., 2006, "Thermal Modeling and Experimental Verification of the Interstellar Boundary Explorer's High Energy Neutral Atom Imaging Instrument (IBEX-Hi)," *Proceedings to the AIM Infotech@Aerospace 2007 Conference and Exhibit*, Rohnert Park, CA. (LA-UR-06-4259).
- Bernardin, J.D., Konecni, Z., and Wiens, R., 2006, "Design and Testing of a Prototype Atmospheric Gas Collection Apparatus for a Mission to Mars," *Proceedings to the 2006 ASME International Mechanical Engineering Congress and Exposition*, IMECE2006-14499, Chicago, IL.
- Prettyman, T.H., Bernardin, J. D., et al., 2006, "Gamma Ray and Neutron Spectrometer for Dawn," *Proceedings to the 37th Lunar and Planetary Science Conference*, Houston, TX.
- Bernardin, J.D., 2006, "The Performance of Methanol and Water Heat Pipes for Electronics Cooling Applications in Spacecraft Instrumentation," *Proceedings of the 2006 Spacecraft Thermal Control Workshop*, The Aerospace Corp., Los Angeles, CA. (LA-UR-04-8490).
- Jones, D.C and Bernardin, J.D., 2006, "Computational Modeling and Verification of the Interstellar Boundary Explorer's High Energy Instrumentation Payload (IBEX-Hi)," *Proceedings of the 2006 Spacecraft Thermal Control Workshop*, The Aerospace Corp., Los Angeles, CA. (LA-UR-06-0343).
- Bernardin, J.D. and Mudawar, I., 2005, "Transition Boiling Heat Transfer of Droplet Streams and Sprays," *Proceedings to the 2005 ASME International Mechanical Engineering Congress and Exposition*, IMECE2005-79351, Orlando, FL.
- Bernardin, J.D. and Mudawar, I., 2004, "A Leidenfrost Point Model for Impinging Droplets and Sprays," *ASME Journal of Heat Transfer*, Vol. 126, pp. 272-278.
- Bernardin, J. D. and Mudawar, I., 2002, "A Cavity Activation and Bubble Growth Model of the Leidenfrost Point," *ASME Journal of Heat Transfer*, Vol. 124, pp. 864-874.
- Bennett, M., Bernardin, J., Boissevain, J., Chang, C., Clark, D., Conway, R., Cunningham, R., Emerey, M., Ericson, N., Fung, S.Y., Hahn, S., van Hecke, H., Jaffe, D., and Kang, J.H., 1999, "Simulations of the Performance of the MVD in PHENIX," *IEEE Transactions on Nuclear Science*, Vol. 46, pp. 2022-2026.
- Bernardin, J. D. and Mudawar, I., 1999, "The Leidenfrost Point - Experimental Study and Assessment of Existing Models," *ASME Journal of Heat Transfer*, Vol. 121, pp. 894-903.

