

Curriculum Vitae
J. Iwan D. Alexander

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Nationality: US

Positions and appointments held

- 2001- Professor of Mechanical and Aerospace Engineering, Case Western Reserve University, Cleveland, Ohio
- 1998- Chief Scientist, National Center for Microgravity Research on Fluids and Combustion, Case Western Reserve University, Cleveland, Ohio
- 1998-2001 Associate Professor of Mechanical and Aerospace Engineering, Case Western Reserve University, Cleveland, Ohio
- 1998- Associate Professor of Physics (secondary appt.), Case Western Reserve University, Cleveland, Ohio
- 1995-98 Associate Professor of Physics, University of Alabama in Huntsville
- 1991-98 Associate Director, Center for Microgravity and Materials Research, University of Alabama in Huntsville
- 1992-98 Adjunct Professor of Materials Science, University of Alabama
- 1991- Professeur Associée, Institute de Mécanique des Fluides de l'Université Aix-Marseille, France.
- 1991-95 Associate Research Professor of Physics, University of Alabama in Huntsville
- 1987-91 Senior Research Scientist, Center for Microgravity and Materials Research, University of Alabama in Huntsville
- 1985-87 Universities Space Research Association Visiting Scientist, Marshall Space Flight Center, Huntsville, Alabama
- 1982-85 Post-Doctoral Research Fellow, Departments of Mathematics and Physics, Mellon College of Science, Carnegie-Mellon University, Pittsburgh, Pennsylvania
- 1981-82 Assistant Professor of Oceanography and Ocean-Engineering, Florida Institute of Technology, Melbourne, Florida
- 1978-81 Teaching Assistant, Department of Geology, Washington State University, Pullman, Washington
- 1978 Research Assistant, Department of Geology, Washington State University, Pullman, Washington

Education and qualifications

- 1972-74 United World College of the Atlantic, Llantwit Major, Wales, U.K., International Baccalaureate
- 1974-77 University College Swansea, Wales, U.K.: B.Sc. Joint Honours, Geology and Oceanography
- 1978-81 Washington State University, Pullman, Washington, U.S.A., Ph.D., Geology

Teaching experience

1998-present EMAE 350 Engineering Analysis, EMAE 181, Dynamics, ENGR225
Introduction to Thermodynamics, Mass and Heat Transfer
1995-97 PH 560 Solid State Physics I, PH 561 Solid State Physics II
1991 PH 607- Mathematical Methods for Physicists (Graduate course)
1989 UAH Dept. of Continuing Education: Microgravity Environment Short Course.
1985 Carnegie-Mellon University, Department of Mathematics. Graduate course on
Stability Theory Applied to Problems in Hydrodynamics and Solidification.
1981-82 Florida Institute of Technology, Department of Oceanography and Ocean
Engineering: Introduction to Oceanography, Mineralogy, Petrology, Optical
Mineralogy, Tectonics, Marine Geology.

Academic Service

Chair: Case School of Engineering Research Committee, August 2002-present
Chair: Case School of Engineering Graduate Committee, 2000-2001
Case School of Engineering Graduate Committee, 1998-2000
Chair: Search committee for a Director of Technology Management, Summer, 2000
University Undergraduate Faculty Academic Computing Committee, 1999-2000
Case School of Engineering Undergraduate Curriculum Committee, 1998-1999
Chairman, graduate committee, Department of Physics 1993-1997
SACS Self-Study committee on Research and Creative activities, 1993-94
Physics Department Curriculum Committee, 1992-3

Societies

American Society of Mechanical Engineers
American Association for Crystal Growth
American Institute for Aeronautics and Astronautics
American Physical Society

Research Interests

My research interests cover a broad range of topics ranging from fluid physics and fluid mechanics to microscopic aspects of crystal growth. Most of my work over the last ten years has been associated with theoretical studies using both "closed form" analytical and numerical methods to solve the governing equations. During this period, I have also been involved with 5 space experiments, 3 involving crystal growth, a liquid diffusion experiment and an acceleration measurement experiment. Most recently I have become involved with exploring the interfaces between the biosciences and physical science and engineering, particularly those interfaces concerned with long and short-term manned space travel.

- Experimental and theoretical studies of the dynamics and static behavior of fluid surfaces and interfaces
- Vibrational convective transport in melts and inhomogeneous liquids

- Control of flow and nutrient transport in plant growth media under weightless conditions for advanced life support
- Physicochemical transport processes in biological systems
- Fluid transport processes in bone
- Dynamics of two phase miscible and immiscible fluids
- Binary and self-diffusion in liquid metals and compound semiconductors
- Effects of fluid convection (forced and free) on heat and mass transfer in melts and solutions associated with materials preparation processes

As chief scientist at the National Center for Microgravity Research on Fluids and Combustion I am directly involved in implementing the center's vision to become a focal point for microgravity fluids and combustion research that will develop a knowledge base for the design and development of reliable efficient and cost-effective space experiments.

Current research

- Fluid, Mass and Thermal Transport in Space Advanced Life Support Systems
- Vibrational and Thermovibrational flows.
- Numerical simulation of momentum, thermal, species transport and phase changes in fluid systems.
- Stability and dynamics of nonaxisymmetric liquid bridges. (Experiment, theory and numerical simulation)
- Simulation of self-diffusion in liquid metals: effects of magnetic fields and disturbances due to residual flow. Analysis of experimental diffusion data.
- Flow and transport in loose porous media with application to plant growth in low and reduced gravity environments.
- Flow and transport in cell culture bioreactors

Previous research

- Orbital processing of high quality CdTe semiconductors (co-investigator on a space experiment flown on USML-2, in October 1995) numerical simulation of transport and dewetting phenomena.
- Stochastic models for the prediction of microstructure in binary eutectic systems.
- Nonlinear analysis of the morphological stability of a solidifying binary alloy, with latent heat effects at the solid-fluid interface.
- The determination of the residual acceleration environment in Spacelab and problems associated with reduction and dissemination of residual acceleration data taken from low earth-orbit spacecraft.
- Passive Accelerometer Experiment: acceleration measurements using a novel accelerometer on the MIR space station

- Formulation of a mathematical model of the microgravity field in a spacecraft, including the effects of variable spacecraft attitude and atmospheric drag. Examination of the model's effect on free particle motion and fluid motion.
- Thermodynamics of surfaces in solid-liquid and two-phase solid systems. The work included an examination of surfaces of arbitrary shape and included elastic effects, both in the bulk solid and in the surface. Conditions necessary for thermomechanical equilibrium were obtained using a variational approach.
- Coupling of strain effects with phase transformation kinetics. The general problem here is to calculate, at each instant of time, the strain field about a precipitate of arbitrary shape, growing from a solid solution. This work is part of a study of the effects of elastic strains on interface morphology during diffusion-controlled precipitation in solids.
- Stress-assisted diffusion in solids. Examining in detail the approaches of mixture theory, and "irreversible thermodynamics," an attempt to deduce appropriate constitutive relations for diffusion in stressed solids from first principles.
- Dissertation research: application of fluid dynamic models to problems associated with the buckling of layered rocks subjected to low rates of strain. Ph.D. Thesis: "Folds and Folding in Single- and Multilayered Rocks: Mathematical Models and Field Observations." Washington State University, 1981.

Graduate students

Ph.D.

- Yuen Zhao, Ph.D. Candidate, Mechanical and Aerospace Engineering, Case Western Reserve University, *Effects of vibration on heat and mass transfer in partially molten systems under terrestrial and low gravity conditions*, 1999-
- Gary Wilson, Ph.D. Candidate, Mechanical and Aerospace Engineering, Case Western Reserve University, *Interfacial instability in a miscible two-phase flow*, 2000-
- Josee Adamson, Ph.D. Candidate, *Fluid and transport effects on the growth of osteoblast monolayers*, 2002-
- Stephen Barsi, Ph.D. Candidate, Mechanical and Aerospace Engineering, *Zero Boil-off Pressure Control of Space Propellant Tanks*, 2002-
- Qingming Chang, *A Lattice Boltzmann approach to the simulation of non-isothermal convective processes in two-phase liquids*. 2002-
- Nicholas Georgiadis, Ph.D. 2001, Mechanical and Aerospace Engineering, Case Western Reserve University, *Large Eddy Simulation of Compressible Turbulent Mixing Layers*,
- Kok Ngai Loo, Ph.D., 2000, Physics, University of Alabama in Huntsville, *Monte Carlo simulation of the surface morphology of Potassium Dihydrogen Phosphide (KDP) crystals during growth from solution*.
- Andrew H. Resnick, Ph.D. 1997, Physics, University of Alabama in Huntsville, *Experimental Study of the dynamics and statics of nonaxisymmetric liquid bridges*.
- Susan Hill, Ph.D. 1996, Materials Science, University of Alabama in Huntsville, *Monte-Carlo simulation of electrodeposition*.

Phillipe Larroude Ph.D. 1995, Institute de Mécanique des Fluides de Marseille, University of Aix-Marseille II, France, *Flow transitions in models of directional solidification*).

M.S.

Tiffany Boarts, M.S. Candidate, *Infiltration flows during the processing of woven fiber composites*, 2002-

Viral Patel, M.S. 2000, Mechanical and Aerospace Engineering, Case Western Reserve University, *Stability margin for weightless liquid bridge*.

Michael Dumesh, M.S., 2000, Case Western Reserve University, *Application of dynamic light scattering to the study of grid-generated turbulence in a wind tunnel*.

Ray Matthews, MS 1995, Mechanical Engineering, University of Alabama in Huntsville, *Oscillatory thermocapillary convection at high Marangoni number*.

Helene Cordier, MS 1992, Mechanical Engineering, University of Alabama in Huntsville, *A Chebyshev spectral collocation method for 2D thermocapillary flows*.

Sakir Amiroudine, MS 1992, Mechanical Engineering, University of Alabama in Huntsville, *Bridgman-Stockbarger crystal growth in low gravity: Numerical analysis of the effects of orientation and magnitude of oscillatory acceleration*.

Randy Wolf, MS 1993, Computer Science, University of Alabama in Huntsville, *Analysis of ill-understood datasets using a combination of techniques*.

Honors and service to scientific community

Member Committee on Microgravity Research, National Science Council, 2001-present

Member Consolidated Space Operations Contract: Science Working Group, 1999-2002

Member, Microgravity Fluid Physics Discipline Working Group, 1998-present

Member, Microgravity Science Advisory Board, Universities Space Research Association, January, 1998 - 2001.

Convener, Microgravity Science Advisory Board, Universities Space Research Association, January, 1996 - 1998.

Vice -Chair Committee on Space Research (COSPAR) Commission G, July, 1994 - June, 1996.

Session organizer and Chair: "Fluid Dynamics of Materials Processing" 20th International Congress of the International Union of Theoretical and Applied Mechanics (IUTAM), August 27- September 2, 2000, in Chicago, Illinois, USA.

Session Chair: "Electromagnetic Processing of Materials", 20th International Congress of the International Union of Theoretical and Applied Mechanics (IUTAM), August 27- September 2, 2000, in Chicago, Illinois, USA.

Discussion leader, Gordon Research Conference on Gravitational Effects on Physico-Chemical Systems, Henniker, N.H., June 27- July 2 1999.

Discussion leader, Gordon Research Conference on Thin Films and Crystal Growth Mechanisms, Plymouth, N.H., June 20-25, 1999.

Invited Lecturer, Summer School on "Free Surface Flows," Centre International des Sciences Mecaniques, Udine, Italy, September 1-5, 1997.

Co-Chair, Gordon Research Conference on Thin Films and Crystal Growth Mechanisms, Plymouth, N.H., July 6-11, 1997.

- Chair, Gordon Research Conference on Gravitational Effects on Physico-Chemical Systems, July 9-14, 1995.
- Session Convener for "Kinetics," International Conference on Crystal Growth (ICCG XI), The Hague, Netherlands, June 18-23, 1995.
- Invited Lecturer, International Summer School on Crystal Growth (ISSCG IX), Arnhem, Netherlands, June 11-16, 1995.
- Invited Lecturer, Summer School on "Liquid Bridges: theory and applications," Centre International des Sciences Mecaniques, Udine, Italy, July 17-21, 1995.
- Vice-Chair, Gordon Research Conference on Crystal Growth, Proctor Academy, N.H., June 26-July 3, 1994.
- Vice-Chair, Gordon Research Conference on Gravitational Effects on Physico-Chemical Systems, Henniker, N.H., July, 1993.
- NASA Technical Innovation Award for the development of the "Passive Accelerometer" 1991.
- Principal Investigator for the "Passive Accelerometer System" experiment on NASA's Spacelab mission: "United States Materials Science Laboratory" (USML-1), June 1992.
- Reviewer for: Physics of Fluids, Journal of Fluid Mechanics, Journal of Crystal Growth, Physical Review A, Physical Review E, Physical Review Letters, AIAA Journal of Spacecraft and Rockets, AIAA Journal of Thermophysics and Heat Transfer, Journal of Numerical Methods in Fluids and the Materials Science and Engineering Journal, Microgravity Science and Technology, Journal of Heat Transfer

Manuscripts in preparation and submitted for publication

- L.A. Slobozhanin and J.I.D. Alexander, Stability of a disconnected surface filling a slit pore, submitted to Physics of Fluids (2003)
- X. Ai, B. Li, and J.I.D. Alexander, "The spectral and HOFD methods for computational fluid dynamics: a comparison, submitted to J. Computational Physics (2002).

Publications in refereed journals and books

- L.A. Slobozhanin and J.I.D. Alexander, Universal stability diagrams for disconnected capillary surfaces, Physics of Fluids, 15, 3532-3545 (2003).
- L.A. Slobozhanin and J.I.D. Alexander, "On the stability of double bubbles and drops," J. Colloids and Interface Science 262, 212-220 (2003).
- J. P. Kizito, J.I.D. Alexander and M. A. Banish, Transient effects in Diffusion Measurements, Journal of Thermophysics and Heat Transfer 17, 186-192 (2003).
- L.A. Slobozhanin and J.I.D. Alexander, "On the stability of double bubbles and drops, in press, J. Colloids and Interface Science (2003).
- N. J. Georgiadis, J.I.D. Alexander, and E. Reshotko, A hybrid RANS/LES method for compressible mixing layer simulations," AIAA Journal Vol. 41, 218-229, (2003).
- M.P. Mahajan, M. Tsige, S. Zhang, J. I. D. Alexander, P.L. Taylor, and Charles Rosenblatt, "Resonance behavior of liquid bridges under axial and lateral oscillating total body forces," Experiments in Fluids, 33, 503-507, (2002).

- Y.-Y. Khine, M. A. Banish and J.I.D. Alexander, Convective effects during diffusivity measurements in liquids with an applied magnetic field, *International Journal of Thermophysics*, 23, 649-664, 2002.
- R.M. Banish, L.B.J. Albert, T.L. Pourpoint, J.I.D. Alexander and R.F. Sekerka, "Mass and thermal diffusivity algorithms - Reduced algorithms for mass and thermal diffusivity determinations," *Ann. N.Y. Acad. Sci.*, 974, 146-156 (2002).
- N. Bhat, M.R. Dodge, J.I.D. Alexander, L.A. Slobozhanin, P.L. Taylor and C. Rosenblatt, "Stability of connected cylindrical bridges", *Physical Review E*, 65. 026306- (2002).
- L. A. Slobozhanin, J. I. D. Alexander and V. Patel, "The stability margin for weightless liquid bridges" *Physics of Fluids*, 14, 209-224 (2002).
- N. E. Daidzic, J.I.D. Alexander and C.A. Camardo, "Some aspects of the fluid flow in a porous media in microgravity conditions for space plant production systems," *Mag. Resonance Imaging*, 19, 593-59, (2001).
- Bhim. S. Singh, F. Kohl and J. Iwan Alexander, "Going with the flow: Microgravity Fluid Physics", *Aerospace America*, pp. 20-22, October 2001.
- J. Meseguer, J.M. Perales and J.I.D. Alexander "A perturbation analysis of the stability of long liquid bridges between almost circular supporting disks", *Physics of Fluids*, 13, 2724-2727, (2001).
- J. P. Garandet, J.I.D. Alexander, S. Corre and J.J. Favier, "Composition variations induced by g-jitter in Bridgman Growth of Sn-Bi Alloys in microgravity," *J. Crystal Growth*, 226, 543-554, (2001).
- L. A. Slobozhanin, J.I.D. Alexander "Stability of disconnected free surfaces in a cylindrical container under zero gravity: simple cases" *Physics of Fluids*, 12, 2800-2808, 2000.
- R. M. Banish, J.I.D. Alexander and L.B. Jalbert, Experimental confirmation of the insensitivity of mass diffusion measurements to blockages and voids along the diffusion path" *Rev. Sci. Instr.*, 71, 4497-4501, (2000).
- F. Zayas, J.I.D. Alexander and J. Meseguer, On the stability of slender nonaxisymmetric liquid bridges, *Physics of Fluids*, *Physics of Fluids*, 12 979-985, 2000.
- P. Vekilov and J.I.D. Alexander, Dynamics of layer growth in protein crystallization, *Chemical Reviews*, 100, 2061 –2090, 2000.
- A. I. Fedoseyev and J.I.D. Alexander, Investigation of vibrational control of convective flows in Bridgman melt growth configurations, *J. Crystal Growth*, 211, 34-42, 2000.
- M.P. Mahajan, M. Tsige, S. Zhang, J. I.D. Alexander, P. L. Taylor, and C. Rosenblatt, "Collapse Dynamics of Liquid Bridges Investigated by Time-Varying Magnetic Levitation," *Physical Review Letters*, 84, 203-398, 2000.
- L. A. Slobozhanin, J.I.D. Alexander and A. I. Fedoseyev, "Shape and stability of doubly connected axisymmetric free surfaces in a cylindrical container," *Physics of Fluids*, 12, 3668-3777, 1999.
- L. A. Slobozhanin, J.I.D. Alexander and V. Rakov, "Contactless directional solidification," *J. Crystal Growth*, 207, 127-137, 1999.
- J.I.D. Alexander and R.M. Banish, "Modeling g-sensitivity of low-gravity experiments," *Microgravity Science and Technology*, 11, 90-95, 1999.

- L. A. Slobozhanin, and J.I.D. Alexander, "Combined effect of disk inequality and axial gravity on axisymmetric liquid bridge stability," *Physics of Fluids*, 10 (1998) 2473-2488.
- D.V. Lyubimov, T.P. Lyubimova, J. Iwan D. Alexander and N. Lobov, "On the Boussinesq approximation for fluids systems with deformable interfaces," *Advances in Space Research*, 22 (1998) 1159-1169.
- J. I. D. Alexander, "Drops, jets and bubbles," in *Free Surface Flows*, H. C. Kuhlman and H.-J. Rath, Eds., CISM Courses and Lectures No. 391 (Springer, Wien, New York, 1998) pp. 209-266.
- A. Lizée and J.I.D. Alexander, "Thermovibrational convection, parametric resonance and transitions to chaos," *Physical Review E*, 56, 4152-4156, 1997.
- S. Hill and J.I.D. Alexander, "Modified Diffusion limited aggregation simulation of electrodeposition," *Physical Review E*, 56, 4317-4327, 1997.
- F. Rosenberger, P.G. Vekilov, H. Lin and J.I.D. Alexander, "A rationale for system dependent advantages and disadvantages of solution crystal growth at low gravity," *Microgravity Science and Technology*, 1997.
- J.I.D. Alexander, J.P. Garandet, J.J. Favier and A. Lizée, "G-jitter effects on segregation during directional solidification of tin-bismuth in the MEPHISTO furnace facility," *J. Crystal Growth*, 178, 657-661, 1997.
- L. Slobozhanin, and J.I.D. Alexander, "Stability of an isorotating liquid zone in an axial gravity field," *Physics of Fluids*, 9, 1880-1892, 1997.
- L. Slobozhanin, J.I.D. Alexander and A. Resnick, "Bifurcation of the equilibrium states of a weightless liquid bridge", *Physics of Fluids*, 9, 1893-1905, 1997.
- J.I.D. Alexander, S. Delafontaine, A. Resnick, and W.C. Carter, "Stability of nonaxisymmetric liquid bridges, *Microgravity Science and Technology*," 9, 193-200, 1997.
- J.I.D. Alexander, J.-F. Ramus and F. Rosenberger, "Numerical simulations of the convective contamination of diffusivity measurements in liquids," *Microgravity Science and Technology*, 9, 158-162, 1997.
- A. Resnick and J.I.D. Alexander, "An apparatus for the liquid bridge experiments, *Review of Scientific Instruments*," 68, 1495-1500, 1997.
- Fedoseyev and J.I.D. Alexander, "An inverse finite element method for pure and binary solidification problems," *J. Computational Physics*, 130, 243-255, 1997.
- J.I.D. Alexander, Y. Zhang, S. Delafontaine and A. Fedoseyev, "Numerical Simulation of Liquid Bridge Dynamics and Statics," in *Numerical Methods in Heat and Mass Transfer Problems* (Institute for Problems in Mechanics, Russian Academy of Sciences, Moscow, 1997) pp.109-135.
- P. G. Vekilov, J.I.D. Alexander and F. Rosenberger, "Response of layer dynamics in the mixed kinetics-bulk transport regime," *Physical Review E*, 54, 6650-6660, 1996.
- J.P. Garandet, S. Corre, S. Gavoille, J.J. Favier and J.I.D. Alexander, "On the effect of gravity perturbations on composition profiles during Bridgman crystal growth in space," *J. Crystal Growth*, 165, 471-481, 1996.
- †J.I.D. Alexander, "Response of crystal growth experiments to time-dependent residual acceleration," *Lecture Notes in Physics Vol. 464*, Eds. L. Ratke, H. Walter and B. Feuerbacher (Springer Verlag, Berlin, 1996) 95-105.

- J.I.D. Alexander, "Estimation of experiment sensitivity to residual acceleration," *Microgravity Quarterly*, 5, 23-28, 1995.
- H. Lin, F. Rosenberger, J.I.D. Alexander and A. Nadarajah, "Convective-diffusive transport in protein crystal growth," *J. Crystal Growth*, 151, 153-162 (1995).
- M.J.B. Rogers, B. P. Matisak and J.I.D. Alexander, Venting force contributions to accelerations on USML-1, *Microgravity Science and Technology*, 7, 293-297 (1995).
- J.I.D. Alexander, Lattice Models, in *Science and Technology of Crystal Growth*, (Kluwer, 1995) pp. 81-95.
- J. Meseguer, M.A. González and J.I.D. Alexander, "Dynamic stability of long axisymmetric liquid bridges," *Microgravity Science and Technology*, 7, 234-242. 1994.
- Y.Q. Zhang and J.I.D. Alexander, "A Chebyshev collocation method for heat transfer, interface shape and convection during directional solidification," *International Journal of Numerical Methods for Heat and Fluid Flow*, 4, 115-129, 1994
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Eutectic and off-eutectic growth patterns," *Materials Science and Engineering*, A178, 233-238, 1994.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Monte Carlo studies of the interdependence of crystal growth morphology, growth kinetics and bulk transport," *Faraday Discussions*, 95, 85-95, 1993.
- P. Larroude, J. Ouazzani and J.I.D. Alexander, "Symmetry breaking flow transitions and oscillatory flows in a 2D directional solidification model," *European Journal of Mechanics B/Fluids*, 13, 353-381, 1994.
- J.I.D. Alexander, "Residual gravity jitter effects on fluid processes," *Microgravity Science and Technology*, 7, 131-136, 1994.
- M.J.B. Rogers, J.I.D. Alexander and J. Schoess, "Detailed analysis of Honeywell In-Space accelerometer data - STS-32," *Microgravity Science and Technology*, 6, 28-35, 1993.
- R. Wolf, M.J.B. Rogers and J.I.D. Alexander, "A residual acceleration data analysis and management system," *Advances in Space Research*, 13, (7)256-(7)265, 1993.
- A.J. Watkinson and J.I.D. Alexander, "Castile microfolding," in *Carlsbad Region, New Mexico and West Texas, New Mexico Geological Society Road Log*, pp. 14-16, 1993
- J.I.D. Alexander, R.-F. Xiao and F. Rosenberger, "Modelling growth morphologies on different length scales," *Materials Research Society Symposium Proceedings Vol. 278*, 269-280, 1992
- J.P. Pulicani, S. Krukowski, J.I.D. Alexander, J. Ouazzani, and F. Rosenberger, "Convection in an asymmetrically heated cylinder," *International Journal of Heat and Mass Transfer*, 35, 2119-2130, 1992.
- F. Rosenberger, J.I.D. Alexander and W.Q. Jin, " Gravimetric capillary method for kinematic viscosity measurements, " *Review of Scientific Instruments*, 63, 4196-4199, 1992.
- Y. Q. Zhang and J. I. D. Alexander "Surface tension and buoyancy-driven flow in a nonisothermal liquid bridge," *International Journal of Numerical Methods in Fluids*, 14, 197-216, 1992.
- Nadarajah, F. Rosenberger and J.I.D. Alexander, "Effects of buoyancy-driven flow and thermal boundary conditions on physical vapor transport," *Journal of Crystal Growth*, 118, 49-59, 1992.

- M.J.B. Rogers and J.I.D. Alexander, "Residual acceleration data analysis for spacelab missions," *Microgravity Science and Technology*, 5, 43-49, 1992.
- M.J.B. Rogers and J.I.D. Alexander, "Analysis of Spacelab 3 residual acceleration data," *AIAA Journal of Spacecraft and Rockets*, 28, 52-59, 1992.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Microscopic growth morphologies in a binary system," *Physical Review A*, 45, R571-574, 1992.
- J.I.D. Alexander, J. Ouazzani, S. Amiroudine and F. Rosenberger, "Analysis of low gravity tolerance of Bridgman-Stockbarger crystal growth. II: transient accelerations," *Journal of Crystal Growth*, 113, 21-38, 1991.
- J.I.D. Alexander, S. Amiroudine, J. Ouazzani and F. Rosenberger, "Numerical analysis of the sensitivity of crystal growth experiments to spacecraft residual acceleration," *Microgravity Science and Technology*, 4, 130-131, 1991. *extended abstract; Full article in: *Microgravity Fluid Mechanics* ed. H.J. Rath, Proceedings of the IUTAM Symposium, Bremen, Germany (Springer Verlag, Berlin, 1991) pp. 297-305.
- J.I.D. Alexander and Y.Q. Zhang, "The sensitivity of a nonisothermal liquid bridge to residual acceleration," *Microgravity Science and Technology*, IV, 128-129, 1991. extended abstract; Full article in: *Microgravity Fluid Mechanics*, ed. H.J. Rath, Proceedings of the IUTAM Symposium, Bremen, Germany (Springer Verlag, Berlin, 1991) pp. 167-174.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Simulation of surface morphologies in crystal growth from the vapor," *Journal of Crystal Growth*, 109, 43-49, 1991.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Growth morphologies of crystal surfaces" *Physical Review A* 43, 2977- 2992, 1991.
- M.J.B. Rogers and J. I.D. Alexander, "A strategy for residual acceleration data and reduction," *Advances in Space Research*, 11, (7) 5-(7)8, 1991.
- J.I.D. Alexander, "Microgravity experiment sensitivity to residual accelerations: A review," *Microgravity Science and Technology*, 3, No. 2, 52-68, 1990.
- J.I.D. Alexander and F. Rosenberger, "Bridgman crystal growth in low gravity: a scaling analysis,," in *Progress in Low-Gravity Fluid Dynamics and Transport Phenomena*, (AIAA, Washington D.C.) J. Koster and R. Sani, eds., 1990, pp. 87-117.
- F. Rosenberger, J.I.D. Alexander, A. Nadarajah and J. Ouazzani, "Influence of residual gravity on crystal growth processes," *Microgravity Science and Technology*, 3, 162-164, 1990.
- Nadarajah, F. Rosenberger and J. I.D. Alexander, "Modelling the solution growth of TGS Crystals in low gravity," *Journal of Crystal Growth*, 104, 218-232, 1990.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Growth morphology with anisotropic growth kinetics," *Journal of Crystal Growth*, 100, 313-329, 1990.
- Y. Q. Zhang and J.I.D. Alexander, Sensitivity of liquid bridges to axial vibration, *Physics of Fluids A*, 2, 1966-1974, 1990.
- J.I.D. Alexander, J. Ouazzani, and F. Rosenberger, "Analysis of the low gravity tolerance of Bridgman-Stockbarger crystal growth. I: Steady and impulse-type accelerations," *Journal of Crystal Growth*, 97, 285-302, 1989.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "Morphological evolution of crystals growing in the presence of a uniform drift: A Monte Carlo simulation," *Physical Review A*, 39, 6397-6401, 1989.

- J.I.D. Alexander, J. Ouazzani and F. Rosenberger, "Response of convective-diffusive transport to spatial and temporal variations in effective gravity," in Drops and Bubbles: The Third International Colloquium, Monterey California, September 1988 (AIP, New York, 1989).
- Ecker, D.O. Frazier and J.I.D. Alexander, "Fluid flow in the melt of solidifying monotectic alloys," Metallurgical Transactions A, 20, 2517-2527, 1989.
- J.I.D. Alexander and C.A. Lundquist, "Motions in fluids caused by microgravitational accelerations and their modification by relative rotation," AIAA Journal, 25, 34-39, 1988.
- J.I.D. Alexander, Oblique flow onto a growing crystal interface: An exact solution, Journal of Crystal Growth, 89, 251-256, 1988.
- G. B. McFadden, S. R. Coriell and J.I.D. Alexander, "Hydrodynamic and free boundary instabilities," Communications on Pure and Applied Mathematics, Vol. XLI 683-706, 1988.
- R.-F. Xiao, J.I.D. Alexander and F. Rosenberger, "The morphological evolution of a growing crystal," Physical Review A, 38, 2447-2456, 1988.
- J.I.D. Alexander and A.J. Watkinson, "Microfolding in the Permian Castille formation - an example of geometric systems in multi-layer folding," Bulletin of the Geological Society of America 101, 742-750, 1988.
- J.I.D. Alexander and C.A. Lundquist, "Residual motions caused by microgravitational accelerations," Journal of Astronautical Sciences, 35, 193-211, 1987.
- M. Radcliffe, M.C. Drake, G. Zvan, W.W. Fowles, J.I.D. Alexander, G.D. Roberts, J. K. Sutter and E. Bergman, "Fluid flow in low earth orbit," Polymer Preprints, 28, 463-464, 1987.
- W.C. Johnson and J.I.D. Alexander, "Interfacial conditions for thermomechanical equilibrium in two-phase solid systems," Journal of Applied Physics, 59, 2735-2746, 1986.
- J.I.D. Alexander, D.J. Wollkind and R.F. Sekerka, "A weakly non-linear stability analysis of the solidification of a dilute binary alloy," Journal of Crystal Growth, 79, 849-865, 1986.
- J.I.D. Alexander and W.C. Johnson, "Thermomechanical equilibrium in solid-fluid systems with curved interfaces," Journal of Applied Physics, 58, 816-824, 1985.
- J.I.D. Alexander, P.H. Leo, and R.F. Sekerka, "The elastic-fields associated with a perturbed cylindrical inclusion," Acta Metallurgica, 33, 975-983, 1985.
- P.H. Leo, J.I.D. Alexander and R. F. Sekerka, "The elastic-fields associated with a perturbed spherical inclusion," Acta Metallurgica, 33, 985-989, 1985.
- D. J. Wollkind and J.I.D. Alexander, "A Newtonian fluid model for the onset of plane folding in a single rock layer with surface tension effects," International Journal of Math. Modelling, 2, 319-384, 1981.
- D. J. Wollkind and J.I.D. Alexander, "Kelvin-Helmholtz and Rayleigh-Taylor instabilities in Newtonian fluid models of rock folding," SIAM J. of Applied Math., 42, 1276-1295, 1981.

Articles published in conference proceedings

Fred J. Kohl, Bhim S. Singh, J. Iwan Alexander, Nancy J. Shaw, Myron E. Hill and Frank J. Gati, "The NASA microgravity fluid physics program – knowledge for use on earth and future space missions," Proceedings of the 53rd International Astronautical Congress: The World Space Congress, IAC-02-T.4.02, October 10-19, Houston, Texas, 2002.

- N. J. Georgiadis, J.I.D. Alexander, and E. Reshotko, "Investigation of a compressible turbulent mixing layer using a hybrid RANS/LES Method," 15th AIAA computational fluid dynamics conference, June 11-14, 2001, Anaheim, CA.
- N. J. Georgiadis, J.I.D. Alexander, and E. Reshotko,, "Development of a hybrid RANS/LES method for compressible mixing layer simulations," AIAA Paper 2001-0289, January 2001.
- J.I.D. Alexander and L.A. Slobozhanin, "Stability of disconnected free surfaces of a capillary liquid: a review" AIAA Paper No. 2001-1070, 39th AIAA Aerospace Sciences Meeting & Exhibit 8-11 January 2001 / Reno, NV.
- J.I.D. Alexander and B. Singh, "Results of recent fluid physics and transport phenomena space flight experiments" Proceedings of the Space Technology and Applications International Forum (STAIF-2000), Jan. 30th-Feb. 3rd, 2000 Albuquerque, New Mexico.
- B. S. Singh and J.I.D. Alexander, Microgravity Fluid Physics and Transport Phenomena Experiments Planned aboard the International Space Station, Proceedings of the Space Technology and Applications International Forum (STAIF-2000), Jan. 30th-Feb. 3rd, 2000 Albuquerque, New Mexico.
- J. P. Kizito, J. I. D. Alexander, and R. M. Banish, Transient effects on diffusion measurements, Proceedings of the 38th Aerospace Sciences Meeting, January 10-13, 2000, Reno NV, 2000. AIAA Paper 2000-1017.
- B. S. Singh and J.I.D. Alexander, Microgravity Fluid Physics and Transport Phenomena Research: An overview of Recent Accomplishments-I Dynamics and Instabilities, 38th Aerospace Sciences Meeting, January 10-13, 2000, Reno NV, 2000. AIAA Paper 2000-0303.
- L. A. Slobozhanin, J.I.D. Alexander and A. I. Fedoseyev, Doubly connected axisymmetric free surfaces in a cylindrical container: shape, stability and application, AIAA Paper No. 99-1029 (1999).
- A. I. Fedoseyev and J.I.D. Alexander, Thermovibrational flow in Bridgman melt growth configurations, AIAA Paper No. 99-0839 (1998).
- D.V. Lyubimov, T.P. Lyubimova, J.I.D. Alexander and S.V. Shklyaev, Long-wave instability of a differentially heated two-layer system with a deformable interface, Proceedings of the Third International Conference on Multiphase Flow, ICMF'98, Lyon, France, June 8-12, 1998.
- R. M. Banish, L. Jalbert and J. I.D. Alexander, Self-diffusion in liquid elements, proceedings of the 1998 NASA Microgravity Materials Science Conference, Von Braun Center, Huntsville, Alabama, USA, July 14-16, 1998.
- R. M. Banish and J.I.D. Alexander, Thermophysical property measurements of Te-based II-VI semiconductors, Proceedings of the 1998 NASA Microgravity Materials Science Conference, Von Braun Center, Huntsville, Alabama, USA, July 14-16, 1998.
- J.I.D. Alexander, J.-J. Favier, J.-P. Garandet, Study of Interesting Solidification Phenomena on the Ground and in Space (MEPHISTO), Proceedings of the 1998 NASA Microgravity Materials Science Conference, Von Braun Center, Huntsville, Alabama, USA, July 14-16, 1998.
- J.I.D. Alexander, L. A. Slobozhanin, A.H. Resnick, J.-F. Ramus and S. Delafontaine, "Stability limits and dynamics of nonaxisymmetric liquid bridges," Proceedings of the 4th Microgravity Fluid Physics & Transport Phenomena Conference, Aug. 12-14, 1998, Cleveland, OH.

- A. Resnick and J.I.D. Alexander, "A coherent Fourier imaging system for liquid bridge experiments, Optical Pattern Recognition VIII, 22-23 April, 1997, SPIE Proceedings Reprints Vol. 3073, 469-477, 1997.
- J. Iwan D. Alexander, Impulses, Vibrations and random disturbances: Consequences for convective diffusive transport and fluid interfaces in low gravity experiments AIAA Paper No. 96-2073, Proc. 27th AIAA Fluid Dynamics Conference, June 17-20, New Orleans, La., 1996
- L. A. Slobozhanin, J.I.D. Alexander and A. Resnick, "Stability of Liquid bridges under reduced gravity," Proceedings of the 2nd Symposium on Fluids in Space, Naples, Italy, April 22-26, 431-439, 1996.
- A. Lizee and J.I.D. Alexander, "Transitions to chaos during vibrational forcing of a differentially heated cavity," Proceedings of the 2nd Symposium on Fluids in Space, Naples, Italy, April 22-26, 413-417, 1996.
- J. Ouazzani, J.C. Lo Pinto, R.T. Matthews and J.I.D. Alexander, A numerical study of 2D and 3D thermocapillary flow in rectangular boxes under different gravity conditions, Proceedings of the 2nd Symposium on Fluids in Space, Naples, Italy, April 22-26, 167-173, 1996.
- J.I.D. Alexander and M.J.B. Rogers, "Passive accelerometer system: Measurements on STS-50 (USML-1)," Proceedings of the USML-1/USMP-1 L+1 Conference, Huntsville, September, 1993, ed. D.O. Frazier, NASA CP 3773, 1994.
- B.P. Matisak , M.J.B. Rogers and J.I.D. Alexander, Analysis of the Passive Accelerometer System Measurements during USML-1," 32nd Aerospace Sciences Meeting, January 10-13, 1994, Reno NV, 1994. AIAA 94-0434, 1994.
- J.I.D. Alexander, H. Cordier, J. Ouazzani and Y. Zhang, Numerical Simulation of Thermocapillary flow under Zero and Low Gravity Conditions, AIAA Paper no. 93-0254, 31st Aerospace Sciences Meeting, Reno, Nevada, January, 1993.
- J.I.D. Alexander, M.J.B. Rogers and B.P. Matisak, "Passive accelerometer system: Measurements on STS-50," Proceedings of the USML/USMP L+1 Meeting, Huntsville, Alabama, September 1993.
- J.I.D. Alexander, H. Cordier, J. Ouazzani and Y. Zhang, Numerical Simulation of Thermocapillary flow under Zero and Low Gravity Conditions, AIAA Paper no. 93-0254, 31st Aerospace Sciences Meeting, Reno, Nevada, 1993.
- P. Larroude, J. Ouazzani and J.I.D. Alexander, "Flow Transitions in a 2D Directional Solidification Model," Proceedings of the 6th Material Science Symposium, European Space Agency, Brussels, Belgium, 1992.
- M.J.B. Rogers and J.I.D. Alexander, "Experiment Specific Processing of Residual Acceleration Data," Proceedings of the 30th Aerospace Sciences Meeting, January 6-9, 1992, Reno, Nevada, AIAA paper 92-0244.
- M.J.B. Rogers and J.I.D. Alexander, "Cross Correlation of On-Orbit Residual Accelerations in Spacelab," Proceedings of the 29th Aerospace Sciences Meeting, January 7-10, 1991, Reno, Nevada, AIAA paper 91-0348.
- M.J.B. Rogers and J.I.D. Alexander, "Cross-Correlation Analysis of On-orbit residual Accelerations in Spacelab," Proceedings of the 29th Aerospace Sciences Meeting, January 7-10, Reno, Nevada, AIAA paper 91-0348.

M.J.B. Rogers and J.I.D. Alexander, "A Strategy for Residual Acceleration Data Reduction and Dissemination," Proceedings of the 28th COSPAR Plenary Meeting, Den Haag, Netherlands, 1990.

A. Ecker, J.I.D. Alexander and D. Frazier, "Classification of Fluid Flow in Front of Solidifying Monotectic Alloys," Proceedings of the 7th European Symposium on Materials Sciences under Microgravity Conditions, Oxford, England, 10-15 September 1989 (ESA SP-295 January 1990).

J.I.D. Alexander and C.A. Lundquist, "Motions in Fluids Caused by Microgravitational Accelerations and their Modification by Relative Rotation," Proceedings of the AIAA 25th Annual Aerospace Science Meeting, Reno, Nevada, USA, January 12-16, 1987.

J.I.D. Alexander, J. Ouazzani and F. Rosenberger, Response of Convective-Diffusive Transport to Spatial and Temporal Variations in Effective Gravity, AIP Conference Proceedings 197, Drops and Bubbles: The Third International Colloquium, Monterey California, September 1988 (AIP, New York, 1989).

J.I.D. Alexander and J. Ouazzani, "A Pseudo-Spectral Collocation Method Applied to the Problem of Convective Diffusive Transport in Fluids Subject to Unsteady Residual Acceleration," Numerical Methods in Laminar and Turbulent Flow, C. Taylor, R. Sani and P. Gresho eds., Vol. 6 Part 2 (Pineridge Press, Swansea) p. 1043, 1989.

A. Ecker, J.I.D. Alexander and D.O. Frazier, "Simultaneous Temperature and Concentration Measurement in Front of Solidifying Systems Using the Two Wavelength Holographic Technique," Proceedings of the 6th Material Science Symposium, European Space Agency, Bordeaux, France, 2-5 December, 1986, (ESA SP-256, February 1987) p. 309.

J.I.D. Alexander and C.A. Lundquist, "Microgravity and Its Effects on Residual Motions in Fluids," Proceedings of the Measurement and Characterization of the Acceleration Environment on Board Space Station Workshop, Guntersville Alabama, August 11-14, (Teledyne-Brown Engineering, 1986).

J.I.D. Alexander and A.J. Watkinson, "The Importance of Geometric Systems in Multilayer Folding," Proceedings of the Tectonic Studies Group Conference on Periodicity in Geologic Structures, Nottingham, U.K., J. Structural Geology 1, p. 95, 1978.

Invited papers, seminars and lectureships

"Stability of equilibrium disconnected surfaces," Presented at the 34th COSPAR Scientific Assembly, The Second World Space Congress, Houston, USA, 10-19 October, 2002.

"Stability of disconnected surfaces", Presented at the Soc. Industrial and Applied Mathematics, 50th Anniversary and 2002 Annual Meeting, July 8-12, 2002, Philadelphia.

"Fluid Processes and their Significance for Space and Planetary Exploration," Presented at the ASGSB, Nov. 8-10, 2001, Alexandria, Virginia, 2001.

"Monte Carlo simulation of KDP growth morphologies", J.I.D. Alexander and K.N. Loo, presented at the 2001 Materials Research Society Annual Meeting, San Francisco, California, April 16-20, 2001.

"Scale problems in biotechnology and biomedical fluid processes" presented at the 3rd International Symposium on Scale Modeling (ISSM) III, Nagoya, Japan, September 10-13, 2000.

"Numerical simulation of solidification and crystal growth: Modeling or Muddling?" presented at the Materials Science and Engineering Fall Colloquium, Case Western Reserve University, September 5th, 1999.

"Results of recent fluid physics and transport phenomena space flight experiments" presented at Space Technology and Applications International Forum (STAIF-2000), Jan. 30th-Feb. 3rd, 2000 Albuquerque, New Mexico.

"Microgravity fluid physics and transport phenomena research" An overview of Recent Accomplishments-I Dynamics and Instabilities, presented at the 38th Aerospace Sciences Meeting, January 10-13, 2000, Reno NV, 2000.

"Modeling g-sensitivity", Presented at the Physical Sciences Working Group Workshop on g-sensitivity of planned experimentation on the International Space Station, ESTEC, Noordwijk, The Netherlands, 10-11 September, 1998.

"Vibrational, thermovibrational and g-jitter convective flows," 1999 Symposium on Optical Science, Engineering, and Instrumentation (SPIE Annual Meeting) 18-23 July 1999 Denver, Colorado.

"Microgravity fluids research: Industrial relevance" , 1999 Lecture series NASA-ASEE Summer Faculty Fellowship Program, NASA Glenn Research Center, July 16th, 1999.

"Modelling convective motions during solidification" 1999 Lecture series NASA-ASEE Summer Faculty Fellowship Program, NASA Glenn Research Center, July 31st, 1998.

"Jets, Drops and bubbles," Summer School on "Free Surface Flows," Centre International des Sciences Mecaniques, Udine, Italy, Sept. 1-5, 1997.

"G-Jitter and chaos," Gordon Research Conference on Gravitational Effects in Physico-Chemical Systems, Henniker, New Hampshire, June 29-July 4, 1997.

"Stability of liquid layers and bridges under microgravity," Royal Society of London/CIBA Foundation Discussion Meeting on Marangoni Effects in Crystallization, Portland Place, London, June 7th, 1997.

"Study of interesting solidification phenomena on the ground and in space (MEPHISTO)," USML-2 and USMP-3 Launch-plus 1 Year Conference, National Academy of Science, Washington D.C., February 10-11, 1997.

"Quantitative experimental characterization of g-jitter effects on directional solidification," 35th AIAA Symposium, Reno, Nevada, January 6-10, 1997.

"Large deformations of liquid bridges," The Second Symposium on Fluids in Space, Naples, Italy, April 22-26, 1996.

"Response of crystal growth experiments to time-dependent residual acceleration," Ninth European Symposium on Gravity Dependent Phenomena in Physical Sciences, Berlin 2-5 May, 1995

"Lattice growth models," International Summer School on Crystal Growth (ISSCG IX), Arnhem, Netherlands, June 11-16, 1995.

"Stability of nonaxisymmetric liquid bridges," European Low Gravity Research Association Biannual Meeting (ELGRA), Madrid, Spain, December 11-14, 1994.

"Scaling and estimation of experiment response to g-jitter" ESA Physical science working group meeting, Sept, 9th, 1994, ESA HQ, Paris France.

"What factors determine the influence of spacecraft attitude motions, vibration and transient disturbances on convective transport in Bridgman systems?" presented at Cospar, '94, Hamburg, Germany, July 1994.

"Analysis of experiment sensitivity to residual acceleration," International Symposium on Microgravity Science and Application, Beijing, China, May 10-12, 1993

"Modelling or muddling? Analysis of buoyancy effects on transport under low gravity conditions," presented at the World Space Congress, Washington D.C. August 28-September 5, 1992.

"Modelling growth morphologies on different length scales," presented at the Materials Research Society 1992 Spring Meeting, San Francisco, April 27-31, 1992

"Numerical analysis of the effects of low gravity on convection and transport," Case Western Reserve University, Department of Mechanical Engineering, February 6th, 1992.

"Numerical simulation of low-g fluid transport," AIAA Short Course on Low-Gravity Fluid Mechanics, January 10-12, 1992, Reno, Nevada

"The effects of vibration on convection and transport during directional solidification," University of Erlangen, September 10, 1991.

"Modelling crystal surfaces on different length scales," Gordon Research Conference on Crystal Growth, July 16 August 20, 1991, Plymouth State College, Plymouth, New Hampshire.

"Numerical analysis of the sensitivity of experiments to spacecraft low gravity environments," April 9, 1991, Clarkson University, Department of Mechanical Engineering, Potsdam, New York.

"Residual acceleration effects on low gravity experiments," Institute de Mécanique des Fluides de l'Université d'Aix-Marseille II, Marseille, France, January, 1991 (3 Lectures).

"Commercial numerical codes: To use or not to use? Is this the question?" Microgravity Fluids Workshop, Westlake Holiday Inn, Cleveland Ohio, August 7-9, 1990.

"Sensitivity of crystal growth experiments to residual accelerations," Gordon Conference on Gravitational Effects in Materials and Processes, July 30 -August 4, 1989, Plymouth State College, Plymouth, New Hampshire.

"The effect of microgravity conditions on solute transport during directional solidification," Low Gravity Science Lecture Series, University of Colorado, November 7th 1988.

"The morphological evolution of a growing crystal," Carnegie-Mellon University, Physics Colloquium, May 1, 1989.

"Experiment sensitivity : determination of requirements for vibration isolation," Vibration Isolation Technology Workshop, NASA Lewis, September 28-29, 1988.

"Response of convective-diffusive transport to spatial and temporal variations in effective gravity," Third International Colloquium on Drops and Bubbles, Monterey California, September, 1988.

"The effects of residual acceleration on fluid motion," Space Research and Applications Center Laboratory, 3M Center, Minneapolis, January 31, 1986.

"Thermomechanical equilibrium in solid-fluid and two-phase solid systems with curved interfaces," A.I.M.E.-A.S.M. Symposium on Elastic Effects on Phase Transformations, Detroit, Michigan, Sept. 16-20, 1984.

Contributed conference presentations

- “Stability of Disconnected Surfaces,” poster presented at the Gordon Research Conference on Gravitational Effects in Physico-chemical Systems, New London, Conn., July 2003.
- “Osteoblastic monolayers exhibit barrier functions,” J.R. Adamson, M.L. , J.I.D. Alexander , M.L. Knothe Tate, U. Hopfer , R.J. Midura, poster presented at the Gordon Research Conference on Gravitational Effects in Physico-chemical Systems, New London, Conn., July 2003.
- “Osteoblastic monolayers exhibit electrical resistance,” J.R. Adamson, M.L. , M.L. Knothe Tate, R.K. Kolb , J.I.D. Alexander , U. Hopfer , X. Su , R.J. Midura, poster presented at the 5th International Workshop Bone Fluid Flow Workshop, Cleveland, September 17-18, 2003.
- “Estimate of porosity length-scales in soils by MRI for microgravity plant growth experiments,” N.E. Daidzic, S. Altobelli , A. Caprihan, E. Schimdt and J.I.D. Alexander, 6th International Conference on MR Applications in Porous Media, Ulm, Germany, Sept. 8-12th, 2002.
- “Is a soap double double bubble stable?” L. Slobozhanin and J.I.D. Alexander, Applied Problems in Mechanics, 2002, St. Petersburg, June 27 – July 6, 2002.
- “Universal Diagrams of Stability for disconnected surfaces,” L. Slobozhanin and J.I.D. Alexander, Applied Problems in Mechanics, St. Petersburg, June 27 – July 6, 2002.
- “Uncoupling mass transport issues from the decrease of forces on cells in microgravity: predicting the mass transport and forces on cells in a perfused and stirred culture systems,” J. Kizito, E. Nelson, N. Searby, I. Alexander, M. Nall and D. Vandendriesche, Proceedings of the NASA Cell Science Conference Annual Investigators Working Group Meeting, San Francisco, February, 2002
- “Stability of disconnected surfaces”, J.I.D. Alexander, Soc. Industrial and Applied Mathematics 50th Anniversary and 2002 Annual Meeting, July 8-12, 2002, Philadelphia. (Invited paper).
- “The NASA microgravity fluid physics program – knowledge for use on earth and future space missions,” Fred J. Kohl, Bhim S. Singh, J. I. Alexander, Nancy J. Shaw, Myron E. Hill and Frank J. Gati, Proceedings of the 53rd International Astronautical Congress: The World Space Congress, IAC-02-T.4.02, October 10-19, Houston, Texas, 2002.
- “Stability of equilibrium disconnected surfaces,” J.I.D. Alexander and L. Slobozhanin, Presented at the 34th COSPAR Scientific Assembly, The Second World Space Congress, Houston, USA, 10-19 October, 2002. (Invited).
- “Low Gravity Fluid Mechanics” J.I.D. Alexander, presented at the Department of Pure and Applied Mathematics Colloquium, April 12th, 2001.
- “MR Imaging of wetting front dynamics: The effect of gravity,” A. Caprihan, N.E. Daidzic, E. Fukushima, J.I.D. Alexander, In Proc: 6th International Conference on Magnetic Resonance Microscopy, September 2001, Jubilee Campus, University of Nottingham.
- “Splashing Droplets,” Van der Wal, J.P. Kizito, G.M. Berger, J.I.D. Alexander and G. Trygvasson, presented at the 6th Microgravity Fluid Physics Workshop, August 14-16, 2002. Cleveland, Ohio.

- "Monte Carlo simulation of lattice structure effects on KDP crystal growth morphologies" J.I.D. Alexander and K.N. Loo, Third International 3rd Intl. Workshop on Modeling in Crystal Growth, Haupage NY, Oct. 18-20, 2000.
- "Stability of doubly connected and disconnected free surfaces in a cylinder under microgravity" J. I. D. Alexander and L. A. Slobozhanin, presented at the 20th International Congress of the International Union of Theoretical and Applied Mechanics (IUTAM), August 27-September 2, 2000, in Chicago, Illinois, USA.
- "The stability margin for zero-gravity liquid bridges", L. A. Slobozhanin and J. I. D. Alexander, presented at the 20th International Congress of the International Union of Theoretical and Applied Mechanics (IUTAM), August 27- September 2, 2000, in Chicago, Illinois, USA.
- "Thermovibrational flow control in Bridgman melt growth configurations," Alexandre I. Fedoseyev and J. Iwan D. Alexander, (Poster) Gordon Research Conference on Gravitational Effects on Physico-Chemical Systems, Henniker, N.H., June 19- June 23 1999.
- "Stability of doubly connected and simple disconnected free surfaces in a cylindrical container under zero-gravity" (Poster) L. A. Slobozhanin and J. I. D. Alexander, Gordon Research Conference on Gravitational Effects on Physico-Chemical Systems, Henniker, N.H., June 19- June 23 1999.
- "Quantitative experimental characterization of g-jitter effects on directional solidification," presented at the 35th AIAA Symposium, Reno, Nevada, January 6-10, 1997.
- "Monte-Carlo studies of the interdependence of crystal growth morphology, surface kinetics and bulk transport," Faraday Discussion No. 95: Crystal Growth: Equilibrium Structure, Interface Kinetics, Lattice Defects and their Inter-relationships, University of Strathclyde, April 14-16, 1993.
- "Numerical simulation of thermocapillary flow under zero and low gravity conditions" presented at the AIAA 31st Annual Aerospace Science Meeting, Reno, Nevada, USA, Jan. 11-14, 1993.
- "Detailed analysis of the Honeywell In-Space Accelerometer data STS-32," (poster) presented at the World Space Congress, Washington D.C. August 28-September 5, 1992.
- "A data base management system for residual acceleration data," (poster) presented at the World Space Congress, Washington D.C. August 28-September 5, 1992.
- "Vibrational convection and transport under low gravity conditions," Society of Engineering Science 28th Annual Technical Meeting, November 6-7 1991, Gainesville, Florida.
- "The sensitivity of a nonisothermal liquid bridge to residual acceleration," 5th Annual Alabama Materials Research Conference, September 25-26 1991, Birmingham, Alabama.
- "Numerical analysis of the sensitivity of crystal growth experiments to spacecraft residual acceleration," IUTAM Symposium on Microgravity Fluid Mechanics, September 2-6, 1991, Bremen, Germany.
- "The sensitivity of a nonisothermal liquid bridge to residual acceleration," IUTAM Symposium on Microgravity Fluid Mechanics, September 2-6, 1991 Bremen, Germany.
- "Low gravity accelerations: Influence on dopant redistribution during directional solidification," Third International Symposium on Experimental Methods for Microgravity Materials Science Research, COSPAR XXVIII Plenary Meeting, June 25-July 6, 1990.

- "Modelling the solution growth of TGS crystals in low gravity," Third International Symposium on Experimental Methods for Microgravity Materials Science Research, COSPAR XXVIII Plenary Meeting, June 25-July 6, 1990.
- "Convective-diffusive transport in Bridgman-Stockbarger configurations," First NATO Workshop on Computer Modelling in Crystal Growth from the Melt, Parma, Italy, April 6-7th, 1989.
- "Motions in fluids caused by microgravitational accelerations and their modification by relative rotation," AIAA 25th Annual Aerospace Science Meeting, Reno, Nevada, USA, Jan. 12-16, 1987.
- "Microgravity and its effects on the residual motions of fluids," Measurement and Characterization of the Acceleration Level On-board Space Station Workshop, Guntersville, AL, August 11-14, 1986.
- "A weakly non-linear analysis of the effect of latent heat on morphological stability," Workshop on the Structure and Dynamics of Partially Solidified Systems, Stanford Sierra Lodge, Lake Tahoe, California, May 12-16, 1986.
- "The effect of microgravity on the Stokes motion of a sphere," 10th Annual Congress on Applied Mechanics at Austin, Texas, June 16-20, 1986.
- "Boundary conditions for multilayer folds," Tectonic Studies Group Annual Meeting, Oxford, England, Dec. 1981;
- "Kelvin-Helmholtz and Rayleigh-Taylor instabilities in Newtonian fluid models of rock folding," Northwest Thermal and Fluid Sciences Workshop, Richland, WA, Oct., 1980.
- "A Newtonian fluid model appropriate for representing the onset of plane folding in a single rock layer," Geological Society of America Annual Meeting, San Diego, CA, Nov. 1979.
- "A discussion of some properties of multi-layer folds from New Mexico and Scotland," 52nd Annual Meeting of the NW Science Association, Bellingham, WA, 1979.
- "The importance of geometric systems in multilayer folding," Tectonic Studies Group Conference on Periodicity in Geologic Structures, Nottingham, U.K., November 1978.