

# Curriculum Vitae

Helge Kristian Jenssen

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## Education

Ph.D. Mathematics 1998  
Norwegian University of Science and Technology (NTNU), Trondheim, Norway

M.Sc. Mathematics 1994  
University of Oslo, Oslo, Norway

## Employment/Experience

Professor July 2012-present  
Department of Mathematics, Penn State University  
University Park, Pennsylvania

Associate Professor July 2007-June 2012  
Department of Mathematics, Penn State University  
University Park, Pennsylvania

Assistant Professor Aug 2005-June 2007  
Department of Mathematics, Penn State University  
University Park, Pennsylvania

Assistant Professor Aug 2003-July 2005  
Department of Mathematics, North Carolina State University  
Raleigh, North Carolina

Zorn Visiting Assistant Professor Sept 2000-Aug 2003  
Department of Mathematics, Indiana University  
Bloomington, Indiana

EU Postdoc, Scuola Internazionale di Studi Avanzati (SISSA) Sept 1998-Aug 2000  
Trieste, Italy

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| Military service, Norwegian Defense Research Establishment<br>Department of Underwater Acoustics, Horten, Norway | June 1994-June 1995 |
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### Editorial

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|---|---------------------------|
| Associate editor for Journal of Mathematical Analysis<br>and Applications (Elsevier). | November 2015 - July 2018 |
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### Short Term and Visiting Positions

|  |                    |
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| Department of Mathematics, University of California, Davis | January-April 2012 |
| CAS fellow, Centre for Advanced Study (CAS), Oslo, Norway  | Spring 2009        |
| Centre of Mathematics for Applications (CAM), Oslo, Norway | June-July 2005     |
| Mittag-Leffler Institute, Stockholm, Sweden                | Sept-Oct 2005      |
| SISSA, Trieste, Italy (1-3 weeks stays)                    | Summers 1998-2003  |
| Mittag-Leffler Institute, Stockholm, Sweden                | Sept-Dec 1997      |

### Awards and Honors

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| NSF CAREER Award   | 2005 - 2010 |
| ESSO Award for Best Ph.D. in Fundamental Research<br>Norwegian University of Science and Technology, Trondheim, Norway | 1998        |
| Nordic Academy for Advanced Study Grant  | Fall 1997   |

### Research Support

|  |           |
|--|-----------|
| NSF Award, "Construction and Physicality of Compressible Euler Flows"<br>(NSF DMS-1813283, \$320 K), sole PI   | 2018–2021 |
| NSF Award, "Fundamental challenges in nonlinear hyperbolic PDE"<br>(NSF DMS-1311353, \$360 K, no-cost extended), sole PI   | 2013–2018 |
| Serving as external sponsor for Charis Tsikkou<br>(Assistant Professor, Department of Mathematics, West Virginia University, Morgantown,<br>WV) through WVU ADVANCE Centers Sponsorship Program. The program is funded by<br>the National Science Foundation's ADVANCE IT Program (Award HRD-100797): "WVU<br>faculty (Associates) will be paired with mentors (Sponsors) to work on a clearly identified<br>project with specific outcomes. (Associate \$10,000; Sponsor \$ 5,000)." <sup>1</sup> | 2014-2016 |

<sup>1</sup>From <http://advance.wvu.edu>, accessed Sept. 23, 2014.

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| NSF Award, “Entropies, geometric structures, and interactions for systems of conservation laws” (NSF DMS-1009002, \$140 K + post-doc supplement \$104 K, 2011-2013), sole PI | 2010–2013 |
| NSF CAREER Award, “Large and Multi-Dimensional Solutions of Conservation Laws” (NSF DMS-0539549, \$400 K), sole PI   | 2005–2010 |
| NSF Award, “Large solutions to systems of Nonlinear Equations” (NSF DMS-020663, \$65 K, with supplements \$16.5 K), sole PI  | 2002–2005 |

### Students and Postdoc Mentoring

|  |           |
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| Yushuang Luo, Ph.D. student, Penn State University   | 2017-     |
| Anthony Deluca, Master student, Penn State University  | 2015-2016 |
| Mike Benfield, Ph.D. student North Carolina State University<br>(joint with Prof. Irina Kogan)<br>Currently Lecturer at San Diego State University | 2012-2016 |
| Geng Chen, Postdoctoral Associate, Penn State University<br>Currently Assistant Professor at University of Kansas, Lawrence)                       | 2010-2013 |
| Nick Costanzino, Postdoc, Penn State University<br>Currently at AIG Investments, New York  | 2006-2009 |
| Erik Endres, Ph.D. student, Penn State University<br>Currently at US Department of Defense   | 2004-2008 |

### PUBLICATIONS

#### Submitted

1. H. K. JENSSEN, Y. LUO, A Front Tracking Approach to the 3-d Linearized, Radial Euler System, November 2018.
2. M. BENFIELD, H. K. JENSSEN, I. KOGAN, Jacobians with prescribed eigenvectors, December 2017.

#### Accepted

1. H. K. JENSSEN, C. TSIKKOU, On similarity flows for the compressible Euler system, 2018. Accepted for publication in Journal of Mathematical Physics.
2. M. BENFIELD, H. K. JENSSEN, I. KOGAN, A generalization of an integrability theorem of Darboux. Accepted for publication in The Journal of Geometric Analysis.

## Articles Published in Refereed Journals

1. H. K. JENSSEN, On Exact Solutions of Rarefaction-Rarefaction Interactions in Compressible Isentropic Flow, *Journal of Mathematical Fluid Mechanics*, **19** (2017), 685–708.
2. H. K. JENSSEN, C. TSIKKOU, Radial solutions to the Cauchy problem for  $\square_{1+3}U = 0$  as limits of exterior solutions, *Journal of Hyperbolic Differential Equations*, **13** (2016), 833–860.
3. H. K. JENSSEN, C. TSIKKOU, Convergence of exterior solutions to radial Cauchy solutions for  $\partial_t^2 U - c^2 \Delta U = 0$ , *Electron. J. Differential Equations*, **2016** (2016), 1–16.
4. G. CHEN, H. K. JENSSEN, No TVD fields for 1-D isentropic flow, *Comm. Partial Differential Equations*, **38** (2013), 629–657.
5. H. K. JENSSEN, I. KOGAN, Extensions for Systems of Conservation Laws, *Comm. Partial Differential Equations*, **37** (2012), 1096–1140.
6. G. CHEN, E. ENDRES, H. K. JENSSEN, Pairwise wave interactions in ideal polytropic gases. *Arch. Ration. Mech. Anal.* **204** (2012), 787836.
7. H. K. JENSSEN, T. K. KARPER, One-Dimensional compressible flow with temperature dependent transport coefficients, *SIAM Journal of Mathematical Analysis* **42** (2010) 904–930.
8. E. ENDRES, H. K. JENSSEN, M. WILLIAMS, Singularly perturbed ODEs and profiles for stationary symmetric Euler and Navier-Stokes shocks, *Discrete Contin. Dynam. Systems* **27**, (2010), 133–169.
9. H. K. JENSSEN, I. KOGAN, Systems of hyperbolic conservation laws with prescribed eigen-curves, *Journal of Hyperbolic Differential Equations*, **7** (2010), 211–254.
10. E. ENDRES, H. K. JENSSEN, Compressible 1D Euler equations with large data: a case study, *Journal of Hyperbolic Differential Equations*, **6**, (2009), 389 – 406.
11. E. ENDRES, H. K. JENSSEN, M. WILLIAMS, Symmetric Euler and NavierStokes shocks in stationary barotropic flow on a bounded domain, *Journal of Differential Equations*, **245**, (2008), 3025 – 3067.
12. K. DEVAULT, P. GREMAUD, H. K. JENSSEN, Numerical investigation of cavitation in multi-dimensional compressible flows, *SIAM Journal of Applied Mathematics*, **67** (2007), 1675–1692.
13. N. COSTANZINO, H. K. JENSSEN, G. LYG, M. WILLIAMS, Existence and stability of curved multidimensional detonation fronts, *Indiana University Mathematics Journal*, **56** (2007), 1405 – 1461.
14. A. BRESSAN, H. K. JENSSEN, P. BAITI, An Instability for the Godunov Scheme, *Communications on Pure and Applied Mathematics*, **59** (2006), 1604–1638.
15. H. K. JENSSEN, G. LYG, M. WILLIAMS, Equivalence of Low Frequency Stability Conditions for Multidimensional Detonations in Three Models of Combustion, *Indiana University Mathematics Journal*, **54** (2005), 1–64.

16. P. BAITI, A. BRESSAN, H. K. JENSSEN, Instability of Travelling Wave Profiles for the Lax-Friedrichs Scheme, *Discrete and Continuous Dynamical Systems*, **13** (2005), 877–899.
17. H. K. JENSSEN, R. YOUNG, Gradient Driven and Singular Flux Blowup of Smooth Solutions to Hyperbolic Conservation Laws, *Journal of Hyperbolic Differential Equations*, **1** (2004), 627–641.
18. D. HOFF, H. K. JENSSEN, Symmetric Nonbarotropic Flows with Large Data and Forces, *Archive for Rational Mechanics and Analysis*, **173** (2004), 297–343.
19. P. BAITI, H. K. JENSSEN, Blowup in  $L^\infty$  for a Class of Genuinely Nonlinear Hyperbolic Systems of Conservation Laws, *Discrete and Continuous Dynamical Systems*, **7** (2001), 837–853.
20. H. K. JENSSEN, C. SINISTRARI, On the spreading of characteristics for nonconvex conservation laws, *Proceedings of the Royal Society of Edinburgh Section A*, **131** (2001), 909–925.
21. A. BRESSAN, H. K. JENSSEN, On the Convergence of Godunov Scheme for  $n \times n$  Systems of Hyperbolic Conservation Laws, *Chinese Annals of Mathematics Series B*, **21** (2000), 1–16.
22. H. K. JENSSEN, Blowup for Systems of Conservation Laws, *SIAM Journal of Mathematical Analysis* **31** (2000) 894–908.
23. H. K. JENSSEN, C. SINISTRARI, Blowup Asymptotics for Scalar Conservation Laws with a Source, *Communications in Partial Differential Equations*, **24** (1999), 2237–2261.
24. P. BAITI, H. K. JENSSEN, On the Front-Tracking Algorithm, *Journal of Mathematical Analysis and Applications*, **217** (1998), 395–404.
25. P. BAITI, H. K. JENSSEN, Well-posedness for a Class of  $2 \times 2$  Conservation Laws with  $L^\infty$  Data, *Journal of Differential Equations*, **140** (1997), 161–185.

### Articles Published in Refereed Proceedings; Appendices; Reports; Reviews

1. M. BENFIELD, H. K. JENSSEN, I. KOGAN, 1-D conservative systems: A geometric approach, *Proceedings of the 14th International Conference on Hyperbolic Problems, held June 25-29, 2012 Università di Padova, Padova, Italy*, AIMS Series on Applied Mathematics, **8** Part 2, (2014), 749 – 757.
2. H. K. JENSSEN, Review of “Quasilinear hyperbolic systems, compressible flows, and waves,” by Vishnu D. Sharma, *Bull. Amer. Math. Soc.* **49** (2012), 591–596.
3. H. K. JENSSEN, On radially symmetric solutions to conservation laws, in *The IMA Volumes in Mathematics and its Applications*, 153. Springer-Verlag, New York, 2011.
4. N. COSTANZINO, H. K. JENSSEN, Symmetric solutions to multi-dimensional conservation laws, *Nonlinear Partial Differential Equations and Hyperbolic Wave Phenomena*, Contemporary Mathematics, **526**, Amer. Math. Soc., 2010, pp. 91 – 124.

5. H. K. JENSSEN, I. KOGAN, Construction of conservative systems, *Proceedings of the 12th International Conference on Hyperbolic Problems, held June 9-13, 2008 University of Maryland, College Park*, Proceedings of Symposia in Applied Mathematics, **67** Part 2, (2009), 673 – 682.
6. E. ENDRES, H. K. JENSSEN, On global large solutions to the 1-D gas dynamics, *Hyperbolic Problems: Theory, Numerics, Applications*, 593 – 600, Springer, Berlin, 2008.
7. A. BRESSAN, P. BAITI, H. K. JENSSEN, Instability of finite difference schemes for hyperbolic conservation laws. *Mathematical aspects of nonlinear dispersive equations*, 43–53, Ann. of Math. Stud., **163**, Princeton Univ. Press, Princeton, NJ, 2007.
8. G. LYNG, K. ZUMBRUN, H. K. JENSSEN, Stability of detonation waves. EQUADIFF 2003, 517–519, World Sci. Publ., Hackensack, New Jersey, 2005.
9. H. K. JENSSEN, G. LYNG, M. WILLIAMS, Low frequency stability of planar multi-D detonations, in Oberwolfach Reports, Volume 1, Issue 2, 2004, report No. 18/2004, 927–928.
10. H. K. JENSSEN, G. LYNG, The Lopatinski determinant for multi-dimensional Euler equations, 15 pages (pp. 507–524), appendix to K. Zumbrun, Stability of Large-Amplitude Shock Waves of Compressible Navier-Stokes Equations, 311–533, *Handbook of Fluid Mechanics, Vol. III*, North-Holland, Amsterdam, 2004.
11. D. HOFF, H. K. JENSSEN, Multidimensional Compressible Flows with Symmetry, *Hyperbolic Problems: Theory, Numerics, Applications*, 493–498, Springer, Berlin, 2003.
12. A. BRESSAN, H. K. JENSSEN, Convergence of Godunov Scheme for Straight Line Systems, *Hyperbolic Problems: Theory, Numerics, Applications, Vol. I*, 187–196, International Series of Numerical Mathematics 140, Birkhäuser, Basel, 2001.
13. H. K. JENSSEN, C. SINISTRARI, Blowup for Hyperbolic Equations, *Hyperbolic Problems: Theory, Numerics, Applications, Vol. II*, 515–524, International Series of Numerical Mathematics 130, Birkhäuser, Basel, 1999.

## Short courses

1. Lecture Series on Conservation Laws June 22–July 2, 2010  
6 lectures, Rocky Mountain Mathematics Consortium Summer School  
University of Wyoming, Laramie, Wyoming
2. *Reactive Flow and Detonations I–IV* January–February, 2004  
4 lectures, Department of Mathematics  
North Carolina State University, Raleigh, North Carolina

### Invited Seminars and Colloquium Talks

1. *Radial Similarity Flows for Compressible Euler* October 5, 2018  
Smith Colloquium, Department of Mathematics  
University of Kansas, Lawrence, KS
2. *Global solutions of conservative hyperbolic systems* February 4, 2014  
Applied Analysis Seminar, Department of Mathematics  
West Virginia University, Morgantown, West Virginia
3. *Compressible Euler Flow and TVD Fields* November 11, 2013  
PDE and Analysis Seminar, Department of Mathematics  
University of Pittsburgh, Pennsylvania
4. *Existence Theory for Non-Linear Hyperbolic Systems* September 12, 2013  
Fluid Dynamics Research Consortium seminar  
Penn State University, University Park, Pennsylvania
5. *On Variation Bounds for Conservation Laws* January 17, 2012  
Combined Applied Math & PDEs seminar  
University of California, Davis, California
6. *On Extending Glimm's Theorem for Systems of Conservation Laws* September 26, 2011  
Lefschetz Center for Dynamical Systems Seminar  
Division of Applied Mathematics, Brown University, Providence
7. *The Cauchy problem for systems of conservation laws* May 5, 2011  
Colloquium, Drexel University, Philadelphia, Pennsylvania
8. *Eigen-structure and entropies for conservative systems* January 21, 2011  
PDE Seminar, University of Houston, Houston, Texas
9. *Eigen-structure and entropies for conservative systems* November 16, 2010  
Applied Analysis Seminar, Department of Mathematics  
University of Pittsburgh, Pittsburgh, Pennsylvania
10. *Hyperbolic systems: geometric structure and entropies* December 1, 2009  
Colloquium, Department of Mathematics and Statistics  
University of Massachusetts at Amherst, Amherst, Massachusetts
11. *Geometric construction of hyperbolic systems of conservation laws* July 2, 2009  
Colloquia Patavina, Department of Pure and Applied Mathematics  
University of Padova, Padova, Italy
12. *Multi-dimensional Symmetric Waves for Conservation Laws* April 30, 2009  
Guest Lecture, Centre for Advanced Study (CAS)  
Norwegian Academy of Science and Letters, Oslo, Norway
13. *Existence of Hyperbolic Systems with Prescribed Geometry* March 31, 2009  
PDE Seminar, Georgia Institute of Technology, Georgia
14. *Conservative Systems with Given Geometry* February 6, 2009  
Guest Lecture, Centre for Advanced Study (CAS)  
Norwegian Academy of Science and Letters, Oslo, Norway

15. *Geometric Properties of Hyperbolic Conservation Laws* July 16, 2008  
Applied Mathematics Seminar, Department of Mathematics  
University of Bari, Bari, Italy
16. *Conservation Laws in One and Several Space Dimensions* May 23, 2007  
Applied Mathematics Seminar, Department of Mathematics  
University of Bari, Bari, Italy
17. *Conservation Laws in One and Several Space Dimensions,* April 5, 2007  
Department of Mathematics Colloquium  
University of Wyoming, Laramie, Wyoming
18. *Large Data Solutions of the 1-D Compressible Euler Equations* March 20, 2006  
Differential Equations Seminar  
University of Michigan, Ann Arbor, Michigan
19. *Systems of Conservation Laws with Prescribed Wave Curves* September 22, 2005  
Mittag-Leffler Institute, Stockholm, Sweden
20. *Instabilities in Finite Difference Schemes for Conservation Laws* August 16, 2004  
Seminar, Centre of Mathematics for Application (CMA),  
University of Oslo, Oslo, Norway
21. *Compressible and heat conductive flows with large data  
and symmetry* February 13, 2004  
CAM Colloquium, Department of Mathematics  
Penn State University, University Park, Pennsylvania
22. *Navier-Stokes equations for compressible fluids* February 13, 2004  
Luncheon Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
23. *Compressible and heat conductive flows with large data and symmetry* February 9, 2004  
Applied Math and Analysis Seminar, Department of Mathematics  
Duke University, Durham, North Carolina
24. *Blowup for systems of conservation laws* February 6, 2004  
Seminar, Department of Mathematics  
University of Houston, Houston, Texas
25. *Large solutions to systems of nonlinear equations* February 5, 2003  
Seminar, Department of Mathematics  
Texas A&M University, College Station, Texas
26. *Large solutions to systems of nonlinear equations* February 3, 2003  
Seminar, Department of Mathematics  
North Carolina State University, Raleigh, North Carolina
27. *Systems of Conservation Laws* January 28, 2003  
Seminar, Department of Mathematics and Statistics  
University of Nevada, Reno, Nevada



28. *Hyperbolic Conservation Laws: Existence of Solutions and Qualitative Properties* April 13, 2001  
Seminar, Department of Mathematics  
University of Colorado at Boulder, Boulder, Colorado
29. *Large solutions to systems of conservation laws* February 10, 2001  
Colloquium, Department of Mathematics and Statistics  
University of Massachusetts at Amherst, Amherst, Massachusetts

### Invited Conference Talks

1. *Isentropic Flow with Large Data* August 26, 2013  
International Conference on Applied and Computational Science (AMMCS '13)  
Waterloo, Ontario, Canada
2. *TVD Fields & 1-D Isentropic Gas Dynamics* April 26 2012  
Symposium "Hyperbolic Conservation Laws and Applications"  
CUNY Graduate Center, Manhattan, New York
3. *Entropies for hyperbolic systems with prescribed eigenfields* December 9, 2009  
Special session Multi-Dimensional Conservation Laws and Related Applications  
SIAM Conference on Analysis of PDE, Miami, Florida
4. *Symmetric waves for conservation laws* July 27, 2009  
Workshop "Nonlinear Conservation Laws and Applications"  
The Institute for Mathematics and its Applications (IMA)  
University of Minnesota
5. *Geometric Structure of Hyperbolic Conservation Laws* June 8-11, 2009  
Special session "Nonlinear Partial Differential Equations"  
25th Nordic and 1st British-Nordic congress of Mathematicians  
University of Oslo, Norway
6. *Geometry of Hyperbolic Conservation Laws* April 4-5, 2009  
Special session "Geometry of Differential Equations"  
AMS 2009 Spring Southeastern Meeting, Raleigh, North Carolina
7. *Existence and Stability of Shocks with Geometric Structure* July 21-24, 2008  
Special session "Analysis of Nonlinear PDE in Wave Propagation Problems"  
SIAM Conference on Nonlinear Waves and Coherent Structures, Rome, Italy
8. *Modeling of Multi-Step Reactions* July 21-24, 2008  
Special session "Stability of Combustion Waves"  
SIAM Conference on Nonlinear Waves and Coherent Structures, Rome, Italy
9. *Hyperbolic Conservation Laws with Prescribed Eigencurves* May 5-9, 2008  
Workshop "Exterior Differential Systems and the Method of Equivalence"  
Mathematical Sciences Research Institute (MSRI), Berkeley, California

10. *Hyperbolic Conservation Laws with Prescribed Eigencurves* February 22-23, 2008  
The Geometry and Analysis of Dynamical Systems  
Conference to Celebrate the Mathematical Contributions  
of Xiao-Biao Lin & Steve Schechter, Raleigh, North Carolina
11. *Symmetric Stationary Inviscid and Viscous Profiles in Multi-D* December 10-12, 2007  
Minisymposium on “Mathematical Problems in Compressible  
Fluid Flow”, SIAM Conference on Analysis of Partial  
Differential Equations, Mesa, Arizona
12. *Stationary Gas Dynamical Shocks with Symmetry* November 3-4, 2007  
Special Session on Nonlinear Partial Differential Equations and Applications  
AMS 2007 Fall Southeastern Meeting, Murfreesboro, Tennessee
13. Declined: Special Session on Wave Propagation October 5-6, 2007  
from Mathematical and Numerical Viewpoints  
AMS 2007 Fall Central Section Meeting, Chicago, Illinois
14. *Systems of Conservation Laws with Geometric Constraints* June 1, 2007  
Invited talk, INdAM International workshop on Nonlinear  
Hyperbolic Problems, Istituto Nazionale di Alta Matematica  
(INdAM), Rome, Italy
15. *Existence and Stability of Spherical Shocks* April 16-19, 2007  
Session on “Non-Self-Adjoint Spectral Problems”, 5th IMACS  
International Conference on Nonlinear Evolution Equations  
and Wave Phenomena, Athens, Georgia
16. *A Particular Large Data Solution of the 1-D Euler System* July 10-12, 2006  
Minisymposium on “Nonlinear Conservation Laws  
and Related Models”, SIAM Conference on Analysis of  
Partial Differential Equations, Boston, Massachusetts
17. *Numerical Investigation of Cavitation in Multi-D Compressible Flow* June 25-28, 2006  
Special session “The Navier-Stokes equations and related problems”  
AIMS’ 6th International Conference on Dynamical Systems,  
Differential Equations and Applications, Poitiers, France
18. *Blowup and Non-blowup in 1-D Systems of Conservation Laws* May 11-13, 2006  
“Fluids and Waves: Recent Trends in Applied Analysis”  
University of Memphis, Memphis, Tennessee
19. *BV Instability of Finite Difference Schemes for Systems  
of Conservation Laws* April 1-2, 2006  
Special session “Nonlinear Waves”  
AMS Sectional Meeting, Miami, Florida
20. *1-D Systems of Conservation Laws with Prescribed Eigen-structure* June 13-14, 2005  
4th Meeting on Hyperbolic Conservation Laws, Trieste, Italy
21. *BV Instability of the Upwind and Lax-Friedrichs Schemes* December 6-8, 2004  
Special session “Recent Advances in Hyperbolic Conservation Laws”  
SIAM Conference on Analysis of PDE, Houston, Texas

22. *BV instability for Godunov and Lax-Friedrich schemes* November 6-7, 2004  
Special session "Partial Differential Equations and Applications"  
AMS Fall 2004 Eastern Section Meeting, Pittsburgh, Pennsylvania
23. *Instabilities in the Lax-Friedrichs and Godunov schemes* June 16-19, 2004  
*for systems of conservation laws*  
Special session "Nonlinear Dynamics for Hyperbolic Systems"  
AIMS 5th International Conference on Dynamical Systems  
and Differential Equations, Pomona, California
24. *Low frequency stability of multi-D viscous and inviscid* May 9-12, 2004  
*planar detonations*  
Special session "Mathematical analysis of detonation problems"  
SIAM Conference on Numerical Combustion, Sedona, Arizona
25. *Global existence for the full multi-dimensional compressible* October 12-13, 2002  
*Navier-Stokes equations with large, symmetric data*  
Special session "Hyperbolic Differential Equations and Kinetic Theory"  
AMS Fall 2002 Central Section Meeting, Madison, Wisconsin
26. *On the convergence of Godunov Scheme for nonlinear* September 11-13, 2000  
*hyperbolic systems*  
Final Meeting, European Training and Mobility of Researchers  
(TMR) Network "Nonlinear Hyperbolic Problems", Paris, France

### Contributed Conference Talks

1. *Construction of Conservative Systems* June 9-13, 2008  
12th International Conference on Hyperbolic Problems  
College Park, Maryland
2. *Stability of Planar Combustion Fronts and Spherical Waves* October 30, 2006  
Workshop on Hyperbolic Systems of Conservation Laws and Related Problems  
Banff International Research Station, Banff, Canada
3. *On Global Large Solutions to 1-D Gas Dynamics* July 17-21, 2006  
11th International Conference on Hyperbolic Problems  
Lyon, France
4. *Low frequency stability of planar multi-D detonations* April 4-10, 2004  
Workshop "Hyperbolic Conservation Laws"  
Mathematisches Forschungsinstitut Oberwolfach  
Oberwolfach, Germany
5. *Multidimensional compressible flows with symmetry* March 25-29, 2002  
9th International Conference on Hyperbolic Problems  
Pasadena, California

6. *On the convergence of Godunov scheme for  $n \times n$  systems of hyperbolic conservation laws* February 28-March 3, 2000  
8th International Conference on Hyperbolic Problems  
Magdeburg, Germany
7. *Blowup in Hyperbolic systems* May 9-15, 1999  
Workshop “Hyperbolic Aspects of Fluid Dynamics”  
Mathematisches Forschungsinstitut Oberwolfach  
Oberwolfach, Germany
8. *Spreading of characteristics for non-convex scalar equations* June 15-July 18, 1998  
Theoretical and numerical aspects of hyperbolic systems  
Heraklion, Crete, Greece
9. *Blowup for hyperbolic equations* February 9-13, 1998  
7th International Conference on Hyperbolic Problems  
Zürich, Switzerland

### Other Talks

1. *Radial Similarity Flows for Compressible Euler* February 13, 2018  
PDE Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
2. *Entropies for systems with prescribed eigen-frame I-II* Sept. 27 & Oct. 4, 2010  
PDE Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
3. *Systems of hyperbolic conservation laws with prescribed eigencurves* December 1, 2008  
PDE Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
4. *How to construct systems of conservation laws with prescribed geometry* October 3, 2008  
Luncheon Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
5. *What is a shock?* October 16, 2007  
Talk at the Slow Pitch Seminar  
Penn State University, University Park, Pennsylvania
6. *Modeling and Theory of Compressible Flows* October 1, 2007  
Talk at the Penn State Math Club  
Penn State University, University Park, Pennsylvania
7. *Conservation Laws* January 30, 2006  
Talk at the Penn State Math Club  
Penn State University, University Park, Pennsylvania

8. *Vacuum Formation in Compressible Flow* December 2, 2005  
Luncheon Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
9. *Singular Behavior for Solutions to Conservation Laws* January 14, 2005  
CAM Colloquium, Department of Mathematics  
Penn State University, University Park, Pennsylvania
10. *Singular Behavior for Solutions to Conservation Laws* January 14, 2005  
Luncheon Seminar, Department of Mathematics  
Penn State University, University Park, Pennsylvania
11. *BV Instability of Numerical Schemes for Conservation Laws* September 8, 2004  
Seminar, Department of Mathematics  
North Carolina State University, North Carolina
12. *Conservation Laws, Shock Waves, Numerics and Blowup Phenomena* November 17, 2003  
Mathematics Graduate Student Seminar (presenting field of research)  
Department of Mathematics  
North Carolina State University, Raleigh, North Carolina
13. *Global existence for heat conducting multidimensional flow with large, symmetric data* October 7, 2002  
Seminar, Department of Mathematics  
Indiana University, Bloomington, Indiana
14. *Blow-up for systems of hyperbolic conservation laws* September 10, 2001  
Seminar, Department of Mathematics  
Indiana University, Bloomington, Indiana
15. *Hyperbolic Conservation Laws: Existence of Solutions and Qualitative Properties* April 25, 2001  
Seminar, Department of Mathematics  
Indiana University, Bloomington, Indiana
16. *Convergence of Godunov Scheme for Nonlinear Hyperbolic Systems* September 4, 2000  
Seminar, Department of Mathematics  
Indiana University, Bloomington, Indiana

**Teaching**

- Penn State University

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| MATH 251: Ordinary and Partial Differential Equations            | Fall 2017   |
| MATH 513: Partial Differential Equations I                       | Fall 2017   |
| MATH 514: Partial Differential Equations II                      | Spring 2017 |
| MATH 403: Analysis I   | Fall 2016   |
| MATH 403: Analysis I   | Fall 2015   |
| MATH 503: Functional Analysis                                    | Spring 2015 |
| MATH 441: Matrix Algebra   | Fall 2014   |
| MATH 514: Partial Differential Equations II                      | Spring 2014 |
| MATH 403: Analysis I   | Fall 2013   |
| MATH 514: Partial Differential Equations II                      | Spring 2013 |
| MATH 441: Matrix Algebra   | Fall 2012   |
| Reading course on Hyperbolic Conservation Laws (2 students)      | Spring 2011 |
| MATH 412: Fourier Series and Partial Differential Equations      | Spring 2011 |
| MATH 417: Qualitative Theory of Differential Equations           | Spring 2011 |
| MATH 513: Partial Differential Equations I                       | Fall 2010   |
| MATH 251-H: Ordinary and Partial Differential Equations (honors) | Spring 2009 |
| MATH 513: Partial Differential Equations I                       | Fall 2009   |
| MATH 232: Integral Vector Calculus                               | Fall 2009   |
| MATH 597A Hyperbolic Systems                                     | Fall 2008   |
| MATH 403: Analysis I   | Fall 2008   |
| MATH 511: Ordinary Differential Equations I                      | Spring 2008 |
| MATH 513: Partial Differential Equations I                       | Fall 2006   |
| MATH 403: Analysis I   | Fall 2006   |
| MATH 251: Ordinary and Partial Differential Equations            | Spring 2006 |
| MATH 251-H: Ordinary and Partial Differential Equations (honors) | Spring 2006 |

- North Carolina State University

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| MA798: Advanced Numerics and Modeling in Science and Engineering | Spring 2005 |
| MA797: Conservation Laws: Theory, Numerics, Applications         | Fall 2004   |
| MA242: Analytic Geometry and Calculus III                        | Fall 2004   |
| MA734: Partial Differential Equations                            | Spring 2004 |
| MA534: Introduction to Partial Differential Equations            | Fall 2003   |

- Indiana University

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| M442: Introduction to Partial Differential Equations with Applications II | Spring 2003 |
| M118: Finite mathematics  | Fall 2002   |

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| M441: Introduction to Partial Differential Equations with Applications I | Fall 2002   |
| M343: Introduction to Ordinary Differential Equations                    | Spring 2002 |
| M118: Finite mathematics   | Fall 2001   |
| M413: Introduction to Analysis   | Fall 2001   |
| M118: Finite mathematics   | Spring 2001 |
| M211: Calculus I   | Fall 2000   |

### New Courses Developed

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|---|-----------------------|
| MATH 597A Hyperbolic Systems<br>Department of Mathematics, Penn State   | Fall 2008             |
| Developed (with Pierre Gremaud, North Carolina State University)<br>two new special topics courses with online lecture notes,<br>Department of Mathematics, North Carolina State University<br>- MA797: Conservation Laws: Theory, Numerics, Applications<br>- MA798: Advanced Numerics and Modeling in Science and Engineering | Fall 2004-Spring 2005 |

### Service to profession

|  |                   |
|--|-------------------|
| Peer Reviewer for National Science Foundation  | 2015              |
| Member of PhD committee for Yajie Zhang<br>Department of Mathematics, Penn State   | 2013-2017         |
| Member PhD committee for Alex Iaroshenko<br>Department of Mathematics, Penn State  | 2013-2018         |
| Member PhD committee for Russell deForest<br>Department of Mathematics, Penn State   | 2012-2019         |
| Member PhD committee for Tianyou Zhang<br>Department of Mathematics, Penn State  | 2009-2012         |
| Examiner for MASS course<br>Department of Mathematics, Penn State  | December 17, 2009 |
| Member of PhD adjudication committee for Hilde Sande<br>Department of Mathematical Sciences<br>Norwegian University of Science and Technology<br>Trondheim, Norway | January 16, 2009  |
| Examiner, Master Thesis of Jakub Bogumił Warszawski<br>Evaluation of thesis and oral examination<br>University of Oslo, Norway                                     | June 21, 2007     |

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| Reviewer of proposals for The U.S. Civilian Research & Development Foundation (CRDF)                           | June 2006          |
| Reviewer for Mathematical Reviews  | June 2005 – 2012   |
| Organized (with Kenneth Karlsen) workshop Recent Advances in Nonlinear PDEs, University of Oslo, Norway        | March 3-4 2005     |
| Organized (with Michael Shearer) three mini-symposia at the SIAM Conference on Analysis of PDE, Houston, Texas | December 6-8, 2004 |
| Peer Reviewer for National Science Foundation  | 2003 & 2005        |

Refereed papers for:

- *Applied Mathematics Research eXpress*
- *AMS Contemporary Mathematics*
- *Archive for Rational Mechanics and Analysis*
- *Communications in Mathematical Sciences*
- *Communications on Pure and Applied Analysis*
- *Computers and Fluids*
- *Discrete and Continuous Dynamical Systems*
- *Duke Mathematical Journal*
- *European Journal of Mechanics - B/Fluids*
- *Indiana University Mathematics Journal*
- *International Journal of Mathematics and Mathematical Sciences*
- *Journal de l'École polytechnique*
- *Journal of Computational and Applied Mathematics*
- *Journal of Differential Equations*
- *Journal of Hyperbolic Differential Equations*
- *Journal of Mathematical Analysis and Applications*
- *Journal of Mathematical Fluid Mechanics*
- *Mathematical Modelling and Analysis*
- *Methods and Applications of Analysis*
- *Networks and Heterogeneous Media*
- *Nonlinear Analysis Series A: Theory, Methods & Applications*
- *Nonlinearity*
- *SIAM Journal of Mathematical Analysis*
- *SIAM Journal of Applied Mathematics*
- *Transactions of the American Mathematical Society*
- *Zeitschrift für Analysis und ihre Anwendungen (ZAA) (Journal of Analysis and its Applications)*
- *Zeitschrift für Angewandte Mathematik und Physik (ZAMP)*



**College Service**

|   |           |
|---|-----------|
| College Promotion and Tenure Committee, Chair<br>Eberly College of Science, Penn State University | 2017-2018 |
| College Promotion and Tenure Committee<br>Eberly College of Science, Penn State University        | 2016-2018 |

**Department Service**

|   |                       |
|---|-----------------------|
| Department Promotion and Tenure Committee<br>Department of Mathematics, Penn State University   | 2016-2018             |
| Qualifying Examinations Panel<br>Department of Mathematics, Penn State University   | 2015-2018             |
| Provided bios for 6 external evaluators for the Promotion<br>and Tenure Committee (case of promotion to Full Professor)<br>Department of Mathematics, Penn State University | August 2015           |
| Graduate Studies Committee<br>Department of Mathematics, Penn State University  | 2013-2016             |
| Computer Committee<br>Department of Mathematics, Penn State University  | July 2007 – present   |
| Personnel Committee<br>Department of Mathematics, Penn State University   | July 2008 – June 2011 |
| Ph.D. committee for Brian Haines<br>Department of Mathematics, Penn State University  | 2008-2011             |
| First-year mentor for incoming students<br>(Kurt Vinage, Dan Lin, and Daniel Droz)<br>Department of Mathematics, Penn State University                                      | 2010-2011             |
| Qualifying exam committee (real and functional analysis)<br>Department of Mathematics, Penn State University  | Summer 2010           |
| Coordinator of Luncheon Seminar<br>Center for Computational Mathematics and Applications<br>Department of Mathematics, Penn State University                                | Fall 2009             |
| Coordinator of PDE Seminar<br>Center for Computational Mathematics and Applications<br>Department of Mathematics, Penn State University                                     | Fall 2009             |
| Coordinator of Computational and Applied<br>Mathematics Colloquium<br>Department of Mathematics, Penn State University  | Fall 2008-Fall 2009   |
| PDE exam committee<br>Department of Mathematics, Penn State University  | Spring 2008           |

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| Subcommittee of Undergraduate Studies Committee<br>Search for instructor candidates  | February 2008               |
| PDE exam committee<br>Department of Mathematics, Penn State University   | Spring and Summer 2007      |
| PDE exam committee<br>Department of Mathematics, Penn State University   | Spring and Summer 2006      |
| Undergraduate Studies Committee<br>Department of Mathematics, Penn State University  | July 2006 – June 2009       |
| Graduate Teaching Assistant Oversight Committee<br>Department of Mathematics, Penn State University                                  | January 2006– December 2008 |
| Ph.D. committee for Chris Kuster<br>Department of Mathematics, North Carolina State University                                       | Spring 2005                 |
| Teaching mentor for graduate student Stacy Beun<br>Department of Mathematics, North Carolina State University                        | Fall 2004-Spring 2005       |
| Organized (with Dmitry Zenkov) weekly Differential<br>Equation Seminar, Department of Mathematics<br>North Carolina State University | Fall 2004-Spring 2005       |

### **Additional information**

Nationality: Norwegian

US Permanent Resident

Married, three children

Languages: Norwegian (native), English (fluent), Italian (speak and read), French (read), Swedish and Danish.