VITA: CHESTER E. GROSCH - January, 2017

EDUCATION

M.E.	1956	Stevens Institute of Technology	Engineering
M.S.	1959	Stevens Institute of Technology	Applied Mathematics
Ph.D	1967	Stevens Institute of Technology	Physics-Fluid Dynamics

PROFESSIONAL POSITIONS

June 2016 — Professor Emeritus of Ocean, Earth & Atmospheric Sciences, Old Dominion University
June 2016 — Eminent Professor Emeritus, Old Dominion University
1973 to May 2016 — Samuel L. & Fay M. Slover Professor of Oceanography, Old Dominion University
1989 to May 2016 — Eminent Professor, Old Dominion University
1982 to 2010 — Joint Appointment, Professor of Computer Science, Old Dominion University
1989 — Royal Society Guest Research Fellow, University of Cambridge, U.K.
1980 to 2000 — Consultant, Institute for Computer Applications in Science & Engineering (ICASE).
1972 — Visiting Fellow in Computational Physics, University of Reading, U.K.
1971 to 1973 — Chair, Dept. of Computer Science & Director Computer Center, Pratt Institute
1969 to 1973 — Associate Professor of Computer Science and Physics, Pratt Institute
1968 to 1969 — Scientist, Teledyne-Isotopes, Inc.
1968 to 1972 — Adjunct Assistant Professor of Ocean Engineering, Columbia University
1966 to 1968 — Research Associate, Hudson Laboratories, Columbia University
1961 to 1968 — Visiting Lecturer in Mathematics, Stevens Institute of Technology
1956 to 1966 — Research Scientist, Davidson Laboratory, Stevens Institute of Technology

AWARDS

2005 — Old Dominion University Distinguished Research Career Award.
1994 — NASA Group Achievement Award to the ICASE Fluid Mechanics Group.
1964 — Ottens Award for Excellence in Research, Stevens Institute of Technology.

JOURNAL ARTICLES

C.E. Grosch *and A.E. Gargett* "Why do LES of Langmuir supercells not include rotation?", *J. Physical Oceanography, 46, 3595-3597, DOI: 10.1175/JPO-D-16-0092.1, 2016.*

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1970 to 1976 — Defense Advanced Research Projects Agency. Proposal Review ; Program Review and Evaluation
1971 to 1975 — Institute for Defense Analysis. Oceanography and Anti-Submarine Warfare
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S.J. Lukasik and **C.E. Grosch**, "Dissipation of Standing Waves", Davidson Laboratory Technical Note 605, Stevens Institute of Technology, 1960.

C.E. Grosch, "Attenuation of Shallow Water Waves", Davidson Laboratory Technical Note 612, Stevens Institute of Technology, 1961.

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C.E. Grosch, "Internal Wave Field of a Dipole in a Fluid with an Exponentially Varying Density", Davidson Laboratory Report 1042, Stevens Institute of Technology, 1964.

C.E. Grosch, "High Pressure Equations of State", Davidson Laboratory Technical Note 574, Stevens Institute of Technology, 1964.

C.E. Grosch, "Sound Speed - Tillotson's Equation of State", Davidson Laboratory Technical Note 694, Stevens Institute of Technology, 1965.

S.J. Lukasik and **C.E. Grosch**, "Summary Report on Hydrodynamic Investigations of Pressure-Mine Countermeasures", Davidson Laboratory Report 1081 (Secret), Stevens Institute of Technology, 1965.

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P.H. Rank, **C.E. Grosch**, *G.W. Zepko, and S.J. Lukasik,* "The Directional Swell Spectrum Off Block Island", Davidson Laboratory Report 1155, Stevens Institute of Technology, 1967.

C.E. Grosch *and E.Y.T. Kuo,* "Some Comments on the Modeling of the Turbulent Wake of a Self-Propelled Body in a Stratified Fluid", Ocean and Atmospheric Science, Inc. Report 72-073, 1972.

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C.E. Grosch, "Turbulent Diffusion in a Stratified Fluid with Application to the Ocean", Ocean and Atmospheric Science, Inc. Report 72-089, 1972.

C.E. Grosch, *E.Y.T. Kuo, and M. Bernstein,* "Thermal Structure of the Air-Sea Interface", Ocean and Atmospheric Science, Inc. Report 72-105, 1973.

K.M. Case, F.J. Dyson, E.A. Frieman, **C.E. Grosch**, *and F.W. Perkins,* "Numerical Simulation of Turbulence", Jason-Stanford Research Institute, Technical Report JSR-73-3, 1973.

C.E. Grosch, "Numerical Simulation of Transition", Institute of Oceanography Technical Report 24, Old Dominion University, 1975.

C.E. Grosch *and S.A. Orszag,* "Numerical Solution of Problems in Unbounded Regions: Coordinate Transforms", Institute of Oceanography Technical Report 26, Old Dominion University, 1976.

C.E. Grosch *and H.Salwen,* "The Continuous Spectrum of the Orr-Sommerfeld Equation, I"

: The Spectrum and The Eigenfunctions", Institute of Oceanography Technical Report 33, Old Dominion University, 1976.

C.E. Grosch *and W.J. Comery,* "Finite Amplitude Wave Refraction", Institute of Oceanography Technical Report 34, Old Dominion University, 1977.

E.C. Gritton, W.S. King, I. Sutherland, R.S. Gaines, C. Gazley Jr, **C.E. Grosch**, *M. Juncosa, and H. Peterson,* "Feasibility of a Special Purpose Computer to Solve the Navier-Stokes Equations", Rand Corp. R-2183-RC, 1977.

C.E. Grosch, "Poisson Solvers on a Large Array Computer", Dept. Math. & Comp. Sci. Technical Report TR78-4, Old Dominion University, 1978.

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C.E. Grosch, "Performance Analysis of Tri-Diagonal Equation Solvers on Array Computers", Dept. Math. & Comp. Sci. Technical Report 79-4, Old Dominion University, 1979.

C.E. Grosch, "The Receptivity of Boundary Layers on Blunt Bodies to Oscillations in the Free Stream", NASA Contractor Report 3639, 1982.

R.E. Spall, T.B. Gatski, and **C.E. Grosch**, "On a Criterion for Vortex Breakdown", ICASE Report 87-3, NASA Langley Research Center, Hampton, VA., 1987.

C.E. Grosch, "Receptivity of the Boundary Layer on a Blunt Body", Old Dominion University Research Foundation, 1987.

J.R. Fischer, C. Grosch, M. McAnulty, J. O'Donnell, and O. Story, "Report from the MPP Working Group to the NASA Associate Administrator for Space Science and Applications", NASA Technical Memo. 87819, 1987.

T.L. Jackson and **C.E. Grosch**, "Spatial Stability of a Compressible Mixing Layer", *ICASE Report 88-33, NASA Langley Research Center, Hampton, VA., 1988.*

T.L. Jackson and **C.E. Grosch**, "Effect of Heat Release on the Spatial Stability of a Supersonic Reacting Mixing Layer", *ICASE Report 88-68, NASA Langley Research Center, Hampton, VA., 1988.*

T.L. Jackson and **C.E. Grosch**, "Inviscid Spatial Stability of a Compressible Mixing Layer. Part II. The Flame Sheet Model", *ICASE Report 89-18, NASA Langley Research Center, Hampton, VA., 1989.*

T.L. Jackson and **C.E. Grosch**, "Inviscid Spatial Stability of a Compressible Mixing Layer. Part III. Effect of Thermodynamics", *ICASE Report 89-32, NASA Langley Research Center, Hampton, VA., 1989.*

T.L. Jackson and **C.E. Grosch**, "Absolute/Convective Instabilities and the Convective Mach Number in a Compressible Mixing Layer", *ICASE Report 89-38, NASA Langley Research Center,*

Hampton, VA., 1989.

T.L. Jackson and **C.E. Grosch**, "Zero Wavenumber Modes of a Compressible Supersonic Mixing Layer", *ICASE Report 90-82, NASA Langley Research Center, Hampton, VA., 1990.*

C.E. Grosch *and T.L. Jackson,* "Ignition and Structure of a Laminar Diffusion Flame in a Compressible Mixing Layer with Finite Rate Chemistry", *ICASE Report 91-35, NASA Langley Research Center, Hampton, VA., 1991.*

A. Dubey, M. Zubair and **C.E. Grosch** , "A General Purpose Subroutine for Fast Fourier Transform on a Distributed Memory Parallel Machine ", *ICASE Report 92-56, NASA Langley Research Center, Hampton, VA., 1992.*

M. Gaster, **C.E. Grosch** *and T.L. Jackson* "The Velocity Field Created by a Shallow Bump in a Boundary Layer", *ICASE Report 94-21, NASA Langley Research Center, Hampton, VA., 1994.*

PROFESSIONAL SOCIETIES

Sigma Xi
American Physical Society (APS)
Society for Industrial and Applied Mathematics (SIAM)
IEEE Computer Society
Oceanography Society

PROFESSIONAL SERVICE

Proposal Review and Panel Service for the National Science Foundation.
Reviewer for the Journal of Fluid Mechanics.
Reviewer for the Journal of Physical Oceanography.
Reviewer for Proceedings of the Royal Society
Reviewer for the Physics of Fluids.
Reviewer for the Journal of Computational Physics.
Reviewer for the AIAA Journal.
Reviewer for Computers and Fluids.
Reviewer for the International Journal of Engineering Science.
Reviewer for the International Conference on Parallel Processing.
Reviewer for Oxford University Press.

RESEARCH INTERESTS

Fluid Dynamics, Boundary Layer Theory, Hydrodynamic Stability, Computational Fluid Dynamics, Algorithms for Parallel Computation, Geophysical Fluid Dynamics, Analysis of Time Series of Geophysical Data.

Ph.D. STUDENTS

V. E. Delnore - Physical Oceanography, 1976 *"Numerical Simulation of Thermohaline Convection in the Mixed Layer of the Ocean".*

P. F. Moersdorf - Physical Oceanography, 1978 *"The Response of an Idealized Continental Shelf to Atmospheric Forcing"*

J. Y. Chung - Physical Oceanography, 1979 *"Turbulence Spectra in a Well Mixed Estuary"*

I. S. Oh - Physical Oceanography, 1981 *"The Refraction of Finite Amplitude Waves"*

R. A. Fatoohi - Electrical Engineering, 1987 *"Implementation and Performance Analysis of Numerical Algorithms on the MPP, FLEX/32, and CRAY/2".*

I. Oka - Oceanography, 1989 *"Nonlinear Solutions to a Two Layer Quasi-Geostrophic Model of the Gulf Stream".*

S. Gupta - Computer Science (Jointly with M. Zubair), 1992 "Multigrid Algorithms for Massively Parallel Machines".

A. Dubey - Computer Science (Jointly with M. Zubair), 1993 *"Fast Fourier Transforms on Distributed Memory Parallel Machines".*

J.J. Holdzkom II - Oceanography (Jointly with A.D. Kirwan, Jr.), 1998 *"Studies of Warm-Core Rings Using Particle-in-Cell Methods".*

W.J. Schulz, Jr. - Oceanography (Jointly with A.D. Kirwan, Jr.), 1999 *"Ocean Surface Maps from Blending Disparate Data Through Normal Mode Analysis".*

M.S. STUDENTS

W.D. Morris - Physical Oceanography - 1979 *"A Comparison of Simulated and Experimental Wave Spectra in the Nearshore Region"*

P.L. Spence - Physical Oceanography - 1985 *"Numerical Experiments with the Quasigeostrophic Potential-Vorticity Equation"*

W.D. Boll - Physical Oceanography - 2015 *"Doppler Shifted Internal Wavesin a Shallow Water Region"*

COLLEGE AND UNIVERSITY SERVICE

Chair, Mathematics Advisory Committee, 1974-1975
Chair, Search Committee for Chair of the Department of Mathematical and Computing Sciences, 1975
Member, Computer Center Faculty Advisory Committee, 1975-1978
Chair, Dept. Oceanography Tenure and Promotion Committee, 1975-1984
Member, Search Committee for Associate Provost for Research, 1977

Member, Search Committee for Director Computer Center, 1977
Member, College Science Promotion Committee, 1976-1977
Member, College Science Tenure Committee, 1977-1979
Member, University Reaccreditation Committee: Mission, 1979
Chair, College of Science Tenure and Promotion Committee, 1980-1984
Member, College of Science Tenure and Promotion Committees, 1992-1994
Chair, College of Science Tenure and Promotion Committee, 1994
Member, University Tenure and Promotion Committees, 1994
Chair, Search Committee for Chair of the Department of Mathematics and Statistics, 2001-2002
Member, Search Committee for Dean of the College of Sciences, 2002-2003
Chair, College of Science Tenure and Promotion Committee, 2003
Chair, College Tenure and Promotion Committee, 2004
Member, University Tenure and Promotion Committee, 2004
Chair, College of Science Tenure and Promotion Committee, 2005
Chair, University Tenure and Promotion Committee, 2005

GRANTS AWARDED SINCE 1973

C.E. Grosch - Principal Investigator, 1974; Westinghouse Electric Corp., Oceanic Div., "Numerical Modeling of Transition", $55,126.

C.E. Grosch - Principal Investigator, 1975; Office of Naval Research "Numerical Transition", $77,555.

C.E. Grosch - Principal Investigator, 1979; National Aeronautics & Space Administration "Free Stream Disturbances, Continuous Eigenfunctions, Boundary Layer Instability, and Transition", $24,904.

W.D. Lakin - Principal Investigator & **C.E. Grosch** - Co-Principal Investigator, 1980; National Science Foundation "Higher Modes of the Orr-Sommerfeld Equation for Unbounded Flows", $27,630.

C.E. Grosch - Principal Investigator, 1980; National Aeronautics and Space Administration "Boundary Layer Receptivity", $49,985.

W.D. Lakin - Principal Investigator & **C.E. Grosch** - Co-Principal Investigator, 1981; National Aeronautics and Space Administration "Higher Modes of the Orr-Sommerfeld Problem for the Stability of Boundary Layer Flows", $32,923.

C.E. Grosch - Principal Investigator, 1981; National Aeronautics and Space Administration (Sub-Contract from Stevens Institute of Technology) "Spatial Stability of a Non-Parallel Flow", $14,598.

C.E. Grosch - Principal Investigator, 1983; National Aeronautics and Space Administration "Receptivity of the Boundary Layer on a Blunt Body", $35,000.

C.E. Grosch - Principal Investigator, 1984; Office of Naval Research "Numerical Solution of the Navier-Stokes Equations for Separating Flows", $28,864.

R.L. Ash - Principal Investigator & **C.E. Grosch** - Co-Principal Investigator, 1985; National Aeronautics and Space Administration "Studies of Vortex Stability and Control", $79,483.

R.L. Ash - Principal Investigator & **C.E. Grosch** - Co-principal Investigator, 1986; NASA Langley Research Center "Studies of Vortex Stability and Control", $90,655.

C.E. Grosch - Principal Investigator & M. Zubair - Co-principal Investigator, 1989; National Science Foundation "Parallel Computing Laboratory for Undergraduates", $243,045.

C.E. Grosch - Principal Investigator & M. Zubair - Co-principal Investigator, 1989; Center for Innovative Technology "Massively Parallel Computation of Compressible Flows", $136,200.

C.E. Grosch - Principal Investigator & M. Zubair - Co-principal Investigator, 1989; Active Memory Technology, Inc. "Massively Parallel Computation of Compressible Flows", $136,200.

C.E. Grosch - Principal Investigator, 1991; Air Force Office of Scientific Research "Structure and Stability of Reacting Compressible Mixing Layer", $38,000.

M. Zubair and **C.E. Grosch** - Co-principal Investigators, 1995; Naval Research Laboratory "Solution of 3D Mid-Frequency Acoustic-Elastic Scattering on Distributed Memory Massively Parallel MIMD Computers", $351,589.

C.E. Grosch - Principal Investigator, 1999; NASA Langley Research Center "Disturbance Dynamics in Transitional and Turbulent Flows", $15,000.

C.E. Grosch - Principal Investigator, 2000; NASA Langley Research Center "Disturbance Dynamics in Transitional and Turbulent Boundary Layers", $27,000.

T.C. Royer - Principal Investigator, **C.E. Grosch** - Co-Principal Investigator, NSF - "GLOBEC: Gulf Alaska Long Term Observation Program", $339,390; December 2000 to November 2005.

T.C. Royer - Principal Investigator, **C.E. Grosch** - Co-Principal Investigator, NOAA - "Ocean climate variability as a potential influence on Steller's Sea Lion populations", $192,548; July 2001 to August 2004.

C.E. Grosch - Principal Investigator; NASA Langley Research Center "Studies in Transition and Time Varying Turbulent Flows", $75,000; November 2001 to February 2004.

A. Gargett - Principal Investigator, **C.E. Grosch** and J.M. Klinck - Co-principal Investigators, NSF - "Doppler turbulence techniques for ocean observatories: an interactive approach using in situ measurements and LES models", $845,885; April 2002 to March 2009.

C.E. Grosch - Principal Investigator, NASA Langley Research Center "Studies in Forced and Time Varying Turbulent Flow" $50,000; February 2004 to February 2005.

T.J. Miller - Principal Investigator, C.M. Jones and **C.E. Grosch** - Co-Principal Investigators, National Marine Fishery Service, NOAA Chesapeake Bay Office, "Assessing the Impact of Correlated Recruitments in Multispecies Models", $28,000; June 2004 to May 2006.

C.E. Grosch - Principal Investigator and A.E. Tejada-Martinez - Co-Principal Investigator, NASA Langley Research Center "Studies in time-varying, forced turbulent flow and temporally filtered large eddy simulation", $102,147; February 2005 to February 2007.

The two grants starred (*) below were originally awarded by NSF to Dr. Brian Ward at Old Dominion University. In December 2008 Dr. Ward resigned from Old Dominion University to become a full-time faculty member at the National University of Ireland - Galway. On 22 December 2008, NSF approved a change of PI for these Grants. I became the PI for both Grants. On 27 January 2009, NSF approved the issuance of a subaward to the National University of Ireland - Galway with Dr. Brian Ward as PI. As of 10 February 2009, there was a fully executed subcontract between the Old Dominion University Research Foundation and the National University of Ireland - Galway.

* **C.E. Grosch** - Principal Investigator, "Collaborative Research: Near-surface Controls of Air-Sea CO2 Exchange: A Contribution to the UK-SOLAS "Deep Ocean Gas Exchange Experiment".", National Science Foundation, OCE-0623247, $179,519; September 2006 to August 2010.

* **C.E. Grosch** - Principal Investigator, "Measurement of the Diurnal Warm Layer and Biologically-Induced Heating during the the CIRENE Campaign", National Science Foundation, OCE-0629707, $351,677; April 2006 to December 2010.

C.E. Grosch - Principal Investigator and A.E. Gargett - Co-Principal Investigator, "Collaborative Research: LES & Modeling of Turbulence on Shallow Shelves under Combined Langmuir, Tidal & Convective Forcing with Comparision to VADCP Observations", National Science Foundation, OCE-0927724, $554,972; September 2009 to September 2012.