John C. Crepeau

Work: University of Idaho, 1776 Science Center Drive, Idaho Falls, ID 83402 Tel (208)282-7955, Fax (208)282-7950
Home: 3439 Spring Creek Drive, Idaho Falls, ID 83404-8213 Tel: (208)525-9335, E-mail: crepeau@uidaho.edu

EDUCATION:

University of Utah, Salt Lake City, Utah.
Doctor of Philosophy, Mechanical Engineering, June 1991.
Dissertation: "Spectral Entropy Behavior in Transitional Flows."

Santa Fe Institute, Santa Fe, New Mexico.
Complex Systems Summer School, June 1990.
Project: Nonlinear Dynamics of Boundary Layer Transition.

International Space University, Strasbourg, France.
Department of Space Policy and Law, August 1989.
Project: Variable Gravity Research Facility.

University of Utah, Salt Lake City, Utah.
Master of Science, Mechanical Engineering, December 1988.
Thesis: "A Deterministic Approach to Shear Flow Transition."

University of California, Berkeley, California.
Bachelor of Science, Mechanical Engineering, June 1983.

EXPERIENCE:

University of Idaho, Department of Mechanical Engineering, Idaho Falls, Idaho.
Professor: July 2007 – present; Associate Professor: July 2000 – June 2007; Assistant Professor, August 1994 – June 2000: Teach undergraduate and graduate courses in the general area of thermal-fluid science. Administer departmental activities at the Idaho Falls branch campus. Perform research in the areas of flow visualization, treatment of spent nuclear fuels, transition to turbulence in fluid mechanics, and natural convection and solidification of fluids with internal heat generation.

Courses taught:	CE 320, *Fluid Mechanics*	ME 345, *Heat Transfer*
	ME 546, *Convection Heat Transfer*	ME 527, *Thermodynamics*
	ME 520, *Fluid Dynamics*	ME 557, *Advanced Fluid Dynamics*
	ME 541, *Mech. Eng. Analysis*	ME 504, *Nuclear Heat Transport*
	ME 412, *Gas Dynamics*	EM 584, *Writing Winning Proposals*
	ME 526, *Statistical Thermodynamics*	ME 443, *Propulsion Systems*
	ME 504, *Turbulence*	ME 525, *Advanced Heat Transfer*

Andrulis Research Corp., Salt Lake City, Utah. March 1988-July 1992; September 1993-July 1994.
Engineer: Devised test plans and analyzed system performance for ion spectroscopy and laser detection devices. Wrote impact and equipment assessments related to the Chemical Weapons and Biological Weapons Treaties.

Humboldt University, Berlin, Germany. July 1992-June 1993.
NSF-NATO Postdoctoral Fellow: Studied the transition to turbulence between parallel plates and in circular pipes. Employed analytical techniques of non-equilibrium thermodynamics to model coherent structures.

University of Utah, Salt Lake City, Utah. July 1991-June 1992.
Visiting Assistant Professor:
Courses taught: ME 660, *Advanced Thermodynamics* ME 350, *Fluid Mechanics*

University of Utah, Salt Lake City, Utah. December 1988-June 1991.
Instructor:

Courses taught:	ME 364, *Heat Transfer*	ME 369, *Heat Transfer Laboratory*
	ME 350, *Fluid Mechanics*	ME 557, *Expr. Fluid Mechanics*

Hydroflame Corp., Salt Lake City, Utah. June 1988-September 1988.
Engineering Consultant: Designed and built a production prototype of an instantaneous hot water heater for recreational vehicle applications.

Hercules Aerospace Corp., Magna, Utah. June 1987-September 1987.
Engineer: Analyzed data from the II-III stage separation tests for the Midgetman missile system.

Litton Guidance and Control, Woodland Hills, California. July 1983-July 1984.
Engineer: Analyzed failures of the 28cm Ring Laser Gyroscope, and implemented corrective actions into the production procedure. Sustaining Engineer in charge of production of Ring Laser Gyroscopes.

PUBLICATIONS:

Siahpush, A., J. O'Brien and J. Crepeau, "Phase Change Heat Transfer Enhancement Using Copper Porous Foam," submitted to *Journal of Heat Transfer*.

Crepeau, J., and A. Siahpush, "Approximate Solutions to the Stefan Problem with Internal Heat Generation," to appear, *Heat and Mass Transfer*.

Rempe, J., D. Knudson, K. Condie, S.C. Wilkins, J. Crepeau, J. Daw, P. Green, "Options to Increase the Applicability of High Temperature Irradiation Resistant Thermocouples (HTIR-TCs)," Proc. NURETH-12, Sept 30 – Oct. 4, 2007, Pittsburgh, PA.

Crepeau, J., A. Siahpush and B. Spotten, "Comparison of Computational and Quasi-Static Solutions of Phase Change with Heat Generation," Proc. 2007 ASME Heat Transfer Conference, Paper #32162, 8-12 July, Vancouver, BC, Canada.

Daw, J., J. Crepeau, J. Rempe, D. Knudson, K. Condie, S.C.Wilkins, "Initial Results from Investigations to Enhance the Performance of High Temperature Irradiation-Resistant Thermocouples," Proc. 15th International Conference on Nuclear Engineering, Paper #10842, 22-26 April 2007, Nagoya, Japan.

Ferdows, M., K. Kaino and J. Crepeau, "Natural Convection of a Magnetohydrodynamic Flow Past a Semi-Infinite Vertical Porous Plate in a Porous Medium," to appear, *JP Journal of Heat and Mass Transfer*.

Ferdows, M., K. Kaino and J. Crepeau, "Natural Convection of a Magnetohydrodynamic Flow Past a Semi-Infinite Vertical Porous Plate in a Porous Medium with Internal Heat Generation, to appear, *International Journal of Heat and Technology*.

Crepeau, J., "Josef Stefan: His Life and Legacy in the Thermal Sciences," *Experimental Thermal and Fluid Science*, Vol. 31, 2007, pp. 795-803.

Crepeau, J., "From Rags to Research: The Life of Josef Stefan," *bridges*, online magazine of the Austrian Office of Science and Technology, Austrian Embassy of the United States, http://www.ostina.org/content/view/1667/640/.

Palmer, C., J. Crepeau, E. Mattson and R. Smith, "Equations of Flow through Porous Media in a Centrifugal Field," submitted to *Water Resources Research*.

Foust, T., J. O'Brien, J. Crepeau and M. Sohal, "Heat Transfer Enhancement and Pressure Drop Performance in a Single Finned Oval Tube with a Winglet Vortex Generator: A Detailed Analysis of Flow and Heat Transfer Patterns," submitted to *International Journal of Heat and Mass Transfer*.

Crepeau, J.C. and H.McIlroy, "Dye-Bubble Interactions in an Open Channel Flow," *Heat and Mass Transfer*, Vol. 42, 2005, pp. 104-111.

Crepeau, J.C., and A.Siahpush, "Effects of Internal Heat Generation on Solidification," *Proc. ASME Heat Transfer Conference*, 2005, Paper #72079, San Francisco, CA.

Siahpush A., and J.C. Crepeau, "Integral Solutions of Phase Change with Internal Heat Generation," *Proc. 12th International Conference on Nuclear Engineering*, Paper No. 49412, 2004, Arlington, VA.

Crepeau, J.C., "Introduction to Hydrodynamic Stability," by P.Drazin, book review, *Applied Mechanics Review*, Vol. 56, May 2003, pp. B43-B44.

Crepeau, J.C., "Theory and Applications of Nonviscous Flows," by R.K. Zeytounian, book review, Applied Mechanics Review, Vol. 55, Sept. 2002, B97-B98.

Crepeau, J.C., and H.M.McIlroy, "Dye Interactions with Rising Bubbles in a Crossflow," *Journal of Visualization*. Vol. 4, No. 3, 2001, p.215.

Crepeau, J.C., "Nonlethal Weapons: War without Death," by D.A. Morehouse, book review, *Peace and Change*, Vol. 25, October 2000, pp.542-543.

Crepeau, J.C., and H.M.McIlroy, "Effect of a Passivation Reaction on a Boundary Layer Flow," *Proc. 9th International Symposium on Flow Visualization*, ed. G.M.Carlomagno and I. Grant, Edinburgh, Scotland, 22-25 Aug. 2000, paper number 66.

Crepeau, J.C., "The Other Missiles of October: Eisenhower, Kennedy, and the Jupiters 1957-1963," by P. Nash, book review, *Peace and Change*, Vol. 25, July 2000, pp.423-424.

Crepeau, John C., S. Reese, H.M.McIlroy, and R. Lords, "Drying of Mock Spent Nuclear Fuel Elements," *Drying Technology*, Vol. 16, 1998, pp. 545-560.

Crepeau, John C., and R.L. Clarksean, "Similarity Solutions of Natural Convection with Internal Heat Generation," *Journal of Heat Transfer*, Vol. 119, 1997, pp. 183-185.

Crepeau, John, "Tomorrow's Professor," book review, *ASEE Prism*, December 1997, pp.34-35.

Clarksean, R.L., J.C. Crepeau, P. Mueller, S. Gifford, P. Harris, and J.C. Batty, "The Role of Numerical Modeling and Experiments in the Design of a Freezing Point Measurement System," *Proc. National Heat Transfer Conference*, Baltimore, MD, Vol. 10, 1997, pp. 129-136.

Crepeau, J.C., "Center Manifold Theory and an Application to Fluid Mechanics," *Dynamik-Evolution-Strukturen*, ed. J. Freund, Verlag Koster, Berlin, 1996, pp.101-107.

Lords, R.E., Windes, W.E., Crepeau, J.C., and Sidwell, R.W., "Drying Studies of Simulated DOE Aluminum Plate Fuels," *Proc. DOE Spent Nuclear Fuel and Fissile Material Management Meeting*, 16-20 June, 1996.

Crepeau, John C., and H. Herzel, "Comparison of Spectral Entropy with Statistical Entropy in Selected Physical Systems," *Journal of Non-Equilibrium Thermodynamics*, Vol. 21, 1996, pp.169-174.

Crepeau, John C., "Spectral Entropy and Self-Organization," *Lectures in the Sciences of Complexity*, Vol. 3, eds. L. Nadel and D. Stein, Addison-Wesley, 1992, pp. 493-495.

Crepeau, J.C., "Probability and Heat," by Friedrich Schlögl. Book review in the *Journal of Non-Equilibrium Thermodynamics*, Vol. 17, 1992, pp. 191-192.

Crepeau, John C. and L.K. Isaacson, "Spectral Entropy as a Measure of Self-Organization in Transition Flows," *Proc. NATO Advanced Research Workshop on Self-Organization, Emerging Properties and Learning*, ed. A. Babloyantz, Plenum Press, Vol. 260, 1991, pp. 287-294.

Crepeau, John C., and L. King Isaacson, "Spectral Entropy Measurements of Coherent Structures in an Evolving Shear Layer," *Journal of Non-Equilibrium Thermodynamics*, Vol. 16, 1991, pp. 137-151.

Crepeau, John C., "Deterministic Analysis of a Free Shear Layer," *AIAA Student Journal*, Vol. 28, Number 4, Winter 1991, pp. 2-5.

Crepeau, J.C., and L. King Isaacson, "On the Spectral Entropy Behavior of Self-Organizing Processes," *Journal of Non-Equilibrium Thermodynamics*, Vol. 15, 1990, pp. 115-126.

Isaacson, L.K., M.K. Denison, and J.C. Crepeau, "Unstable Vortices in the Near Region of an Internal Flow Cavity," *AIAA Journal*, Vol. 27, Dec. 1989, pp. 1667-1672.

Crepeau, John C. and L.K. Isaacson, "Unstable Bursts In the Near Region of an Internal Free Shear Layer," *Proc. First National Fluid Dynamics Congress*, Cincinnati, Ohio, Vol. 2, July 25-28, 1988, pp. 853-857, AIAA-88-3578-CP.

CONFERENCE PRESENTATIONS:

Crepeau, J., A. Siahpush and B. Spotten, "Comparison of Computational and Quasi-Static Solutions of Phase Change with Heat Generation," Proc. 2007 ASME Heat Transfer Conference, Paper #32162, 8-12 July, Vancouver, BC, Canada.

"Effects of Internal Heat Generation on Solidification," with Ali Siahpush, ASME Heat Transfer Conference, San Francisco, CA, July 2005.

"Integral Solutions of Phase Change with Internal Heat Generation," International Conference on Nuclear

Engineering, Washington, DC, April 2004.

"Fundamental Equations for Fluid Flow in a Geocentrifuge," poster presented at the American Geophysical Union, San Francisco, CA, December 8-12, 2003.

"Computational Modeling of the Fluid Flow in a Representative Spent Nuclear Fuel Canister," American Nuclear Society 2002 Annual Meeting, Hollywood, Florida, June 9-13, 2002.

"Flow Visualization of a Chemically Reacting Boundary Layer," International Mechanical Engineering Conference and Exposition, Orlando, Florida, November 5-10, 2000.

"Effect of a Passivation Reaction on a Boundary Layer Flow," 9th International Symposium on Flow Visualization, Edinburgh, Scotland, August 22-25, 2000.

"Flow Visualization in the Presence of a Surface Reaction," American Physical Society, Division of Fluid Dynamics, New Orleans, LA, Nov. 1999.

"Drying Techniques for Wet-Stored and Particulate Spent Nuclear Fuel," International Drying Symposium, Thessalonica, Greece, August 19-22, 1998.

"The Role of Numerical Modeling and Experiments in the Design of a Freezing Point Measurement System," National Heat Transfer Conference, Baltimore, MD, August 8-12, 1997.

"Deterministic Analysis of a Blasius Boundary Layer," Paper AF6, American Physical Society, Division of Fluid Dynamics, Scottsdale, Arizona, 24-26 November 1991.

"Spectral Entropy Behavior in Self-Organizing Processes," Invited lecture, Humboldt University, Berlin, Germany, 21 October 1991.

"Dynamical Systems Study of Mixing and Boundary Layers," Institute of Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia, 9 August 1991.

"Deterministic Analysis of a Free Shear Layer," 17th Congress of the International Council of the Aeronautical Sciences, Stockholm, Sweden, 9-14 September 1990, Paper 7.9.2.

"Spectral Entropy and Self-Organization," 1990 Summer School on Complex Systems, Santa Fe Institute, 11 June 1990, Santa Fe, New Mexico.

"Unstable Bursts In the Near Region of an Internal Free Shear Layer," First National Fluid Dynamics Congress, Cincinnati, Ohio, 25 July 1988.

EXTERNALLY FUNDED RESEARCH:
"Enhancements to High Temperature In-Pile Thermocouple Performance," DOE Nuclear Energy Research Initiative (NERI), March 2006-March 2008, $399,999.

"Gas Test Loop Booster Fuel Hydraulic Tests," BEA, Idaho National Laboratory, September 2005-August 2006, $21,085.

"Heat Transfer Enhancement Using Oval Tubes and Vortex Generators," BBWI, March 2000-April 2002, $141,050.

"Chaos Modeling of Flow in Porous Media," BBWI, June 2000-September 2001, $27,541.

"Stabilization of Particulate Spent Nuclear Fuels Using Sodium Silicate," Lockheed Martin Idaho Technologies," April 1998-September 1998, $20,000.

"Drying Simulation Experiments," Lockheed Martin Idaho Technologies, June 1998-September 1998, $24,541.

"Pilot-Scale Oxide Reduction Impeller Design," Argonne National Laboratory, December 1997-June 1998, $24,987.

"Flow Visualization of Forced and Natural Convection in Internal Cavities," Department of Energy, Environmental Management Science Program, October 1997-September 2000, $1,077,000.

"Development of the Virtual Laboratory Experience," (Co-PI), Idaho SBOE, June 1997-June 1999, $179,400.

"Drying Characteristics of Mock Spent Nuclear Fuels," Lockheed Martin Idaho Technologies, May 1995 - September 1997, $184,597.

"Freezing Point Measurement System for Chemical Weapons," Associated Western Universities, May 1996-September 1996, $31,162.

"Remote Gas Analyzer Experiments," Lockheed Martin Idaho Technologies, August 1995-March 1996, $11,622.

"A Thermodynamic Approach to Fluid Transition," National Science Foundation-North Atlantic Treaty Organization Postdoctoral Fellowship, July 1992 - June 1993, $46,800.

TEACHING:
A thorough teaching portfolio has been assembled and is available upon request.

MAJOR PROFESSOR COMMITTEE SERVICE:
Tom Foust, Ph.D., Spring 2004
Jeremy Freeman, M.S., Fall 2003
Byron Hansen, Ph.D., Spring 2002
Daniel Wachs, Ph.D., Spring 2002
Scott Jackson, M.E., Fall 2001
Jay Roach, M.E., Spring 2001
Robert Spears, M.S., Spring 2001
Wesley Benjamin, M.S., Spring 2001
Scott Barrie, M.E., Fall 2000
Hugh M. McIlroy, M.S., Spring 2000
Mona Huffaker, M.E., Spring 2000
Rex Sheldon, M.E., Fall 1998
Mark Neeley, M.E., Summer 1998

Kyle Oswald, M.E., Spring 1997

AWARDS:

- Nominated, Annual Award for Teaching Excellence, University of Idaho, 2003-2004
- Kodak Award for Excellent Visualized Image, Visualization Society of Japan, 2002
- Idaho National Engineering and Environmental Laboratory Summer Faculty Fellow, 2001
- Summer Faculty Researcher, Argonne National Laboratory, Idaho Falls, Idaho, 1997
- NASA-ASEE Summer Faculty Fellow, NASA-Ames Research Center, 1996
- Associated Western Universities Summer Faculty Fellow, 1995
- Jesse and Mabel Hoffman Endowment Teaching Award, University of Idaho, 1995
- Instructor of the Year, Department of Mechanical Engineering, University of Utah, 1990-1991
- NSF Advanced Study Institute Travel Award, 1991
- John F. McCarthy, Jr. Memorial Award for the research paper entitled, "Deterministic Analysis of a Free Shear Layer," presented by the International Council of the Aeronautical Sciences during its 17th Congress held in Stockholm, Sweden, 9-14 September, 1990
- Abe M. Zarem Award for the research paper entitled, "Deterministic Analysis of a Free Shear Layer," presented by the American Institute of Aeronautics and Astronautics, Reno, Nevada, January, 1990
- California Alumni Scholar, University of California, Berkeley, 1979-1983

PROFESSIONAL REGISTRATION:
Registered Professional Engineer, State of Idaho, License #7902.

PROFESSIONAL SOCIETY MEMBERSHIPS:
ASME, APS, ASEE

PROFESSIONAL SERVICE:
Reviewer for:
DOE, Advanced Nuclear Research for Universities Grant Program, 2004
DOE Nuclear Engineering Education Research (NEER) Grant Program, 2000, 2001, 2003
US Civilian Research and Development Foundation, 2000, 2001, 2003
Journal of Thermophysics and Heat Transfer, 1999, 2002
ASME Journal of Solar Energy Engineering
Journal of Porous Media
Journal of Heat Transfer
Heat and Mass Transfer
Applied Thermal Engineering
AIAA Journal of Aircraft
International Conference on Nuclear Engineering, 1997
ASME National Heat Transfer Conference, 1995, 1996
International Mechanical Engineering Conference, 1995
International Journal of Heat and Mass Transfer, 2002

Major Committee Assignments:
Member, Technical Committee, APS Division of Fluid Dynamics, 2007 Annual Meeting
College of Engineering Strategic Planning Committee, 2006-2007
Dean, College of Engineering Search Committee, 2004
UI Strategic Reinvestment Program, 2002
Dean's Promotion and Tenure Task Force, 2000-2002

ASME Visualization of Heat Transfer Committee (K-22), 2000-present
Search Committee, UI-IF Dean, 2000
Graduate Committee, Department of Mechanical Engineering, 1998-present
Strategic Planning Committee, Department of Mechanical Engineering, 1998-2000
Planning Committee, Department of Mechanical Engineering, 1997-1998
ASME Idaho Section Scholarship Committee, 1997-1998
Search Committee, Department Chair, Department of Mechanical Engineering, 1995
Task Force for Engineering in Boise, 1994
Deans Council, College of Engineering, University of Utah, 1988-1989
Chairman, Engineers Week Committee, University of Utah, 1988-1989

CONSULTING:
Expert Witness, Weeks v. EIRMC, May-September 2005
Puna Geothermal Ventures, August 2002-August 2003
North Star Spaceport, May 1999-August 1999
Idaho Technologies, October 1998-March 1999

COMMUNITY SERVICE:
Cubmaster, Pack 135, Boy Scouts of America, June 1995 – July 1997
Member, Board of Directors, Westmark Federal Credit Union, May 1996 – May 1999
Scoutmaster, Troop 36, Boy Scouts of America, May 1987-September 1989
Youth baseball and basketball coach

SPECIAL SKILLS:
Familiar with DOS, SUN OS, VAX/VMS, UNIX, Windows and Macintosh operating systems, and associated word processing, spreadsheet, drawing and computational programs.
Programming languages: FORTRAN and BASIC.
Fluent in written and spoken Spanish; working knowledge of German.
SECRET clearance, 1991-1992

PERSONAL:
Born: 21 July 1961, Long Beach, California. US Citizen.
Married, three children.