

JODI L. MEAD

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Academic Experience

Visiting Professor, Department of Mathematics, Arizona State University, Spring 2007.
Associate Professor, Department of Mathematics, Boise State University, August 2005 - present.
Assistant Professor, Department of Mathematics, Boise State University, August 2000 - 2005.
Post-doctoral Fellow, College of Oceanic and Atmospheric Sciences, Oregon State University, August 1998 - July 2000.
Graduate Research Fellow, Department of Mathematics, Arizona State University, August 1996 - August 1998.
Teaching Assistant, Department of Mathematics, Arizona State University, August 1992-August 1996.

Education

Ph.D., Mathematics, August 1998, Arizona State University, Tempe, AZ.
Ph.D. Thesis: Numerical Methods for Problems in Computational Aeroacoustics.
M.A., Mathematics, December 1994, Arizona State University, Tempe, AZ.
Master's Thesis: A Study of a Different Pivoting Strategy in Gaussian Elimination.
B.S., Mathematics, May 1989, Syracuse University, Syracuse, NY.

Papers in Refereed Journals

J.L. Mead and R.A. Renault, "Least squares problems with inequality constraints as quadratic constraints", in preparation.
J.L. Mead and R.A. Renault, "A Newton root-finding algorithm for estimating the regularization parameter for solving ill-conditioned least squares problems", submitted to *Inverse Problems*.
J.L. Mead, "Parameter estimation: A new approach to weighting a priori information", *Journal of Inverse and Ill-posed Problems*, Vol. 16, No.2, 2008 .
J.L. Mead and B. Zubik-Kowal, "An Iterated Pseudospectral Method for Functional Differential Equations", *Applied Numerical Mathematics*, Vol. 55 Issue 2, pp 227-250, 2005.
J.L. Mead and B. Zubik-Kowal, "Pseudospectral iterated method for differential equations with delay terms", *Lecture Notes in Computer Science 3039*, Springer-Verlag, pp. 451-458, 2004.
J.L. Mead, "The Shallow Water Equations in Lagrangian Co-ordinates", *J. Comp.Phys.*, Vol 200, No. 2 pp 654-669, 2004.
J.L. Mead, "Assimilation of Simulated Float Data in Lagrangian Coordinates", *Ocean Modelling*, Vol 8, Issue 4 pp. 369-394, 2005.
J.L. Mead and R.A. Renault, "Accuracy, Resolution and Stability Properties of a Modified Chebyshev Method", *SIAM Journal on Scientific Computing*, Vol. 24 No. 1 pp. 143-160, 2002.
J.L. Mead, R.A. Renault and B.D. Welfert, "Stability of a Pivoting Strategy for Parallel Gaussian Elimination", *BIT* 41:2, pp. 633-639, June 2001.
J.L. Mead and A.F. Bennett, "Towards Regional Assimilation of Lagrangian Data: The Lagrangian form of the Shallow Water Reduced Gravity Model and its Inverse", *Journal of Marine Systems*, 29, pp. 365-384, 2001.

J.L. Mead and R.A. Renaut, "Optimal Runge-Kutta Methods for First Order Pseudospectral Operators", *Journal of Computational Physics*, Vol 152, pp. 404-419, 1999.

J.L. Mead and R.A. Renaut, "High Order Methods for Problems in Computational Aeroacoustics", *SIAM Mathematical and Numerical Aspects of Wave Propagation*, June 1998.

Funding

- *NSF EPSCoR*, BSU portion: \$1,511,853, "Idaho Grand Challenge Initiative for Water Resources", PI Jim McNamara, co-PIs Molly Gribb and Shawn Benner, 2005-2008.
- *EPA subcontract*, \$50,000, "Boise State University for developing multi-purpose sensors to detect and analyze environmental contaminants", with Tom Clemo, Summer 2005.
- *BSU Collaborative Grant Improvement Initiative*, \$150,000, "Development of an Environmental Hydrology Center", co-PIs Jim McNamara and Molly Gribb, June 2004-July 2006.
- *NSF Interdisciplinary Grant in the Mathematical Sciences*, \$99,181, "Mathematics in Near Sub-Surface Science", Fall 2003-Summer 2004.
- *Office of Naval Research subcontract*, \$21,934, "Assimilation of Lagrangian Data into Regional Models", Summer 2001.
- *Office of Naval Research postdoctoral fellowship*, \$47,000, "Lagrangian Data Assimilation", Fall 1999-Fall 2000.
- *NSF postdoctoral fellowship*, \$43,000, "Open Ocean Data Assimilation", Fall 1998-Fall 1999.
- *NASA graduate research fellowship*, \$32,000, "Numerical Methods for Problems in Computational Aeroacoustics", Fall 1996-Spring 1998.

Conference Presentations

2008 SIAM Annual Meeting, "The χ^2 Method for Parameter Estimation, Combining Data Sets and Uncertainty Quantification", July 8, 2008, San Diego, CA.

15th ILAS, "Calculating Weights in Least Squares Estimation Using the χ^2 Method", June 20, 2008, Cancun, MX.

Tenth Copper Mountain Conference on Iterative Methods, "The chi-squared method for constrained parameter estimation, and calculation of data weights", April 10, 2008, Copper Mountain, CO.

AGU Fall meeting, "Using the χ^2 -curve method to assimilate large data sets from different sources", December 15, 2007, San Francisco, CA.

SIAM Conference on Mathematical Computational Issues in the Geosciences, "Parameter Estimation: A New Approach to Weighting A Priori Information", March 20, 2007, Santa Fe, NM.

AGU Fall meeting, "Parameter Estimation in Spatially Varying and Heterogeneous Soils", December 13, 2006, San Francisco, CA.

SIAM Conference on Imaging Science, "Regularization and Prior Error Distributions in Ill-posed Problems", May 15, 2006, Minneapolis, MN.

SIAM Conference on Mathematical Computational Issues in the Geosciences, "The Shallow Water Equations in Lagrangian Coordinates", June 9, 2005, Avignon France.

2004 SIAM Annual Meeting, "Parameter Estimates with Non-necessarily Gaussian Noise", July 14, 2004, Portland, OR.

Summer School for Mathematical Geophysics & Uncertainty in Earth Models, "Data Assimilation and Inversion", June 25, 2004, Colorado School of Mines.

Women of Applied Mathematics: Research and Leadership, "The Shallow Water Equations in Lagrangian Coordinates", October 8-10, 2003, College Park, MD.

Inverse Ocean Modeling Workshop, "IOM, Float Data, and Lagrangian Coordinates", July 16-18, 2003, Boulder, CO.

SIAM Conference on Mathematical and Computational Issues in the Geosciences, "High Order

Numerical Methods for the Spherical Shallow Water Equations in Lagrangian Coordinates”, March 17-20, 2003, Austin, TX.

Lagrangian Analysis and Predictability of Coastal and Oceanic Dynamics Meeting, “Lagrangian Coordinates for Ocean Data Assimilation”, December 12-16, 2002, Key Largo, FL.

2002 SIAM Annual Meeting, “Numerical Solution of the Shallow Water Equations in Lagrangian Coordinates”, July 8-12, 2002, Philadelphia, PA.

Progress in Partial Differential Equations and Applications, “An Inverse Problem in Physical Oceanography for Lagrangian Data”, May 23-25, 2002, Pullman, WA.

Seventh Copper Mountain Conference on Iterative Methods, “An Iterative Inverse Method for Physical Oceanography”, March 24-29, 2002, Copper Mountain, CO.

INRA/INEEL Subsurface Science Symposium, “The Representer Method: An Efficient Inverse Method with some Results from Physical Oceanography”, September 6-7, 2001, Idaho Falls, ID.

International Conference on Spectral and High Order Methods, “Phase and Amplitude Errors in a Modified Chebychev Method”, June 11-15, 2001, Uppsala University, Sweden.

Lagrangian Analysis and Predictability of Coastal and Oceanic Dynamics Meeting, “Lagrangian Coordinates for Ocean Data Assimilation”, October 2-6, 2000, Ischia, Italy.

Inverse Problems Seminar of the Pacific Northwest, “Inverse Methods in Physical Oceanography”, June 3-4, 2000, Corvallis, OR.

8th Workshop on the Solution of Partial Differential Equations on the Sphere, “The Lagrangian Form of the Shallow Water Equations on the Sphere and its Inverse”, November 30 - December 3, 1999, San Francisco, CA.

Workshop on Predictability in the Ocean and Atmosphere, “Data Assimilation with a Regional Reduced Gravity Model”, October 26-27, 1999, Arlington, VA.

31st International Liège Colloquium on Ocean Hydrodynamics, “Regional Assimilation of Lagrangian Data”, May 3-7, 1999, University of Liège, Belgium.

SIAM Fourth International Conference on Mathematical and Numerical Aspects of Wave Propagation, “High Order Methods for Problems in Computational Aeroacoustics”, June 1-5, 1998, Colorado School of Mines.

17th Biennial Conference on Numerical Analysis, “Analysis of a Pivoting Strategy for Gaussian Elimination on Parallel Machines” and “Employment of Recent Ph.D.s: How the Culture is Changing in Higher Education”, June 24-27, 1997, University of Dundee, Scotland.

Society of Engineering Science 33rd Annual Technical Meeting, “A different pivoting strategy in Gaussian elimination for parallel machines”, October 20-23, 1996, Tempe, AZ.

Teaching Experience

- *Numerical Analysis*, Boise State University Fall 2008.
- *Applied Mathematics*, Boise State University, Fall 2004, 2006.
- *Dynamical Systems*, Boise State University, Fall 2005.
- *Numerical Methods for Differential Equations*, Boise State University, Fall 2002.
- *Mathematical Modeling*, Boise State University, Fall 2001.
- *Differential equations with matrix theory*, Boise State University, Fall 2000, 2002, Spring 2001, 2008 and Arizona State University Spring 2007.
- *Engineering Statistics*, Boise State University, Spring 2002.
- *Inverse methods and data assimilation*, Oregon State University, Summer 1999.
- *Multivariable Calculus*, Boise State University, Spring 2003, Fall 2006, 2008

- *Calculus II*, Boise State University, Fall 2000, 2004, 2008.
- *Calculus I*, Boise State University, Fall 2001, Spring 2002, 2005.
- *Pre-Calculus and College Algebra*, Arizona State University, Fall 1992-Summer 1996.

Service

- *Director of Graduate Studies*, Boise State University, 2007-present.
- *Graduate advisor*, Rayna Treneva (M.S. Spring 2007) Shannon Murray (M.S. Spring 2008), Garrett Saunders (M.S. anticipated Spring 2009).
- *Graduate committee member*, Laura Pool (M.S. Geophysics 2007), Carlyle Miller (Ph.D. Geophysics 2006) Marc Bursink (Ph.D. Geophysics 2007), and Shannon Murray (Ph.D. Geophysics anticipated 2011).
- *Journal Reviewer*, *Inverse Problems*, *Applied Numerical Mathematics*, *Journal of Geophysical Research*, *Computers and Mathematics with Applications*, *Advances in Water Resources*, *International Journal for Numerical and Analytical Methods in Geomechanics*, and *Ocean Modelling*
- *NSF Reviewer*, annually on panels 2006-2008, and paper 2004-2008, for programs in Mathematics, Cyberinfrastructure and Geoscience.
- *Coach, Mathematical Contest in Modeling*, Boise State University 2001-2004.