

Department of Applied Mathematics
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EXPERIENCE

Instructor, APPM, University of Colorado at Boulder	9/03 – Present
Lecturer, APPM, University of Colorado at Boulder	5/01 – 5/03
Instructor, MCEN, University of Colorado at Boulder	9/96 – 8/98
Assistant professor, adjunct, MCEN, University of Colorado at Boulder	1/94 – 5/03
Part-time instructor, APPM, University of Colorado at Boulder	1/94 – 5/01
Engineering consultant, Kawamura Design, Broomfield, CO	9/93 – 5/94
Lead graduate teacher coordinator, Univ. of Colorado at Boulder	11/93 – 5/94
Research engineer, The Timken Company, Canton, OH	4/80 – 8/85

EDUCATION

University of Colorado, Ph.D. in Mechanical Engineering, 1993.
Massachusetts Institute of Technology, M.S. in Mechanical Engineering, 1980.
University of Colorado, B.S. in Applied Mathematics (distributed engineering minor), 1977.

COURSES TAUGHT AT CU BOULDER

GEEN 1300	Introduction to Engineering Computing
GEEN 1340	Calculus Ia with Algebra
GEEN 1345	Calculus Ib with Algebra
APPM 1350	Calculus I for Engineers
APPM 1360	Calculus II for Engineers
APPM 2350	Calculus III for Engineers
APPM 2360	Introduction to Linear Algebra and Differential Equations
APPM 2750	Java II
APPM 3050	Symbolic and Numerical Computation
APPM 4570	Statistical Methods
APPM 4650	Intermediate Numerical Analysis I
APPM 4660	Intermediate Numerical Analysis II
APPM 5040	Extend Your Limits
APPM 5570	Statistical Methods
MCEN 3022	Heat Transfer
MCEN 4027	Mechanical Engineering Senior Laboratory
MCEN 4030	Computational Methods
MCEN 4122	Thermodynamics II
MCEN 5022	Thermodynamics

CURRENT RESEARCH

Rapid solidification of undercooled pure liquids

This research involves the formulation, and solution, of a mathematical model to describe the effect of finite rate heat release on the macroscopic propagation speed of a solidification front through an undercooled pure liquid. Based on continuum equations, the model describes heat and mass transport in a volumetrically averaged mixture of solid and liquid in the thin phase transformation region. This thin solidification zone is examined on a length scale larger than any microstructural detail, yet smaller than macroscopic thermal conduction length scales in the pure liquid and solid regions. Arrhenius-type source terms are used to represent the volumetrically averaged, finite rate phase transformation process occurring within the solidification zone.

PUBLICATIONS

Henderson, K., Snyder, H., Curry, J., Norris, J.A. and Hoffman, P., "Scott the Baker." Submitted to *Journal of Undergraduate Science and Engineering*.

Norris, J.A. and Kassoy, D.R., "The Effect of Finite Rate Heat Release on the Transient Solidification of an Undercooled Pure Liquid." For submission to *Proceedings of the Royal Society of London, Series A*.

Norris, J.A. and Kassoy, D.R., "The Effect of Finite Rate Heat Release on the Solidification of an Undercooled Pure Liquid." *Proceedings of the Royal Society of London, Series A*, v. 454, pp. 2347–2370, 1998.

Norris, J.A. and Kassoy, D.R., "Effects of Finite Rate Phase Transformation Kinetics on the Steady-State Solidification Front Propagation Speed in Undercooled Pure Liquids." In *Phase Transformations and Systems Driven Far From Equilibrium*, (eds. E. Ma, P. Bellon, M. Atzmon, and R. Trivedi), v. 481, Materials Research Society Proceedings, Boston, MA, 1997.

Hetzner, D.W. and Norris, J.A., "Effect of Austenitizing Temperature on the Carbide Distributions in M42 Tool Steel." *Microstructural Science*, v. 17, pp. 91–101, 1989.

Weidman, P.D. and Norris, J.A., "Capillary Gravity Waves With Fixed Contact Lines: An Approximate Analysis." *PHC PhysicoChemical Hydrodynamics*, v. 9, no. 1/2, pp. 393–402, 1987.

PRESENTATIONS

"Phase Transformation Kinetics and Solidification Front Propagation in Undercooled Pure Liquids." Materials Research Society, 1997 Fall meeting, Boston MA, December 2, 1997.

"Solidification of Undercooled Pure Liquids." Metallurgy Department, Colorado School of Mines, Golden, CO. January 27, 1994.

"Effects of Finite Rate Phase Transformation on the Solidification of Undercooled Pure Liquids." The American Physical Society, 46th annual meeting of the Fluid Dynamics Division. Albuquerque, NM. November 23, 1993.

“Rapid Solidification of Highly Undercooled Melts.” Department of Mechanical Engineering, University of Colorado, Boulder, CO. March 2, 1992.

“An Approximate Analysis for Capillary-Gravity Waves with Fixed Contact Lines.” The American Physical Society, 39th annual meeting of the Fluid Dynamics Division. The Ohio State University, Columbus, OH. November 24, 1986.

DEPARTMENT SERVICE

Undergraduate committee, Dept. of Applied Mathematics, 2005 – present.

Faculty advisor, Theta Tau (Engineering fraternity), 2005 – present.

Freshman and sophomore advisor, Dept. of Applied Mathematics, 2006 academic year.

Freshman and fifth-year senior advisor, Dept. of Applied Mathematics, 2005 academic year.

Fifth-year senior advisor, Dept. of Applied Mathematics, 2004 academic year.

Undergraduate committee, Dept. of Mechanical Engineering, 1996 – 1998 academic years.

Faculty advisor, The American Society of Mechanical Engineers, 1996–1998 academic years.

UNIVERSITY SERVICE

Non-tenured at-large Boulder Faculty Assembly representative, 2006 – present.

Boulder Faculty Assembly representative to the CU Intercollegiate Athletics Committee, 2006 – present.

Boulder Faculty Assembly representative to the Chancellors Program Accessibility Committee, 2007 – present.

ASSOCIATIONS

Materials Research Society.

Tau Beta Pi (Engineering honorary fraternity).

The American Physical Society.

CERTIFICATIONS

Sun certified Java programmer.

Sun certified Java academic instructor.

TEACHING HONORS

CU-LEAD Faculty Award, CU-LEAD Alliance scholars, 2005.

Marinus Smith Teaching Award, CU Parents Association, 2004, 2006.

MEP Faculty Appreciation Award, Multicultural Engineering Program, 2002.

Residence Life Academic Teaching Award, 2002, 2004, 2006.