JOSEPH V. KOEBBE

Birthdate:	June 23, 1958	Birthplace:	Hardin, Montana
Spouse:	Nan Godfrey Koebbe		

Contact Information:

Mailing Address:	3900 Old Main Logan, UT 84322-3900 USA
Department:	Department of Mathematics and Statistics Utah State University Logan, UT 84322-3900 USA
Phone:	1-435-797-2825
e-mail:	Joe.Koebbe@.usu.edu
web page:	http://www.math.usu.edu/~koebbe

Education:

Institution	Dates Attended	Degree Date	Degree	Major
Carroll College	1976-1980	1980	B.A.	Mathematics
Washington State U.	1980-1982	1982	M.S.	Mathematics
Univ. of Wyoming	1982-1988	1988	Ph.D	Mathematics

Awards:

- WRI/UW Energy Research Fellowship, 1985-1986 academic year, University of Wyoming
- Senior Graduate Research Assistant, 1985-1986 academic year, University of Wyoming
- Senior Graduate Research Assistant, 1986-1987 academic year, University of Wyoming
- Senior Graduate Research Assistant, 1987-1988 academic year, University of Wyoming
- 'Top Prof' award by the Utah State University Chapter of Mortar Board, February, 1994.
- 'Top Prof' award by the Utah State University Chapter of Mortar Board, February, 1996.
- 'Teacher of the Year' in the Department of Mathematics and Statistics at Utah State University 1998-99.

Appointments:

• Associate Professor of Mathematics at Utah State University- 1994-present.

• Assistant Professor of Mathematics at Utah State University- 1988-1994.

Nonacademic Experience:

- Summer hire at Chevron Oil Field Research Company of LaHabra, CA for the summer of 1985 in the Reservoir Engineering Division (Supervisor E.Y. Chung)
- Consulting with Chevron Oil Field Research Co. of LaHabra, CA. (1985-1993)
- Consulting with the Institute for Scientific Computation, University of Wyoming, Laramie Wyoming, 1988-1992
- Research scientist with the Utah Geological Survey on modeling problems on the Ferron Sandstone project. This project was funded by DOE.
- Consulting with Exxon Production Research in Houston Texas on fault zone modeling with Craig Forster and Jonathan Caine from the Earth Sciences Research Institute (ESRI) at the University of Utah (ongoing see the simulation results on my Web page).
- Worked with Lee Davis and Laura Watkins on particle packing problems for Thiokol Corporation. (funded) (1998-99).
- Work on modeling fishing fleets in the Bering Seas with Keith Criddle and AFSC (1999-present)
- Work with Mike Epton at Boeing on optimal robot path planning using Fast Marching Methods (2001-2003)
- Work with David Sullivan at Dupont Authenication on optimization of the production of holograms for security features. (2009-present)

Travel:

- Invited to the University of Pau in Pau France as a visiting professor, Oct/Nov 2003.
- Invited to the University of Pau in Pau France as a visiting professor, May/June, 2002.
- Attended the Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences, Boulder Colorado, June 11-14, 2001.
- Attended the Fifth Joint Meeting of the American Mathematical Society and the Mexican Mathematical Society, Morelia Mexico, May 23-26, 2001.
- Attended the XIII International Conference on Computational Methods in Water Resources, Calgary Canada, June 25-29, 2000.
- Invited to the University of Pau in Pau France as a visiting professor, Sept 3 through Sept 24, 1997.
- Served on the 1995 DOE EPSCOR review panel for the proposal from the State of Montana project. Traveled to Bozeman and Butte Montana, Sept. 20-22, 1995.
- Attended the SIAM Annual meeting in San Diego, Californnia, July 25-29, 1994.
- Attended the Fifth International Hyperbolic Conference at the State University of New York (SUNY) in Stony Brook, New York, June 15-19, 1994
- Traveled to Los Alamos National Lab with Kevin Hestir, Craig Forster and Steve Martel to work with researchers on fracture mechanics. This was supported by the Association of Western Universities and was directly related to the NSF grant with Hestir listed below, May 16-17 1993.

- Attended the SIAM Geosciences Conference in Houston TX, April 19-21, 1993.
- Visited the Institute for Scientific Computation at Texas A&M University, in College Station Texas, April 16-18, 1993.
- Attended the IX International Conference on the use of Computational Methods in Water Resources in Denver, CO., June 8-12, 1992.
- Invited to the University of Bergen in Norway for 5 days in the spring of 1992, (April 1-5, 1992).
- Invited to the University of St. Etienne for one month as a visiting professor (March 24-April 17, 1992).
- Attended the Fifth Annual INEL Computing Symposium in Idaho Falls, ID., September 10-12, 1991.
- Invited to the University of Pau in Pau France as a visiting professor for one month (June 3-25, 1990). One week of this visit was spent in St. Etienne at the University of St. Etienne (June 25-30, 1990).
- Attended the Regional Workshop on Nonlinear Conservation Laws in Stony Brook, New York held at the State University of New York at Stony Brook, (May 1990).
- Attended the Society of Petroleum Engineers conference on Reservoir Simulation in Houston, TX., (Feb. 4-8, 1989)
- Invited to the University of Bergen for a 4 week period of time to work with Magne Espedal and Helge Dahle from May 15 to June 15 of 1988. Work was done at the IBM Institute in Bergen for a short period of time while in Bergen.
- Attended the NSF/BCS Supercomputer Summer Institute, Session I, in Seattle, WA., June 2-20, 1986.

Publications:

Ph.D. dissertation:

• "Numerical Schemes for the Immiscible Displacement Equations Using a General Polynomial Framework for the Saturation Equation and Mixed Finite Element Methods for the Pressure", Ph.D. dissertation, Department of Mathematics, University of Wyoming, 1988.

Refereed Scholarly Papers/Articles:

- "Mixed Finite Element Methods for Computing Groundwater Velocities", (with M.B. Allen and R.E. Ewing), Numerical Methods for Partial Differential Equations, 1985, pp. 195-207.
- "Velocity Weighting Techniques for Fluid Displacement Problems", (with R.E. Ewing, R.F. Heinemann, and U.S. Prasad), in Computer Methods in Applied Mechanics and Engineering, 64(1987), pp. 137-151.
- "The Determination of Rate Constants from Unknown Linear Combinations in a Chemical Reaction", (with J.R. Cannon and R.M. Schmidt), IMA Journal of Applied Mathematics, ed. J.R. Ockendon and D.A. Spence, (1988) vol. 41, pp. 67-84.

- "Numerical Simulation and Homogenization of Two-Phase Flow in Heterogeneous Porous Media", (with B. Amaziane and A. Bourgeat), Transport in Porous Media II, ed. Hornung, Dogan, and Knaber, vol. 6, no. 5&6, Oct/Dec 1991, pp. 519-548, Kluwer Academic Publishers
- "A Computationally Efficient Modification of Mixed Finite Element Methods for Flow Problems with Full Transmissivity Tensors", Numerical Methods for Partial Differential Equations, ed. G. Pinder, vol. 9, pages 339-355, 1993.
- "Accuracy Optimized Methods for Constrained Numerical Solutions to Hyperbolic Conservation Laws, (with C. Coray), JCP, vol. 109, pp 115-132, November, 1993.
- "High Order Accuracy Optimized Methods for Constrained Numerical Solutions of Hyperbolic Conservation Laws", (with C. Coray), SIAM Journal on Scientific and Statistical Computing, vol. 15, no. 4, pp 846-865, June 1994.
- "Minimization of Grid Orientation Effects in Simulation of Oil Recovery Problems through the use of an Unsplit Higher Order Scheme", (with A. Bourgeat), Numerical Methods for Partial Differential Equations, ed. G. Pinder, vol. 12, pages 161-189, 1996.
- "Equivalent Permeability and Simulation of Two-Phase Flow in Heterogeneous Porous Media", (with B. Amaziane and T. Hontons), Computational Geosciences, 5,: 279–300, 2001
- "Modeling Permeability Structure and Simulating Fluid Flow in a Reservoir Analog: Ferron Sandstrone, Ivie Creek Area, East-Central Utah", (with C. Forster and S. Snelgrove), AAPG Studies in Geology 50, ed. T.C. Chidsey, R.D. Adams, and T.H. Morris, 2004.
- "JHomogenizer: a computational tool for upscaling permeability for flow in heterogeneous porous media", (with B. Amaziane) Comput Geoci, (2006) 10:343–359.
- "Homogenizer++: A Platform for Upscaling Multiphase Flows in Heterogeneous Porous Media", 2006, (with B. Amaziane, A. Bourgeat, M. El Ossmani, and M. Jurak) in the Proceeding of the Monografias del Seminario Matimatico Garcia de Galdemo, 33, 395-402.

Nonrefereed Papers Presented and/or Research Papers:

- "Computing Accurate Velocities for Fluid Flow in Porous Media", (with R.E. Ewing, R. Gonzales, and M.F. Wheeler), Proc. 5th Int. Symp. on Finite Elements and Flow Problems, Austin, TX., Jan. 23-26, 1984.
- "Determination of a Rate Constant and an Activation Energy in some Exothermic Chemical Reactions", (with J.R. Cannon and J.C. Cavendish), Mathematical Methods in Energy Research, K.I. Gross ed., SIAM, Philadelphia, 1984.
- "Mixed Finite Element Methods for Groundwater Flow and Contaminant Transport", (with R.E. Ewing), Proc. 5th IMACS Int. Symp. on Computer Methods for Partial Differential Equations, Bethlehem, PA., June 19-22, 1984.
- "Mixed Finite Elements for Accurate Fluid Velocities", (with R.E. Ewing, R. Gonzales, and M.F. Wheeler) Finite Elements in Fluids, Vol. VI, John Wiley and Sons, Ltd., pp. 233-249, 1985.
- "Mixed Finite Element Methods for Computing Groundwater Velocities", (with M.B. Allen and R.E. Ewing) NUMETA 85, Numerical Methods in Engineering; Theory and Applications, Volume II, J. Middleton and G.N. Pande eds., Rotterdam, Netherlands,

1985, pp. 609-614.

- "Finite Element Techniques for Reservoir Simulation", (with R.E. Ewing), Innovative Numerical Methods in Engineering, R.R. Shaw, J. Peraux, A. Chaodoust, J.W. CiMerino, and C.A. Brebbia eds., Springer-Verlag, Berlin, 1986, pp. 173-186.
- "Accurate Velocity Weighting Techniques", (with R.E. Ewing and R.R. Lagnado), Proc. of the Second Wyoming Enhanced Oil Recovery Symposium, Casper, Wyoming, May 15-16, 1986.
- "Numerical Simulation and Homogenization of Two-Phase Flow in Heterogeneous Porous Media", (with B. Amaziane and A. Bourgeat), presented at the SIAM Conference on Mathematical and Computational Issues in Geophysical Fluid Flow and Solid Mechanics in Houston, Texas, Sept. 25-29, 1989, (appears in the proceedings)
- "Numerical Simulation and Homogenization of Diphastic Flow in Heterogeneous Reservoirs", (with B. Amaziane and A. Bourgeat), Proc. of the 2nd European Conference on the Mathematics of Oil Recovery, Sept. 11-14, 1990, Latitudes Cumargue, Ardes France, (invited).
- "Inverse Modeling Using Simulated Annealing with Homogenization", (with K. Hestir), Proc. of the IX International Conference on Computational Methods in Water Resources, pp. 421-428, June 9-12, 1992.
- "An Integrated Approach for Characterizing Reservoir-Scale Heterogeneity Using Microand Macroscale Petrophysical Data: Implications for Ferron Sandstone Studies" (with C. Forster, M. Chan, and K. Hestir), 1993 Rocky Mountain Section Meeting of AAPG-SEPM-EMD-DEG, Salt Lake City, Sept. 12-15, 1993
- "Integrated multidisciplinary reservoir characterization of a deltaic system 2: Developing a petrophysical model for reservoir simulation using data from the Ferron Sandstone, Utah.", (with Snelgrove, S., Forster, C., and R. Jarrard, AAPG/SEPM Annual Convention, March 5-8, 1995.
- "HomCode: A Code for Scaling Up Permeabilities Using Homogenization", Technical Report in the Department of Mathematics and Statistics at USU, Fall 1995.
- "Characterization and Upscaling of Sedimentary Depositional Formations using Archteypal Analysis and Homogenization", (with L. Watkins and R. Thomas), in Iterative Methods In Scientific Computation (Ed. Junping Wang, Myron B. Allen III, Benito M. Chen and Tarek Mathew), vol 4, IMACS Series in Computational and Applied Mathematics, Proceeding of the Third IMACS International Symposium on Iterative Methods in Scientific Computation Jackson Hole, Wyoming, USA, July 9-12, 1997.
- "Wavelet construction based on homogenization", (with Ryan Thomas) Proceedings of the XIII International Conference on Computational Methods in Water Resources, Calgary Canada, June 25-29, 2000.
- "JHomogenizer: User's Guide, Version 1.0", 2005, available at http://www.math.usu.edu/~koebbe/wwwHomog/"
- "Pooled and Individual Bycatch Quota: Exploring Tradeoffs Between Observer Coverage Levels, Bycatch Frequency, Pool Size, and the Precision of Bycatch Estimates", (with Landon Jensen and Keith Criddle) Economic Research Institute # ERI 04-21, Utah State

University, 19p., 2004.

Technical Reports:

- "Final Report, Drillstring Computer Simulation Project", (with R.E. Ewing and K. Hulsebosch), for Teleco Oilfield Services Inc., completed February 27, 1987.
- "Alternate Methods for Upstream Weighting in Immiscible Displacement Simulation", (with R.E. Ewing) for Chevron Oil Field Research Co. of LaHabra California, completed May 30, 1987.

Research Manuscripts:

- "Computational Homogenization", in preparation.
- "Homogenization and Computational Linear Algebra", in preparation.

Software Development:

- "Using Interactive Whiteboards for Online Mathematics Tutoring", with Jason Bell. The project involves the development of web based platform that will allow tutors/recitation leaders to interact with students using existing online tutoring/review materials to enhance basic mathematics skills.
- "Plasma Modeling/Simulation", with Farrell Edwards, Eric Held, Ajay Singh, Tim Doyle, Richard Datwyler, Marcus Stone, Taren McKenna, and others. This is a USTAR funded project intended to model and simulate a working tokamak at USU. The project will involve the development of mathematical models and computer simulators.
- "Distributed Computing for Regional Environmental Modeling", in conjunction with Jim Powell in Math & Stat and Jerry James in Computer Science. The work will develop a distributed computing platform for simulating regional scale problems in forestry and fisheries. Corporative sponsorship from IBM and Gigaspaces is being pursued.
- "JHomogenizer", in conjunction with researchers in France a computational environment for the testing of methods of homogenization has been developed. The software allows users to test new methods of homogenization on benchmark problems that can be compared with results from well known methods.
- "Linear Solvers Framework ", methods of computational linear algebra are implemented to allow users to compare wavelet characterizations with standard computational algorithms.
- "NATool:" This software will implement standard methods in a platform that will include coding examples and an interface for testing codes and graphing results.

Papers Presented at Professional Meetings / Colloquia:

- "Mixed Finite Element Methods for Groundwater Flow and Contaminant Transport", at the 5th IMACS Int. Symp. on Computer Methods for Partial Differential Equations, Bethelem, PA., June 19-22, 1984.
- "Accurate Velocity Weighting Techniques", at the Second Wyoming Enhanced Oil Recovery Symposium, Casper, Wyoming, May 15-16, 1986 (invited).

- "Alternate Upstream Weighting Techniques", at the Fourth Mexican American Exchange in Mathematics and its Applications, Two Bar Seven Ranch, Colorado, August 3-6, 1987, Organized by Myron Allen at the University of Wyoming, (invited).
- "Some Problems Arising in the Construction of Numerical Methods for Flow in Porous Media", at the University of Pau, in Pau France, June 21, 1990.
- "Parallelization, Vectorization, and Anisotropy in the use of Mixed Finite Element Methods for Porous Media Problems", at the Fifth Annual INEL Computing Symposium, Idaho Falls, Idaho, Sept. 10, 1991.
- "Accuracy Optimized Methods for Constrained Solutions of Scalar Conservation Laws and Higher Order TVD Schemes", at the University of Bergen, in Bergen, Norway, April 2, 1992.
- "Accuracy Optimized Methods for Constrained Solutions Hyperbolic Conservation Laws", at the Singularities in Physical Systems mini-conference in the Department of Mathematics and Statistics, Utah State University, June 11-13, 1993.
- "Numerical Methods for Stiffly Forced Conservation Laws", at the First Nonlinear Analysis Conference. Sept. 18, 1993, at Utah State University. This involves the nonlinear analysis groups at the University of Utah, BYU and USU.
- "Accuracy Optimized Methods for Nonlinear Systems of Conservation Laws", a colloquium presented at Idaho State University, Oct. 14, 1993.
- "Accuracy Optimized Methods for Stiffly Forced Conservation Laws", to be presented at the Fifth International Conference on Hyperbolic Problems: Theory, Numerics, Applications, June 13-17, 1994, University at Stony Brook, New York.
- "Numerical Schemes for Partial Differential Equations Constrained by the Nonlinear Dynamics of the Problem", presented at the 1994 SIAM Annual Meeting, July 25-29, 1994, San Diego, CA.
- "Characterization and Upscaling of Sedimentary Depositional Formations using Archteypal Analysis and Homogenization", (with L. Watkins and R. Thomas), presented at the Third IMACS International Symposium on Iterative Methods in Scientific Computation, Jackson Hole, Wyoming, July 9-12, 1997.
- "Computer Aided Applied Problem Solving Capstone Courses at USU", presented for a seminar at Brigham Young University, March 24, 1998.
- "An Master of Science Program in Industrial Mathematics at Utah State University", SIAM Western Regional Mathematics in Industry Workshop, Hun 16-19, the Claremont Colleges, Claremont CA.
- "A Family of Numerical Methods for Stiffly Forced Conservation Laws", (with C. Hillyard), AMS regional meeting, Salt Lake City, Sept 25-26, 1999.
- "Wavelet construction based on homogenization", (with Ryan Thomas) XIII International Conference on Computational Methods in Water Resources, Calgary Canada, June 25-29, 2000.
- "Wavelets conditioned on homogenization", (with Laura Watkins) Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences, Boulder Colorado, June 11-14, 2001.

- "Wavelets based schemes for conservation laws", (with David Sattinger) Fifth Joint Meeting of the American Mathematical Society and the Mexican Mathematical Society, Morelia Mexico, May 23-26, 2001 (invited).
- "Wavelet Construct via Lifting using Two Examples", Weber State University May 24, 2000.
- "Homogenization Based Wavelets for Solving Elliptic Partial Differential Equations", (with L. Watkins), AMS regional meeting, Salt Lake City, Oct. 26-27, 2002.
- "JHomogenizer: une plate-forme de mise l'chelle en milieux poreux heterogenes" (with B Amaziane) Les joures scientifiques du GDR MoMaS, CIRM, Marseille, Luminy, November 12-14, 2003
- "Homogenization Based Wavelets for Solving Elliptic Partial Differential Equations", Numerical Analysis Colloquim, University of Pau, Pau, France, Nov. 20, 2003.
- "Retention and Math Skills", Utah State University Retention Symposium, Utah State University, October 11, 2007.
- "Construction of Adaptive Wavelets Using Differential Operators", Applied Mathematics Seminar, University of Utah April 14, 2008.

Conferences/Sessions Organized:

• Special Session on Numerical Methods in Modeling, Differential Equations", (with S. Chow), AMS regional meeting, Salt Lake City, Oct. 26-27, 2002.

Workshops:

- "Java for the World Wide Web", taught for the FACT center on March 4, 1997.
- "Java for the World Wide Web", taught for the FACT center on April 21, 1997.

Paper Reviewing:

Reviews have been done of various articles for

- SIAM journals
- Physica-D,
- Advances in Water Resources
- Numerical Methods for Partial Differential Equations
- Computational Geosciences

Proposal Reviewing:

Proposals have been reviewed for:

- Department of Energy (including one site visit)
- National Science Foundation
- Utah State University (internal research proposals)

Grants / Funded Research:

Project Title: Funding Source: Amount:	Basic Research on Homogenization Chevron Oil Field Research Company, LaHabra CA. 10 CPU hours on a CRAY XMP/48 plus associated costs
Project Title: Funding Source: Amount:	Vectorization of Mixed Finite Element Methods and Pre-conditioned Conjugate Gradient Methods IBM Cambridge Scientific Center, Cambridge Mass. 50 CPU Hours on the IBM 3090 plus \$1500 for expenses
Project Title: Funding Source: Amount:	A Riemann Operator Splitting for the Reduction of Grid Orientation Effects Faculty Research Grant, Utah State University \$5188 for 1989-90
Project Title: Funding Source: Amount:	Decomposition of Nonlinear Flux Functions in Scalar Conservation Laws Faculty Research Grant, Utah State University \$4300 for 1990-91
Project Title: Funding Source: Amount: Co-Investigators	 Physically Based Stochastic Models of Fracture and Fluid Flow in Rock Division of Mathematical Sciences, NSF, DMS-99200254 \$78,686 for 1992-94 K. Hestir, J. Evans, C. Forster, and S. Martel
Project Title: Funding Source: Amount:	Computer Aided Mathematics with Symbolic Manipulation Software College of Science, USU \$2,500 for 1993-94
Project Title: Funding Source: Amount: Co-Investigators	Mathematical Sciences Computing Research Environments Division of Mathematical Sciences, NSF/SCREMS, DMS-9305519 \$53,014 for 1993 H. Walker, K. Hestir, and J. Powell

Project Title: Funding Source: Amount: Co-Investigators	Geological and Petrophysical Characterization of the Ferron Sandstone for 3-D Simulation of a Fluvial-Deltaic Reservoir Department of Energy \$1,717,479 for 1993-1996 C. Forster, and Utah Geological Survey (L. Allison)
Project Title:	Mathematics Teacher Network Expansion to MacIntosh Users
Funding Source: Amount: Co-Investigator	Edcational Technology Initiative \$32,855 for a computer lab Jim Cangelosi
Project Title:	Color Capabilities for Computer Aided Mathematics Courses in the Department of Mathematics and Statistics at Utah State University
Funding Source: Amount:	Sun Microsystems Academic Equipment Grant (AEG) Program \$7,990 for two color laser printers
Project Title: Funding Source: Amount: Co-Investigators Submitted	Multimedia Intermediate Algebra: A CD-ROM Based Approach HETI \$447,286 for CDROM teaching development A. Ghoreishi and F. Richards at Weber State February 3,1995
Project Title: Funding Source: Amount:	A Student Research Project in Geostatistics Applied in the Ferron Sandstone at Utah State University CIMD approximately \$1,600 for support of an undergraduate
Resubmitted	March 10,1995

Project Title: Funding Source: Amount: Start Date: Co-Investigator Comment:	Development of Multi-media Quantitative Labs in the Biology Curriculum for Public Schools and Higher Ed. Sun Microsystems Academic Equipment Grant (AEG) Program around \$65,000 July 1, 1997 J. Haefner This is a companion proposal to the FIPSE proposal below
Project Title: Funding Source: Amount: Start Date: Co-Investigators	Laboratory Exercises in Biomathematics FIPSE \$402,444 September 1, 1997 J. Haefner, A. Lindahl, R. Mueller, J. Powell, and J Cangelosi
Project Title: Funding Source: Amount: Start Date: Comment:	A Problem In Solid Rocket Fuel Thiokol Corp. \$22,030 January 1, 1998 Funding supported a student (L. Walker) for 18 months
Project Title: Funding Source: Amount: Start Date: Comment:	Development of Online Math Refresher Materials College of Science, Utah State University \$20,000 June 1 2007 Funding supported 6 undergraduate students for summer semester of 2007
Project Title: Funding Source: Amount: Start Date: Comment:	Online Math Tutoring using Smartboard Technology College of Science and Distance Education, Utah State University \$15,000 June 1 2008 Funding supported 1 student and interactive whiteboard for the project

Project Title:	Plasma Modeling/Simulation Project
Funding Source:	USTAR
Amount:	\$500,000
Start Date:	June 1 2008
Comment:	Funding supports 2 student Marcus Scott and Taren
	McKenna

Pending Support for Education and Research:

Comment: Nothing at this time - maybe this year

Unfunded Grants:

Project Title: Funding Source: Amount: Co-Investigators	Mathematical Sciences Computing Research Environments Division of Mathematical Sciences, NSF \$20421 C. Coray, A. Cutler, R. Cutler, and L. Littlejohn
0	
Project Title: Funding Source: Amount: Co-Investigators	Problems in Numerical Simulation of Porous Media Flow Department of Energy \$83,459 C. Duffy and C. Forster
Project Title: Funding Source: Amount: Co-Investigators	Numerical Study of Optical Shock Formation in Self- Focusing, Ultra-short Pulses AFOSR \$61,101 J. Powell and C. Coray
Project Title: Funding Source: Amount: Co-Investigators	Optical Shock Formation and Regularization in Self- Focusing, Ultra-short Pulses NSF \$89,208 for 1993-1996 J. Powell and C. Coray

Project Title:	Introduction of Computer-Aided Capstone Courses in Mathematics and Statistics
Funding Source:	Instrumentation and Laboratory Improvement Program at NSF (ILI-IG)
Amount:	\$145,026 for a computer lab
Co-Investigators	Adele Cutler and Jim Cangelosi
Project Title:	A Acquisition of a High Performance Computational Facility for Research and Education at Utah State University
Funding Source:	OSTL/ARI at NSF. STI-9413428
Amount:	\$810.564 for a parallel computer
Co-Investigators Submitted	14 others in the College of Science March 15,1994
Project Title:	A Vertically Integrated Program of Education and Outreach in Industrial Mathematics
Funding Source	NSF DMS
Amount:	\$1,410,954
Project Title: Funding Source: Amount: Co-Investigators	Adapted Wavelet Transforms for Nonlinear Evolution Equations DMS, National Science Foundation \$143,543 David Sattinger
Project Title: Funding Source:	Effective Computer Aided Teaching of Mathematics Micron Foundation
Amount:	24-30 computers (\$19,000)
Co-Investigators	Dan Johnson and Rob Hoggan from Mount Logan Middle Scho ol
Project Title:	A Vertically Integerated Applied and Industrial
Den din e C	Mathematics Program at Utah State University
Funding Source:	Division of Mathematical Sciences, NSF \$1,828,208
Alloulu:	91,020,200 Claudia Mora Jim Powell Emily Stone and Stophen Voung
00-micsugators	Chaudia mora, Jim i owen, Emmy Stone, and Stephen fettig

Project Title: Funding Source: Amount:	Mathematical Sciences Computing Research Environments Division of Mathematical Sciences, NSF \$57768
Co-Investigators	R. Thompson, P. Howell, M. Minnotte, and J. Powell
Project Title: Funding Source: Amount: Co-Investigators	SCREMS: High speed computation in Applied Mathematics and StatisticsDivision of Mathematical Sciences, NSF/SCREMS, DMS-9305519\$57,766 for 2005-06R. Thompson, P. Howland, P. Kokoszka, and J. Powell
Project Title: Funding Source: Amount: Start Date: Comment:	Plasma Modeling/Simulation Project NSF \$2,000,000 June 1 2008 Funding will support student(s) for 4 years and Koebbe

Research Visitors:

- Brahim Amaziane, six months, 1996
- Brahim Amaziane, one month, Sept, 1989
- Alain Bourgeat, six weeks, July/August, 1991
- Brahim Amaziane, two months, May/June, 1992
- Lindsay Hess, academic year, 1992-3
- Magne Espedal, 1 week, February, 1994
- Randy LeVeque, March 31, 1995
- Brahim Amaziane, two weeks, June, 1996
- Brahim Amaziane, one weeks, June, 1997
- Brahim Amaziane, Feb. through April, 1998

Professional Memberships:

- American Mathematical Society (AMS)
- Society of Industrial and Applied Mathematics (SIAM)

Students:

Directed and/or Current Students

• Joan L. Oana, M.S. in Mathematics, graduation - Aug. 1991

- Helen Alkes, M.S. in Mathematics, graduation Dec. 1992
- Laura Watkins, M.S. in Mathematics Dec. 1997
- Christy Isakson, nondegree worked on HETI grant
- Amanda Brown, M.S. in Mathematics May 1999
- Andrea Woodhouse, M.M. in Mathematics August 1999
- Cinnamon Hillyard, Ph.D. in Mathematics August 1999
- Yijing Luo, M.S. in Mathematics May 2000
- Ryan Thomas, M.S. in Mathematics August 2000
- Landon Jensen, M.S. in Industrial Mathematics August 2000
- Anna Furniss, M.S. in Industrial Mathematics May 2002.
- J.J. Clark, M.S. in Industrial Mathematics June 2002.
- Andrea Van Sickle, M.S. in Mathematics December 2004.
- Laura Watkins, Ph.D. in Mathematics May 2005.
- Jeremy Christiansen, MS. in Mathematics Summer 2007.
- Marcus Scott, MS. in Mathematics August 2010.
- Marcus Scott, PhD. in Mathematics expected to complete in 2012.
- David Sullivan, MS. in Industral Mathematics expected 2011.

Undergraduate Research Students

• Taren McKenna, Undergraduate Research, Goldwater Scholar (2009-2011).

Research Experiences for Undergraduates (REU) Students

- Amanda Pollard, New Mexico Highlands, Summer 1997, Project: The Effect of Averaging Correlated Permeabilities in a Porous Medium
- John A. Hayes, Western Washington University, Summer 1998, Project: Exploring Numerical Solutions of Hyperbolic Conservation Laws.
- Elizabeth John and Ron Wilkens, Summer 1999, Project: Analysis of Numerical Methods for Hyperbolic Conservation Laws using Dynamical Systems.

Committee Member (Most Recent) for

- Tyson, Computer Science, PhD. Advisor Jerry James
- John James, Physics, PhD, Advisor: Eric Held (completed)
- Richard Datwyler, Physics, PhD, Advisor: Farrell Edwards
- Sharma Mukta, Physics, PhD, Advisor: Eric Held
- David Hansen, Physics, PhD, Advisor: Robert Shunk
- Agniesca Jach, Mathematics and Statistics, PhD, Advisor: Piotr Kokoszka (completed)
- Brian Yurk, Mathematics and Statistics, PhD, Advisor: Jim Powell
- Justin Heavilin, Mathematics and Statistics, PhD, Advisor: Jim Powell
- Michael Rigby, Mathematics and Statistics, MS, Advisor: Jim Powell

External Student Funding

- Joan L. Oana, from Utah Water Research Lab Academic Year 1990-91
- Carolyn Murphy, from Utah Water Research Lab Academic Year 1990-91
- Christy Isakson, from HETI and FACT lab Academic Year 1996-97
- Laura Watkins, from Thiokol Corp. January 1998 to May 1999
- Landon Jensen, from Alaska Fishery Science Center Internship, summer 2000
- J.J. Clark, from Boeing Internship, summer 2001
- Anna Furniss, from SEAGrant Assistantship and Internship, 2001
- Marcus Scott, USTAR funding, Summer 2008 and the 2008-2009 academic year
- Taren McKenna, College of Science Minigrant, Summer 2008
- Taren McKenna, USTAR undergraduate research funding, 2008-2009
- Taren McKenna, Goldwater Fellowship, 2009-2011

Student Teachers Observed:

- Jessica Burch with Nancy Pullman and Joyce Smart
- Rob Hoggan with Nancy Pullman and Roger Wilson
- Jaime Glover with Dona Reeder
- Sonja Scott with Michelle Hatch
- Malisa Bowen with Jean Culbertson
- Richard Spackman with Jeffrey Strait
- Trevor Timmins with Mr. Stevens (spring 2001)

Teaching:

Classes Taught:

- Math 220 Calculus I (1 time)
- Math 221 Calculus II (many times)
- Math 222 Calculus III (3 times)
- Math 281 Topics Course: Introduction to Mathematical Ecology (2 times)
- Math 320 Vector Calculus (2 time)
- Math 321 Linear Algebra (many times)
- Math 322 Differential Equations I (many times)
- Math 341 Differential Equations II (2 times)
- Math 420 Introduction to Analysis (3 times)
- Math 461 Numerical Methods (4 times)
- Math 462 Computer Aided Mathematics for Secondary Mathematics Teachers (many times)
- Math 463 Computer Aided Mathematics for Science and Engineering (many times)
- Math 541 Methods of Applied Math I (2 times)
- Math 542 Methods of Applied Math II (2 times)

- Math 543 Methods of Applied Math III (2 times)
- Math 561 Numerical Analysis I (1 time)
- Math 562 Numerical Analysis II (1 time)
- Math 563 Numerical Analysis III (1 time)
- Math 661 Numerical Partial Differential Equations I (1 time)
- Math 662 Numerical Partial Differential Equations II (1 time)
- Math 663 Numerical Partial Differential Equations III (1 time)
- Math 681 Topics: Reservior Modeling (1 time on an overload)
- Math 761 Numerical Methods for Conservation Laws I (2 times)
- Math 762 Numerical Methods for Conservation Laws II (2 times)
- Math 763 Numerical Methods for Conservation Laws III (2 times)
- Math 1100 Business Calculus (many times)
- Math 1210 Calculus I (¿3 time)
- Math 1220 Calculus II (¿3 time)
- Math 2210 Calculus I (1 time)
- Math 2250 ODE and Linear Algebra ($\gtrsim 3$ times)
- Math 2280 ODE and Linear Algebra (1 time)
- Math 4200 Introduction to Analysis (¿3 time)
- Math 4620 Computer Aided Mathematics for Secondary Mathematics Teachers (all offerings 1992 through 2003)
- Math 4630 Computer Aided Mathematics for Science and Engineering (¿ 10 times)
- Math 4700 Engineering Mathematics (1 time)
- Math 5410 Methods of Applied Mathematics (many times)
- Math 5420 Methods of Applied Mathematics (many times)
- Math 5610 Computational Linear Algebra and Solution of Systems of Equations (many times)
- Math 5620 Numerical Solution of Differential Equations (many times)
- Math 5810 Topics: Introduction to Wavelet Analysis (1 time)
- Math 5810 Topics: Transform Method (1 time)
- Math 6610 Numerical Analysis I (¿ 3 times)
- Math 6620 Numerical Analysis II (¿ 3 times)

Independent Study Course Development:

- Course coordinator for Math 1100 Calculus Techniques: This involves the development and maintenance of on-line course materials for the course.
- Course coordinator for Math 1100 Calculus Techniques for the International Program in the College of Business.

Course Development:

• Revised syllabus for the Math 541-2-3 sequence in spring 1990

- Revised syllabus for the Math 561-2-3 sequence in spring 1990
- Developed the course "Computer Aided Mathematics", Math 581, in summer 1992. The course was the foundation of two courses developed, Math 462 Computer Aided Mathematics for Secondary Mathematics Teachers and Math 463 Computer Aided Mathematics for Scientists and Engineers, which have been added to the undergraduate curriculum. Currently Math 462 is required for all Secondary Mathematics Teachers and Math 463 is considered an alternative to Math 461 as a requirement for graduation in some departments including Computer Science.
- Development will begin in the fall of 1997 on a problem solving course for biology students that can be taken after the first two quarters of calculus and one quarter of statistics. This is intimately related to the Biomath minor that is being developed with Jim Powell, Jim Haefner, and others on the faculty.
- Development of a problem solving course for Natural Resources majors will occur in 1995-96 and is funded by a HETI grant from the State of Utah. The first offering of the course will occur in Spring Quarter of 1997.
- Development of an electronic version of Math 462 has been completed. This involves the submission of homework and term projects over the network. No paper is turned in by the students. The problems with discussion are being turned in as notebooks within *Mathematica*, are graded and are picked up by the students via anonymous ftp.
- Worked on the revision of the interdisciplinary degrees in the graduate program with a variety of others in the Department. The Interdisciplinary PhD has been revised and a Master's program for applied and interdisciplinary students will be constructed in 1995-96.

Program Development:

- Chaired the committee in charge of developing the BioMath minor for students in both the Department of Biology and the Department of Mathematics and Statistics. The minor has been approved by the appropriate administrative organizations up through the Board of Trustees of USU. The program has been approved by the Board of Regents.
- Chaired the committee in charge of the development of an Industrial Mathematics degree at the Masters level. This program was approved by the Board of Regents on Jun 4 1999.

Departmental Service:

- Computer Committee 1988-1993 (chair), 1999-2005
- Graduate Committee 1989-1990,1994-1997,1998-2003 (chair)
- Colloquium Committee 1989-1990
- Position Search Committee 1989-1990
- Industrial Masters Committee 1996-1999 (chair)
- Industrial Math Position Search Committee 2002-2003
- Industrial Math Position Search Committee 2003-2004 (chair)
- Pure Math Position Search Committee 2007-2008
- Undergraduate Committee 1996-1998, 2006-2009 (chair)
- Mathematics Education Committee 1996-1998, 1999-2003

- Tenure Committee Chair for Peg Howland 2004-2006
- Faculty Mentor for Byyjna Kohler 2004-present
- Tenure Committee for Nghiem Nguyen 2009-present
- Tenure Committee for Chad Mano, Computer Science, 2007-present
- Tenure Review Committee for Eric Held, Physics, 2009-2010.

University Service:

- Ralph Johnson Summer Lecture Series Committee 1989-1990
- Dean's Science Initiative Committee 1993-1995
- USU Outstanding Dissertation Award Committee 1995
- CURI Proposal Review Committee 2009-present
- Retention Proposal Committee 2010-present

Other Major Service:

• Developed and implemented the current adivising and placement test structure in the Department. This includes the math refresher course, Math 0920 Math Skills Review, the Math Advisement Office (with Linda Skabelund), the Math Placement Test and scoring, the MPATL, and the online course materials for students.

References:

Available unopon request