CURRICULUM VITAE

JOHN R. GRANT

November 2017

EDUCATION

Ph.D., Department of AstroGeophysics
University of Colorado, Boulder, 1979
(adviser: W.H. Hooke)

M.A., Department of Physics
Dartmouth College, 1969
(adviser: R.A. Morrow)

B.A., Department of Physics
Centre College, 1967

Postdoctoral Fellow at the National Center for Atmospheric Research, 1978 – 1979
(adviser: D.K. Lilly)

EMPLOYMENT

June 2014- present	New England Research & Development, LLC
July 2006 – April 2014	Senior Principal Scientist, Alion Science & Technology
March 2001 – July 2006	Senior Principal Scientist, Anteon Corporation (purchased by Alion)
October 1987 – March 2001	Physicist, Naval Undersea Warfare Center
October 1982 – September 1987	Manager, Theoretical Fluid Dynamics, Gould, Inc.
November 1979 – August 1982	Senior Physicist, Science Applications, Inc. (Acting Manager, Fluid Dynamics Division, 9/1981 – 8/1982)

JOURNAL ARTICLES

Grant, JR & JS Marshall (2005) Diffusion velocity for a three-dimensional vorticity field. *Journal of Theoretical & Computational Fluid Dynamics* 19(6), 377-390.

Marshall, JS, JR Grant, AA Gossler and SA Huyer (2000) Vorticity transport on Lagrangian tetrahedral mesh. *Journal of Computational Physics* 161, 85-113.

Huyer, SA & JR Grant (2000) Solution of the 2D vorticity equation on a Lagrangian mesh. *AIAA Journal* 38, 774-783.

Marshall, JS & JR Grant (1997) A Lagrangian vorticity collocation method for viscous, axisymmetric flows with and without swirl. *Journal of Computational Physics* 138, 302-330.

Huyer, SA & JR Grant (1996) Computation of unsteady separated flow fields using anisotropic vorticity elements. *Journal of Fluids Engineering* 118, 839-849.

Marshall, JS. & JR Grant (1996) Penetration of a blade into a vortex core: vortex response and unsteady blade forces. *Journal of Fluid Mechanics* 306, 83-109.

Marshall JS & JR Grant (1996) A method of determining the velocity induced by highly anisotropic vorticity blobs. *Journal of Computational Physics* 126, 286-298.

Marshall, JS & JR Grant (1994) Evolution and break-up of vortex rings in straining and shearing flows. *Journal of Fluid Mechanics* 273, 285-312.

Chimonas, G & JR Grant (1984) Shear excitation of gravity waves. Part I: Modes of a two-scale atmosphere. *Journal of the Atmospheric Sciences* 41, 2269-2277.

Chimonas, G & JR Grant (1984) Shear excitation of gravity waves. Part II: Upscale scattering from Kelvin-Helmholtz waves. *Journal of the Atmospheric Sciences* 41, 2278-2288.

Merrill, JT & JR Grant (1979) A gravity wave-critical level encounter observed in the atmosphere. *Journal of Geophysical Research* 84, 6315-6320.

VanZandt, TE, JL Green, WL Clark & JR Grant (1979) Buoyancy waves in the troposphere: Doppler radar observations and a theoretical model. *Geophysical Research Letters* 6, 429-432.

PROCEEDINGS

Kirschner, IN, R. Chamberlin & JR Grant (2009) A simple approach to estimating three-dimensional supercavitating flow fields. *Proceedings of the Seventh International Symposium on Cavitation*, Ann Arbor, MI.

Grant, JR & IN Kirschner (2006) Steady high speed motion of an axisymmetric slender body in a bubbly liquid: behavior of the drag coefficient. *Proceedings of the Sixth International Symposium on Cavitation (CAV2006)* Wageningen, The Netherlands, September.

Grant, JR, & IN Kirschner (2005) Supercavitation in a bubbly mixture: toward a slender body theory and implications for drag. *Proceedings of the Second International Symposium on Seawater Drag Reduction (ISSDR 2005),* Busan, Korea.

Grant, JR, IN Kirschner, & JS Uhlman (2004) High-speed motion in bubbly flow: comments on drag. *Proceedings of the 2004 High-Speed Hydrodynamics International Summer Scientific School (HSH2004),* Chuvash Academy of Science and Art, Cheboksary, Russia. (invited lecture)

Grant, JR. & IN Kirschner (2003) High speed motion in bubbly flows. *Proceedings of the Fifth International Symposium on Cavitation*, paper number Cav03-GS-4-006, Osaka, Japan, November.

Imas, L., JR Grant, D Kring & WM Milewski (2003) Investigation of free-surface flow in the near-field of an advancing surface-piercing body using three-dimensional smoothed particle hydrodynamics. *Proceedings of the Eighth International Conference on Naval Ship Hydrodynamics,* Busan, Korea, September.

Huyer, SA & JR Grant (2000) Simulation of UUV recovery hydrodynamics. *Proceedings of the National Academy of Sciences Twenty-third Symposium on Naval Hydrodynamics*, Val du Reuil, France, September.

Huyer, SA & JR Grant (2000) Computation of unsteady naval hydrodynamics using a Lagrangian vorticity method. *AIAA Fluids Conference*, Paper No. 2000-2532, Denver, CO, June.

Grant, JR & JS Marshall (1999) Inviscid interaction of vortex rings: approach to singularity? *European Series in Applied and Industrial Mathematics (ESAIM) Proceedings, Third International Workshop on Vortex Flow and Related Numerical Methods, Vol. 7 Sept 1999*. Editors: A. Giovannini, G.H. Cottet, Y. Gagnon, A. Ghoniem, E. Meiburg. www.emath.fr/Maths/Proc

Huyer, SA & JR Grant (1999) Characterization of unsteady thruster hydrodynamics using Lagrangian vorticity methods, *ASME Fluids Engineering Division Summer Meeting*, Paper FEDSM99-6969, San Francisco, CA, July.

Huyer, SA & JR Grant (1997) Examination of unsteady flow past multiple bodies by solution of the vorticity equation. *AIAA 35th Aerospace Sciences Meeting*, paper no. 97-0661, Reno, January.

Huyer, SA & JR Grant (1996) Computation of incipient separation via solution of the vorticity equation on a Lagrangian mesh. *European Series in Applied and Industrial Mathematics, Vortex Flows and Related Numerical Methods II*, eds. Y Gagnon, G-H Cottet, DG Dritschel, AF Ghoniem, E Meiburg.

Marshall, JS, JR Grant & SA Huyer (1995) Computation and modeling of blade penetration into a vortex in an inviscid fluid, *AIAA 26th Fluid Dynamics Conference*, paper no. 95-2239, San Diego, June.

Marshall, JS & JR Grant (1995) A Lagrangian collocation method for vorticity transport in viscous fluids, *Forum on Vortex Methods for Engineering Applications Papers,* Sandia National Laboratory, Albuquerque, NM, February.

Grant, JR, S. A. Huyer & JS Uhlman (1995) Solution of the vorticity equation on a Lagrangian mesh using triangularization: computation of the Biot-Savart integral in three dimensions, *Forum on Vortex Methods for Engineering Applications Papers*, Sandia National Laboratory, Albuquerque, NM, February**.**

Huyer, SA & JR Grant (1995) Incorporation of boundaries for 2D triangular vorticity element methods, *Forum on Vortex Methods for Engineering Applications Papers,* Sandia National Laboratory, Albuquerque, NM, February.

Huyer, SA, JR Grant & JS Uhlman (1994) Computation of unsteady separated flow fields past an oscillating airfoil using discrete vortex elements, *AIAA 25th Fluid Dynamics Conference*, paper no. 94-2257, June.

Huyer, SA, JR Grant & JS Uhlman (1994) A vortex element representation of two-dimensional unsteady separated flow fields. *AIAA 32nd Aerospace Sciences Meeting,* paper no. 94-0075, Reno, January.

Huyer, SA, JR Grant & JS Uhlman (1993) Numerical solution of three-dimensional unsteady flow past a wing using a discrete vortex element algorithm, *ASME Fluids Engineering Spring Meeting,* Washington, D. C., June.

Uhlman, JS & JR Grant (1993) A new method for the implementation of boundary conditions in the discrete vortex element method, *ASME Fluids Engineering Spring Meeting,* Washington, D.C., June.

Grant, JR (1988) Some effects on laser propagation of turbulence due to wave breaking. *Proceedings SPIE 0874, Nonlinear Optical Beam Manipulation, Beam Combining, and Atmospheric Propagation*, 284-289, Los Angeles, April.

PRESENTATIONS

Grant, JR & JS Marshall (2004) Evolution of the magnitude and geometry of vorticity during inviscid interaction of vortex rings. *Meeting of the American Mathematical Society*, Lowell, MA, March.

Grant, JR (2003) Robust time stepping and boundary condition algorithms for Lagrangian vorticity methods. *Second MIT Conference on Computational and Solid Mechanics*, Cambridge, MA, June.

Grant, JR, SA Huyer & JS Uhlman (1994) Algorithms for integration and differentiation on irregularly spaced points, *Forty-Seventh Annual Meeting of the Division of Fluid Dynamics, American Physical Society,* Atlanta, GA, November.

Marshall, JS & JR Grant (1994) Penetration of a blade into a vortex core, *Forty-Seventh Annual Meeting of the Division of Fluid Dynamics, American Physical Society,* Atlanta, GA, November.

Uhlman, JS, JS Marshall, JR Grant & SA Huyer (1993) A note on the calculation of boundary forces by vortex methods, *Forty-Sixth Annual Meeting of the Division of Fluid Dynamics, American Physical Society,* Albuquerque, NM, November.

NUWC Technical Digest

Grant, JR & SA Huyer (1998) Modeling and Simulation of the Unsteady Flow over a Wide-Aperture Array, in Naval Undersea Warfare Center Technical Digest, ed. Richard Russell, August.

Grant, JR & SA Huyer (1996) Development of Lagrangian vorticity methods for computing unsteady flows, in Naval Undersea Warfare Center Technical Digest, ed. J. C. S. Meng, pp. 45 - 59, August.

AWARDS

Naval Undersea Warfare Center 'Excellence in Science', 1996.

PATENTS

Gieseke, TJ, R Kuklinski, AN Varghese, JR Grant (2004) Array system for supercavitating hydrofoils. Patent No. 7,120,088.

Huyer, SA, JR Grant, JS Uhlman, JS Marshall (2000) Method for computing three dimensional unsteady flows by solution of the vorticity equation on a Lagrangian mesh. Patent No. 6,424,923.

Grant, JR (1996) Apparatus and method for computing unsteady flows by direct solution of the vorticity equation. Patent No. 5,600,060.

Huyer, SA, JR Grant, JS Uhlman (1995) Apparatus and method for predicting flow characteristics. Patent No. 5,544,524.

INVITED SEMINARS

UMaryland, Mechanical Engineering, 1998
Brown U, Applied Mathematics, 1997
UCalifornia/Berkeley, Mathematics, 1997
UIowa, Mechanical Engineering & Hydraulics Institute, 1994
UCalifornia/Berkeley, Mathematics, 1994

CONTRACT AWARDS (award amounts representative but estimated, since access to those figures is now not available)

Uhlman, JS (PI), JR Grant & BS Paul, Future Platform Technology, *Office of Naval Research*, $250,000, 10/1/2013-3/30/2014.

Uhlman, JS (PI), JR Grant & BS Paul, Future Platform Technology, *Office of Naval Research*, $700,000, 10/1/2012-9/31/2013.

Uhlman, JS (PI), JR Grant & BS Paul, Future Platform Technology, *Office of Naval Research*, $800,000, 10/1/2011-9/31/2012.

Uhlman, JS (PI), JR Grant & BS Paul, Future Platform Technology, *Office of Naval Research*, $1,200,000, 10/1/2010-9/31/2011.

Kirschner, IN (PI) & JR Grant, High Speed Motion in Bubbly Liquids, *Office of Naval Research*, $70,000, 10/1/2008 – 9/31/2009.

Grant, JR (PI on subcontract), Distributed Shock Source, *Defense Advanced Research Projects Agency*, $150,000, 7/2008 – 2/2009.

Grant, JR (PI on subcontract), Acoustic Arrays for Torpedo Defense, *Defense Advanced Research Projects Agency*, $400,000, 4/2006 – 11/2007.

Grant, JR (PI on subcontract), Acoustic Arrays for Torpedo Defense, *Defense Advanced Research Projects Agency*, $375,000, 8/2004 – 11/2005.

Kirschner, IN (PI) & JR Grant, High Speed Motion in Bubbly Liquids, *Office of Naval Research*, $60,000, 10/1/2004 – 9/31/2005.

Kirschner, IN (PI) & JR Grant, High Speed Motion in Bubbly Liquids, *Office of Naval Research*, $100,000, 10/1/2003 – 9/31/2004.

Grant, JR (PI), Acoustic Effects of a Flapping Foil, *Office of Naval Research*, $40,000, 3/2004 – 8/2004.

Uhlman, JR (PI) & JR Grant, Vortex-Bubble Interaction for Microbubble Drag Reduction, *Defense Advanced Research Projects Agency*, $500,000, 3/2001 – 12/2002.

Grant, JR (PI), Fluid Forces on Yawed Cables, *Office of Naval Research*, $50,000, 10/2000 – 9/2001.

Grant, JR (PI), Forces on Propellers in Turbulent Flow, *Office of Naval Research*, $250,000, 9/1999 – 3/2001.

Grant, JR (PI), Calculation of Internal Flow, *Office of Naval Research*, $50,000, 3/1998 – 7/1998.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $65,000, 9/1996 – 10/1997.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $65,000, 9/1995 – 10/1996.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $65,000, 9/1994 – 10/1995.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $130,000, 9/1993 – 10/1994.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $120,000, 9/1992 – 10/1993.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $90,000, 9/1991 – 9/1992.

Grant, JR (PI) & JS Uhlman, Calculation of Flow Using a Lagrangian Vortex Method, *Office of Naval Research*, $60,000, 10/1990 – 9/1991.

Grant, JR (PI), Turbulence Produced by Breaking Gravity Waves, *Office of Naval Research*, $25,000, 10/1990 – 9/1991.

Grant, JR (PI), Turbulence Produced by Breaking Gravity Waves, *Office of Naval Research*, $25,000, 10/1989 – 9/1990.

Grant, JR (PI), Turbulence Produced by Breaking Gravity Waves, *Office of Naval Research*, $25,000, 10/1988 – 9/1989.

Grant, JR (PI) & JT Merrill, Turbulence Produced by Breaking Gravity Waves, *National Science Foundation*, $30,000, 10/1985 – 9/1986.

Grant, JR (PI), Turbulence Produced by Breaking Gravity Waves, *Air Force Office of Scientific Research*, $30,000, 10/1984 – 9/1985.