

CHRISTOPHER COX

U.S. Citizen
Curriculum vitae

The George Washington University
Department of Mechanical and Aerospace Engineering
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1 CURRENT RESEARCH

High-order discontinuous methods – flux reconstruction and spectral difference – for solving the unsteady incompressible and compressible Navier-Stokes equations on moving and deforming unstructured grids. Convergence acceleration with implicit time stepping, p -multigrid and high performance parallel computing. Current applications involve secondary flow structures in curved arteries under pulsatile flow conditions.

2 EDUCATION

Present	The George Washington University, Washington, DC Ph.D., Mechanical and Aerospace Engineering
2005	Stanford University, Stanford, CA M.S., Aeronautics and Astronautics
2003	Rensselaer Polytechnic Institute, Troy, NY B.S., Dual Aeronautical and Mechanical Engineering

3 ACADEMIC POSITIONS

2011-	The George Washington University, Washington, DC Graduate Research Assistant Computational Aerodynamics and Hydrodynamics Laboratory Biofluid Dynamics Laboratory Advisers: Chunlei Liang, Michael W. Plesniak
2005-2006	Stanford University, Stanford, CA Research and Development Engineer Hansen Experimental Physics Laboratory Advisers: Rodney Torii, C.W. Francis Everitt
2003-2005	Stanford University, Stanford, CA, 2003-2005 Graduate Research Assistant Hansen Experimental Physics Laboratory Advisers: Rodney Torii, C.W. Francis Everitt

2002 Rensselaer Polytechnic Institute, Troy, NY
 Undergraduate Research Assistant
 Mechanical and Aeronautical Engineering Fluid Mechanics Laboratory
 Adviser: Amir H. Hirs

4 AWARDS & HONORS

2011-Present, The George Washington University Presidential Merit Fellowship
2015, The George Washington University Graduate Research Theoretical Award, 1st Place
2013, ASME Pressure Vessel and Piping Outstanding Technical Paper for Fluid-Structure Interaction
2003-2005, Stanford University Graduate Federal Research Assistantship Award
1998-2003, Rensselaer Polytechnic Institute Donald V. Edwards Endowed Engineering Scholarship
1998-2003, Rensselaer Polytechnic Institute Dean's Scholarship
2000, Sigma Gamma Tau National Aerospace Engineering Honor Society
2000, Pi Tau Sigma International Mechanical Engineering Honor Society

5 PUBLICATIONS & PRESENTATIONS

Refereed Journals

C. Cox, C. Liang and M.W. Plesniak, "A High-order Solver for Unsteady Incompressible Navier-Stokes Equations using the Flux Reconstruction Method on Unstructured Grids with Implicit Dual Time Stepping," *Journal of Computational Physics* (under review).

C. Liang, C. Cox and M.W. Plesniak, "A Comparison of Computational Efficiencies of Spectral Difference Method and Correction Procedure via Reconstruction," *Journal of Computational Physics*, Vol 239, pp 138-146, April 15, 2013.

Refereed Conference Proceedings

C. Cox, C. Liang and M.W. Plesniak, "A Flux Reconstruction Solver for Unsteady Incompressible Viscous Flow using Artificial Compressibility with Implicit Dual Time Stepping," AIAA SciTech 54th Aerospace Sciences Meeting, January 4-8, 2016, San Diego, CA.

C. Cox, C. Liang and M.W. Plesniak, "A High-order Method for Solving Unsteady Incompressible Navier-Stokes Equations with Implicit Time Stepping on Unstructured Grids," AIAA SciTech 53rd Aerospace Sciences Meeting, January 5-9, 2015, Kissimmee, FL.

C. Cox, C. Liang and M.W. Plesniak, "Spectral Difference Solution of Incompressible Flow over an Inline Tube Bundle with Oscillating Cylinder," ASME 2012 Pressure Vessels and Piping Conference, July 15-19, 2012, Toronto, ON, Canada.

Non-Refereed Abstracts and Presentations

C. Cox, C. Liang and M.W. Plesniak, "A High-order Solver for Unsteady Incompressible Navier-Stokes Equations using the Flux Reconstruction Method," APS Division of Fluid Dynamics 68th Annual Meeting, November 22-24, 2015, Boston, MA.

C. Cox, C. Liang and M.W. Plesniak, "Development of a Parallel High-order Solver with Flux Reconstruction for the Incompressible Navier-Stokes Equations," AIAA Young Professional, Student and Education Conference, November 13, 2015, JHU Applied Physics Laboratory, MD.

C. Cox, C. Liang and M.W. Plesniak, "A Parallel 3D High-order Solver for Unsteady Incompressible Navier-Stokes Equations using Flux Reconstruction on Unstructured Grids," 13th U.S. National Congress on Computational Mechanics, July 26-30, 2015, San Diego, CA.

C. Liang, C. Cox and M.W. Plesniak, "A High-order Compact Spectral Difference Method for Unsteady Incompressible Flow," 5th International Conference on Scientific Computing and Partial Differential Equations, December 8-12, 2014, Kowloon Tong, Hong Kong.

C. Cox, C. Liang and M.W. Plesniak, "A Compact High-order Unstructured Method for Unsteady Incompressible Flow," APS Division of Fluid Dynamics 67th Annual Meeting, November 23-25, 2014, San Francisco, CA.

C. Mehls, D. Gill, C. Cox, N. Vora, D. Stricker, E. Berglund, P. Ambekar, R. Torii and S. Wang, "Effect of Surface Roughness on Critical Current of Niobium Films," AIP 24th International Conference on Low Temperature Physics, Vol 850, pp 991-992, September 7, 2006.

C. Mehls, C. Bayart, J. Bower, B. Clarke, C. Cox, D. Gill, D. Stricker, N. Vora, S. Wang, P. Zhou, R. Torii, P. Worden, D. Debra, H. Dittus and F. Loeffler, "STEP Prototype Development Status," The 11th Marcel Grossmann Meeting, On Recent Developments in Theoretical and Experimental General Relativity, Gravitation and Relativistic Field Theories, pp 2553-2555, July 23-29, 2006.

M. Vogel, P. Steen, A. Bhandar, A. Hirs, C. Cox and C. Matalanis, "Bubbles and Beetles: Applications of Capillary Stability," The 1000 Islands Fluid Mechanics Meeting, May 9-11, 2003, Gannanoque, ON, Canada.

P. Steen, C. Matalanis, A. Hirs and C. Cox, "Capillary Micro-Switches," APS Division of Fluid Dynamics 55th Annual Meeting, November 24-26, 2002, Austin, TX.

Posters

C. Cox, C. Liang and M.W. Plesniak, "Development of a Parallel 3D High-order Navier-Stokes Solver for Studying Secondary Flow Structures in a Curved Artery Model," The George Washington University Research and Development Competition, February 24, 2016.

C. Cox, C. Liang and M.W. Plesniak, "Development of a Fast Algorithm for Solving the Unsteady Incompressible Navier-Stokes Equations," The George Washington University Research and Development Competition, February 18-19, 2015.

C. Cox, C. Liang and M.W. Plesniak, "Development of a High-order Incompressible Flow Solver with Implicit Time Stepping," The George Washington University Research and Development Competition, February 19, 2014.

C. Cox, C. Liang and M.W. Plesniak, "High-order Numerical Simulations of Incompressible Flow using Correction Procedure via Reconstruction," The George Washington University Research and Development Competition, February 20, 2013.

C. Cox, C. Liang and M.W. Plesniak, “An Implicit Time Marching Scheme for Shock Capturing with MUSCL Reconstruction,” The George Washington University Research and Development Competition, February 29, 2012.

6 TEACHING EXPERIENCE

2013-2015 The George Washington University, Washington, DC
Teaching Assistant
Partial Differential Equations (graduate)
Linear Algebra (graduate)
Fluid Mechanics I (undergraduate)

7 INDUSTRY POSITIONS

2008-2010 McGowan Investors, Philadelphia, PA
Quantitative Research Analyst
Equity / Index Volatility

2006-2008 Volare Capital Management, Philadelphia, PA
Quantitative Research Analyst
Equity / Index Volatility

2001 Pratt & Whitney – United Technologies Corporation, East Hartford, CT
Design and Project Engineering Co-op
Hollow Fan Blades Department

8 AFFILIATIONS

Member, American Institute of Aeronautics and Astronautics
Member, American Physical Society