Curriculum Vitae - Wolfgang Kliemann – January 2014

January 2014

Wolfgang Kliemann

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Personal Information

Born March 23, 1949
Citizen of the Federal Republic of Germany
Permanent resident of the United States of America
Married, no children

1. Professional Experience

1.1 Education

1967-1970	Freie Universität Berlin, Germany, Sociology
1970-1974	Universität Bielefeld, Germany, Mathematics, Diplom, 1974
1976-1980	Universität Bremen, Germany, Mathematics, Dr. rer. nat., 1980

1.2 Positions Held

2008-2013	Chair, Department of Mathematics, Iowa State University
2001-2005	Associate Vice Provost for Research, Iowa State University
2000-2001	Associate Dean for Research, College of Liberal Arts and Sciences, Iowa State University
1999	Associate Chair - Graduate Studies, Department of Mathematics, Iowa State University
1992-present	Professor, Department of Mathematics, Iowa State University
1987-1992	Associate Professor, Department of Mathematics, Iowa State University
1983-1987	Assistant Professor, Department of Mathematics, Iowa State University
1978-1983	Research position ('wissenschaftlicher Mitarbeiter'), Institute for Dynamical Systems, University of Bremen, Germany
1982	Postdoctoral Work, Institute for the Physics of Fluids, Universidad Autonoma, Madrid, Spain
1981	Postdoctoral Work, Mathematics Institute of the Polish Academy of Sciences, Warsaw, Poland
1976-1978	Doctorate Fellowship from 'Studienstiftung des Deutschen Volkes', Germany
1974-1976	Instructor, University of Oldenburg, Germany

1.3 Visiting Positions

Summer 1985	Dipartimento di Matematica, Universita degli Studi di Roma 'La Sapienza', Rome, Italy
Summer 1986	Institut für Dynamische Systeme, Universität Bremen, Germany, and and Instituto de Matematica, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil
Summer 1987	Institut für Dynamische Systeme, Universität Bremen, Germany
Summer 1988	Dipartimento di Matematica, Universita degli Studi di Roma 'La Sapienza', Rome, Italy
Spring 1989	Institut für Dynamische Systeme, Universität Bremen, Germany
Summer 1989	Centro de Matematicas and PEDECIBA, Universidad de la Republica, Montevideo, Uruguay
Fall 1989	Dipartimento di Matematica, Universita degli Studi di Roma 'La Sapienza', Rome, Italy, and Departamento de Fisica Fundamental, UNED, Madrid, Spain
Summer 1991	Institut für Mathematik, Universität Augsburg, Germany
Summer 1992	Institut für Mathematik, Universität Augsburg, Germany
Summer 1993	Departamento de Fisica Fundamental, UNED, Madrid, Spain
Fall 1996	Departamento de Ingenieria Matematica, Universidad de Chile, Santiago, Chile
Fall 2007	Facultad de Matemáticas, Pontificia Universidad Católica de Chile, Santiago, Chile
Spring 2008	Facultad de Matemáticas, Pontificia Universidad Católica de Chile, Santiago, Chile

1.4 Professional Societies

Member of SIAM, AMS, IMS, DMV, and AAAS.

1.5 Awards and Honors

Iowa State University Teaching Excellence Award (1990)
Iowa State University College of Liberal Arts and Sciences Award for Excellence in Research (1998)
Iowa State University Honors Program Recognition for Contributions Made to the Program (1998)
Iowa State University College of Liberal Arts and Sciences Master Teacher (1999)
State of Iowa Board of Regents Award for Faculty Excellence (2000)
Friend of Mathematics Award from Iowa Council of Teachers of Mathematics (2013)
Member of Sigma Xi

1.6 Research Interests

Deterministic and stochastic nonlinear systems theory, in particular dynamical systems, skew product flows, stochastic systems, control systems and their interconnections, with applications in engineering and the natural sciences

2. Teaching

2.1 Classroom Teaching

Numbers in brackets indicate no. of students responding to Instructor Evaluation Questionnaire and average score on question no. 12 (Overall performance of instructor). Scores are 1 - 5, with 1 being high.

Year	Semester	Courses Taught		
1983-84	Fall	M165 (35:1.94)	M267 (36:1.47)	
	Spring	M166 (31:1.68)		
1984-85	Fall	M514		
	Spring	M555		
1985-86	Fall	(none)		
	Spring	M165, 3 Sections (18:1.39, 27:1.44, 26:1.65)		
1986-87	Fall	M514 (18:1.17)		
	Spring	M690T		
1987-88	Fall	M266	M690	
	Spring	M267 (36:1.47)	M562	
1988-89	Fall	M150	M554 (8:1.13)	
1989-90	Spring	M166		
1990-91	Fall	M150	M175H (10:1.00)	
	Spring	M166 (26:1.38)	M562 (6:1.00)	
1991-92	Fall	M515 (10:1.20)		
	Spring	M516X (9:1.11)		
1992-93	Fall	M514 (21:1.19)		
1993-94	Fall	M577 (co-listed with EE, Aer E, ME) (22:1.18)		M610
	Spring	M554	M690W	M610
1994-95	Fall	M150	M690W (5:1.00)	M610 (5:1.00)
	Spring	M562 (8:1.00)	M610	
1995-96	Fall	M165H (20:1.00)	Stat333 (52:4.46/5.00)*	M610 (2 students)
	Spring	M166H (24:1.11)	M590 (2)	
1997-98	Fall	M104 (157:1.81)	M514 (16:1.13)	
	Spring	M265H (10:1.10)	HON290H (2)	
1998-99	Fall	M166 (30:1.24)	Stat101 (57:4.25/5.00)*	
	Spring	M561 (5:1.00)	HON290H (1)	
1999-2000	Fall	M166 (104:4.39)*		

*These evaluations rank from 1 - 5, with “5” being the high score.

Classroom Teaching - continued

Academic Year	Semester	Course Number	Evaluation*	No. students responding
2006-2007	Fall	Math 265H	4.39	18
		Math 307	4.19	21
	Spring	Math 166 (LL)	4.47	74
		Math 266	4.88	25
2010-2011	Spring	Math 492	4.85	26

* These evaluations rank from 1 - 5, with "5" being the high score.

'Logik und Mathematik für Sozialwissenschaftler' (with N. Müller), Universität Bielefeld, Germany (1972-1974).

'Mathematisches Vorsemester', a TV-guided course for High School seniors, Universität Bielefeld, Germany (Summer 1973 and 1974).

'Lehrerfortbildung Mathematik', a continuing education course for High School teachers in mathematics (linear algebra, numerical methods), Universität Bielefeld, Germany (1973).

'Graphentheorie und ihre Anwendungen', a TV-course for use in High School teaching (with K. Kiesewetter), Universität Bielefeld, Germany (1973-1974).

'Modellierung in der Mathematik', education of High School teachers, (with I. Pieper), Universität Oldenburg, Germany (1974-1975).

'Pädagogische Theorien', education of High School teachers, (with I. Pieper), Universität Oldenburg, Germany (1975-1976).

'Spectral theory of skew product flows', Universität Bremen, Germany (1989).

'Numerics of differential equations', Facultad de Matemáticas, Pontificia Universidad Católica de Chile, Santiago, Chile (2008)

2.2 Mentor for Undergraduate Students

Allen, Erik	P CHE	Spring 1998	
Keyte, Anna	LAS	Spring 1998	
Skutnik, Steve	Phys	Spring 1999	
Vujosevic, Milena	Math	Summer 2000	
Hartman, Lindsay	Math	Summer 2003	
Veit, Anna	Math	Summer 2003	
Anderson, Michael	Math	Summer 2004	
Carayol, Denrol	Math	Summer 2004	
Beal, Rien	Math	Summer 2005	
Corbin, Patrick	Math	Summer 2005	
McConville, Kelly	Math	Summer 2005	
Monford, Christina	Math	Summer 2005	
Newton, Danielle	Math	Summer 2005	
Ayala, José Manuel	Math	2004-2005	Supervisor thesis for Licenciatura, Universidad Catolica del Norte, Antofagsta, Chile
James Kalafus	Math	Summer 2006	
Laura Zuchlewski	Math	Summer 2006	

Mentor for Undergraduate Students – continued

Jonathan Ackerman	Math	Summer 2009
Kim Ayers	Math	Summer 2009
Eduardo Beltran	Math	Summer 2009
Joshua Bonet	Math	Summer 2009
Devin Lu	Math	Summer 2009
Xavier Garcia	Math	Summer 2011
Jennifer Kunze	Math	Summer 2011
Thomas Rudelius	Math	Summer 2011
Anthony Sanchez	Math	Summer 2011
Sijing Shao	Math	Summer 2011
Emily Speranza	Math	Summer 2011
Stephanie De Graaf	Math/Stats	Spring 2012
Stephen Bergeson	Physics/Math	Spring/Summer 2012

2.3 Supervisor for M. S. Students

Volfovicz, Roberto Math 2002
Creative Component: Topics in mathematical biology

Baldwin, Morgan C. Math 2007
Thesis: Stochastic analysis of the Marotzke and Stone climate model

Ayala, Jose Manuel Math 2008
Thesis: Global behavior of graph dynamics with applications to Markov chains

2.4 Supervisor for Ph.D. Students

Homblé, Patrick Stat 1989 (co-advisor with K.B. Athreya)
Thesis: On the stability of linear stochastic difference equations

Fan, Kaisheng Math 1992
Thesis: Topics in nonlinear filtering

Joseph, Elizabeth Math 1993
Thesis: Stability radii of two dimensional bilinear systems: Lyapunov exponent approach

O'Donnell, Brian Math 1994 (co-advisor with Eimear Goggin)
Thesis: Nonlinear filtering of stochastic dynamical systems

Lin, Shan Math/E.E. 1996
Thesis: Analysis and synthesis of nonlinear control systems
Recipient of 1994 ISU Mathematics Department Lambert Award

Lai, Ruey-Gang Math. 1996
Thesis: Practical feedback stabilization of nonlinear control systems and applications
Recipient of 1996 SIAM Student Paper Award

Ou, Chung-Ming Math 1996
Thesis: Global aspects of control systems - Perspectives from control Lyapunov functions

Supervisor for Ph.D. Students – continued

Wang, Hualin Math 1998
Thesis: Feedback stabilization of bilinear control systems
Recipient of 1996 ISU Mathematics Department Lambert Award
Recipient of Spring 1998 ISU Research Excellence Award

Hawkins, Richard E. Econ / Stat 1999
Thesis: Numerical methods for optimization of recursive systems

Majumdar, Ruchira Math 2001
Thesis: The Lyapunov and Morse spectrum of dynamical systems

Camaño-Garcia, Gabriel Stat 2006 (co-advisor with Alicia Carriquiry)
Thesis: Statistics on Stiefel manifolds

Li, Wen Stat 2009 (co-advisor with Alicia Carriquiry and Cindy Yu)
Thesis: Memory indicators and their incorporation into dynamic models

Cruz, Efrain Math (Chile) 2009 (co-advisor with Victor Ayala, UCN, Chile)
Thesis: Controlabilidad y Estabilidad de Sistemas de Control Bilineales de Dimensión 2

Ayers, Kimberly Math current

2.5 Supervisor for Postdoctoral Associates / Visiting Scholars

Budhiraja, Amarjit	Math	Fall 1995, Spring 1996, Summer 1996 and 1997
Balaji, Srinivasan	Math.	Spring 1998, Fall 1998, Spring 1999
Femat, Ricardo	Math.	Summer 2000
Cruz, Efrain	Math.	Fall 2006, Spring 2007
Verdejo, Humberto	E.E.	Spring 2009, Fall 2009
Xi Zhu	Math.	Fall 2013, Spring 2014

2.6 Member of M. S. Committee

Homblé, Patrick	Stat	1984
Zakaria, Rahmat S.	Stat	1985
Kim, Joo-Hwan	Stat	1986
Grondona, Martin	Stat	1987
Karim, Saqib Saleem-Ul	E.E.	1988
Kruger, Gayle Ruth	Math	1989
Lin, Kuo-Chin	Stat	1991
Papadopoulos, Savas	Stat	1992
Wilmarth, Steven	Stat	1992
Olson, Susan	Math	1993
Kurzhals, Reiner	Stat	1993
Schröder, Jürgen	Stat	1993
Ou, Chung-Ming	Math	1993
Venkataraman, Sunder	E.E.	1993
Lai, Ruey-Gang	Math	1993
Huang, Hsin-Cheng	Stat	1994
Yu, Namkyu	Stat	1994
Baltrum, Robert John	Aero. E., E.M.	1995
Thapar, Jyotika	E.E.	1996

Member of M.S. Committee – continued

Shah, Jatan	E.E.	1996	
Wang, Hualin	E.E.	1998	
Sinharay, Sandip	Stat	1998	
Hui, Wai-Leung	E.E.	1998	
Flemisch, Bernd	Math	2001	
Yang, Zhong	E.E.	2001	
Solanki, Aparna	Econ	2002	
Liu, Jialing	E.E.	2002	
Solanki, Aparna	Stat	2004	
Ament, Diane	MPA	2006	
Wimmer, Maximilian	Math	2006	
Padmasola, Prashanth	E.E.	2006	
Cofré Torres, Rodrigo	I.M.	2009	Ingeniería Matemática, Universidad Católica de Chile, Santiago

2.7 Member of Ph.D. Committee

Cho, Yun-Ok	E.E.	1985	
Mehailia, Abdelghani	Math	1988	
Andrews, Douglas	Stat	1989	
Amin, Wael	Math	1989	
Fuh, Cheng-Der	Math	1989	
Li, Seung-Chun	Stat	1990	
Sarkar, Sahadeb	Stat	1990	
Lin, Chiou-Hua	Stat	1990	
Ho, Chao-Pao	Math	1991	
Hsieh, Wei-Hua	Math	1991	
Medepalli, Anand	Math	1992	
Croos, Joseph	Stat	1992	
Chakak, Abderrahmane	Stat	1993	
Wang, Lih-Chyun	Math	1993	
Treinen, Roger	E.E.	1993	
Chadalavada, Vamsi	E.E.	1993	
Coffin, Marie	Stat	1993	
Vidyashankar, Anand	Stat/Math	1994	
Starrett, Shelly	E.E.	1994	
Wang, Rong	Math	1995	
Lin, Chih-Ming	E.E.	1995	
Lee, Kye-Don	Stat	1995	
Kang, Hye-Jeong	Math	1995	
Saha, Swapan	E.E.	1995	minor representative
Deo, Rohit Siddheshwar	Stat	1995	
Irizarry-Rivera, Agustin	E.E.	1996	
An, Anthony B.	Stat	1996	
Kumar, Jayant	E.E.	1996	minor representative
Häckl, Gerhard	Math	1996	University of Augsburg, Germany, external referee
Grüne, Lars	Math	1996	University of Augsburg, Germany, external referee
Huang, Hsin-Cheng	Stat	1997	
Jang, Gilsoo	E.E.	1997	minor representative
Sarkar, Pradipta	Stat	1997	
Balaji, Srinivasan	Math	1997	Indian Statistical Institute, Bangalore, India, external referee
Brabec, Marek	Stat	1997	

Member of Ph.D. Committee – continued

Jorgenson, Joel Avrin	E.E.	1997	
Melkonian, Tigran A.	Econ	1998	
Rong, Qi	E.E.	1999	
Mortezapour, Siamak	E.E.	1999	
Yu, Xuechun	E.E.	2000	
Zhu, Songzhe	E.E.	2000	
Yu, Baiying	E.E.	2000	
Wu, Lin	E.E.	2000	
Lee, Jaehyung	Stat	2001	
Liu, Xiaohu	Stat	2001	
Fernandez, Soledad	Stat	2001	
Wang, Qin	E.E.	2001	
Zhou, Yuan	E.E.	2001	
Zhu, Chuanjiang	E.E.	2001	
Qi, Xin	E.E.	2002	
You, Haibo	E.E.	2002	
Dietz, Zach	Stat	2002	
Solis, Gualberto	Math/Mexico	2002	
You, Haibo	E.E.	2003	
Malonza, David	Math	2003	
Qiu, Wen Zheng	E.E.	2004	
Sebastian, Abu	E.E.	2004	
Furukawa, Kyoji	Stat	2004	
Bhatt, Ghan Shyam	Math	2004	
Aydinyan, Ruben	Math	2004	
Wen, Xiaoyu	E.E.	2005	
Liu, Jialing	E.E.	2005	minor representative
Sahoo, Deepak R	E.E.	2006	minor representative
Liu, Qian	E.E.	2006	
Shao, Wei	E.E.	2006	
Liu, Shu	E.E.	2006	minor representative
Wu, Yu	Stat	2006	
Yadav, Vikas	E.E.	2007	minor representative
De, Tathagata	E.E.	2007	minor representative
Pryporova, Olga	Math	2009	
Vera, Fernando	Math	2009	UCN Antofagasta, Chile
Pintar, Adam	Stat	2010	
Baldwin, Morgan	Aero.E.	2010	
Wang, Jing	E.E.	2011	
Diwadkar, Amit	E.E.	2012	
Andalam, Vamsi	E.E.	2012	
Rastegar, Reza	Math	2012	
Verdejo, Humberto	E.E.	2012	Universidad de Chile, Santiago, Chile
Schmidt, Kristian	Stat	2012	
Tims, Geoff	Math	2012	
Li, Chong	E.E.	2013	minor representative
Wang, Shin	E.E.		minor representative
Simsek, Sevim	Math		
Fostvedt, Luke	Stat		
Ma, Xu	E.E.		
Voller, Zachary	Math		
Lois, Brian	Math		

2.8 Curriculum Development

'Logic and Mathematics for Social Scientists' (Logik und Mathematik für Sozialwissenschaftler, with N. Müller, University of Bielefeld, Germany, 1972-1974) a two semester graduate course covering logic, set theory, calculus, probability theory, graph theory, linear algebra, linear systems theory. The material was published in 1973, 1974 (see below).

'Graph theory and its applications' (Graphentheorie und ihre Anwendungen, with K. Kiesewetter, University of Bielefeld, Germany, 1973-1974), a TV course on the basic concepts and applications in graph theory, used in High School teaching in Germany.

'Lie groups and Lie algebras in systems theory' (ISU, Spring 1987), and "Deterministic and stochastic systems" (ISU, Fall 1987) a graduate course on geometric nonlinear systems theory, taught for the first time as a two semester M690 course in Spring/Fall 1987. The course material has been used also at University of Augsburg (Germany), Catholic University of Santiago (Chile), and Colorado State University.

'Spectral theory of skew product flows' (Bremen, Germany, 1989), a graduate course on spectral theory of dynamical, control, and stochastic systems, with applications to stability and stabilization of systems, basic material for a monograph (jointly with F. Colonius).

'Applications of Hilbert space theory in statistics' (ISU, 1994) a graduate course on Hilbert space theory and its applications to estimation, optimization, linear models, signal processing and filtering. Taught for the first time Spring 1994 as Stat 517X, Math 517X (jointly with P. Sherman, Department of Statistics).

2.9 Member of Graduate Faculty

I am a member of the Graduate Faculty in the Department of Mathematics and the Department of Statistics at Iowa State University. As such, I can direct M. S. and Ph.D. students in both departments.

2.10 Education Grants

2000 – 2002	*Redesign of the Course Discrete Mathematics*, The Pew Grant Program in Course Redesign, (M. Gunzburger, PI), $200,000
2008	Linear Algebra and Applications, IMA Summer Workshop, Co-PI (with L. Hogben and Y.T. Poon), Institute for Mathematics and its Applications, $50,000.
2008	Linear Algebra and Applications, IMA Summer Workshop, Co-PI (with L. Hogben and Y.T. Poon), NSF, $25,000.
2008 – 2013	REU Site: Mathematics and Computing Research Experiences for Undergraduates at Iowa State University (Co-PI with L. Hogben and J. Peters), NSF $352,351.
2011 – 2013	GSE/RES: *Exploring the STEM Gender Gap: Introductory College Mathematics and Statistics Instruction and its Association with Self-Efficacy*, (U. Genschel, PI; with Co-PIs A. Carriquiry, B. Dougherty, and E. Johnston), NSF $521,423.
2013	Course Development and Scaling Planning, Gates Foundation through Association of Public and Landgrant Universities (APLU), $11,500.

3. Research

3.1 Publications

3.1.1 Books, Authored and Edited

1. Kliemann, W. and N. Müller, *Logik und Mathematik für Sozialwissenschaftler Vol. I*, Wilhelm Fink Verlag, München, 1973, 307 pp.

2. Kliemann, W. and N. Müller, *Logik und Mathematik für Sozialwissenschaftler Vol. II*, Wilhelm Fink Verlag, München, 1974, 668 pp.

3. Fink, A.M., R.K. Miller, and W. Kliemann (eds.), *Delay and Differential Equations*, World Scientific, Singapore, 1992, 166 pp.

4. Kliemann, W. and N.S. Namachchivaya (eds.), *Nonlinear Dynamics and Stochastic Mechanics*, CRC Press, Boca Raton, 1995, 530 pp.

5. Kliemann, W., W.F. Lanford, and N.S. Namachchivaya (eds.), *Nonlinear Dynamics and Stochastic Mechanics*, AMS Press, Fields Institute Communication Vol. 9, 1996, 238 pp.

6. Colonius, F. and W. Kliemann, *The Dynamics of Control*, Birkhäuser, Boston, 2000, 629 pp.

3.1.2 Chapters in Books, Invited

1. Arnold, L. and W. Kliemann, *Qualitative Theory of Stochastic Systems*, in: Probabilistic Analysis and Related Topics, Vol. 3 (Bharucha-Reid, A.T., ed.), Academic Press, New York (1983), 1-79.

2. Kliemann, W., *Analysis of Nonlinear Stochastic Systems*, in: Analysis and Estimation of Stochastic Mechanical Systems, (Schiehlen, W. and W. Wedig, eds.), CISM Courses and Lecture, No. 303, Springer, New York (1988), 43-102.

3. Colonius, F. and W. Kliemann, *Control Theory and Dynamical Systems*, in: Six Lectures on Dynamical Systems, (Aulbach, B. and F. Colonius, eds.), World Scientific, (1996), 121-161.

4. Colonius, F., W. Kliemann, and L.A.B. San Martin, *Asymptotic Problems - From Control Systems to Semi Groups*, in: Positivity in Lie Theory: Open Problems, (Hilgert, J., D. Lawson, K.-H. Neeb, and E.B. Vinberg, eds.), De Gruyter Expositions in Mathematics, Vol. 26, Berlin (1998), 21-43.

5. Colonius, F. and W. Kliemann, *Topological, Smooth, and Control Techniques for Stochastic Systems*, in: Stochastic Systems, (Crauel, H. and M.V. Gundlach, eds.), Springer-Verlag, (1999), 181-208.

6. Colonius, F. and W. Kliemann, *An Invariance Radius for Nonlinear Systems*, in: Advances in Mathematical Systems Theory, (F. Colonius, U. Helmke, D. Prätzel-Wolters, and F. Wirth, eds.), Birkhäuser (2000), 77-91.

7. Colonius, F. and W. Kliemann, *Collision of Control Sets*, in: Ergodic Theory, Analysis, and Efficient Simulation of Dynamical Systems, (B. Fiedler, ed.), Springer-Verlag, Berlin (2001), 131—144.

Chapters in Books, Invited – continued

8. Colonius, F. and W. Kliemann, *Bifurcations of Control Systems: A View from Control Flows*, in: New Trends in Nonlinear Dynamics and Control, and Their Applications (W. Kang, C. Borges, and M. Xiao, eds.), Lecture Notes in Control and Information Sciences 295, Springer-Verlag (2004), 19-36.

9. Colonius, F. and W. Kliemann, *Dynamical systems and linear algebra*, in: Handbook of Linear Algebra (L. Hogben, ed.), CRC Press (2006), 56.1 – 56.31.

3.1.3 Articles in Refereed Journals

1. Kliemann, W., *Stabilität und Wachstum linearer, parametererregter Systeme*, ZAMM 61 (1981), T 339-341.

2. Ehrhardt, M. and W. Kliemann, *Controllability of linear stochastic systems*, Systems and Control Letters 2 (1982), 145-153.

3. Kliemann, W., *Qualitative theory of stochastic dynamical systems: Applications to life sciences*, Bull. Math. Biol. 45 (1983), 483-506.

4. Kliemann, W., *Recurrence and invariant measures for degenerate diffusions*, Ann. Prob. 15 (1987), 690-707.

5. Kliemann, W., *A stochastic dynamical model for the characterization of the geometrical structure of dendritic processes*, Bull. Math. Biol. 49, (1987), 135-152.

6. Arnold, L. and W. Kliemann, *On unique ergodicity for degenerate diffusions*, Stochastics 21 (1987), 41-61.

7. Athreya, K.B., W. Kliemann, and G. Koch, *On sequential construction of solutions of stochastic differential equations with jump terms*, Systems and Control Letters 10 (1988), 141-146.

8. Colonius, F. and W. Kliemann, *Infinite time optimal control and periodicity*, Appl. Math. and Opt. 20 (1989), 113-130.

9. Kliemann, W., G. Koch, and F. Marchetti, *On the unnormalized solution of the filtering problem with counting process observations*, IEEE Trans. IT 36 (1990), 1415-1425.

10. Carriquiry, A., W.P. Ireland, W. Kliemann, and E. Uemura, *Statistical evaluation of dendritic growth models*, Bull. Math. Biology 53 (1991), 579-589.

11. Colonius, F. and W. Kliemann, *Minimal and maximal Lyapunov exponents of bilinear control systems*, J. Diff. Equations 101 (1993), 232-275.

12. Colonius, F. and W. Kliemann, *Control properties of linear semigroups on projective spaces*, J. Dynamics and Differential Equations 5 (1993), 495-528.

13. Colonius, F. and W. Kliemann, *Some aspects of control systems as dynamical systems*, J. Dynamics and Differential Equations 5 (1993), 469-494.

14. Colonius, F. and W. Kliemann, *Limit behavior and genericity for nonlinear control systems*, J. Diff. Equations 109 (1994), 8-41.

Articles in Refereed Journals – continued

15. Colonius, F. and W. Kliemann, *Random perturbations of bifurcation diagrams*, Nonlinear Dynamics 5 (1994), 353-373.

16. Colonius, F. and W. Kliemann, *Local robust stabilization of nonlinear oscillators under parametric excitation*, Stochastic Dynamics and Reliability of Nonlinear Ocean Systems, ASME DE-Vol. 77 (1994), 1-5.

17. Colonius, F. and W. Kliemann, *Controllability and stabilization of one dimensional systems near bifurcation points*, Systems and Control Letters 24 (1995), 87-95.

18. Uemura, E., A. Carriquiry, W. Kliemann, and J. Goodwin, *Mathematical modeling of dendritic growth in vitro*, Brain Research 671 (1995), 187-194.

19. Colonius, F., G. Häckl, and W. Kliemann, *Dynamic reliability of nonlinear systems under random excitation*, Vibrations of Nonlinear, Random, and Time-Varying Systems, ASME DE-Vol. 84-1 (1995), 1007-1024.

20. Colonius, F. and W. Kliemann, *Stability of time varying systems*, Vibrations of Nonlinear, Random, and Time-Varying Systems, ASME DE-Vol. 84-1 (1995), 365-373.

21. Colonius, F. and W. Kliemann, *The Morse spectrum of linear flows on vector bundles*, Transa. AMS. 348 (1996), 4355-4388.

22. Colonius, F. and W. Kliemann, *The Lyapunov spectrum of families of time-varying matrices*, Transa. AMS. 348 (1996), 4389-4408.

23. Colonius, F., F.J. de la Rubia, and W. Kliemann, *Stochastic models with multistability and extinction levels*, SIAM J. Applied Mathematics 56 (1996), 919-945.

24. Lin, C.-M., V. Vittal, W. Kliemann, and A.A. Fouad, *Investigation of modal interaction and its effects on control performance in stressed power systems using normal forms of vector fields*, IEEE Transactions on PWRS 11 (1996), 781-787.

25. Treinen, R., V. Vittal, and W. Kliemann, *An improved technique to determine the controlling unstable equilibrium point in a power system*, IEEE Transactions on CS 43 (1996), 313-323.

26. Ni, Y.-X., V. Vittal, W. Kliemann, and A.A. Fouad, *Nonlinear modal interaction in HVDC/AC power systems with DC power modulation*, IEEE Transactions on PWRS 11 (1996), 2011-2017.

27. Saha, S., A.A. Fouad, W. Kliemann, and V. Vittal, *Stability boundary approximation of a power system using the real norm of vector fields*, IEEE Transactions on PWRS 12 (1997), 797-802.

28. Thapar, J., V. Vittal, W. Kliemann, and A.A. Fouad, *Application of the normal form of vector fields to predict interarea separation in power systems*, IEEE Transactions on PWRS 12 (1997), 844-850.

29. Colonius, F. and W. Kliemann, *Robustness of time varying systems*, ASME DETC (1997), No. 4025, 10pp (CD-ROM).

30. Colonius, F. and W. Kliemann, *Nonlinear systems with multiplicative and additive perturbation under state space constraints*, ASME DE-Vol. 95 (1997), 131-142.

Articles in Refereed Journals – continued

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38. Zhu, S., V. Vittal, and W. Kliemann, *Analyzing dynamic performance of power systems over parameter space using normal forms of vector fields, Part II: Comparison of the system structure*, IEEE Transactions on PWRS 16 (2001), 451-455.

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40. Colonius, F. and W. Kliemann, *Limits of input-to-state stability*, Systems and Control Letters 49 (2003), 111-120.

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42. Ayala, V. and W. Kliemann, *A decomposition theorem for singular control systems on Lie groups*, Computers and Mathematics with Applications 45 (2003), 635-646.

43. Ayala, V., W. Kliemann, and L.A.B. San Martin, *Control sets and total positivity*, Semigroup Forum 69 (2004), 113-140.

44. Ayala, V., F. Colonius, and W. Kliemann, *Dynamic characterization of the Lyapunov form of matrices*, Linear Algebra and Its Applications 402 (2005), 272-290.

45. Ayala-Hoffmann, J., P. Corbin, K. McConville, F. Colonius, W. Kliemann, J. Peters, *Morse decompositions, attractors and chain recurrence*, Proyecciones Journal of Mathematics 25 (2006), 79-109.

Articles in Refereed Journals – continued

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3.1.4 Articles in Refereed Collections and Proceedings

1. Kliemann, W., *Some exact results on stability and growth of linear, parameter excited stochastic systems*, Springer Lecture Notes in Control and Information Sciences No. 16 (1979), 457-471.

2. Kliemann, W., *Transience, recurrence and invariant measures for diffusions*, in: Nonlinear Stochastic Problems (Bucy, R.S. and J.M.F. Moura, eds.), Reidel Publ., Dordrecht (1983), 437-454.

Articles in Refereed Collections and Proceedings – continued

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4. Arnold, L. and W. Kliemann, *Large deviations of linear stochastic differential equations*, Springer Lecture Notes in Control and Information Sciences No. 96 (1987), 117-151.

5. De la Rubia, F.J. and W. Kliemann, *Stochastic bifurcations in a generic dynamical system: A qualitative analysis*, in: Noise and Nonlinear Phenomena in Nuclear Systems (J.L. Muñoz-Cobo and F.C. Difilippo, eds.), Plenum Press, New York (1989), 19-28.

6. Colonius, F. and W. Kliemann, *Stability radii and Lyapunov exponents*, in: Control of Uncertain Systems (D. Hinrichsen and B. Martensson, eds.), Birkhäuser (1990), 19-56.

7. Colonius, F. and W. Kliemann, *Lyapunov exponents of control flows*, Springer Lecture Notes in Mathematics No. 1486 (1991), 331-365.

8. Colonius, F. and W. Kliemann, *Stabilization of linear uncertain systems*, in: Modeling, Estimation and Control of Systems with Uncertainty (A.B. DiMasi, A. Gombani, A.B. Kurzhansky, eds.), Birkhäuser (1991), 76-90.
9. Colonius, F. and W. Kliemann, *Stabilization of uncertain linear systems via Lyapunov exponents*, in: Proceedings of IEEE Conference on Decision and Control 1991, Brighton, England (1991), Vol. I. 887-893.

10. Colonius, F. and W. Kliemann, *Remarks on ergodic theory of stochastic flows and control flows*, in: Diffusion Processes and Related Problems in Analysis, Vol. II, (M. Pinsky and V. Wihstutz, eds.), Birkhäuser (1992), 203-240.

11. Colonius, F. and W. Kliemann, *Controlling the dynamics of a random system*, in: Nonlinear Stochastic Mechanics (N. Bellomo, F. Casciati, eds.), Springer (1992), 333-346.

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13. Colonius, F. and W. Kliemann, *A Dynamical Systems Approach to Control*, in: Proceedings of IFAC NOLCOS '92, Bordeaux, France (1992), 361-367.

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23. Colonius, F. and W. Kliemann, *Asymptotic null-controllability of bilinear systems*, in: Geometry in Nonlinear Control and Differential Inclusions, Banach Center Publications Vol. 32, Warsaw (1995), 139-148.

24. Ni, Y.-X., V. Vittal, W. Kliemann, and A.A. Fouad, *Application of normal form of vector fields to AC/DC power systems*, in: Proceedings of the 27th North American Power Symposium (1995), 6-12.

25. Saha, S., W. Kliemann, V. Vittal, and A.A. Fouad, *Effect of stress on the boundary of stability of a power system*, in: Proceedings of the 27th North American Power Symposium (1995), 257-262.

26. Colonius, F. and W. Kliemann, *A stability radius for nonlinear differential equations subject to time varying perturbations*, in: Proceedings of IFAC NOLCOS '95 (1995) 44-46.

27. Kliemann, W., *Nonlinear time series - bifurcation, chaos, and stationarity*, in: Modeling and Prediction Honoring Seymour Geisser (J.C. Lee, W.O. Johnson, and A. Zellner, eds), Springer (1996), 389-401.

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29. Colonius, F. and W. Kliemann, *On the global controllability structure of nonlinear systems*, in: Proceedings of ECC '97, Paper No. 529, 6pp (CD-ROM).

30. Ni, Y.-X., V. Vittal, and W. Kliemann, *Investigation of nonlinear modal behavior of HVDC/AC power systems through a scanning tool via normal form technique*, Proceedings of IEEE International Symposium on Circuits and Systems, Paper no. 2P1-16, Hong Kong (1997), 945-948.

31. Colonius, F. and W. Kliemann, *Exponential growth behavior of bilinear control systems*, in: Proceedings of 36th IEEE Conference on Decision and Control 1997, San Diego (1997), 4425-4430 (CD-ROM).

32. Colonius, F. and W. Kliemann, *Spectral theory for perturbed systems*, ECC ’99 (1999).

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37. Zhu, S., W. Kliemann, and V. Vittal, *Analyzing dynamic performance of power systems over parameter space using the method of normal forms*, in: Proceedings of the National Power Systems Conference, Bangalore, India (2000), 100-105.

38. Colonius, F. and W. Kliemann, *On dynamic bifurcations in control systems*, in: Proceedings of the IFAC Symposium on Nonlinear Control systems (NOLCOS 2001), St. Petersburg, Russia, (2001), 140-143.

39. Colonius, F. and W. Kliemann, *Attractors, input-to-state stability, and control sets*, in: Electronic Proceedings of the 15th Conference on Mathematical Theory of Networks and Systems (MTNS), University of Notre Dame, Southbend, Indiana, August 12-16 2002, (D.S. Gilliam, J. Rosenthal, eds .), 11 pp.

40. Colonius, F. and W. Kliemann, *Behaviors and controllability*, in: Electronic Proceedings of the 16th Conference on Mathematical Theory of Networks and Systems (MTNS), July 5-9, 2004, Leuven (Belgium), 10 pp.

41. Ayala, V., F. Colonius, and W. Kliemann, *Towards a topological classification of bilinear control systems*, Electronic Proceedings of the 17th Conference on Mathematical Theory of Networks and Systems (MTNS), July 24-28, 2006, Kyoto (Japan), 5 pp.

42. Vargas, L.S., H. Verdejo, and W. Kliemann, *A stochastic methodology for modeling PSS in small signal stability analysis*, in Proceedings of the North American Power Symposium 2008, Calgary, 6 pp.

43. Vargas, L.S., H. Verdejo, and W. Kliemann, *Stability reserve in stochastic linear systems with applications to power systems*, in Proceedings of PMAPS 2010, p. 491-496.

44. Verdejo, H., Vargas, L.S., and W. Kliemann, Stability Reserve under Random Perturbations in Power Systems, IEEE Power and Energy Society General Meeting 2010, 7 pp.

3.1.5 Articles, not Refereed, and Technical Reports

1. Kliemann, W., *Qualitative Theorie nichtlinearer stochastischer Systeme*, Ph.D.-Thesis, Report No. 32 of Institute for Dynamical Systems, Bremen (1980), 384 pp.

Articles, not refereed, and Technical Reports – continued

2. Kliemann, W. and W. Rümelin, *On the Growth of Linear Systems Parametrically Disturbed by a Diffusion Process*, Report No. 27 of Institute for Dynamical Systems, Bremen (1981), 31 pp.

3. Colonius, F. and W. Kliemann, *Extremal exponential growth rates of bilinear control systems*, in: Differential Equations and Applications (R.A. Aftabizadeh, ed.), Ohio University Press (1989), 186-190.

4. Colonius, F., W. Kliemann, and S. Krull, *Stability and stabilization of linear, uncertain systems -A Lyapunov exponents approach*, Report No. 372 of the Schwerpunktprogramm der Deutschen Forschungsgemeinschaft 'Anwendungsbezogene Optimierung und Steuerung' (1992), 38 pp.

5. Fouad, A.A., V. Vittal, and W. Kliemann, *Analysis of Stressed Interconnected Power Networks*, EPRI Report TR-103704 (1994), 95 pp.

6. Lin, S., V. Ajjarapu, B. Lee, V. Vittal, and W. Kliemann, *Control of voltage collapse in an electrical power system using center manifold theory*, in: Proceedings of the Midwest Power Symposium 95 (1995) 4 pp.

7. Colonius, F. and W. Kliemann, *Lyapunov exponents in nonlinear stochastic dynamics*, in: Proceedings of 32nd Annual Technical Meeting of the Society of Engineering Science, New Orleans, Oct. 1995 (1995), 273-275.

8. Pradlwarter, H.J. and W. Kliemann, *First exit times in nonlinear dynamical systems by advanced Monte Carlo simulation*, in: Proceedings of the 11th Conference on Engineering Mechanics, ASCE, Fort Lauderdale, May 1996 (1996), Vol. I, 523-526.

9. Fouad, A.A., W. Kliemann, and V. Vittal, *Nonlinear Power System Behavior using Normal Forms: Extension of Linear System Analysis via Higher Order Correction*, EPRI Report TR-107798 (1997), 189 pp.

10. Vittal, V., W. Kliemann, and Y.-X. Ni, *Testing Methods for Prediction of Onset of Interarea Split in a Full-Scale Real World Context*, EPRI Report TR-108533 (1998).

11. Kliemann, W., *Dynamics and Linear Algebra*, Lecture Notes for Sociedad de Matemática de Chile (2007), 28 pp.

12. Kliemann, W., *Risk and reliability in stochastic systems*, Proceedings of the Simposio 2007 of the Sociedad de Matemática de Chile (2007), 4 pp.

13. Kliemann, W., *Calculo Científico II – Métodos numéricos para ecuaciones diferenciales*, Lecture Notes for Pontificia Universidad Católica de Chile (2008), 125 pp.

3.1.6 Articles, Submitted

1. Vargas, L.S., H. Verdejo, and W. Kliemann, *Stability Region and Radius in Electric Power Systems under Sustained Random Perturbations*, revised version sent to IET Generation, Transmission & Distribution.

2. Ayala, V., E. Cruz, W. Kliemann, and L. Laura, *Controllability properties of bilinear systems in dimension 2*, submitted to M3AS.

3.1.7 Book Reviews

1. *Stochastic Integration and Differential Equations*, by P. Protter, Springer (1990), Jahresberichte der Deutschen Mathematiker Vereinigung, 94, 2 (1992), 7-11.

2. *Stability of Stochastic Differential Equations with Respect to Semimartingales*, by X.R. Mao, Wiley (1991), for Mathematical Reviews.

3. *Stochastic Differential Equations*, by B. Øksendal, Springer (3rd edition, 1992), for Zentralblatt.

4. *The Fokker-Planck Equation for Stochastic Dynamical Systems and Its Explicit Steady State Solutions*, by C. Soize, World Scientific (1994), for Zentralblatt and for Mathematical Reviews.
5. *Exponential Stability of Stochastic Differential Equations*, by X.R. Mao, Marcel Dekker (1994), for Mathematical Reviews.

6. *Stochastic Dynamical Systems*, by J. Honerkamp, VCH Publishers (1994), for Mathematical Reviews.

5. *Analyse und Simulation stochastischer Schwingungssysteme*, by J. vom Scheidt, B. Fellenberg, and U. Wöhrl, B.G. Teubner (1994), for Mathematical Reviews.

6. *Introduction to the Theory of Diffusion Processes*, by N.V. Krylov, AMS (1995), for Zentralblatt.

7. *Frequency-Domain Methods for Nonlinear Analysis*, by G.A. Leonov, D.V. Ponomarenko, and V.B. Smirnova (1996), for Mathematical Reviews.

8. *Partially Observable Linear Systems Under Dependent Noises*, by A.E. Bashirov (2004), IEEE Transactions on Automatic Control 49 (2004), 1417-1418.

9. *Stochastic Differential Equations*, by B. Øksendal, Springer (6th edition, 2003), IEEE Transactions on Automatic Control 51 (2006), 1731-1732.

10. *Applied Linear Algebra*, by P.J. Olver and C. Shakiban, Pearson Prentice Hall (2006), with L. Hogben, MAA The American Mathematical Monthly 115 (2008), 373-378.

11. *Dynamic Stability of Structures*, by W.-C. Xie, Cambridge University Press (2006), SIAM Review 50 (2008), 176-179.

3.1.8 Publications on Mathematics Education

1. Froelich, A.G., W. Kliemann and H. Thompson, *Changing the statistics curriculum for future and current high school mathematics teachers: a case study*, in: International Commission on Mathematical Instruction / International Association for Statistical Education (ICMI-IASE) Study Conference on Teaching Statistics in School Mathematics 2008, 6pp, on the web at http://www.ugr.es/~icmi/iase_study/Files/Topic6/T6P5_Froelich.pdf .

3.1.9 Popular Scientific Articles

1. *Umweltschutz, Umweltschutzbewegung und "Die Grünen"*, Schatzkammer 12 (1986), 10-26.

2. *Prinzip der gefederten Hochhäuser* (with F.M. Rudel), Weser Kurier (May 3, 1997), (Bremen, Germany), 48.

Popular Scientific Articles – continued

3. *Die Dynamik des Zufalls: Zufallsforschung an der Universität Bremen*, Impulse 23 (1997), (Bremen, Germany), 52-55.

3.2 External Research Grants

1984-1986 Grant Kl 513/1-1 from Deutsche Forschungsgemeinschaft, DM 84,523.

1989-1991 *Lyapunov Exponents of Bilinear Control Systems: Stability and Stabilization*, NSF Grant No. DMS-8813976 (with F. Colonius), $49,500.

1989-1992 *Nonlinear Real Time Filtering: Theory and Numerics*, NSF Grant No. DMS-8913222 (with E. Goggin (PI)), $28,830.

1990-1991 *Lyapunov Exponenten bilinearer Kontrollsysteme: Stabilität and Stabilisierung*, DFG Grant No. Co 124/6-1 (with F. Colonius (PI)), DM 68,000.

1990-1991 *Stabilität und Stabilisierung nichtlinearer Kontrollsysteme*, DFG Grant No. Co 124/8-1 (with F. Colonius (PI)), DM 9,500.

1991 *Mixed Linear Models in Quantitative Genetics*, (with A. Carriquiry (PI), Statistics), Iowa Agriculture Experiment Station Innovative Research Grant, $3,810.

1991-1994 *Mathematical Approach to Modeling Dendritic Growth*, NIH N528416 (with E. Uemura (PI), (Veterinary Anatomy) and A. Carriquiry (Statistics)), $299,317.

1992-1993 *Analysis of Stressed Interconnected Power Networks*, EPRI RP8010-28 (with A.A. Fouad (PI) and V. Vittal, E.E.), $176,085.

1992-1994 *Nichtlineare Kontrollsysteme*, DFG grant No. Co 124/8-2 (with F. Colonius (PI)), DM 106,000.

1993 *International Symposium on Nonlinear Dynamics and Stochastic Mechanics*, NSF (with N.S. Namachchivaya (PI), Aero. E., University of Illinois, Urbana-Champaign), $15,000.

1993-1996 *Reliability of Nonlinear Stochastic Dynamical Systems*, ONR grant No. N00014-93-1-0868, $345,000.

1994-1995 *Nonlinear Power System Behavior Using Normal Forms*, NSF grant No. ECS-9314453 (with A.A. Fouad (PI) and V. Vittal, E.E.), $139,995.

1994-1997 *Nonlinear Power System Behavior Using Normal Forms*, EPRI grant No. RP8050-08 (with A.A. Fouad (PI) and V. Vittal, E.E.), $171,630.

1996-1998 *Nonlinear Filtering Approaches to Multi Target Tracking*, ONR grant no. N00014-96-1-0279 (with J. Breidt (Statistics), A. Budhiraja, A. Carriquiry (Statistics), D. Mirkovic, and B. O'Donnell (Grandview College)), $604,340.

1996 *Nonlinear Filtering Approaches to Multi Target Tracking*, ONR grant no. N00014-96-1-0279 MP1, $23,006.

1996 *Dynamic Reliability*, ONR Conference Grant (with A. Heinricher (PI), WPI), $17,000.

1996 *Stochastic Analysis of Dynamical Systems*, Fundacion Andes (Chile) grant no. C12999/1 (with J. San Martin (PI), UChile), $5,500.

1997 *Random Dynamical Systems*, DFG Conference Grant (with F. Colonius (PI)), DM 25,000.

Research Grants – continued

1998 – 1999 *Nonlinear Filtering Approaches to Multi Target Tracking*, ONR (with J. Breidt and A. Carriquiry, Statistics), $50,000.

1998 – 2003 *Innovative Technologies for Defense Against Catastrophic Failures of Complex, Interactive Power Networks*, EPRI and DOD (with V. Vittal (PI), V. Ajjarapu, M.H. Khammash, J.D. McCalley, G.B. Sheble, L. Tesfation, S.S. Venkata, all EE), ISU part $1,481,234.

ISU Sciences and Humanities Research Institute (SHRI) grants: Fall 1984 and Fall 1985.

3.3 Lectures and Papers at Conferences

3.3.1 Plenary Lectures at International Conferences

1979 'Some exact results on the growth of linear stochastic systems', Conference on Stochastic Differential Systems, Bad Godesberg, Germany.

1980 'Controllability of linear, white noise systems', Workshop on Linear and Nonlinear Control Theory, Edzell, Scotland.

'Stochastic processes in life sciences', Conference on Stochastic Processes in Life Sciences, Trento, Italy.

1981 'Control sets and the recurrence-transience dichotomy', Conference on Stochastic Systems in Physics, Chemistry, and Biology, Bielefeld, Germany.

'Control theoretic approach to the qualitative behavior of diffusion processes', Workshop on Stochastik, Oberwolfach, Germany (series of 3 lectures).

1982 'Transience, recurrence and invariant measures for diffusions', NATO ASI on Nonlinear Stochastic Problems, Algarve, Portugal.

1984 'Lyapunov exponents of linear stochastic systems', Workshop on Lyapunov Exponents, Bremen, Germany.

1985 'On stability results for linear stochastic systems', Conference on Mathematische Stochastik, Oberwolfach, Germany.

Large deviations for linear stochastic systems', Workshop on Large Deviations, IMA, Minneapolis, USA.

1986 'Are a.s. exponentially stable stochastic systems `stable'?', Conference on Nonlinear Random Vibrations, Oberwolfach, Germany.

1987 'Analysis of Nonlinear Stochastic Systems', CISM Conference on Analysis and Estimation of Stochastic Mechanical Systems, Udine, Italy, (series of 5 60-min. lectures).

1988 'Limit theorems for random dynamical systems', Third Latin American Congress on Probability and Mathematical Statistics, Montevideo, Uruguay.

1989 'Stability radii and Lyapunov exponents', Workshop on Control of Uncertain Systems, Bremen, Germany.

'Ergodic theory of stochastic flows', EIPES VIII (8th Winter School of Probability and Statistics), SCIENES, Santiago, Chile (series of 6 90-min. lectures).

1990 'Stochastic and control flows: General principles', Conference on Stochastic Flows, UNCC, Charlotte NC.

'The Lyapunov spectrum of control systems', Conference on Lyapunov Exponents, Oberwolfach, Germany.

'Stabilization of uncertain linear systems: A Lyapunov exponents approach', Conference on Modeling and Control of Uncertain Systems, IIASA, Sopron, Hungary.

Plenary Lectures at International Conferences - continued

A dynamical systems approach to control', 3. Escuela Internacional de Sistemas Dinamicos, Santiago, Chile.

1991 'Nonlinear real time filtering', Conference on Analytical and Numerical Methods in Recursive Filtering, Torino, Italy.

'Stabilization of random vibrations and its relation to control and chaos', IUTAM Symposium on Nonlinear Stochastic Mechanics, Torino, Italy.

'A dynamical systems approach to nonlinear control', IIASA Workshop on Geometric Methods in Nonlinear Optimal Control, Sopron, Hungary.

'On two perturbation theorems for ordinary differential equations', Conference on Nonlinear and Random Vibrations, Oberwolfach, Germany.

1992 'Numerical computation of exact stability regions for uncertain systems', International Workshop on Numerics for Stochastic Systems, Charlotte NC.

'A dynamical systems approach to control', IFAC NOLCOS '92, Bordeaux, France (with F. Colonius).

'Complexity and chaos in control systems', International Workshop on Dynamical Measures of Complexity and Chaos II, Bryn Mawr, PA.

'Hypoellipticity and invariant measures for stochastic systems', International Workshop on Stochastic Control, Centre de Récherches Mathématique, Montreal, Canada (2 60-min. presentations).

1993 'One dimensional control systems: Bifurcations, robustness, stochastic perturbations', DFG Workshop on Nonlinear Control Theory, Augsburg, Germany .

'Geometric control - topological dynamics - random perturbations', Banach Center Workshop on Geometry and Control, Warsaw, Poland.

'Response theory for nonlinear stochastic dynamical systems', ONR Workshop on Reliability of Nonlinear Ocean Structures under Stochastic Excitation, Washington D.C.

1994 'Random dynamical systems: Global analysis and control', Workshop on Control Techniques for Nonlinear Systems, Bremen, Germany.

'The influence of parametric vibrations on nonlinear oscillations and their control', 5th Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, VPI Blacksburg, VA.

'Response and response control in nonlinear stochastic systems', ONR Workshop on Reliability of Nonlinear Ocean Structures under Stochastic Excitation, Washington, D. C.

'Some remarks on nonlinear robustness', WIAS Workshop on Nonlinear Control Theory, Berlin, Germany.

1995 'Flows on vector bundles and linearization of dynamical systems over function spaces', Workshop on Random Dynamical Systems, Urbana, IL.

Plenary Lectures at International Conferences - continued

'Random nonlinear oscillators: Qualitative behavior and stabilization under non-Gaussian excitation', IUTAM Symposium on Advances in Nonlinear Stochastic Mechanics', Trondheim, Norway, July 1995.

'Some remarks on robust stability', Institute for Dynamical Systems, Third Day Full of Randomness, University of Bremen, July 1995.

'Dynamic reliability of nonlinear systems under random excitation', ONR Workshop on Reliability of Nonlinear Ocean Structures under Stochastic Excitation, Renaissance Hotel, Arlington, VA, July 1995.

'Dynamic reliability theory', Conference on Nonlinear and Stochastic Systems, Oberwolfach, Germany, September 1995.

1996 'Nonlinear filtering - exact and approximate approaches', ONR/NRaD Workshop on Multitarget Tracking, San Diego, California, February 1996.

'Some remarks on Lyapunov exponents and their computation', NSF-INRIA Workshop on Weak Convergence and Applications, INRIA Sophia Antipolis, France, March 1996.

'Problems in nonlinear stochastic dynamics and numerical approaches', Workshop on Numerics in Stochastic Dynamical Systems, Oberwolfach, Germany, July 1996.

'Persistence of attractors', Tercer Coloquio Nacional de Sistemas Dinamicos, Osorno, Chile, November 1996.

'Spectral theory of nonlinear semi-groups', Conference on Positivity in Lie Theory, Oberwolfach, Germany, December 1996.

1997 'Dynamic reliability of systems under random excitation', Workshop on Response and Reliability of Stochastic Dynamical Systems, University of Notre Dame, IN, May 1997.

'Characterization of stabilizability in nonlinear systems', AMS - SRI on Differential Geometry and Control, Boulder, CO, July 1997.

'Dynamic reliability of stochastic systems', COMCA '97, Antofagasta, Chile, July 1997.

'Towards a bifurcation theory of control systems', COTA '97, Antofagasta, Chile, August 1997.

'Global analysis of Markov diffusion processes', Workshop on Nonlinear Noisy Systems, Graduate College of the University of Augsburg, Germany, September 1997 (2 lectures).

1998 'Approximation of attractors via control theory', DFG Workshop on Numerical Methods for Perturbed and Controlled Dynamical Systems, Kloster Irsee, Germany, March 1998.

'Towards a bifurcation theory of nonlinear control systems', IMA Workshop on Nonlinear Identification and Control, Institute for Mathematics and Its Applications, Minneapolis, May 1998.

1999 'Lie semigroups in control theory', International Workshop on Advances in Mathematical Systems Theory, Borkum, Germany, April 1999.

2003 'Skew product flows: The control case', International Workshop on the Foundations of Nonautonomous Dynamical Systems, Friedrichsdorf, Germany, September 2003.

Plenary Lectures at International Conferences - continued

2008 'Stability Radii', International Conference on Stochastic Analysis and Mathematical Physics VI, Santiago, Chile, January 2008.

2010 'The Lyapunov Structure of Matrices and Linear Systems', Summer School in Mathematics, Universidade Estadual de Maringá, Brazil, March 1 - 5, 2010.

2010 'Global behavior of dynamical systems and the case of chaos', 2010 Puerto Rico Conference on Graduate School in Mathematics, Humacao, Puerto Rico, Nov. 13, 2010.

2010 'The Graduate School Experience: What to expect, how to succeed, challenges and how to overcome them', 2010 Puerto Rico Conference on Graduate School in Mathematics, Humacao, Puerto Rico, Nov. 13, 2010.

2012 'Stability Radii via Lyapunov Exponents for Large Stochastic Systems', IUTAM Symposium on Multiscale Problems in Stochastic Mechanics, Karlsruhe, Germany, June 28, 2012.

2012 'Spectra of Sew Product Flows', COMCA 2012, Antofagasta, Chile, August 2, 2012.

3.3.2 Invited Presentations at International Conferences

1985 'Qualitative theory for diffusion processes', AMS Spring Meeting, Chicago, Illinois, USA.

1988 'Bifurcations in stochastic systems', 17th Conference on Stochastic Processes and their Applications, Rome, Italy.

1990 'Common techniques in dynamical and stochastic systems', SIAM Conference on Dynamical Systems, Orlando (Minisymposium: Dynamical Systems and Stochastic Processes).

1991 'A dynamical systems approach to control', AMS-MAA Annual Meeting, San Francisco (Special Session: Deterministic Nonlinear Control Theory).

'Dynamical systems and control systems: An introduction', ICIAM '91, Washington, D.C. (Minisymposium: Chaos, Control, and Noise)

1992 'Invariant manifolds for control flows', SIAM Conference on Control and its Applications, Minneapolis, MN (Special Session: Control, Chaos, and Dynamical Systems).

1993 'Exact regions of asymptotic null-controllability for bilinear systems', Conference on Mathematical Theory of Networks and Systems, MTNS '93, Regensburg, Germany (Special Session: Dynamical Aspects of Nonlinear Control).

'Reliability assessment of dynamical systems with random excitation', 32nd IEEE Conference on Decision and Control, San Antonio, Texas (Special Session: Nonlinear Dynamics in Control Systems).

1994 'Response behavior of dynamical systems with stochastic excitation', AMS-MAA Joint Mathematical Meetings, Cincinnati (Special Session: Stochastic Analysis).

'Robust stabilization of nonlinear systems with random excitation', 1994 ASME Winter Annual Meeting, Chicago (Special Symposium: Stochastic Dynamics and Reliability of Nonlinear Ocean Systems).

Invited Presentations at International Conferences - continued

'Nonlinear time series-bifurcation, chaos, and stationarity', Conference on Forecasting, Prediction and Modeling in Statistics and Econometrics, CFPMSE '94, Hsinchu, Taiwan.

1995 'Global analysis of perturbed dynamical systems', 3rd SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 1995.

1995 'Multistability for stochastic models and control sets', ICIAM '95, Congress Center, Hamburg, July 1995 (presented by F. Colonius).

'Stability of time-varying systems', ASME 1995 Design Engineering Conferences, Boston, MA, September 1995 (Special Conference: Time Varying Systems and Structures).

'Dynamic reliability of nonlinear systems under random excitation', ASME 1995 Design Engineering Conferences, Boston, MA, September 1995 (Special Conference: Random Vibration and Stochastic Dynamics).

1995 'Lyapunov exponents in nonlinear stochastic dynamics', SES 32nd Annual Technical Meeting, New Orleans, LA, October 1995 (Special Meeting: Nonlinear Vibration and Chaos).

1996 'On the spectrum of control and stochastic systems', MTNS '96, St. Louis, June 1996 (Special Session: Spectral Theory for Time-Varying Linear Systems and Stabilization).

'Dynamic reliability of systems under random excitation: analysis and numerics', 2nd World Congress of Nonlinear Analysts, Athens, Greece, July 1996 (Special Session: Stochastic Analysis).

'Dynamic reliability and exit statistics', 7th ASCE Specialty Conference on Probabilistic Mechanics and Structural Reliability, WPI Worcester, MA, August 1996.

1997 'Global theory of control systems', Annual GAMM Meeting 1997, Regensburg, Germany, March 1997 (Special Session: Nonlinear Control Theory).

'Persistence of attractors and spectra in nonlinear flows with applications to stability and bifurcations', McNU '97, Evanston, IL, July 1997 (Symposium: Stability and Bifurcation of Nonlinear Stochastic Systems).

'Nonlinear analysis of power systems using normal forms of vector fields', COMCA '97, Antofagasta, Chile, July 1997 (Special Session: Power Systems).

'Robustness of time-varying systems', ASME 1997 Design Engineering Technical Conferences, Sacramento, CA, September 1997 (Symposium: Time-Varying Systems and Structures).

'Towards a bifurcation theory for control systems', CDC 1997, San Diego, CA, December 1997 (Special Session: Spectral Theory of Control Systems)

1998 'Towards a bifurcation theory for control systems', ISCAS 1998, Monterey, CA, May/June 1998 (Special Invited Session: Control of Bifurcation and Chaos).

'Smooth dynamics of nonlinear control systems', MTNS '98, Padova, Italy, July 1998, (Special Invited Session: Numerical Methods for Stability and Stabilization of Control Systems).

1999 'Basics of dynamic reliability theory', 10th INFORMS Applied Probability Conference, Ulm, Germany, July 1999, (Special Invited Session: Probabilistic Aspects of Reliability Theory).

Invited Presentations at International Conferences - continued

2000 'Applications of dynamic reliability theory', World Congress of Nonlinear Analysts, Catania, Italy, July 2000.

'Computation of almost invariant sets', CDC 2000, Sydney, Australia, December 2000.

2000 'Nonlinear analysis of large power systems', Uruguay Workshop on Electric Power Systems, Montevideo, Uruguay, December 2000.

2001 'Computation of almost invariant sets', Congreso Latino Americano de Probabilidad y Estadistica Matematica, La Habana, Cuba, November 2001.

2003 'Bifurcation theory for control systems', Semester on Mathematical Control and Systems Theory, Institut Mittag-Leffler, Royal Swedish Academy of Sciences, Stockholm, Sweden, May 2003.

'Local bifurcations in control systems', Workshop on Geometric Nonlinear Control, Campinas, Brazil, July 2003.

2003 'Almost invariance', COMCA '03, Antofagasta, Chile, August 2003.

'Chain recurrence and spectra on flag manifolds' COMCA '03, Antofagasta, Chile, August 2003 (Special Invited Session: Geometric Control Theory).

2005 'Almost invariance', EuroMech 2005, Eindhoven, The Netherlands, August 6, 2005 (Special Invited Session: Nonlinear and Stochastic Dynamics).

2007 'Issues in mathematical modeling and design of power systems', First Workshop on Renewable Energy, Energy Efficiency and Stochastic Modeling, Concepcion, Chile, July 3-6, 2007.

2007 'Risk and reliability in stochastic systems', Meeting of the Sociedad de Matemática de Chile, Punta de Tralca, Chile, November 7 – 10, 2007 (Special Invited Session: Stochastic Analysis).

2007 'Some mathematical issues in analysis and design of power systems', Workshop on Power Systems Stability, Universidad de Chile, Santiago, Chile, December 6, 2007.

2010 'Optimal Parameter Tuning for Stability under Uncertainty', Joint Mathematics Meetings 2010, San Francisco, January 13-16, 2010 (Special Invited Session: Analysis and Control under Uncertainty)

2010 'Almost Invariance for Stochastic Systems', First Joint Meeting AMS-SOMACHI, Dec. 2010, Pucón, Chile, Dec. 17, 2010 (Special Invited Session: Stochastic Processes and Quantum Physics)

2012 'Control of Bilinear Systems', COMCA 2012, Antofagasta, Chile, August 2012 (Special Invited Session: Algebra de Lie y Teoria de Control)

2013 'Stochastic Dynamical Systems and their Application to Electric Power Systems', XVI Congreso Boliviano de Matemática, Cochabamba, Bolivia, July 25, 2013.

2013 'Lie Semigroups in Control Theory', COMCA 2013, La Serena, Chile, August 2013 (Special Invited Session: Algebra y Teoria de Lie)

3.3.3 Contributed Papers at Conferences

1979 'Stabilität und Wachstum linear, parametererregter Systeme', GAMM Conference, Berlin, Germany.

'The qualitative behavior of stochastic dynamical systems', 9th Conference on Stochastic Processes and their Applications, Evanston, Ill. USA.

1982 'Stability of parameterexcited linear stochastic systems', Equadiff. '82, Würzburg, Germany.

1983 'Control theory for stochastic systems', 12th Conference on Stochastic Processes and their Applications, Ithaca, N.Y., USA.

'On the magnitude of Lyapunov exponents for linear stochastic systems', 5th Symposium on Multivariate Analysis, Pittsburgh, USA.

1987 'Stability and large deviations in stochastic systems', ICIAM '87, Paris, France.

1988 'Extremal exponential growth rates of bilinear control systems', International Conference on Theory and Application of Differential Equations, Columbus, Ohio (presented by F. Colonius).

'Stochastic bifurcations in a generic dynamical system: A qualitative analysis', Conference on Noise and Nonlinear Phenomena in Nuclear Systems, Valencia, Spain (presented by J. F. de la Rubia).

1989 'The spectrum of nonlinear control systems', SIAM Conference on Control in the 90's, San Francisco, USA (presented by F. Colonius).

1990 'The Lyapunov spectrum of bilinear control systems', SIAM Conference on Dynamical Systems, Orlando FL.

1992 'On control sets and feedback for nonlinear systems', IFAC NOLCOS '92, Bordeaux, France.

1995 'A stability radius for nonlinear differential equations subject to time varying perturbation', IFAC Nonlinear Control Systems Design Symposium NOLCOS '95, Granlibakken Conference Center, Lake Tahoe, June 1995.

1998 'Capsizing a ship in rough sea', Annual MAA / ASA Meeting, Iowa Section, Decorah, IA, April 1998.

2006 ‘Global dynamics and chaos’, Annual MAA Meeting, Iowa Section, Ames, IA, April 2006.

2007 ‘Linear differential equations’, Annual MAA Meeting, Iowa Section, Des Moines, IA, April 2007.

3.3.4 Lectures on Mathematics Education

2008 ‘Mathematics education: discovering, sharing and applying mathematics’, XXII Jornada de Matemática de la Zona Sur, Universidad de Valdivia, Valdivia, Chile, April 23 – 25, 2008.

‘Filosofía y Matemáticas, pilares de la educación integral del ciudadano’, Décimas Jornadas Rolando Chuaqui de Matemáticas y Filosofía, Santiago, Chile, August 2008.

2009 ‘Mathematics on the road experience’, presentation at seven Area Education Agencies in Iowa throughout the year.

Lectures on Mathematics Education - continued

2010 'Proposal for a mathematics assessment and placement system', IMATYC Meeting, DMACC West Des Moines, Iowa, February 5, 2010.

'Mathematics high school – community college – college transition challenges', McGraw Hill Workshop on Mathematics Challenges in the Classroom, April 9, 2010, Dubuque, Iowa.

2011 'Placement Exams – What are they good for?' ICTM Annual Meeting, West Des Moines, February 18, 2011.

'Placement exams and the community college to university transition', Meeting of the IACC (CAOs of Iowa's Community Colleges), Ames, February 4, 2011.

'Early intervention efforts - the role of academic departments', Iowa's First Annual Retention Conference, Hawkeye Community College, Waterloo, Iowa, April 8, 2011.

'ALEKS Placement and Other Tools to Manage Transitions to Iowa's Public Universities', University of Northern Iowa, Cedar Falls, Iowa, October 26, 2011.

2012 'Success across three education systems: A longitudinal study of mathematics and statistics transitions', Conference on 'Pre-Calculus: Three Communities – One Goal', Ames, Iowa, June 7, 2012.

'Career Opportunities in Mathematics', Conference on 'Pre-Calculus: Three Communities – One Goal', Ames, Iowa, June 8, 2012.

'Placement exams – What are they good for?', IMATYC Annual Meeting, Ottumwa, Iowa, October 13, 2012.

2013 'Research statements and cover letters', Preparing Future Faculty, Iowa State University, February 27, 2013

'The Fourth Year mathematics course in high school', IMATYC Annual Meeting, Mason City, Iowa, October 11, 2013.

'Mentoring at the doctoral level', National Alliance Field of Dreams Conference, Phoenix, AZ, November 2, 2013.

3.4 Lectures Series, Colloquia, and Seminars

3.4.1 Invited Series of Lectures

06-07/1985 'Stochastic systems theory', series of four lectures, Instituto 'Guido Castelnuovo', Università degli Studi 'La Sapienza', Rome, Italy.

08/1986 'Stochastic dynamical systems', series of four lectures, Instituto de Matematica, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil.

10/1987 'Nonlinear filtering with point process observations', series of three lectures, Boeing Lecture Series, Wichita State University.

06/1988 'Lyapunov exponents of control systems', series of four lectures, Instituto 'Guido Castelnuovo', Università degli Studi 'La Sapienza', Rome, Italy.

Invited Series of Lectures - continued

07-08/1989 'Linearization techniques for Markovian systems', series of eight lectures, Centro de Matematicas and PEDECIBA, Universidad de la Republica, Montevideo, Uruguay.

11/1989 'Stochastic bifurcations of dynamical systems: An introduction', series of three lectures, Departamento de Fisica Fundamental, UNED, Madrid, Spain.

04/1991 'Stabilization of control systems', series of three lectures, Department of Electrical Engineering, Iowa State University.

11/1993 'Bifurcations from invariant measures of skew product flows', series of 6 lectures, Departamento de Matematicas, Universidad de Santiago de Chile, Santiago, Chile.

09-11/1996 'Stochastic analysis of dynamical systems', series of 12 lectures, Departamento de Ingenieria Matematica, Universidad de Chile, Santiago, Chile.

06/1997 'Nonautonomous dynamical systems', series of 3 lectures, Fachbereich Mathematik, Universität Bremen, Germany.

08/1999 ‘Stochastic dynamical systems’, series of 4 lectures, Institute for Informatics and Automation Problems, Armenian National Academy of Sciences, Yerevan, Armenia.

07/2007 ‘Transient behavior of stochastic systems’, series of 3 lectures, V. Escuela de Invierno de Análisis Estocástico y Aplicaciones, Valparaiso, Chile.

09/2007 ‘Dynamics and Linear Algebra’, series of 3 lectures, Meeting of the Sociedad de Matemática de Chile, Punta de Tralca, Chile.

11/2011 ‘Differential Equations and Linear Algebra’, series of 6 lectures, XV Congreso Boliviano de Matemática 2011, Sociedad Boliviana de Matemática, Cochabamba, Bolivia.

3.4.2 Talks at Colloquia and Seminars

03/1984 'Stability of linear stochastic systems', Mathematics Research Center, Madison, USA.

'Controllability of stochastic systems', Mathematics Department, University of Wisconsin, Madison, USA.

04/1984 'Phase transitions in biological systems', Department of Statistics, Iowa State University, Ames, USA.

10/1984 'The stochastic geometry of dendritic processes', Netherlands Institute for Brain Research, Amsterdam, Holland.

11/1984 'Mathematical modeling in biology: dendritic growth', Colloquium between Mathematicians and Biologists, Iowa State University, Ames, Iowa, USA.

05/1985 'Geometric systems theory and applications to stochastic processes', Division of Applied Mathematics, Brown University, Providence, USA.

07/1985 'Uniqueness of solutions for certain hypoelliptic partial differential equations', Universita di Povo, Trento, Italy.

Talks at Colloquiums and Seminars - continued

01/1986 'Periodic solutions of infinite time optimal control problems', Institute for Dynamical Systems, Universität Bremen, Germany.

06/1986 'Über die Kunst, kleine Wahrscheinlichkeiten zu schätzen', Fachbereich Mathematik, Universität, Bremen, Germany.

'Level-1 and level-2 large deviations of linear stochastic systems', Institute for Dynamical Systems, Universität Bremen, Germany.

07/1986 'Unified treatment of external and internal noise in chemical reactions', Colloquium of the Departamento de Fisica Fundamental, Universidad Nacional de Education a Distancia, Madrid, Spain.

08/1986 'The qualitative behavior of stochastic systems', two talks at the Laboratorio Nacionao de Computaçao Cientifica, Rio de Janeiro, Brazil.

02/1987 'Stabilität und grosse Abweichungen in stochastischen Systemen', Fachbereich Mathematik, University of Kaiserslautern, Germany.

'Large Deviations in Linear Stochastic Systems', Department of Mathematics, Northwestern University, Evanston, IL.

03/1987 'Large Deviations for Stochastic Flows', Department of Mathematics, University of Southern California, Los Angeles, and
Case Western Reserve University, Cleveland, Ohio.

06/1987 'Nonlinear Filtering with Counting Observations', Institute for Dynamical Systems, Universität Bremen, Germany.

12/1987 'Stability and Bifurcation in Vehicle Dynamics', Department of Mechanical Engineering, Iowa State University.

01/1988 'Ergodentheorie stochastischer Systeme' and
'Lyapunov Exponenten und Bifurkation in stochastischen Systemen', Universität Erlangen/ Nürnberg, Germany.

06/1988 'Stochastic Stability and Bifurcation', Department of Mathematics, University of Genoa, Italy.

'Stability and Large Deviations in Stochastic Linear Systems', Department of Mathematics, Politecnico, Torino, Italy.

09/1988 'Exact Stabilization of Control Systems', Department of Mathematics, University of North Carolina, Charlotte.

02/1989 'Spektren stochastischer Flüsse', Fakultät für Mathematik, Universität Bochum, Germany.

03/1989 'Stabilization by Noise', Dipartimento di Matematica, Politecnico, Torino, Italy.

'Approximation of Nonlinear Filters', Dipartimento di Matematica, Universita degli Studi 'La Sapienza', Roma, Italy.

04/1989 'Spektraltheorie für Kontrollsysteme', Institut für Dynamische Systeme, Universität Bremen, Germany (with F. Colonius).

Talks at Colloquiums and Seminars - continued

06/1989 'Qualitatives Verhalten gewöhnlicher und stochastischer Differentialgleichungen', Fachbereich Mathematik, Universität Augsburg, Germany.

'Nonlinear Filtering with Point Process Observations', Department of Applied Mathematics, Technical University of Twente, Enschede, Holland.

07/1989 'Towards a Unified Theory of Dynamical Systems, Control Systems, and Stochastic Systems?', PEDECIBA, Montevideo, Uruguay.

09/1989 'Lyapunov Exponents of Dynamical and Stochastic Systems', Facultad de Ingenieria, Universidad de la Republica, Montevideo, Uruguay.

'Stochastic and Feedback Principles in Biology', INTA Castelar, Buenos Aires, Argentina.

10/1989 'Robust Design of Linear Systems', Dipartimento di Matematica, Universita degli Studi 'La Sapienza', Roma, Italy.

'Ergodic Theory of Flows on Vector Bundles', Dipartimento di Matematica, Universita degli Studi, Genova, Italy.

11/1989 'Control Theoretic Aspects in the Theory of Stochastic Systems', Mathematics Institute of the Polish Academy of Sciences, Warsaw, Poland.

12/1989 'Algunos Aspectos de Sistemas de Control como Sistemas Dinamicos', Centro de Matematica, Universidad de la Republica, Montevideo, Uruguay.

04/1990 'Ergodic theory of stochastic flows', Department of Mathematics, University of Wisconsin, Madison.

04/1990 'Robustness of linear systems via Lyapunov and Bohl exponents', Department of Electrical Engineering, University of Wisconsin, Madison.

11/1990 'Algebras de Lie en sistemas de control y sistemas estocasticos', Departamento de Matematicas, Pontificia Universidad Catolica de Chile, Santiago, Chile.

04/1991 'A dynamical systems approach to control', Department of Electrical Engineering, University of Minnesota, Minneapolis.

'Ergodic theory of stochastic systems', Department of Statistics, University of Georgia, Athens.

'Stabilization of linear uncertain systems', Department of Aerospace Engineering, University of Illinois, Urbana.

06/1991 'Control and chaos', Institute for Dynamical Systems, University of Bremen, Germany.

07/1991 'Control systems and stochastic differential equations', Graduate College, University of Augsburg, Germany.

03/1992 'Chaos, control and noise', Center for Applied Stochastic Research and Center for Complex Systems, Florida Atlantic University, Boca Raton, FL.

02/1993 'Feedback construction for nonlinear control systems', Department of Mathematics, Arizona State University, Tempe.

Talks at Colloquiums and Seminars - continued

03/1993 'Global behavior of nonlinear control systems', Institute for Mathematics and Its Applications, University of Minnesota, Minneapolis.

04/1993 'Spectral theory for linear flows on vector bundles', The Fields Institute for Research in Mathematical Sciences, Waterloo, Canada.

05/1993 'Exact regions of asymptotic null controllability for bilinear systems', Institute for Systems Research, University of Maryland, College Park.

'Chaos, noise, and control of dynamical systems', Naval Research Laboratory, Washington D.C.

06/1993 'Control of dynamical systems', Departamento de Fisica Fundamental, UNED, Madrid, Spain.

11/1993 'Chaos, control and noise in dynamical systems', Departamento de Matematicas, Universidad de Santigao de Chile, Santiago, Chile.

04/1994 'Global analysis and multistability for nonlinear stochastic systems', Wayne State University, Detroit.

'Control, chaos, and randomness', University of Northern Iowa, Cedar Rapids.

02/1995 'Global behavior of nonlinear stochastic dynamical systems', Department of Statistics, University of North Carolina, Chapel Hill.

04/1996 'Robust stability of nonlinear stochastic systems', Department of Mathematics, University of North Carolina, Charlotte.

05/1996 'Some remarks on feedback stabilization', Mathematics Center, University of Notre Dame.

06/1996 'Engineering design principles using qualitative theory of differential equations', Department of Mathematics, Maharishi University of Management, Fairfield, Iowa.

07/1996 'Qualitative analysis of nonlinear stochastic systems with applications to reliability', Institut für Mathematik, Universität Augsburg, Germany.

10/1996 'Spectral theory of control systems and robust stability', Departamento de Matematicas, Universidad de Santiago de Chile, Santiago, Chile.

'Dynamical systems over function spaces', Departamento de Matematica, Universidad de Chile, Santiago, Chile.

11/1996 'Dynamical systems and control theory', Departamento de Matematicas, Universidad Catolica del Norte, Antofagasta, Chile.

'Attractors and chain recurrence in dynamical systems', Departamento de Matematicas, Universidad Tecnica Federico Santa Maria, Valparaiso, Chile.

'Linearization theory for time varying differential equations', Departamento de Matematicas, Universidad de la Frontera, Temuco, Chile.

12/1996 'Continuous skew product flows', Institute for Dynamical Systems, University of Bremen, Germany.

Talks at Colloquiums and Seminars - continued

02/1997 'Persistence of attractors and Lyapunov exponents', Instituto de Matematica, Universidade de Sao Paulo, Brazil.

'Nonlinear control theory and dynamical systems', UMECC, Universidade Estadual de Campinas, Brazil.

04/1997 'The statistics of failure', Seminar on Stochastic Dynamical Systems, Universität Bremen, Germany.

06/1998 'Spectral theory for time varying differential equations with applications to control theory', Universität Augsburg, Graduierten Kolleg, Germany.

07/1998 'Stabilization techniques in control theory' Politecnico di Milano, Dipartimento di Matematica, Milano, Italy.

06/1999 'Confiabilidad de sistemas dinamicos', Pontificia Universidad Catolica de Chile, Departamento de Matematicas, Santiago, Chile.

06/1999 'Recurencia por cadenas y decomposiciones de Morse', Universidad de Concepcion, Departamento de Matematicas, Concepcion, Chile.

06/1999 'Dinamica, espectro, y teoria de control', Universidad Catolica del Norte, Departamento de Matematicas, Antofagasta, Chile.

10/14/00 'Spectra of linear flows on vector bundles', Nebraska - Iowa Seminar on Functional Analysis, Des Moines, Iowa.

10/25/00 'Stochastic dynamical systems', Universidad Catolica del Norte, Departamento de Matematicas, Antofagsta, Chile.

05/11/01 'Spectral properties of skew product flows', North Carolina State University, Department of Mathematics, Raleigh, NC.

10/04/01 'A translation mechanism for stochastic and control systems', Universidad Catolica del Norte, Departamento de Matematicas, Antofagasta, Chile.

03/14/02 'Current trends in mathematical research', Grandview College, Iowa.

11/18/02 'Design of high-speed trains', Cornell College, Iowa.

02/26/04 'Design of high-speed trains', University of Wisconsin – Platteville.

04/01/04 'Recent trends in mathematical research', University of Western Illinois, Macomb, Illinois.

10/28/04 'Control systems on flag bundles', Universidad Catolica del Norte, Antofagasta, Chile.

02/27/05 'Design of high speed trains', Coe College, Cedar Rapids, Iowa.

09/13/05 'Trends in applied mathematics – the example of control theory', Pontificia Universidad Católica, Facultad de Matemáticas, Santiago, Chile.

03/22/06 'Global dynamics and chaos', Universidad Católica del Norte, Departamento de Matemática, Antofagasta, Chile.

Talks at Colloquiums and Seminars - continued

05/12/08 'Control theory – The mathematics of high tech engineering', Universidad Mayor de San Andrés, Carrera de Matemática, La Paz, Bolivia.

06/19/08 'Controllability and stabilizability', Universidad Técnica Santa María, Departamento de Matemática, Valparaíso, Chile.

06/26/08 'Constructions of causality', Tertulias Filosóficas, Universidad de Santiago de Chile, Departamento de Filosofía, Santiago, Chile.

07/02/08 'Dynamical systems and linear algebra', University of Puerto Rico – Las Piedras, Department of Mathematics, San Juan, Puerto Rico.

11/30/10 'Global behavior of dynamical systems, or Where does chaos fit into mathematics', Bowdoin College, Maine.

4. Service

4.1 Mathematics Community

4.1.1 Offices in Professional Societies

Liaison between IEEE Control Systems Society and SIAM SIAG on Control and Systems Theory, 1996 - 1997.

4.1.2 Editorships

Associate editor of 'Random and Computational Dynamics', 1991 - 1997.
Advisory editor of CRC Press 'Mathematical Modeling Handbook Series', 1994 - 1997.
Associate editor of 'Mathematical Models & Methods in Applied Sciences', 1996 - 2000.
Advisory editor of Birkhäuser book series 'Modeling and Simulation in Science, Engineering and Technology', 1996 – 2000, 2002 – 2010.
Comite Editorial 'Proyecciones, Revista de Matematica', 1997 -
Comite Editorial 'Ars Dilemmae Mathematicae', 1997 – 2002
Associate Editor ‘Revista Boliviana de Matematica’, 2002 –
Editorial Board of ‘Boletim da Sociedade Paranaense de Matematica’, 2003 -

4.1.3 Refereeing

Refereed Papers for:

Advances in Applied Probability
Annals of Applied Probability
Annals of Probability
Applied Mathematics and Optimization
Applied Mathematics Letters
Automatika
Banach Center Publications
Bulletin of Mathematical Biology and Applications
Computers & Mathematics with Applications
Discrete and Continuous Dynamical Systems
Dynamical Systems
Dynamics and Stability of Systems
ESAIM : Control, Optimization, and Calculus of Variations
IEEE CDC '92 - '99, CDC 2008
IEEE Transactions on Automatic Control
IEEE Transactions on Circuits and Systems
IEEE Transactions on Power Systems
IMA Journal of Mathematical Control and Information.
International Journal of Control
International Journal of Nonlinear Dynamics
International Journal of Robust and Nonlinear Control
Journal of Applied Mathematics and Computing
Journal of Applied Mechanics
Journal of Applied Probability
Journal of Differential Equations
Journal of Dynamical and Control Systems
Journal of Dynamics and Differential Equations
Journal of Mathematical Analysis

Refereed Papers for - continued

Journal of Mathematical Analysis and Applications
Journal of Mathematical Systems, Estimation, and Control
Journal of Neuroscience Methods
Journal of Nonlinear Mechanics
Journal of the Australian Mathematical Society
Journal of Vibration and Acoustics
Journal of Vibration and Control
Linear Algebra and its Applications
Matematica Contemporanea
Mathematical Biosciences
Mathematical Models & Methods in Applied Sciences
Mathematics of Control, Signals, and Systems
Nonlinear Dynamics
Physica D
Proceedings of the American Mathematical Society
PSCC '96
Qualitative Theory of Dynamical Systems
Random & Computational Dynamics
Revista Proyecciones
SIAM Journal of Applied Mathematics
SIAM Journal of Control and Optimization
Springer Lecture Notes in Mathematics
Statistics and Probability Letters
Stochastic Structural Dynamics
Stochastic Processes and Their Applications
Stochastics
Stochastics and Stochastics Reports
Transactions of the American Mathematical Society
Systems and Control Letters
Journal of Zhejiang University SCIENCE (A&B)

Refereed Proposals for:

National Science Foundation
Deutsche Forschungsgemeinschaft (Germany)
FONDECYT (Chile)
CONICYT (Chile)
ISF (Russia)
NSERC (Canada)
National Academy of Sciences of the USA
Fulbright Visiting Scholars Program
Research Grants Council, Hong Kong
Foundation for Research Development, South Africa

Reviewed Papers for:

Mathematical Reviews
Zentralblatt für Mathematik

Refereed and Reviewed Books for:

Mathematical Reviews
Zentralblatt für Mathematik
Springer-Verlag
Saunders College Publishing
American Mathematical Society
Academic Press
IEEE Transactions on Automatic Control
SIAM Review
MAA American Mathematical Monthly

4.1.4 Other Professional Service and Organization of Conferences

Co-organizer of the 17th Midwest Differential Equations Conference, 1988.

Organizer of the Minisymposium on Chaos, Control and Noise, ICIAM 1991.

Co-organizer of the International Conference on Differential and Delay Equations, Iowa State University, October 1991.

Member of the Organizing Committee of the 13th Midwest Probability Colloquium, Northwestern University, Evanston, October 1991.

Co-organizer of the International Workshop on Nonlinear Dynamics and Stochastic Mechanics, Fields Institute, Waterloo, Canada, August 1993.

Co-organizer of the Special Session on Dynamical Aspects of Nonlinear Control, MTNS '93, Regensburg, Germany, August 1993.

Organizer of the International Workshop on Numerics for Perturbed Dynamical Systems, Iowa State University, March 1994.

Co-organizer of 'Systems and Control Week', Iowa State University, April 26 - May 3, 1994.

Co-organizer of the Minisymposium on Perturbations of Dynamical Systems, 3rd SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 1995.

Co-organizer of the Minisymposium on Control of Complex Systems, ICIAM 1995, Hamburg, Germany, July 1995.

Organizer of the Second International ISU Workshop on Numerics for Dynamical Systems, Ames, Iowa, April 1996.

Co-organizer of the Special Session on Spectral Theory for Time-Varying Linear Systems and Stabilization at MTNS '96, St. Louis, June 1996.

Co-organizer of the Oberwolfach RiP-Workshop on Numerics in Stochastic Dynamical Systems, Oberwolfach, Germany, July 1996.

Co-organizer of the Special Symposium on Dynamic Reliability at 7th ASCE EMD/STD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability, Worcester Polytechnic Institute, August 1996.

Other Professional Service and Organization of Conferences - continued

Co-organizer of the International Conference on Random Dynamical Systems, Bremen, Germany, April 1997.

Co-organizer of the Workshop on Response and Reliability of Stochastic Dynamical Systems, University of Notre Dame, May 1997.

Scientific Committee of COMCA '97, Antofagasta, Chile, July 1997.

Scientific Committee of COTA '97, Antofagasta, Chile, August 1997.

Scientific Committee of the Fourth International Conference on Stochastic Structural Dynamics, University of Notre Dame, August 1998.

Organizer of Special Invited Session at MTNS '98, Padova, Italy.

Co-organizer of the Oberwolfach conference series on 'Nonlinear and Stochastic Systems' 1998 –

Member of NSF Review Panel Probability 2000 (December 1999).

Scientific Committee of the 8th ASCE Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability, University of Notre Dame, July 2000.

Co-organizer of the International Conference on Monte Carlo Simulation (MCS 2000), Monte Carlo, June 2000.

Co-organizer of the Oberwolfach Conference on Nonlinear and Stochastic Systems and Their Numerics, 2002.

Scientific Committee of MTNS 2002, Notre Dame University, 2002.

Scientific Committee of IUTAM Conference on Nonlinear Random Vibrations, Urbana, Illinois, 2002.

Scientific Committee of COMCA 2003, Antofagasta, Chile, 2003.

International Scientific Committee for Advances in Engineering Structures, Mechanics & Construction, Waterloo, Canada, 2006.

Scientific Committee of COMCA 2006, La Serena, Chile, 2006.

Member of the DFG (Deutsche Forschungsgemeinschaft, Germany) panel on 'Regelungstheorie digital vernetzter dynamischer Systeme', 2006 –

Co-organizer of LACOST 2007 (Latin American Conference on Systems Theory), San Pedro de Atacama, Chile, 2007.

Co-organizer of the Conference on Stochastic Analysis and Mathematical Physics VI, Santiago, Chile, 2008.

Co-organizer of IMA Graduate Summer School 'Linear Algebra and Applications', Iowa State University, 2008.

Scientific Committee of COMCA 2009, Antofagasta, Chile, 2009.

Other Professional Service and Organization of Conferences - continued

Scientific Committee of Summer School in Mathematics 2010, Maringa, Brazil.

Scientific Committee of COMCA 2012, Antofagasta, Chile, 2012.

Local Organizing Committee of AMS Sectional Conference, Ames, IA, 2013

Scientific Committee of COMCA 2013, La Serena, Chile, 2013.

4.2 Service at Iowa State University

4.2.1 Departmental

Member of an ad-hoc Grievance Committee, Department of Mathematics, Spring, 1986.

Member of the Graduate Committee and the Admissions Committee, Department of Mathematics, August 1986 - 1989.

Member of search committees, Department of Mathematics, 1986, 1987, 1990, 1991, 1994, 1995, 1996 (chair), 1997, 1998 - 1999(chair).

Member of the Committee to Review the Graduate Program, Department of Mathematics, 1988 - 90.

Member of the Coordination and Policy Committee, Department of Mathematics, 1990-1992 and 1998 - 1999.

Member of the Individual Review Team for Assistant Professors, Department of Mathematics, 1988, 1990, 1991, and 1992.

Chair of the ad-hoc Committee to Draft a Proposal for a Masters Program in Industrial Mathematics, Department of Mathematics, 1993/94.

Member of the Dean's Search Committee for a DEO, Department of Mathematics, 1994/95.

Member of the Individual Review Team for Associate Professors, Department of Mathematics, 1995/96.

Chair of the Promotion and Tenure Committee for R. Smith, Department of Mathematics, 1997.

Member of the Promotion Committee for M. Smiley, Department of Mathematics, 1997.

Member of the Ad-Hoc Committee to Formulate Guidelines on Evaluation of Teaching for Promotion and Tenure, Department of Mathematics, 1998.

Member of the Promotion and Tenure Committee for B. Keller, Department of Mathematics, 1998.

Member of the Promotion Committee for S. Hou, Department of Mathematics, 1999.

Member (ex oficio) of the Advisory Committee, Department of Mathematics, 1999.

Member of the Graduate Committee, Department of Mathematics, 1999 - 2001.

Member of the Dean's Search Committee for a DEO, Department of Mathematics, 2000/01.

Chair of the Promotion and Tenure Committee for Domenico D'Alessandro, 2003.

Member of the Promotion Committee for Leslie Hogben, 2005.

Ex-officio member of the Advisory Committee, the Graduate Committee, the Undergraduate Committee, the Awards Committee, 2008 – 2013.

Member of the Advisory Committee, 2013 –

Service at Iowa State University, Departmental – continued

Chair of the search committee for a probability position, jointly with Statistics, 2013 –

4.2.2 College

Liberal Arts and Sciences Committee on Promotion and Tenure Review, 1993 - 1996.

Member of the Search Committee 'Integrative Biology', Department of Zoology/Genetics, 1995/96.

Liberal Arts and Sciences Committee on Faculty Development, 1997-1999, Chair of the Committee 1999.

Liberal Arts and Sciences Task Force on Internationalization, 1998 – 1999.

Member of the Search Committee for Associate Dean of LAS, 2001.

Member of the Dean's Budget Advisory Committee, 2001.

International Programs Committee, 2002 – 2004.

Member of the Dean's Ad-Hoc Committee to Review Associate Deans, 2003.

Member of the Dean's Calculus Team, 2006 – 2007.

Ex-officio member of the Cabinet of the College of Liberal Arts and Sciences, 2008 – 2013.

Member of Search Committee for named chair, Department of Computer Science, 2009.

Chair, Search Committee for Chair of the Department of English, 2009 – 2010.

Member of the Dean's Budget Advisory Group, 2009 - 2011.

Chair, Search Committee for Chair of the Department of Computer Science, 2012 – 2013.

4.2.3 University

Faculty mentor for Dragan Mirkovic (Mathematics), 1994 – 1995.

Faculty mentor for Manisha Rohatgi (Industrial and Manufacturing Systems Engineering, College of Engineering), 1998.

Faculty mentor for Sunder Sethuraman (Mathematics), 1998 – 1999.

Faculty advisor of 'Zeitgeist', German student organization at Iowa State University, 1994 -

Participant 3rd Annual Iowa State Faculty Conference 'Visioning International Teaching and Learning', March 1995.

Member of the ISU Faculty Senate Committee on Professional Development, 1999.

Member of the Search Committee for a Director of the Office of Sponsored Programs Administration, 2000.

Service at Iowa State University, University – continued

Member of the Council of University Research Institute Administrators, 2000 – 2005.

Member of the Coordinating Council on Technology Transfer, 2000 – 2005.

Member of the Iowa State University Research Foundation, 2000 - 2001.

Member of the Council for International Programs, 2001 – 2005.

Faculty mentor for Jiyeon Suh (Mathematics), 2005 – 2006.

Faculty mentor for Xifang Xing (Community and Regional Planning, College of Design), 2005 – 2006.

Member of the Science Advisory Council of the Center for Excellence in the Arts and Humanities, 2005 – 2008

Member of the AGEP Faculty Council, 2006 – 2011.

Member of the ISU Diversity Council, 2011 –

Member of the ISU High Performance Steering Committee, 2011 –

Mentor of the ISU 2012 Emerging Leaders Academy.

Panelist of the RISE (Re-Igniting the Sophomore Experience) program at Iowa State, Fall 2013

Member of the Honors Program Rhodes Scholar Preparation Team at Iowa State, Fall 2013

4.3 International Service

Investigador Grado 5 at PEDECIBA (Programa de Desarrollo de Ciencias Básicas), Universidad de la Republica, Montevideo, Uruguay, 1989 - 2008.

Departmental Coordinator for the Exchange Program with the Universität Augsburg, Germany, 1993 – 2002.

Departmental Coordinator for the Exchange Program with the Doctorate Program in Mathematical Statistics at the Universita di Pavia, Universita di Milano, Politecnico di Milano, Politecnico di Torino, and Universita Bocconi, Italy, 1997 - .

Departmental Coordinator for the Exchange and Training Program at the Universidad Catolica del Norte, Antofagasta, Chile, 1998 - .

University Coordinator for the Agreement between the National Academy of Sciences of the Republic of Armenia and Iowa State University, 1998 – 2005.

Member of 'Rector's Circle', Universität Bremen, Germany, 2004 – .

4.4 Community Service

Consultant for Iowa Department of Economic Development and for economic development organizations in Central Iowa (Greater Des Moines Partnership, Ames Economic Development Commission) regarding technology transfer and economic development in Europe, 2005.

Mathematics Leadership Team, Iowa Department of Education, 2010 – ..

Smarter Balanced Advisory Group, Iowa Board of Regents, 2012 – .

STEM Hub Advisory Group for the North-Central Iowa Region, The Governor's STEM Initiative, 2012 – .

Iowa Precalculus Advisory Council, member 2012 – .

National Smarter Balanced Consortium Mathematics Review Team, member 2013 –

Collaboration with (two) Iowa companies regarding research and internships for graduate students, 2013 –

Leader of Precalculus group of the APLU Personalized Learning Consortium, 2013 –

5. Administrative Experience at Iowa State University

Jan 1999 – Dec 1999	Director of Graduate Education, Department of Mathematics, Iowa State University
Jan 2000 – Jun 2001	Associate Dean for Research, College of Liberal Arts and Sciences, Iowa State University
Jul 2001 – Aug 2005	Associate Vice Provost for Research, Iowa State University
Jul 2008 – Jun 2013	Chair, Department of Mathematics, Iowa State University

5.1 Director of Graduate Education, Department of Mathematics

- Served as advisor for all incoming graduate students.
- Administered the graduate programs in the department (Mathematics and Applied Mathematics).
- Created targeted recruiting system for new graduate students throughout the Midwest.
- Developed exchange programs with universities in Germany, Italy, Armenia, and Chile.

5.2 Associate Dean for Research, College of Liberal Arts and Sciences

- Was first associate dean for research in the college.
- Built research support system for college, including
    - Gathering and disseminating information about funding sources
    - Consulting on grant proposals for groups of principal investigators and for individual principal investigators
    - Communicating with interdisciplinary centers and institutes
    - Training of grant coordinators in departments and units reporting to the college (grant coordinators are responsible for draft budgets, advice for pre- and post-award services concerning grants, contracts, research compliance).
- Led college effort for several large undergraduate and graduate education proposals (including FIPSE, VIGRE, and Pew Foundation).
- Rebuilt evaluation system for performance in research and scholarship.
- Designed assessment system for start-up packages for new faculty.
- Represented the college at the central university level in research matters, such as Council of University Research Institute Administrators, Coordinating Council for Technology Transfer, ISU Research Foundation.
- Participated in Dean's Team discussing major college initiatives and activities, including promotion and tenure, assessment of departmental performance, budget, inter-college activities.
- Worked on 'Roadblock Program', an internet based database that allows undergraduate students to evaluate each of their courses according to its contribution to timely graduation.

5.3 Associate Vice Provost for Research

- Participated in formulation of new research related policies, including Indirect Cost Policy, Indirect Cost Distribution Policy, Policy on Shared Equipment, Policy on Export Restrictions (ITARS regulations), Costing Policy (OMB circulars).

- Participated in creation of new interdisciplinary centers and institutes, including five science, agriculture and engineering institutes and the Center for Excellence in the Arts and Humanities, planned internal support structures for these centers and institutes.

- Built research support system for the university, including grant development, grant editing, grant consulting, grant coordination, visits to granting agencies, participation of ISU investigators in workshops of agencies and foundations.

- Designed system for assessment of internal seed funding and grantsmanship support funding.

- Advised institute and center directors on issues related to interdisciplinary and inter-institutional activities, grants, budgets, and personnel.

- Advised individual investigators and groups of investigators on all issues related to grant proposals, including interdisciplinary and inter-institutional activities.

- Represented ISU in negotiations of federal and state contracts.

- Represented ISU in industry contacts and negotiation of industry contracts.

- Created new internal grant program for High Performance Computing.

- Built research compliance unit and increased staff from two ½ time employees to four full-time staff.

- Served as ISU's Research Integrity Officer.

- Nominated faculty for national and international awards.

- Built 'Research News Group' consisting of media experts in the central administration and the colleges, centers, and institutes to promote visibility of research achievements.

- Participated in all decision making processes of the VPR office, including strategic planning, policy decisions, budgets, oversight of all units reporting to the VPR office (twelve central research institutes and centers, Office of Sponsored Programs Administration, Research Compliance Office, Grants Development Office, Laboratory Animal Resources, ISU Research Foundation, Office of Intellectual Property and Technology Transfer, ISU Research Park, Industrial Relations), start-up funds, retention funds, internal seed funding, cost sharing and equipment matching funds for proposals to external sponsors, selection of faculty for research and scholarship awards, technology transfer and economic development, comments on state and federal legislation, representation of the office to the President, Provost, Council of Deans, and the Faculty Senate.

- Had frequent interactions with the Office of the President (including University Counsel, Government Relations, Internal Audit), Office of the Provost, Vice Provosts for Extension and Undergraduate Programs, Office of the Vice President for Business and Finance (including budget unit, Sponsored Programs Administration, Environmental Health and Safety), all colleges and (almost all) departments, ISU Foundation.

Associate Vice Provost for Research - continued

- Served as interim director of the Interdisciplinary Research Institute for Survey Science, served as interim director of the Iowa State Water Resources Research Institute.

- Designed a data base for easy access of students to Research Experiences for Undergraduates.

- Gave public presentations on 'Challenges and opportunities in research administration', 'Research policy and institutional change', 'Intellectual property and technology transfer at research intensive institutions', 'Institutional support systems for principal investigators', 'Compliance with human subjects regulations', 'Research and technology transfer administration at large land-grant universities'.

- Collaborated with European economic development organizations and companies to promote technology transfer and economic development in Iowa.

- Participated in the Governor's Delegation to Europe to promote Economic Development as representative of the Iowa universities, 11/05 – 11/12/04, with Governor Tom Vilsack, Director of the Iowa Department of Economic Development, Michael Blouin, and representatives of regional and local economic development groups.

- Worked with the Graduate College at ISU on graduate recruiting, development of full tuition scholarships, creation of new federally supported training programs (IGERT, VIGRE and RTG), establishment of interdisciplinary graduate programs, creation of the 'Preparing Future Faculty' program, design of programs regarding research experiences for undergraduates, AGEP and Alliance programs, and lean electronic office processes.

5.4 Chair, Department of Mathematics

Undergraduate Program
During my tenure as Chair the Department has

- More than doubled the size of the undergraduate Mathematics major program in four years;

- Developed and implemented the Math+ program in coordination with nine departments on campus: this program allows for individualized plans of study for undergraduates with interdisciplinary interests;

- Reviewed offerings of the junior/senior level courses: initiated redesigns for important courses (such as computational mathematics), eliminated others;

- Created the Center for Excellence in Undergraduate Mathematics Education (CEUME) to consolidate research and best practices in course content and delivery methods for large enrollment courses. Center projects include STEM gender gap project (funded by NSF, jointly with Department of Statistics), precalculus project (funded by ALPU and Gates Foundation, national project with nine other research universities and 2-year colleges), student-active environments (e.g. use of clickers in Calculus), and other projects such as teaching workshops;

- Initiated a series of social events for Mathematics majors, including a club for future mathematics teachers;

- Attracted excellent undergraduate Mathematics majors to Iowa State: departmental teams finished in the top 5% of the Putnam competition, and achieved a series of first places in the Iowa Collegiate Math Competition;

- Initiated, in collaboration with STEM fields in the College, rethinking of approaches to program design, including individualized ('adaptive') learning in courses, use of hybrid courses with online components, individualized design of 'majors', program and course planning tools such as 4-year degree audits with student, advising, and departmental planning components.

Graduate Program

- The graduate programs in Mathematics and Applied Mathematics have grown to over 90 students, from about 70 four years ago. Of these students over 60% are US citizens, and almost 90% are PhD students.

- During the last years the Department has graduated more than twelve PhD and more than four MS students per year.

- The Department initiated the redesign of the graduate student seminar (1 credit): serves as teaching preparation course during fall semesters, and as research related workshop in the spring. Students who pass the fall seminar receive teaching certificates and are authorized to teach for the department. The teaching preparation seminar has substantially cut the number of student complaints in TA-led sections, to less than one complaint per 1,000 students;

- Created three working groups for our graduate students to become familiar with and to explore career fields: (i) college teaching, (ii) mathematics and interdisciplinary research, (iii) industry and government. These groups meet about once per month, discuss career opportunities and strategies, and invite speakers from their respective areas of interest; and

- Initiated annual career day (jointly with the Department of Statistics) with speakers from research universities, liberal arts colleges, national laboratories, and industry.

Departmental Lower Division Teaching

During my tenure as Chair the Department has

- Reviewed all lower division mathematics courses: initiated substantial redesigns for most of them, with up to 30% increase of student success rates within two years leading to impact on university-wide retention and graduation rates;

- Created early warning system for students (and advisors) in first year courses;

- Created individualized Summer School in Mathematics;

- Designed a new placement exam in collaboration with ALEKS/McGraw-Hill: this exam is being implemented across Iowa at all public universities and several 2-year colleges for coherence throughout the state.

Departmental Research

- We reformulated strategic plans and mission of the Department through the Advisory Committee, updated the Governance Document, and created, upon recommendation of the departmental strategic planning committee, departmental research clusters with certain budget autonomy for visitors, travel, research assistants and postdocs.

- The Department increased the average number of research publications per faculty member over last 5 years from 2.0 to 2.5 p/a.

- External funding during the last 3-year period was at over $2.5 million p/a, an over 60% increase from the previous 3-year period.

Chair, Department of Mathematics - continued

- 17 (i.e. 44%) of tenured/tenure track faculty have external awards, 19 submitted proposals to federal agencies in 2012. About 50% of external funding is for interdisciplinary projects, mostly with collaborators in the biological sciences and in engineering.

- We negotiated research incentives program with the College that allows six faculty a teaching release based on extraordinary research performance during a given year. A departmental committee recommends outstanding faculty to the Chair.

- The Department hosted two national conferences in 2012/13: MIGHTY LIII with about 150 participants, and the Midwest Regional of the American Mathematical Society with 500 participants, including the Erdös Lecture by 2012 Abel Prize winner Endre Szemerédi.

- The Department published two research brochures 'Research 2010' and 'Research 2012' with 20 articles about departmental research projects, a comprehensive list of research publications, and an overview of research areas represented in the department, distributed to decision makers at Iowa State and in the State of Iowa.

Outreach

During my tenure as Chair the Department has

- Worked with Iowa Department of Education, community colleges, area education agencies and high schools on high-school to 2-year college to university transition issues, including negotiating equivalence of courses and publishing course comparison materials for teachers and students;

- Visited all area education agencies in the state for meetings with over 1,000 students, 100 teachers, 50 high school counselors, and 80 parents;

- Worked with Iowa Department of Education on implementation of Common Core State Standards (CCSS) in Mathematics;

- Worked with Iowa Board of Regents on CCSS assessment via consulting for Smarter Balanced Assessment Consortium, currently serving as state representative for Mathematics Item Quality Review;

- Worked with the Iowa STEM Hub Advisory group for the North-Central region to improve STEM education statewide, specifically for underrepresented groups and female students;

- Initiated Iowa Precalculus Advisory Council to coordinate statewide college mathematics preparation with high schools, 2-year colleges, and all public universities in the state;

- Worked with industry on research consulting and on internships/practica for graduate students.

Diversity

- **Diversity Coordinator:** In 2009 I appointed a tenured faculty member to serve as the departmental diversity coordinator who, among other things, connects with HBCUs and to institutions with a large Hispanic student population, advises all search and admissions committees, and works with national mathematics societies and institutes to further diversity in the mathematical sciences.

- **Undergraduate program:** The Department initiated Mathematicians of Color Alliance (MOCA), a group of mathematics undergraduates (mostly African-American) who discuss issues of mathematics, careers and study for the GRE.

Chair, Department of Mathematics - continued

- **Graduate program:** (1) Of the 22 incoming students in Fall 2012 50% were female (for a program total of 36%), and 20% were from underrepresented groups (for a total of 10%). The Graduate Committee maintains ongoing outreach efforts to HBCUs and to institutions with a large Hispanic student population.

- (2) The Department will have three NSF Alliance (minority) postdocs for the academic year 2013/14.

- (3) Mathematics faculty serve on the ISU Diversity Council where many of the departmental recent initiatives are being scaled up.

- **Faculty:** 23% of the departmental faculty are female, as are 47% of the lecturers and 12% of the research faculty.

Development and Alumni Relations

- The Department communicates regularly with its alumni and donors via an annual newsletter (about 32 pages) and a holiday letter. The research brochures are sent to all donors.

- The Department has created an external Advisory Board: I keep the members of the Advisory Board informed via e-mails, and I involve them in discussions about the department, in particular about goal setting and planning.

- After discussions with donors we have recently revised three key MOA to better protect the donors' intent. We appointed new faculty to the Holl Chair in Applied Mathematics and the Janson Professorship, and extended graduate student opportunities through the Lambert awards and scholarship.

- In 2010 the Department started to present annual 'Distinguished Alumni Awards' to our most successful alumni.

- I regularly meet with departmental donors (established and potential) in Ames and on trips.

- I meet regularly with the College development team to follow up on donors (established, new, and potential) and to plan specific campaigns, such as undergraduate scholarships or faculty research support.