

October 31, 2014

## Curriculum Vitae of Vishal Vasani

S. Chowla Research Assistant Professor  
Department of Mathematics  
Pennsylvania State University  
University Park, PA 16802

Phone: (814) 863-9052  
Fax: (814) 865-3735  
Email: [vasan@math.psu.edu](mailto:vasan@math.psu.edu)  
Homepage: <http://www.personal.psu.edu/vxv10/>

Date of Birth: December 19, 1983  
Citizenship: India  
Marital Status: Single

### Education

Ph.D. Applied Mathematics, University of Washington, June 2012.  
Advisor: Bernard Deconinck

M.S. Applied Mathematics, University of Washington, March 2009.

M.S. Mechanical Engineering, Arizona State University, May 2007.  
Advisor: Don L Boyer

B.E. Mechanical Engineering, Anna University, India, April 2005.

### Fields of Interest

Applied Mathematics, Partial Differential Equations with an emphasis on the theory of surface water-waves and interests in related boundary-value and inverse problems. Analytical and numerical methods to investigate partial differential equations.

### Refereed Publications

J. Wilkening and V. Vasani (2014). *Comparison of five popular methods of computing the Dirichlet–Neumann operator for the water-wave problem*. Accepted in Contemporary Mathematics.

K. L. Oliveras and V. Vasani (2014). *Relationships between the pressure and the free surface independent of the wave speed*. Accepted in Contemporary Mathematics.

B. Deconinck, T. Trogdon and V. Vasani. *The method of Fokas for solving linear partial differential equations*. SIAM Review (2014) **56** 159–186.

V. Vasani and K. L. Oliveras. *Pressure beneath a traveling wave with constant vorticity*. Disc. & Cont. Dyn. Sys. Ser. A (2014) **34** 3219–3239.

V. Vasani and B. Deconinck. *The Bernoulli boundary condition for traveling water waves*. Appl. Math. Letters (2013) **26** 515–519.

- K. L. Oliveras and V. Vasani. *A new equation describing traveling water-waves*. J. Fluid Mech. (2013) **717**, 514–522.
- V. Vasani and B. Deconinck. *The inverse water wave problem of bathymetry detection*. J. Fluid Mech. (2013) **714**, 562–590.
- V. Vasani and B. Deconinck. *Well-posedness of boundary-value problems for the linear Benjamin-Bona-Mahony equation*. Disc. & Cont. Dyn. Sys. Ser. A (2013) **33**, 3171–3188.
- B. Deconinck, K. L. Oliveras and V. Vasani. *Relating the bottom pressure and surface elevation in the water wave problem*. J. Non. Math. Phys. (2012) **19**, Suppl. 1 1240014.
- K. L. Oliveras, V. Vasani, B. Deconinck and D. Henderson. *Recovering the water-wave surface from pressure measurements*. SIAM J. Appl. Math. (2012) **72**, 897–918.
- B. Deconinck, D. Henderson, K. L. Oliveras and V. Vasani (2011). *Recovering the water-wave surface from pressure measurements*. Proceedings of 10<sup>th</sup> International Conference on Mathematical and Numerical Aspects of Waves - WAVES 2011. 4 pages
- J. Riley and V. Vasani (2009). *Spectral energy transfer in strongly stratified flows*. Proceedings of EU-ROMECH Colloquium 512: Small Scale Turbulence and Related Gradient Structures, 94–96.

## In preparation

- J. Lenells, B. Pelloni, N. Sheils and V. Vasani (2014). *The Stefan problem for the heat equation: a novel approach*.
- K. L. Oliveras, V. Vasani and P. Sprenger (2014). *The stability of traveling water waves with a constant vorticity*.
- K. L. Oliveras, V. Vasani, B. Deconinck and D. Henderson (2014). *A method to recover water-wave profiles from pressure measurements*.

## Invited workshops

*Nonhomogeneous boundary-value problems for nonlinear waves*  
 American Institute of Mathematics, Palo Alto, California  
 May 13 to May 17, 2013  
 Organized by Jerry Bona, Min Chen, Shuming Sun, and Bingyu Zhang

## Conference presentations and invited talks

*The bathymetry detection problem: a water-wave approach*  
 Fluid Dynamics Research Consortium  
 October 2 2014 University Park, PA

*Experiments in a fluids laboratory*  
 Applied Mathematics Seminar, Seattle University  
 May 16 2014 Seattle, WA

*Pressure beneath a traveling wave with constant vorticity*  
 SIAM Analysis of Partial Differential Equations  
 December 8 2013 Orlando, FL

*Measuring waves: two inverse problems in the lab*

Mathematical methods seminar

Department of Applied Mathematics, University of Washington-Seattle

October 15 2013

*Some inverse problems related to the theory of water waves*

Invited talk part of Chacha Days Seminar

Department of Mathematics, University of North Carolina-Chapel Hill

August 23 2013 Chapel Hill, NC

*The numerical simulation of time-dependent water waves in two and three dimensions*

AMS Spring Western Section Meeting, University of Colorado

April 13-14 2013 Boulder, CO

*The inverse water wave problem of bathymetry detection*

The Eighth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena:  
Computation and Theory

March 25-28 2013 Athens, GA

*Traveling water waves in three dimensions*

SIAM Conference on Nonlinear Waves and Coherent Structures

June 13-16 2012 Seattle, WA

*The Inverse Problem: Reconstructing the bottom topography from surface measurements*

SIAM Analysis of Partial Differential Equations

November 14-17 2011 San Diego, CA

*Well-posedness of boundary-value problems for Linear BBM*

AMS Fall Western Section Meeting, University of Utah

October 22-23 2011 Salt Lake City, UT

*Boundary-value problems for linear PDEs with mixed derivatives*

7<sup>th</sup> International Congress on Industrial and Applied Mathematics - ICIAM 2011

July 18-22 2011 Vancouver, BC

*Boundary-value problems for the Linear Benjamin-Bona-Mahony Equation*

The Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory

April 4-7 2011 Athens, GA

*Green Meets Jordan: How to Solve PDEs using Complex Analysis*

The Pritchard Lab seminar at the Department of Mathematics, Pennsylvania State University

September 13 2010 University Park, State College, PA

*Direct numerical simulations of stratified turbulence at higher Reynolds numbers*

Annual Meeting of the American Physical Society–Division of Fluid Dynamics

November 23 2008 San Antonio, TX

*On spin-up and spin-down in axisymmetric containers*

Fifth International Symposium on Environmental Hydraulics

December 4-7 2007 Phoenix, AZ

## Poster presentation

*Recovering Surface Elevation from Pressure Measurements: Theoretical Analysis*

Young Researcher Poster Session at the 10<sup>th</sup> International Conference on Mathematical and Numerical Aspects of Waves - WAVES 2011, Simon Fraser University, Vancouver, BC

**Winner of Young Researcher Best Poster Award**

## Academic Experience

*Pennsylvania State University, Department of Mathematics*

Position: S. Chowla Research Assistant Professor

Fall 2012–Spring 2015.

*University of Washington, Department of Applied Mathematics*

Position: Research Assistant

Advisor: B. Deconinck, Department of Applied Mathematics

Autumn 2010. Summer 2011.

Position: Research Assistant

Advisor: J. Riley, Department of Mechanical Engineering

Spring 2008–Autumn 2009.

*Arizona State University, Department of Mechanical and Aerospace Engineering*

Position: Research Assistant

Advisor: D. L. Boyer, Environmental Fluids Laboratory

Spring 2005–Spring 2007.

## Teaching Experience

*Instructor, Penn State University*

MATH 251 Ordinary and Partial Differential Equations Spring 2014

MATH 251 Ordinary and Partial Differential Equations Fall 2013

MATH 250 Ordinary Differential Equations Fall 2012

*Instructor, University of Washington*

AMATH 351 Ordinary Differential Equations Autumn 2011

### *Teaching Assistant, University of Washington*

MATH 498B	Undergraduate Mathematical Sciences Seminar Coordinator	Spring 2012
MATH 498B	Undergraduate Mathematical Sciences Seminar Coordinator	Winter 2012
AMATH 403/503	Methods for Partial Differential Equations	Spring 2011
AMATH 507	Calculus of Variations	Winter 2011
AMATH 403/503	Methods for Partial Differential Equations	Spring 2010
MATH 126	Calculus with Analytic Geometry III	Spring 2010
MATH 126	Calculus with Analytic Geometry III	Autumn 2009
AMATH 352	Applied Linear Algebra and Numerical Analysis	Summer 2009
MATH 126	Calculus with Analytic Geometry III	Spring 2009
MATH 124	Calculus with Analytic Geometry I	Winter 2009
MATH 120	Precalculus	Winter 2008
MATH 124	Calculus with Analytic Geometry I	Autumn 2007

### Mentoring and Advising

Co-advisor of Patrick Sprenger (with Katie Oliveras of Seattle University).

Co-advisor of Edward Charlesworth (with Katie Oliveras of Seattle University).

### Honors and Awards

Boeing Award for Research Excellence in Applied Mathematics (2011)

### Service

#### *Community service*

Mentor in the Teacher Training program organized by the Department of Mathematics, Penn State University

Member of Climate and Diversity Postdoc Subcommittee at Eberly College of Science, Penn State University

#### *Professional societies*

Secretary, SIAM-UW, University of Washington, 2009–2010.

Member SIAM 2009–Present.

Member, American Mathematics Society, 2007–Present.

Member, American Physical Society, 2007–Present.

#### *Minisymposia organized*

Co-organizer of *Minisymposia on Water waves*, 8th IMACS Conference on Nonlinear Waves, Athens, GA, March 25–28 2013

Co-organizer of *Minisymposia on Water Wave Bifurcations: Theory and Numerics*, SIAM Nonlinear Waves and Coherent Structures, Seattle, WA, June 13–16 2012

Co-organizer of *Minisymposia on Analysis and Numerics of Euler Water Wave Equations*, SIAM Analysis of PDEs, San Diego, CA, Nov 14-17 2011

*Referee for*

Journal of Fluid Mechanics

Environmental Fluid Mechanics

European Journal of Fluid Mechanics B/Fluids

Journal of Computational Physics

Discrete and Continuous Dynamical Systems - Series A

MDPI Remote Sensing

## Miscellaneous

*Computer Skills:*

Comfortable in Python, MATLAB, Maple, FORTRAN.

Experience with C/C++ and familiarity with Java.

Knowledge of MPI standard.  $\text{\LaTeX}$ , HTML, Office Suite.

Last updated: October 31, 2014

<http://www.personal.psu.edu/vxv10/cv.pdf>