

BIOGRAPHICAL DATA

Christopher I. Byrnes, Ph.D., P.E.

**The Edward H. And Florence G. Skinner Professor
of Systems Science and Mathematics**

EDUCATION:

B.S.	Mathematics	Manhattan College	1971
M.S.	Mathematics	University of Massachusetts	1973
Ph.D.	Mathematics	University of Massachusetts	1975
Ph.D Advisor	Marshall H. Stone		

HONORS AND AWARDS:

Giovanni Prodi Chair in Nonlinear Analysis, Univ. Visiting Chair, U. Wuerzburg, 2009
Hendrik W. Bode Lecture Prize, IEEE Control Systems Society, 2008
SIAM Reid Prize in Mathematics, 2005
George Axelby Prize for Best Paper in IEEE Trans. Aut. Control, 2003
Foreign Member, The Royal Swedish Academy of Engineering Sciences, 2001
Fellows Award, The Academy of Sciences of St. Louis, 2001
Honorary Doctor of Technology, The Royal Institute of Technology, Stockholm, 1998
Fellow, The Academy of Sciences of St. Louis, 1998
IFAC Automatica Best Paper Award, 1993
George Axelby Prize for Best Paper in IEEE Trans. Aut. Control, 1991
Fellow, IEEE, 1989
The Graduate College Distinguished Research Award, ASU, 1988
Fellow, Japan Society for the Promotion of Science (JSPS), 1986
Case Centennial Scholar, Case Western Reserve University, 1980

ACADEMIC POSITIONS:

2000-present	The Edward H. and Florence G. Skinner Professor of Systems Science and Mathematics	Washington University
2005-present	Professor of Systems and Control, Department of Electrical and Systems Engineering	Washington University
1989-2005	Professor of Systems and Control, Department of Systems Science and Mathematics	Washington University
1991-2006	Dean of the School of Engineering and Applied Science	Washington University
1991 - 2002	Director of the Henry Edwin Sever Graduate School of Engineering and Applied Science	Washington University
1989 - 1991	Chairman, Department of Systems Science and Mathematics	Washington University
1988 - 1989	The Graduate College Distinguished Research Professor	Arizona State University.
1986 - 1990	Adjunct Professor, Department of Optimization and System Theory	Royal Institute of Tech., Stockholm
1984 - 1989	Professor of Engineering and of Mathematics, Department of Electrical and Computer Engineering and Department of Mathematics	Arizona State University
1983 - 1985	Associate Professor on the Gordon McKay Endowment, Division of Engineering and Applied Sciences	Harvard University
1978 - 1982	Assistant Professor, Department of Mathematics and Division of Engineering and Applied Sciences	Harvard University
1975 - 1978	Instructor, Department of Mathematics	University of Utah

VISITING POSITIONS:

2008 (August)	Visiting Professor, Department of Optimization and System Theory, Kungliga Tekniska Hogskolan, Stockholm, Sweden
2003 (January-May)	Visiting Professor, The Royal Swedish Academy of Sciences Mittag-Leffler Insitut, Sweden
2000 (July)	Visiting Professor, Department of Optimization and System Theory, Kungliga Tekniska Hogskolan, Stockholm, Sweden
1997 (June)	Visiting Professor, Dipartimento di Informatica e Sistemistica, Università di Roma, Rome, Italy

1996 (March) Visiting Professor, CEREMADE, Universite Paris - Dauphine, Paris, France

1995 (June-July) Visiting Professor, Department of Optimization and System Theory, Kungliga Tekniska Hogskolan, Stockholm, Sweden

1994 (June), Visiting Professor, Dipartimento di Informatica e Sistemistica, Università di Roma, Rome, Italy

1992 (March), Visiting Professor, Dipartimento di Informatica e Sistemistica, Università di Roma, Rome, Italy

1991 (June) Visiting Professor, Department of Optimization and System Theory, Kungliga Tekniska Hogskolan, Stockholm, Sweden

1991 (May) Visiting Professor, CEREMADE, Universite Paris - Dauphine, Paris, France

1990 (March), Visiting Professor, Dipartimento di Informatica e Sistemistica, Università di Roma, Rome, Italy

1989 (September) Visiting Scientist, Soviet Academy of Sciences, Irkutsk, Kiev, Moscow, USSR

1989 (January) Visiting Professor, CEREMADE, Universite Paris - Dauphine, Paris, France

1988 (November) Visiting Scientist, Department of Systems and Decision Sciences, International Institute for Applied Systems Analysis, Laxenburg, Austria

1987 (July) Visiting Scientist, Department of Systems and Decision Sciences, International Institute for Applied Systems Analysis, Laxenburg, Austria

1987 (April) JSPS Fellow, Department of Mechanical Engineering, Osaka University, Osaka, Japan

1987 (March) JSPS (Japan Society for Promotion of Science) Fellow, Department of Mathematical Engineering and Instrumentation Physics, University of Tokyo, Tokyo, Japan

1987 (January) Visiting Professor, Dipartimento di Informatica e Sistemistica, Università di Roma, Rome, Italy

1986 (Jan) Visiting Scientist, Department of Systems and Decision Sciences, International Institute for Applied Systems Analysis, Laxenburg, Austria

1985 (Jan-June) Visiting Professor, Department of Optimization and System Theory, Kungliga Tekniska Hogskolan, Stockholm, Sweden

1983 (March-July) Visiting Professor, Istituto di Automatica, Università di Roma, Rome, Italy

1983 (Jan-Feb) Visiting Professor, Mathematiks Institute, Universiteit Groningen, Groningen, The Netherlands

1982 (October) Visiting Professor, Forschungsschwerpunkt Dynamische Systeme, Universitat Bremen, Bremen, BRD

- 1981 (May-June) Visiting Professor, Forschungsschwerpunkt Dynamische Systeme, Universität Bremen, Bremen, BRD
- 1979 (July-August) Visiting Professor, Information Systems Laboratory, Stanford University, Palo Alto, USA
- 1978 (Jan-June) Research Fellow, Division of Applied Sciences, Harvard University
- 1977 (July) Visiting Assistant Professor, Department of Mathematics, University of Kansas

PROFESSIONAL ACTIVITIES:

I. Professional and Honor Society Memberships:

AAAS, AIAA, AMS, ASEE, IEEE, SIAM, Pi Mu Epsilon, Sigma Xi, Tau Beta Pi

II. Editorial Activities:

- Editor, Progress in Systems Control, Birkhäuser - Boston (1988 - present)
- Editorial Board, Journal of Robust and Nonlinear Control (1993 - present)
- Editor, Foundations of System and Control: Theory and Applications, Birkhäuser - Boston (1989 - 2002)
- Editorial Board, Advances in Design and Control, SIAM, (2002 - 2006)
- Associate Editor, Journal of Robust and Nonlinear Control (1990 - 1993)
- Advising Editor, Journal of Mathematical Systems, Estimation and Control (1994 - 1998)
- Associate Editor, Journal of Mathematical Systems, Estimation and Control (1990 - 1994)
- Associate Editor, Circuits, Systems and Signal Processing (1984 - 1993)
- Associate Editor, Mathematical System Theory (1983 - 1989)
- Associate Editor, Rocky Mountain Journal of Mathematics (1988 - 1989)
- Associate Editor, Systems and Control Letters (1981 - 1988)

III. Professional Service:

- Member, SIAM W.T. and Idalia Reid Prize Committee (2007 - present)
- Member, International Advisory Committee, Center for Industrial and Applied Mathematics, the Royal Institute of Technology, Stockholm (2006 - present)
- Member, MTNS Steering Committee (1985 - present)
- Chairman, MTNS Steering Committee (1987 - 1989), (1996-1998)
- Chairman, IFAC World Congress Program Committee for Nonlinear Systems (1985 - 1987)

- Program Director, SIAM Activity Group in Systems and Control, (1986 - 1989)
- Co-organizer, Semester on Systems and Control, Mittag-Leffler Institute, Stockholm, 2003
- Member, IEEE Fellow Committee, 1991
- Member, AACC Nomination Committee for the Donald P. Eckmann Award, 1989
- Member, SIAM Program Committee (1986 - 1989)

IV. Governmental Activities

- Organizer, AFOSR-Washington University Workshop on Nonlinear Control and Its Applications, St. Louis, 1991
- Co-organizer, NSF-Washington University Workshop on Nonlinear Control Systems, St. Louis, 1992
- Co-organizer, NASA-NATO/Advanced Study Institute on Algebraic and Geometric Methods in Linear System Theory, Harvard University, USA, 1979
- Member, Review Panel for GAANN (Graduate Assistantships in Areas of National Need), Department of Education, 1990.
- Member, Review Panel for NSF/CBMS Regional Research Conferences, 1990
- Member, Review Panel for Regional Geometry Institutes, National Science Foundation, 1989
- Member, Army Basic Research Committee, National Research Council, 1986 - 1988

V. Community Outreach:

- Chairman, Board of Directors, Center for Emerging Technologies - St. Louis, 1995 - 2004.
- Chairman Emeritus, Center for Emerging Technologies - St. Louis, 2005-present.
- St. Louis Regional Commerce and Growth Association (RCGA): Vice Chairman of the Board (for Science and Technology), 2000-2002; Chair, Technology Gateway Alliance, 2000 - 2002; Chair- Elect, Technology Gateway Alliance, 1998 - 2000; Member, Board of Directors for Science and Technology, 1991 - 1997.
- Co-chair, Manufacturing Subcommittee, St. Louis Critical Technologies Review, Civic Progress, 1993 - 1994, resulting in founding of MAMTEC-St. Louis
- Board of Directors: MAMTEC-St. Louis, 1994 - present; St. Louis Technopolis, 1992 - 2002; Mid-Tec, 1992 - 1995; St. Louis Technology Center, 1991 - 1995; Missouri Innovation Center - St. Louis, 1995 - present.

VI. Industrial Activities:

- Member, Board of Directors, Belden, Inc, 1995 - 2006; Chariman of the Compensation Committee, 1999 - 2004, Chairman of the Nominating and Governance Committee, 2004-2006.
- Member, Board of Directors, WUTA, Inc. (Washington University Technology Associates, Inc.), 1991 - 2003, President 1993-2003.
- Member, Board of Directors, MinMax Technologies Inc., 1997 - 1999, Chairman of the Board, 1998 - 1999.
- Member, Board of Directors, Starnet, Inc., 1996-1998.
- Regional Director and Chairman of the Advisory Board for Emerging Technologies, MidWest Bank, 2000 - 2006.
- Member, Business Advisory Board, The Newberry Group, Inc., 2002 - present.
- Member, Technical Advisory Board, Cernium, Inc., 2002 - 2007
- Member, Scientific Advisory Board, Sherwood, Davis & Geck, Inc, 1996 - 1998
- Consultant, Systems Engineering Inc., Greenbelt, MD, 1986
- Consultant, Scientific Systems, Inc. Cambridge, MA, 1980 - 1984

TEACHING

Courses Taught

1. Applied Algebra (Harvard)
2. Algebraic Geometry (Utah)
3. Algebraic Methods in Systems Theory (Harvard)
4. Business Mathematics (Massachusetts)
5. Calculus I, II, III (Harvard, Massachusetts, Utah)
6. Combinatorics (Harvard)
7. Control Systems (Washington University)
8. Geometric Methods for Linear Systems and Control (Royal Institute of Technology)
9. Group Representations with Applications (Arizona State)
10. Invariant Theory (Utah)
11. Linear Systems Theory (Arizona State, Harvard)

12. Methods of Mathematical Physics I, II (Harvard)
13. Nonlinear Dynamical Systems (Washington University)
14. Nonlinear Feedback Systems (Washington University)
15. Optimization and Optimal Control Theory (Washington University)
16. Ordinary Differential Equations (Harvard)
17. Partial Differential Equations (Utah)
18. Real Analysis (Utah)

Seminars offered

1. Algebraic Geometric Methods in Control Theory (MIT)
2. Fourier Integral Operators (Utah)
3. Linear Control Systems (Utah)
4. Nonlinear Dynamics and Control (Arizona State)

DISSERTATION STUDENTS:

Doctoral Theses

1. D. Delchamps, "The Geometry of Spaces of Linear Systems with an Application to the Identification Problem" - Ph.D., Harvard University, 1982.
2. P.K. Stevens, "Algebro-Geometric Methods for Linear Multivariable Feedback Systems" - Ph.D., Harvard University, 1982.
3. B.K. Ghosh, "Simultaneous Pole Assignability of Multi-Mode Linear Dynamical Systems" - Ph.D., Harvard University, 1983.
4. A. Bloch, "Least Squares Estimation and Completely Integrable Hamiltonian Systems" - Ph.D., Harvard University, 1985.
5. B. Martensson (co-directed with K.J. Åström), "Adaptive Stabilization" - Ph.D., Lund Institute of Technology, 1986.
6. P. Baltas (co-directed with P.E. Russell), "Optimal Control of a PV-Powered Pumping System" - Ph.D., Arizona State University, 1987.
7. X. Hu, "Robust Stabilization of Nonlinear Control Systems" - Ph.D., Arizona State University, 1989.

8. S. Pinzoni, "Stabilization and Control of Linear Time-Varying Systems" - Ph.D., Arizona State University, 1989.
9. X. Wang, "Additive Inverse Eigenvalue Problems and Pole-Placement of Linear Systems" - Ph.D., Arizona State University, 1989.
10. J. Rosenthal, "Geometric Methods for Feedback Stabilization of Multivariable Linear Systems" - Ph.D., Arizona State University, 1990.
11. X. Zhu, "Adaptive Stabilization of Multivariable Systems" - Ph.D., Arizona State University, 1991
12. D. Gupta, "Global Analysis of Splitting Subspaces " - Ph.D., Arizona State University, 1993.
13. W. Lin, "Synthesis of Discrete-time Nonlinear Control Systems" - D.Sc., Washington University, 1993.
14. J. Roltgen, "Inner-Loop Outer-Loop Control of Nonlinear Systems" - D.Sc, Washington University, 1995.
15. R. Eberhardt, "Optimal Trajectories for Infinite Horizon Problems for Nonlinear Systems" - D. Sc., Washington University, 1996.
16. S. Pandian, "Observers for Nonlinear Systems" - D.Sc, Washington University, 1996.
17. J. Ramsey, "Nonlinear Robust Output Regulation for Parameterized Systems Near a Codimension One Bifurcation" - Ph.D., Washington University, December 2000.
18. F. Celani (co-directed with A. Isidori), "Omega-limit sets of Nonlinear Systems that are semiglobally practically stabilized" - D.Sc., Washington University, 2003.
19. N. McGregor (co-directed with A. Isidori), "Semiglobal and Global Output Regulation for Classes of Nonlinear Systems " - D.Sc., Washington University, 2007.
20. A. Berman, in progress
21. B. Whitehead, in progress

Masters Theses:

1. D.W. Parish (co-directed with C.Y. Kuo), "Nonlinear Control and Output Decoupling of Robot Arm Dynamics" - M.S., Arizona State University, 1986.
2. X. Hu, "Stability of Nonlinear Feedback Systems in the Critical Case" - M.S., Arizona State University, 1986.
3. T. Meh-Chu, "The Minimum Growth of Stabilizing Feedback Laws for Nonlinear Feedback System" - M.S., Arizona State University, 1988.

4. J. Williams, "A State Space Analysis of Some Classical Frequency Domain Stabilization Schemes" - M.S., Arizona State University, 1988.
5. T.L. Carlsen, "Nonlinear Dynamics and Modelling Filter Design" - M.S., Arizona State University, 1989.
6. A. Jhemi, "Linear and Nonlinear Optimal Regulation", M.S., Washington University, 1991

SELECTED LIST OF PLENARY AND INVITED ADDRESSES: (One per year)

1. "The Moduli Space for Linear Systems," The Conference on Geometrical Methods in Control Theory - NASA/Ames/Stanford, June 1976, one hour invited lecture.
2. "Algebraic Geometric Methods for Delay Differential Systems," The International Conference on Algebraic System Theory - Puerto Rico, December 1977, one hour invited lecture.
3. "Arithmetic and Topological Problems Arising in the Theory of Systems Depending on Parameters," Journees sur l'analyse des systems - Bordeaux, September 1978, one hour invited lecture.
4. "Lectures on Algebraic and Geometric Aspects of the Analysis of Feedback Systems," NASA/NATO Adv. Study Inst. - Harvard, June 1979, (3 plenary lectures).
5. "Application of Enumerative Geometry to Control Theory," Australia/USA Joint Workshop on Mathematical System Theory - Newcastle, March 1980 (two plenary lectures).
6. "Topological Methods in Nonlinear Oscillations," IEEE Conference on Circuits and Systems, Chicago, April 1981, one hour invited lecture.
7. "Morse Theory, Blow-Ups, and the Stability of Electrical Power Systems," Conference on Differential Geometry and Control Theory - Michigan Tech University, June 1982, one hour invited address.
8. "Disturbance Decoupling for Nonlinear Systems," MTNS 1983 - Beer Sheba, June 1983, plenary lecture.
9. "Algebraic Geometric Methods in Linear System Theory," First Beijing Conference on Systems and Control, Beijing, May 1984, plenary lecture.
10. "Necessary Conditions in Adaptive Control," MTNS-85, Stockholm, June 1985, plenary lecture.
11. "PDE's, Foliations and Nonlinear Control Theory," Pacific Northwest Geometry Seminar, Berkeley, February, 1986, plenary lecture.

12. "Geometric Methods for Nonlinear Feedback Design," University of Tokyo, April 1987, JSPS Fellow Lecture.
13. "Feedback Design for Nonlinear Systems," Midwest Symposium on Differential Equations, Ames, Iowa, October 1988, plenary lecture.
14. "Output Regulation of Nonlinear Systems," IFAC Symposium on Nonlinear Control Systems, Capri, June 1989, plenary lecture.
15. "Inverse Eigenvalue Problems Arising in Systems and Control," SIAM Meeting on Linear Algebra and Its Application, San Francisco, November 1990, plenary lecture.
16. "An Overview of Nonlinear Control," AFOSR-Ohio State University Workshop on Turbulence: Structure and Control, Columbus, April 1991, plenary lecture.
17. "Shock Waves for Riccati Partial Differential Equations for Lagrange Problems," Computation and Control III, Bozeman, Montana, August, 1992, plenary lecture.
18. "Stability, Observability and the Converse Theorems of Lyapunov for Nonlinear Systems," MTNS-93, Regensburg, August 1993, plenary lecture.
19. "On the Rational Covariance Extension Problem," Mathematische Institut - Oberwolfach, March 1994, invited lecture.
20. "Robust Output Regulation for Nonlinear Systems," The 15th Southeastern-Atlantic Regional Conference on Differential Equations, Raleigh, October 1995, plenary lecture.
21. "On the Geometry of Positive Real Functions, with Applications to Kalman Filtering and Covariance Extension Problems," Symposium on Future Directions in Applied Mathematics, Notre Dame, April 1996, plenary lecture.
22. "Robust Nonlinear Control," 28th AIAA Fluid Dynamics Conference/4th AIAA Shear Flow conference, Snowmass Village, Colorado, June 1997, One hour invited lecture.
23. "On the Geometry of Positive Real Functions, with Applications to Nevanlinna-Pick Interpolation," SIAM Conference on Control, Jacksonville, May 1998, plenary lecture.
24. "Toward a Nonequilibrium Theory for Nonlinear Control," The Mathematics of Systems and Control: From Intelligent control to Behavioral Systems, Groningen, September 1999, plenary lecture.
25. "Toward a Nonequilibrium Theory for Nonlinear Control," Nonlinear control in the Year 2000, Paris, June 2000, plenary lecture.
26. "Stabilization and Regulation in Nonequilibria Cases," NOLCOS, St. Petersburg, July 2001, plenary lecture.
27. "Shaping the Steady-State Response of Nonlinear Control Systems," The 41st IEEE Conference on Decision and Control, Las Vegas, December 2002, plenary lecture.

28. “Nonequilibrium Output Regulation for Nonlinear Distributed Parameter Systems, Institut Mittag-Leffler, Djursholm, Sweden, June, 2003, invited lecture.
29. “The Uncanny Effectiveness of Mathematics in Engineering,” Symposium on Mathematics and Engineering, Royal Swedish Academy of Engineering Sciences, Stockholm, September, 2004, plenary lecture.
30. “Nonequilibrium Nonlinear Control,” Reid Prize Lecture, SIAM ANNUAL Meeting July 2005, New Orleans.
31. “Nonlinear Control Systems,” AFOSR Combined Program Meeting, August, 2006, Atlanta, invited lecture.
32. “Differential Forms and Dynamical Systems,” International Conference on Modeling, Estimation and Control, October, 2007, Venice, invited lecture.
33. “The Steady-State Response of a Nonlinear Control System, Lyapunov Stable Attractors, and Forced Oscillations,” Analysis and Design of Nonlinear Control Systems, May, 2008, London, invited lecture.

Colloquia and Presentations at Many Universities and Research Institutes Including these 100:

Harvard University, MIT, Brown University, Yale University, Cornell University, Dartmouth University, University of Massachusetts-Amherst, Wesleyan University, University of Rochester, University of Maryland, VPI, University of North Carolina, North Carolina State University, University of Florida, University of Kentucky, Case Western Reserve, Ohio State, University of Michigan, Michigan Tech University, Notre Dame, University of Chicago, University of Illinois - Champaign/Urbana, Washington University, The Boeing Corporation, University of Minnesota, Iowa State, University of Kansas, University of Colorado, Colorado School of Mines, University of Utah, Montana State University, University of Texas-Austin, University of Texas-Dallas, Texas Tech University, Arizona State University, University of California-Berkeley, University of California-Davis, University of California-San Diego, USC, Stanford University, The Naval Postgraduate School, NASA - Ames, University of Toronto, University of Waterloo, McGill University, Osaka University, University of Tokyo, Kyoto University, Nagoya University, Toshiba Corporate Research and Development Center, Chinese University of Hong Kong, Fudan University, Chinese Academy of Sciences (Beijing), Tsinghua University, University of Newcastle, University of Bath, Cambridge University, Coventry University, Imperial College of Science and Technology, The Royal Institute of Technology, Lund Institute of Technology, Linköping University, Institut Mittag-Leffler, Royal Swedish Academy of Engineering Sciences, CWI-Amsterdam, Universiteit Groningen, Universiteit Erasmus, Vrije Universiteit, Katholiek Universiteit Leuven, Universität Bielefeld, Universität Bonn, Universität Bremen, Universität Mannheim, DfVHL-Oberpfaffenhofen, Universität Regensburg, Universität Würzburg, Mathematisches Forschungsinstitut Oberwolfach, Universität Graz, Universität Basel, ETH - Zurich, Università di Roma - La Sapienza, Università di Bologna, Università di Firenze, Università di

Genova, Università di L'Aquila, Università di Padova, Université Paris - Dauphine, Université Bordeaux I, Ecole Normale Supérieure, CNRS - Fontainebleau, CNRS - Gif-sur-Yvette, INRIA - Sophia Antipolis, Glushkov Institute for Cybernetics - Kiev, Institute for Problems in Control (Moscow), Moscow Institute for Aviation, Moscow State University, Steklov Institute of Mathematics (Moscow), The Russian Academy of Sciences (St. Petersburg), Ben-Gurion University of the Negev

PUBLICATIONS:

Books and Monographs

1. Lectures on the Theory of Harmonic Algebras, University of Massachusetts, 1974.
2. Partial Differential Equations and Differential Geometry, (Editor), Marcel Dekker, Inc., New York, 1979.
3. Geometrical Methods for the Theory of Linear Systems, (Editor, with C.F. Martin), D. Reidel, Dordrecht, 1980.
4. Algebraic and Geometric Methods in Linear Systems Theory, (Editor, with C.F. Martin), Lectures in Applied Mathematics, Vol. 18, Amer. Math. Soc., Providence, 1980.
5. Computational and Combinatorial Methods for System Theory, (Editor, with A. Lindquist), North Holland, 1986.
6. Theory and Application of Nonlinear Control Systems, (Editor, with A. Lindquist), North Holland, 1986.
7. Modelling, Identification and Robust Control, (Editor, with A. Lindquist), North Holland, 1986.
8. Frequency Domain and State Space Methods for Linear Systems, (Editor, with A. Lindquist), North Holland, 1986.
9. Modelling and Adaptive Control, (Editor, with A. Kurzhansky), Springer-Verlag, 1988.
10. Analysis and Control of Nonlinear Systems, (Editor, with C.F. Martin and R. Saeks), North Holland, 1988.
11. Linear Circuits, Systems and Signal Processing: Theory and Applications, (Editor, with C.F. Martin and R. Saeks, North Holland, 1988.
12. Nonlinear Synthesis, (Editor, with A. Kurzhansky), Birkhäuser - Boston, 1991.

13. Systems and Control in the Twenty-First Century, Progress in Systems and Control , Birkhäuser, 1997, (434 pages), (Editor with B.N. Datta, D.S. Gilliam, C.F. Martin).
14. Output Regulation of Uncertain Nonlinear Systems, (with F. Delli Priscoli and A. Isidori), Birkhäuser - Boston, 1997.
15. Directions in Mathematical Systems Theory and Optimization (Editor, with A. Rantzer). Lecture Notes in Control and Information Sciences, Vol. 286, Springer-Verlag, Heidelberg, 2002.
16. Nonequilibrium Nonlinear Control (with D.S. Gilliam and A. Isidori), in preparation.

Papers in Refereed Journals

1. A Spectral Decomposition Theorem for Certain Harmonic Algebras, *Bull. Amer. Math. Soc.*, Vol. 80 (1974) 1271-1275.
2. Closed Algebras of Smooth Functions, *Bull. Amer. Math. Soc.*, Vol. 81 (1975) 195-198.
3. A Decidability Criterion for the Similarity Problem, with Applications to the Moduli of Linear Dynamical Systems (with Michael Gauger), *Advances in Math.*, Vol. 25 (1977) 59-90.
4. Characteristic Free, Improved Decidability Criteria for the Similarity Problem (with Michael Gauger), *Linear and Multilinear Algebra*, Vol. 5 (1977) 153-158.
5. Algebraic Transformation Groups and the Similarity Problem (with Michael Gauger), *Amer. Math. Monthly*, Vol. 85 (1978) 173-182.
6. On the Control of Certain Deterministic, Infinite Dimensional Systems by Algebraic-Geometric Techniques, *Amer. J. of Math.*, Vol. 100 (1978) 1333-1381.
7. On the Moduli of Linear Dynamical Systems (with Normal E. Hurt), *Advances in Math., Suppl.* Vol. 4 (1979) 83-122.*
8. Applications of Algebraic Geometry in System Theory (with P.L. Falb), *Amer. J. of Math.*, Vol. 101 (1979) 337-363.
9. On Certain Problems of Arithmetic Arising in the Realization of Linear Systems with Symmetries, *Astérisque*, Vol. 75-76 (1980) 57-65.

*Translated into Russian in Mathematical Methods in System Theory, MIR Publishers, Moscow, 1979.

10. Multivariable Nyquist Criteria, Root Loci, and Pole Placement by Output Feedback: A Geometric Viewpoint (with R.W. Brockett), *IEEE Trans. on Aut. Control*, Vol. 26 (1981) 271-283.
11. On Root-Loci in Several Variables: Continuity in the High Gain Limit, *Systems and Control Letters*, 1 (1981) 69-73.
12. The McMillan and Newton Polygons of a Feedback System and the Construction of Root-Loci, (with P.K. Stevens), *Int. J. Control*, 35 (1982) 29-53.
13. The Stability and Instability of Partial Realizations (with A. Lindquist), *Systems and Control Letters*, 2 (1982) 99-105.
14. Geometric Critical Point Analysis of Lossless Power System Models, (with J. Bailliel), *IEEE Trans. Circuits and Systems*, Vol. CAS-29 #11 (Nov. 1982) 724-737.
15. On the Stabilizability of Multivariable Systems and the Ljusternick-Schnirelmann Category of Real Grassmannians, *Systems and Control Letters*, 3 (1983), 255-262.
16. On a Theorem of Hermite and Hurwitz, *J. Linear and Multilinear Algebra*, 50 (1983) 61-101.
17. Simultaneous Stabilization and Simultaneous Pole-Placement by Nonswitching Dynamic Compensation, (with B.K. Ghosh), *IEEE Trans. on Circuits and Systems* 30 (1983) 422-428.
18. The Load Flow Equations for a 3-Node Electrical Power System, (with J. Baillieul), *Systems and Control Letters*, 2 (1983) 321-329.
19. The Singularity Theory of the Load Flow Equations for a 3-Node Electrical Power System, (with J. Baillieul), *Systems and Control Letters*, 2 (1983) 330-340.
20. Output Feedback and Generic Stabilizability, (with B.D.O. Anderson), *SIAM J. Control and Optimization*, 22 (1984), 362-380.
21. A Several Complex Variables Approach to the Stabilization of Neutral Delay-Differential Equations (with M. Spong and T.J. Tarn), *Mathematical System Theory*, 17 (1984) 97-134.
22. Remarks on Nonlinear Planar Control Systems which are Linearizable by Feedback, *Systems and Control Letters*, 5 (1985) 363-367.
23. Geometric Methods for the Classification of Linear Feedback Systems, (with P.E. Crouch), *Systems and Control Letters*, 6 (1985) 239-256.

24. Cascade Equivalence of Linear Systems, (with J.W. Helton), *Int. J. Control*, 44 (1986) 1507-1521.
25. Least Squares Estimation, Linear Programming and Momentum, (with J.C. Willems), *IMA Journal of Math. Control & Inf.*, 3 (1986) 103-118.
26. Local Accessibility, Local Reachability, and the Representation Theory of Compact Groups (with P.E. Crouch), *Math System Theory*, 19 (1986) 43-65.
27. Observability of Minimal, Distal Systems, (with P.E. Crouch), *Int. J. Control*, 44 (1986) 929-926.
28. Local Stabilization of Minimum Phase Nonlinear Systems, (with A. Isidori), *Systems and Control Letters*, 11 (1988), 9-17.
29. New Results and Examples in Nonlinear Feedback Stabilization, (with A. Isidori), *Systems and Control Letters*, 12 (1988), 437-442.
30. Régulation Asymptotique dans les systèmes nonlinéaires, (avec A. Isidori), *Comptes Rendus, Acad Sci, Paris*, t. 309 Sér I (1989) 527-530.
31. On the Geometry of the Kimura-Georgiu Parameterization of Rational Modelling Filters, (with A. Lindquist), *Int. J. Control*, 50 (1989) 2301-2312.
32. Control and Stabilization of Decentralized Systems, (with D. Gilliam and C.F. Martin), *Int. J. Control*, 49 (1989) 1819-1833.
33. Output Regulation of Nonlinear Systems, (with A. Isidori), *IEEE Trans. Aut. Control*, 35 (1990) 131-140.[†]
34. Predictability and Unpredictability of the Kalman Filter, (A. Lindquist, and T. Carlsen - McGregor), *IEEE Trans. Aut. Control* 36 (1991) 563-579.
35. On the Attitude Stabilization of Rigid Spacecraft, (with A. Isidori), *Automatica* 27 (1991) 87-95.[‡]
36. Asymptotic Stabilization of Minimum Phase Nonlinear Systems (with A. Isidori), *IEEE Trans. Aut. Control*, 36 (1991) 1122-1137.
37. Passivity, Feedback Equivalence and the Global Stabilization of Minimum Phase Nonlinear Systems, (with A. Isidori and J.C. Willems) *IEEE Trans. Aut. Control*, 36 (1991) 1228-1240.

[†]Awarded the 1991 IEEE George Axelby Prize for Best Paper in the IEEE Transactions of Automatic Control, for 1989 - 1990.

[‡]Awarded the 1993 IFAC Prize for Best Paper in Automatica for 1991 - 1993.

38. The Cohomology of the Moduli Space of Controllable Linear Systems, (with U. Helmke), *Acta Applicandae Mathematica* 28 (1992), 161-188.
39. Singularly Perturbed Zero Dynamics of Nonlinear Systems (with A. Isidori, S. Sastry, and P. Kokotovic) *IEEE Trans. Aut Control* 37 (1992) 1625-1631.
40. Unicité des Contrôles Optimales et Chocs pour les Equations Hamilton-Jacobi-Bellman et de Riccati (avec H. Frankowska), *Comptes Rendus, Acad Sci, Paris*, t. 312 Sér I (1992) 427-431.
41. Decentralized Feedback Pole-Placement of Linear systems (with Xiao-Chang Wang, D. Gilliam and C.F. Martin), *Int. J. Control*, 55 (1992) 511 - 518.
42. Stabilization of Discrete-Time Nonlinear Systems by Smooth State Feedback (with W. Lin and B. K. Ghosh), *Systems and Control Letters* 21 (1993) 255-263.
43. The Additive Inverse Eigenvalue Problems for Lie Perturbations, (with Xiao-Chang Wang), *SIAM J. Matrix Anal. Appl.*, 14 (1993) 113 - 117.
44. The Zero Dynamics Algorithm for General Nonlinear Systems and Its Application in Exact Output Tracking (with X.- M. Hu) *J. Math. Systems, Estimation and Contr* 3 (1993) 51 - 72.
45. On the Nonlinear Dynamics of Fast Filtering Algorithms, (with A. Lindquist and Y.S. Zhou) *SIAM J. Control and Opt.* 32 (1994) 744-789.
46. Root Locus Methods for Boundary Feedback Control of a Class of Distributed Parameter Systems (with D.S. Gilliam and J. He) *SIAM J. Control and Opt.*, 32 (1994) 1364 - 1427.
47. Losslessness, Feedback Equivalence and the Global Stabilization of Discrete-time Nonlinear Systems (with W. Lin), *IEEE Trans. Aut. Control* 39 (1994) 83 -98
48. Toward a Solution of the Minimal Partial Stochastic Realization Problem (with A. Lindquist) *Comptes Rendus, Acad Sci, Paris Sér I Math* 319 (1994) 1231 - 1236.
49. Design of Discrete-time Nonlinear Control Systems via Smooth Feedback (with W. Lin), *IEEE Trans. Aut. Control* 39 (1994) 2340 - 2346.
50. The KYP lemma, state feedback and dynamic output feedback in discrete-time bilinear systems (with W. Lin), *Systems and Control Letters*, 23 (1995) 127 - 136.
51. Passivity and Absolute Stabilization for a Class of Discrete-time Nonlinear Systems (with W. Lin), *Automatica* 31 (1995) 263 - 267.

52. A Complete Parameterization of All Positive Rational Extensions of a Covariance Sequence (with A. Lindquist, S. V. Gusev and A. S. Matveev) *IEEE Trans. Aut. Control.* 40 (1995) 1841 - 1857.
53. Zero-state observability and stability of discrete-time nonlinear systems, (with W. Lin), *Automatica* 31 (1995) 269 -271.
54. Discrete-time Nonlinear H-infinity Control of Control with Measurement Feedback (with W. Lin), *Automatica* 31 (1995) 419 - 434.
55. An Integral Invariance Principle for Nonlinear Systems (with C.F. Martin), *IEEE Trans. Aut. Control.* 40 (1995) 983 - 994.
56. Remarks on Linearization of Discrete-time Autonomous Systems and Nonlinear Observer Design (with W. Lin), *Systems and Control Letters*, 25 (1995) 31 - 40.
57. H-infinity Control of Discrete-time Nonlinear Control Systems via State and Full Information Feedback (with W. Lin), *IEEE Trans. Aut. Control* 41 (1996) 494 - 510.
58. High Gain Limits of Trajectories and Attractors for a Boundary Controlled Viscous Burgers' Equation (with D.S. Gilliam and V. Shubov) *J. of Math. Systems, Estimation and Control* 6 (1996) 485-488 (summary). The full 40 page electronic manuscript was published Oct., 1996. The retrieval code is 07169.
59. Structurally stable output regulation of nonlinear systems (with F. Delli Priscoli, A. Isidori, and W. Kang), *Automatica* 33 (1997) 369 -385.
60. On the Partial Stochastic Realization Problem (with A. Lindquist), *IEEE Trans. Aut. Control.* 42 (1997) 1049 - 1070.
61. The Solution of Nonlinear Lagrange and Bolza Problems via Riccati Partial Differential Equations, *J. Math. Systems, Estimation and Control* 8 (1998) 119-122 (summary), 8, No. 4, 1-54, Jan 1998. (The full 54 page electronic manuscript was published Oct., 1996. The retrieval code is 87727.)
62. On the Global Dynamics for a Boundary Controlled Viscous Burgers Equation (with D.S. Gilliam and V. Shubov), *J. of Dynamics and Control*, 4 (1998), no. 4, 457-519.
63. Harmonic Forcing for Linear Distributed Parameter Systems (with D.S. Gilliam, I. Lauko and V. Shubov), *J. Math. Systems, Estimation and Control* 8 (1998), no. 2, 12 pp. (electronic).
64. A Convex Optimization Approach to the Rational Covariance Extension Problem (with S. V. Gusev and A. Lindquist) *SIAM J. Control and Opt* 37 (1999), no. 1, 211-229.[§]

[§]Named as a SIGEST paper in 2001.

65. Boundary control, stabilization and zero-pole dynamics for a non-linear distributed parameter system (with D.S.Gilliam and V.I.Shubov) *Internat. J. Robust Nonlinear Control* 9 (1999), no. 11, 737–768.
66. Output regulation for nonlinear systems: an overview. (with A. Isidori) *Internat. J. Robust Nonlinear Control* 10 (2000), no. 5, 323–337.
67. A new approach to spectral estimation: A tunable high-resolution spectral estimator, (with T. T. Georgiou and A. Lindquist), *IEEE Trans. Signal Processing* 48 (2000) no. 11, 3189-3205.
68. Output Regulation of Linear Distributed Parameter Systems (with D.S. Gilliam, I. Lauko and V. Shubov), *IEEE Trans. Aut. Control*, AC-45, (2000), No. 12, 2236-2252.
69. On the duality between filtering and Nevanlinna-Pick interpolation (with A. Lindquist), *SIAM J. Control and Opt.* 39 (2000), 757-775.
70. Cepstral coefficients, covariance lags and pole-zero models for finite data strings (with P. Enqvist and A. Lindquist), *IEEE Trans. Signal Processing* 49 (2001) no.4, 677-693.
71. From finite covariance windows to modeling filters: A convex optimization approach (with S. V. Gusev and A. Lindquist) *SIAM Review* 43 (2001) 645-676.
72. Input-output behavior for stable linear systems (with X. Hu, C.F. Martin, and V. Shubov.) *J. Franklin Inst.* 338 (2001), no. 4, 497–507.
73. Persistence of equilibria for locally asymptotically stable systems (with V. Sundarapandian) *Int. J. of Robust and Nonlinear Control*, 11 (2001) 87-93.
74. A generalized entropy criterion for Nevanlinna-Pick interpolation: A convex optimization approach to certain problems in systems and control (with T. T. Georgiou and A. Lindquist) *IEEE Trans. Aut. Control*, 46 (2001) 822-839.[¶]
75. Bifurcation analysis of the zero dynamics and the practical stabilization of nonlinear minimum phase systems (with A. Isidori), *Asian Journal of Control*, 4 (2002) No.2, 171-185.
76. Identifiability and well-posedness of shaping-filter parameterizations: A global analysis approach (with P. Enqvist and A. Lindquist), *SIAM J. Control and Optimization* 41 (2002) 23-59.
77. Regular Linear Systems Governed by a Boundary Controlled Heat Equations (with D. S. Gilliam, V. I. Shubov and G. Weiss), *Journal of Dynamical and Control Systems*, 8(3) (2002) 341–370, 2002.

[¶]Awarded the IEEE George Axelby Prize for Best Paper in the IEEE Transactions of Automatic Control, for 2001-2002.

78. Limit Sets, Zero Dynamics and Internal Models in the Problem of Nonlinear Output Regulation (with A. Isidori), *IEEE Trans. Aut. Control*, 48 (10):1712–1723, 2003.
79. Nonlinear internal models for output regulation, (with A. Isidori), *IEEE Trans. on Automatic Control*, AC-49, 2244-2247, (2004).
80. Omega limit sets of systems that are semiglobally practically stabilized, (with F. Celani, A. Isidori) *Int. J. of Robust and Nonlinear Control*, **15**(7), pp. 315-333 (2005).
81. Generalized interpolation in H^∞ with a complexity constraint, (with T.T. Georgiou, A. Lindquist and A. Megretski) *Trans. of the Amer. Math. Soc.*, 358 (2006), no. 3, 965–987.
82. The generalized moment problem with complexity constraint, (with A. Lindquist), *Integral Equations and Operator Theory*, 56 (2006)163-180.
83. Zero Dynamics Modeling and Boundary Feedback Design for Parabolic Systems, (with D.S. Gilliam, A. Isidori, V. Shubov), *Mathematical and Computer Modelling* **44** (2006) 857-869.
84. Interior point solutions of variational problems and global inverse function theorems, (with A. Lindquist), *Intern. Journal of Robust and Nonlinear Control*, **16** (2007), 1-18.
85. Steady-State Behaviors in Nonlinear Systems with an Application to Robust Disturbance Rejection, (with A. Isidori), *Annual Reviews in Control* **32** (2008) 1 - 16.
86. A note on the Jacobian Conjecture (with A. Lindquist), *The Proc. of the AMS*, September (2008), to appear.
87. On Brockett’s Necessary Condition for Stabilizability and the Topology of Liapunov Functions on R^n , *Communications in Information and Systems*, October (2008), to appear.
88. Important Moments in Systems and Control (with A. Lindquist), *SIAM J. Control and Optimization*, to appear.
89. Nonlinear Oscillations and Vector Fields Paired with a Closed One-Form (with R. W. Brockett), submitted to *Amer. J. of Math.*
90. The Period Fibration of an Angular One-Form and Periodic Solutions to Differential Equations, submitted to *Ann. of Math.*
91. Asymptotic Regulation for Distributed Parameter Systems (with D. S. Gilliam, C.-B. Hu, V. I. Shubov), submitted to *Intern. Journal of Robust and Nonlinear Control*

Papers in Refereed Conference Proceedings

1. On the Realization of Delay Differential Systems, I. Qualitative Results, Canonical Forms, and a New Algorithm, *Proc. of the Joint Aut. Control Conf.*, San Francisco, June 1977, 588-593.
2. On Certain Families of Rational Functions Arising in Dynamics, *Proc. of the 17th IEEE Conf. on Decision and Control, San Diego*, January 1979, 1053-1056, invited paper.
3. Feedback Invariants for Linear Systems Defined over Rings, *Proc. of the 17th IEEE Conf. on Decision and Control*, San Diego, 1979, invited paper.
4. On the Stabilizability of Linear Control Systems Depending on Parameters, *Proc. of the 18th IEEE Conf. on Decision and Control*, Fort Lauderdale, 1979, 233-236, invited paper.
5. On the Algebraic Geometry of the Output Feedback Pole Placement Map (with R.W. Brockett), *Proc. of the 18th IEEE Conf. on Decision and Control*, Fort Lauderdale, 1979, 754-757, invited paper.
6. Realization Theory and Quadratic Optimal Controllers for Systems Defined Over Banach and Frechet Algebras, *Proc. of the 19th IEEE Conf. on Decision and Control*, Albuquerque, 1980, 247-251, invited paper.
7. Hamiltonian Indices and Rational Spectral Densities (with T.E. Duncan), *Proc of the 19th IEEE Conf. on Decision and Control*, Albuquerque, 1980, 649-653, invited paper.
8. Recent Results on Output Feedback Problems, *Proc. of the 19th IEEE Conf. on Decision and Control*, Albuquerque, 1980, 663-664, invited paper.
9. An Algebraic-Geometric and Topological Analysis of the Solutions to the Load-Flow *Proc. IEEE Conf. on Decision and Control*, San Diego, 1981, 1312-1320, invited paper.
10. Critical Point Behavior of Objective Functions Defined on Spaces of Multivariable Systems (with D.F. Delchamps), *Proc. of the 21st IEEE Conf. on Decision and Control*, Orlando, 1982, 937-943, invited paper.
11. Pole Placement by Static and Dynamic Output Feedback (with P.K. Stevens), *Proc. of the 21st IEEE Conf. on Decision and Control*, Orlando, 130-133, invited paper.
12. Remarks on the Number of Solutions to the Load Flow Equations for a Power System with Electrical Losses, (with J. Baillieul), *Proc. of the 21st IEEE Conf. on Decision and Control*, Orlando, 1982, 919-924, invited paper.

13. High Gain Feedback and the Stabilizability of Multivariable Systems, *Analysis and Optimization of Systems*, Versailles 1982, (A. Bensoussan and J.L. Lions, eds), Lecture Notes in Inf. and Control, Vol. 44, Springer-Verlag, Berlin (1982) 20-33, plenary paper.
14. On the Stabilizability of Multivariable Systems by Minimum Order Compensation, (with B.D.O. Anderson), *Proc. of the 22nd IEEE Conf. on Decision and Control*, San Antonio, 1983.
15. Compactifications of Spaces of Systems and Dynamic Compensation, *Proc. of the 22nd IEEE Conf. on Decision and Control*, San Antonio, 1983, invited paper.
16. Feedback Decoupling of Rotational Disturbances for Spherically Constrained Systems, *Proc. of 23rd IEEE Conf. on Decision and Control*, Las Vegas, 1984, invited paper.
17. Adaptive Stabilization of Multivariable Linear Systems (with J.C. Willems), *Proc. of 23rd IEEE Conf. on Decision and Control*, Las Vegas, 1984, invited paper.
18. Global Stabilization of Linear Systems in the Absence of Information on the Sign of the High Frequency Gain, (with J.C. Willems), *Analysis and Optimization of Systems*, Nice, 1984.
19. A Frequency Domain Philosophy for Nonlinear Systems, with Applications to Stabilization and to Adaptive Control, (with A. Isidori), *Proc. of 23rd IEEE Conf. on Decision and Control*, Las Vegas, 1984, invited paper.
20. Global Feedback Stabilization of Nonlinear Systems, (with A. Isidori), *Proc. of the 24th IEEE Conf. on Dec. and Control*, Ft. Lauderdale, 1985, invited paper.
21. Intersection Rings for Linear Systems, (with U. Helmke), *Proc. of 25th IEEE CDC*, Athens, 1986, invited paper.
22. Invariants and Canonical Forms for Output Feedback, *Proc. of 25th IEEE CDC*, Athens, 1986, invited paper.
23. On the Topology and Geometry of Universally Observable Systems, (with C.F. Martin, W. Dayawansa), *Proc. of 26th IEEE Conf. on Dec. and Control*, Los Angeles, 1987, invited paper.
24. Nonlinear Disturbance Decoupling with Stability (with A. Isidori), *Proc. of 26th IEEE Conf. on Decision and Control*, Los Angeles, 1987, invited paper.
25. Adaptive Stabilization of Infinite Dimensional Linear Systems, *Proc. of 26th IEEE Conf. on Decision and Control*, Los Angeles, 1987, invited paper.

26. Linear Model Matching with Prescribed Tracking Error and Internal Stability for Nonlinear Systems, (with R. Castro and A. Isidori), *Analysis and Optimization of Systems*, Springer-Verlag, 1988, 249-258.
27. Fourier Analytic Criteria for Observability of Ergodic Translations, (with D. McMahon), *Analysis and Control of Nonlinear Systems*, North-Holland, 1988.
28. An Algebraic Description of the Rational Solutions to the Covariance Extension Problem, (with A. Lindquist), *Linear Circuits, Systems and Signal Processing: Theory and Applications*, North-Holland, 1988, 9-17.
29. Analytical Techniques for the Optimization of PV Water Pumping Systems, (with P. Baltas and P. Russell), *Proc. of 8th European Photovoltaic Solar Energy Conference*, Florence, 1988.
30. Feedback Stabilization about Attractors and the Problems of Asymptotic Disturbance Rejection, (with A. Isidori), *Proc. of 27th IEEE Conf. on Dec. and Control*, Austin, 1988, 32-36, invited paper.
31. Analysis and Simulation of a Controlled Rigid Spacecraft: Stability and Instability near Attractors, (with A. Isidori, S. Monaco and S. Sabatino), *Proc. of 27th IEEE Conf. on Dec. and Control*, Austin, 1988, 81-85, invited paper.
32. Asymptotic Behavior of Root-Loci for Distributed Parameter Systems, (with D.S. Gilliam), *Proc. of 27th IEEE Conf. on Dec. and Control*, Austin, 1988, 48-51, invited paper.
33. Boundary Feedback Stabilization of Distributed Parameter Systems (with D.S. Gilliam), *Robust Control of Linear Systems and Nonlinear Control* (M.A. Kaashoek, J.H. van Schuppen and A.C.M. Ran, eds.) Birkhäuser-Boston, 1990.
34. Steady-State Response, the Separation Principle and the Output Regulation of Nonlinear Systems, (with A. Isidori), *Proc. of 28th IEEE Conference on Decision and Control*, Tampa (1989) 2247-2251, invited paper.
35. Viability Theory, Controlled Invariance and Zero Dynamics for Nonlinear Control Systems (with J.P. Aubin and A. Isidori) *9th INRIA Conf. Analysis and Optimization of Systems*, (A. Bensoussan and J.L. Lions, eds.) Springer-Verlag, pp. 821-832, 1990, invited paper.
36. The Analysis of Singularly Perturbed Zero Dynamics of Nonlinear Systems (with A. Isidori, P. Kokotovic, and S.S. Sastry) *9th INRIA Conf. Analysis and Optimization of Systems*, (A. Bensoussan and J.L. Lions, eds.) Springer-Verlag, pp. 833-842, 1990, invited paper.

37. Exact Linearization and Zero Dynamics (with A. Isidori), *Proc. of the 29th IEEE Conf. on Decision and Control*, Honolulu, 1990, invited paper.
38. Stabilization and Output Regulation of Nonlinear Systems in the Large (with A. Isidori and J.C. Willems), *Proc. of the 29th IEEE Conf. on Decision and Control*, Honolulu, 1990, invited paper.
39. Stability of Certain Distributed Parameter Systems by Low Dimensional Controllers: A Root Locus Approach (with D.S. Gilliam) *Proc. of the 29th IEEE Conf. on Decision and Control*, Honolulu, 1990, invited paper.
40. New Methods for Nonlinear Optimal Control, *Proc. of the First European Control Conf.*, Grenoble 1991.
41. Hover Control of a PVTOL Using Nonlinear Regulator Theory (with J. Roltgen), *Proc. of 1991 ACC*, Boston.
42. Asymptotic Tracking and Disturbance Rejection in Nonlinear Systems (with A. Isidori) *New Trends in Systems Theory*, Birkhäuser-Boston, 1991.
43. Boundary Feedback Stabilization of Nonlinear Distributed Parameter Systems (with D.S. Gilliam), *Proc. of the 30th IEEE Conf. on Decision and Control*, Brighton, 1991, invited paper.
44. Exponential Observer Design (with S. Pandian), *Proceedings of Second IFAC NOLCOS*, Bordeaux, 1992.
45. G-field Control of Nonlinear Systems (with J. Roltgen), *Proc. of AIAA Conf.*, Hilton Head, 1992
46. Boundary Feedback Stabilization of a Controlled Viscous Burgers Equation (with D.S. Gilliam), *Proc. of the 31st IEEE Conf. on Decision and Control*, Tucson, 1992, invited paper.
47. A Root Locus Methodology for Distributed Parameter Feedback Systems (with D.S. Gilliam and J. He) *Proc. of the 31st IEEE Conf. on Decision and Control*, Tucson, 1992, invited paper.
48. On the Nonlinear Dynamics of Fast Filtering Algorithms, (with A. Lindquist, Y.S. Zhou) *Proc. of the 31st IEEE Conf. on Decision and Control*, Tucson, 1992, invited paper.
49. On the Kalman-Yacubovitch-Popov Lemma for Nonlinear Systems, (with K. A. Doll), *Computation and Control III*, Birkhäuser-Boston, MA, 1993

50. On Discrete-time Nonlinear Control (with W. Lin), *Proc. of the 32nd IEEE Conf. on Decision and Control*, San Antonio, 1993.
51. Discrete-time Lossless Systems, Feedback Equivalence and Passivity (with W. Lin), *Proc. of the 32nd IEEE Conf. on Decision and Control*, San Antonio, 1993.
52. Zero and Pole Dynamics for a Controlled Burgers' Equation (with D.S. Gilliam and V. Shubov) *Proc. of the 33rd IEEE Conf. on Decision and Control*, Lake Buena Vista, Fla, 1994.
53. Global Lyapunov Stabilization of a Nonlinear Distributed Parameter System (with D.S. Gilliam and V. Shubov) *Proc. of the 33rd IEEE Conf. on Decision and Control*, Lake Buena Vista, Fla, 1994.
54. Some Recent Advances on the Rational Covariance Extension Problem (with A. Lindquist), *Proc. IEEE European Workshop on Computer Intensive Methods in Control and Signal Processing*, Prague 1994, 149-158
55. Stability, Detectability and the Problem of Disturbance Decoupling (with W. Kang), *Systems and Networks: Mathematical Theory and Applications*, Vol I, Math. Res. 77, Akademie-Verlag, Berlin (1994) , 71-83.
56. The geometry of positive real functions with applications to the rational covariance extension Problem (with A. Lindquist, S. V. Guseev, and A. V. Matveev), *Proc. of the 32nd IEEE Conf. on Decision and Control*, 1994, 3883-3888.
57. On the Dynamics of Boundary Controlled Nonlinear Distributed Parameter Systems (with D.S. Gilliam and V. Shubov), *Proc. of IFAC Nonlinear Control Systems Symposium*, 1995
58. Zero and Pole Dynamics for a Controlled Burgers Equation (with D.S. Gilliam, V. Shubov) *Proc. of the 34th IEEE Conf. on Decision and Control*, New Orleans, 1995.
59. Global Lyapunov Stabilization of a Nonlinear Distributed Parameter System (with D.S. Gilliam, V. Shubov) *Proc. of the 34th IEEE Conf. on Decision and Control*, New Orleans, 1995.
60. The Geometry of Positive Real Functions with applications to the Rational covariance Extension Problem (with A. Lindquist, S.V. Guseev, A.S. Matveev) *Proc. of the 34th IEEE Conf. on Decision and Control*, New Orleans, 1995, invited paper.
61. High Gain Limit for Boundary Controlled Convective Reactive Diffusion Equations (with D.S. Gilliam, V. Shubov) *Proc. of the 34th IEEE Conf. on Decision and Control*, New Orleans, 1995.

62. On the dynamics of boundary controlled nonlinear distributed parameter systems, (with D.S. Gilliam, V. Shubov), *Proc. IFAC NOLCOS*, Lake Tahoe, 1995.
63. Example of Output Regulation for Distributed Parameter Systems (with D. S. Gilliam, F. Delli Prescoli, A. Isidori, I. Lauko and V. I. Shubov), *Proc. of the 28th AIAA Fluid Dynamics Conference / 4th AIAA Shear Flow Control Conference*, 1997.
64. Output Regulation for Parabolic Distributed Parameter Systems: Set-point Control (with D. S. Gilliam, I. Lauko and V. I. Shubov), *Proc. of the 36th IEEE Conf. on Decision and Control*, 1997, 2231-2236.
65. Semiglobal Asymptotic Model Matching via Output Feedback, (with A. Isidori) *IFAC NOLCOS* 1998.
66. Output Regulation for Nonlinear Systems: An Overview (with A. Isidori), *Proc. of the 37th IEEE Conf. on Decision and Control*, 1998, 3069-3074.
67. Zero Dynamics for Relative Degree One SISO Distributed Parameter Systems (with D. S. Gilliam, I. Lauko and V. I. Shubov), *Proc. 37th IEEE CDC*, (Tampa, FL, 1998), pp. 2390-2391.
68. Conditions for Solvability of the Output Regulator Problem for SISO Distributed Parameter Systems (with D. S. Gilliam, I. Lauko and V. I. Shubov), *Proc. 37th IEEE CDC*, (Tampa, FL, 1998), pp. 2392-2393.
69. Semiglobal Stabilization of a Boundary Controlled Viscous Burgers' Equation (with D. S. Gilliam and V. I. Shubov), *Proc. 38th IEEE-CDC*, (1999), 680-681.
70. Example of Output Regulation for a System with Unbounded Inputs and Outputs (with D. S. Gilliam and V. I. Shubov), *Proc. 38th IEEE-CDC*, (1999), 4280-4284.
71. Compact Attractors of Nonlinear Non-Minimum Phase Systems that are Globally Practically Stabilized, (with F. Celani, A. Isidori), *Proc. 40th IEEE-CDC*, (2001), 3796-3801.
72. Examples of Regular Linear Systems Governed by Partial Differential Equations (with D. S. Gilliam and V. I. Shubov), *Proc. 40th IEEE-CDC*, (2001), 129-130.
73. An Example of Output Regulation for a Distributed Parameter System with an Infinite Dimensional Exosystem (with D. S. Gilliam, V. I. Shubov and J. Hood) *Proceedings of MYNS* 2002.
74. Examples of Output Regulation for Distributed Parameter Systems with Infinite Dimensional Exosystem (with D. S. Gilliam and V. I. Shubov), *Proc. 40th IEEE-CDC*, (2001), 547-548.

75. Compact Attractors of Nonlinear Non-Minimum Phase Systems that are Globally Practically Stabilized, (with F. Celani, A. Isidori), *Proc. 41th IEEE-CDC*, (2002), 4306-4311.
76. The Regulator Equations for Retarded Delay Differential Equations (with D. S. Gilliam and V. I. Shubov), *Proceedings 41st IEEE-CDC*, Dec. 2002, p. 973-974.
77. Modeling Modal Based Sensors for Oscillatory Systems (with J.A. Burns, D. S. Gilliam and V. I. Shubov), *Proceedings 41st IEEE-CDC* Dec. 2002, p. 1725-1726.
78. Identifiability of shaping filters from covariance lags, cepstral windows and Markov parameters (with P. Enquist and A. Lindquist) *Proceedings 41st IEEE-CDC*, (2002),
79. Set-point boundary control for a nonlinear distributed parameter system (with D. S. Gilliam , A. Isidori and V. I. Shubov), *Proceedings 42nd IEEE-CDC*, pp 312-317, Dec 9-12, 2003, Maui, Hawaii.
80. Static and Dynamic Controllers for Boundary Controlled Distributed Parameter Systems, (with D. Gilliam A. Isidori and V.I. Shubov) *Proc. 43rd IEEE Conference on Decision and Control*, December 2004, pp 3324-3325.
81. Design of nonlinear internal models for output regulation, (with A. Isidori) *Proc.of NOLCOS* 2004.
82. Further results on output regulation by pure error feedback, (with A. Isidori, L. Marconi), *Proc. 44nd IEEE Conference on Decision and Control*, 2005.
83. Nonlinear Output Regulation Without Immersion, (with A. Isidori, L. Marconi, L. Praly), *Proc. 44nd IEEE Conference on Decision and Control*, 2005.
84. The Covariance Extension Equation Revisited, (with A. Lindquist), *Proc. 44nd IEEE Conference on Decision and Control*, 2005.
85. Results on Nonlinear Output Regulation for MIMO Systems, (with N. K. McGregor, A. Isidori), *Proceedings of American Control Conference* 2006
86. Interior Point Control of a Heat Equation Using Zero Dynamics Design, (with D.S. Gilliam, A. Isidori), *Proceedings of 2006 American Control Conference* 2006.
87. Bifurcations and Attractors for a Controlled Burgers Equation, (with J. Dockery, D. S. Gilliam), *Proceedings of MTNS* 2006, Kyoto, Japan, 1368 - 1378.
88. Results on Global Robust Output Regulation (with N.K.McGregor, A. Isidori), *IEEE Conference on Decision and Control*, 2006, San Diego.

89. Set-point Boundary Control for the Kuramoto-Sivashinsky Equation, (with D.S. Gilliam, C. Hu), *IEEE Conference on Decision and Control*, 2006, San Diego.
90. Bifurcations and Attractors for a Boundary Feedback Controlled Burgers Equation, (with Jack Dockery, David Gilliam), *Proceedings of European Control Conference 2007*, Kos, Greece, 5037 - 5043.
91. Approximate Solutions of the Regulator Equations for Nonlinear DPS, (with D.S. Gilliam), *IEEE Conference on Decision and Control*, 2007, New Orleans, 854 - 859.
92. Geometric Output Regulation for a Class of Nonlinear Distributed parameter Systems, (with D.S. Gilliam), *Proc. of the Amer. Control Conf.* (2008) 254 - 259.
93. A Conjecture on Sustained Oscillations for a Closed-loop Heat Equation (with D. S. Gilliam), *Proc. of MTNS* (2008), Blacksburg, VA, to appear.

Invited Book Chapters

1. The Moduli Space for Linear Dynamical Systems, *Proc. of the 1976 Ames Research Center (NASA) Conference on Geometric Control Theory*, (C. Martin and R. Hermann, eds.), Math. Sci. Press, 1977, 229-276
2. Introduction to Geometrical Methods for the Theory of Linear Systems, (with M. Hazewinkel, C. Martin, and Y. Rouchaleau) in *Geometrical Methods for the Theory of Linear Systems*, D. Reidel, Dordrecht, 1980, 1-84, tutorial chapter.
3. Algebraic and Geometric Aspects of the Analysis of Feedback System, in *Geometrical Methods for the Theory of Linear Systems*, (C.I. Byrnes and C.F. Martin, eds.), D. Reidel, Dordrecht, 1980, 82-125, plenary chapter.
4. On Certain Topological Invariants Arising in System Theory (with T.E. Duncan), in *New Directions in Applied Mathematics*, (P. Hilton and G.S. Young, eds), Springer-Verlag, 1981, 29-71.
5. A Brief Tutorial on Calculus on Manifolds, with Emphasis on Applications to Identification and Control, *Nonlinear Stochastic Problems* (R.S. Bucy and J.F. Moura, eds.), D. Reidel, Dordrecht, 1982, 123-150, tutorial chapter.
6. Necessary Conditions for Adaptive Control, (with U. Helmke, A.S. Morse), *Modelling, Identification and Robust Control*, North Holland, 1986, plenary paper.
7. Modelling and Algorithmic Issues in Intelligent Control, *New Directions in Applied Mathematics*, (K. Gross and C.F. Martin, eds.), Springer-Verlag, NY, 1986, plenary chapter.

8. Heuristics for Nonlinear Control, (with A. Isidori), *Modelling and Adaptive Control*, Lecture Notes in Inf. and Control, Vol. 105, Springer-Verlag, 1988, 48 - 70.
9. Global Observability and Detectability: An Overview (with C.F. Martin), *Modelling and Adaptive Control, Lecture Notes in Inf. Control*, Vol. 105, Springer-Verlag, 1988, 71 - 89.
10. Robust Feedback Stabilization of Nonlinear Systems, (with Xiao-Ming Hu, A. Isidori), *Computation and Control*, (K. Bowers, J. Lund, eds.), Birkhäuser, Boston, 1989, 11-22.
11. Asymptotic Tracking Properties of Nonlinear Minimum Phase Systems (with A. Isidori), *Lecture Notes in Control and Inform. Sci.* 122 (1989) 511 - 518.
12. Feedback Design from the Zero Dynamics Point of View, (with A. Isidori), *Computation and Control*, (K. Bowers, J. Lund, eds.), Birkhäuser, Boston, 1989, 23-52, plenary paper
13. Pole Assignment by Output Feedback, *Three Decades of Mathematical Systems Theory*, (H. Nijmeier, J.H. Schumacher, eds.), Springer-Verlag, 1989, 31-78, invited chapter.
14. Uniform Bounded Input - Bounded Output Stabilization of Nonlinear Systems (with A. Isidori), in *Visiting Scholars' Lectures - 1989*, (C.F. Martin, J. White, eds.) Texas Tech University Mathematics Series, No. 16, 1990, invited series of lectures.
15. Uniform BIBO-Stabilization of Nonlinear Systems (with A. Isidori), *Signal Processing Part II: Control Theory and Its Application*, (F.A. Grünbaum, J.W. Helton, P. Khargonekar, eds.) Springer-Verlag, New York, pp. 37-50, 1990, invited paper.
16. Nonlinear Output Regulation: Remarks on Robustness, (with A. Isidori) *Proc. of the Allerton Conf.*,1990.
17. Feedback Equivalence to a Passive Nonlinear System (with A. Isidori, J. C. Willems), *Analysis of Controlled Dynamical Systems*, Birkhäuser-Boston, 1991, 118 - 135.
18. A Root Locus Methodology for Parabolic Distributed Parameter Feedback Systems (with D. S. Gilliam and J. He), *Computation and Control II*, Birkhäuser - Boston, 1991, 63 - 83.
19. Some Partial Differential Equations Arising in Nonlinear Control and Optimization, *Computation and Control II*, Birkhäuser - Boston, 1991, 45 - 61.
20. Stable, Unstable and Center Manifolds for Fast Filtering Algorithms, (with A. Lindquist and Y.S. Zhou) *Modeling and Control of Uncertain Systems*, Birkhäuser-Boston, 1991, 58 - 75.
21. New Methods for Shaping the Response of a Nonlinear System (with A. Isidori) *Nonlinear Synthesis*, Birkhäuser-Boston, 1991, 34 - 52.

22. Shock Waves for Riccati Partial Differential Equations arising in Nonlinear Optimal Control (with A. Jhemi), *Systems, Models and Feedback: Theory and Applications*, Birkhäuser - Boston, 1992, 211 - 227.
23. Boundary Control for a Viscous Burgers Equation (with D.S. Gilliam and V. Shubov), *SIAM Frontiers in Science* (H.T. Banks and M. Ito, eds) (1992) 171-185, invited chapter.
24. Boundary Control and Stabilization for a Viscous Burgers' Equation (with D. S. Gilliam), *Computation and Control III*, Birkhäuser - Boston, 1993, 105-120.
25. Convergence of Trajectories for a Controlled Viscous Burgers' Equation (with D. S. Gilliam and V. Shubov), *Control and Estimation of Distributed Parameter systems: Nonlinear Phenomena*, Birkhäuser-Basel, 1994, 61 - 77.
26. The Effect of Viscosity on the Steady State Response of a Nonlinear System (with D. S. Gilliam, V. Shubov and Z. Xu), *Computation and Control IV*, Birkhäuser - Boston, 1995, 75 - 98
27. On Duality Between Filtering and Interpolation (with A. Lindquist), *Systems and Control in the 21st Century*, Birkhäuser-Boston, 1997, 101-136, invited chapter.
28. On the Well-posedness of the Rational Covariance Extension Problem (with H. J. Landau and A. Lindquist), *Current and Future Directions in Applied Mathematics*, Birkhäuser-Boston, 1997, 83-108, invited chapter.
29. Uniqueness of optimal controls and the nonexistence of shocks for Hamilton- Jacobi-Bellman and Riccati partial differential equations (with H. Frankowska), *Differential Inclusions and Optimal Control*, Eds. J. Andres, L. Gorniewicz, P. Nistri, Nicholas Copernicus University, 89-111, 1998.
30. On the Global Analysis of Linear Systems, *Mathematical Control Theory*, (J. Baillieul and J.C. Willems, eds.), Springer, 1998, 99-139, invited chapter.
31. Advances in high-resolution spectral estimation (with T. T. Georgiou and A. Lindquist), *System Theory: Modeling, Analysis and Control*, T.E. Djaferis and I.C. Schick (editors), Kluwer Academic Publishers, 2000, 167-179, invited chapter.
32. Toward a nonequilibrium theory for nonlinear control systems, *Nonlinear control in the year 2000*, Vol. 1 (Paris), 253-275, Lecture Notes in Control and Inform. Sci., 258, Springer-Verlag, London, 2001, invited chapter.
33. Recent advances in output regulation of nonlinear systems (with A. Isidori, L. Marconi and A. Serrani) *Nonlinear control in the year 2000*, Vol. 2 (Paris), 409-419, Lecture Notes in Control and Inform. Sci., 259, Springer, London, 2001.

34. Internal Model Based Design for the Suppression of Harmonic Disturbances (with D. S. Gilliam, A. Isidori, Y. Ikeda and L. Marconi) *Directions in Mathematical Systems Theory and Optimization*, A. Rantzer and C. I. Byrnes (editors) Lecture Notes in Control and Information Sciences, Vol. 286, Springer-Verlag, Heidelberg,, 2002, 51-70, invited chapter.
35. Geometric Theory of Output Regulation for Linear Distributed Parameter Systems (with D. S. Gilliam and V. I. Shubov), In *Research directions in distributed parameter systems (Raleigh, NC, 2000)*, *Frontiers Appl. Math.*, (27) 139–167. SIAM, Philadelphia, PA, 2003.
36. The uncertain generalized moment problem with complexity constraint. (with A. Lindquist) In *New trends in nonlinear dynamics and control, and their applications*, volume 295 of *Lecture Notes in Control and Inform. Sci.*, pages 267–278. Springer, Berlin, 2003.
37. A Convex Optimization Approach to Generalized Moment Problems (with A. Lindquist), *Control and Modeling of Complex Systems: Cybernetics in the 21st Century*, K. Hashimoto, Y. Oishi and Y. Yakomoto (editors) Birkhäuser, 2003, 3-22, invited chapter.
38. On the Steady-state Behavior of Forced Nonlinear Systems (with D. S. Gilliam, A. Isidori, and J. Ramsey), In *New trends in nonlinear dynamics and control, and their applications*, volume 295 of *Lecture Notes in Control and Inform. Sci.*, pages 119–143. Springer, Berlin, 2003.
39. Further Results on Output regulation by Pure Error Feedback, (with A. Isidori, L. Marconi), *16th IFAC World Congress Prague*, July 2005.
40. Set-point Boundary Control for a Viscous Burgers Equation, (with D. S. Gilliam , A. Isidori and V. I. Shubov) *New directions and applications in control theory*, 43–60, Lecture Notes in Control and Inform. Sci., 321, Springer, Berlin, 2005.
41. A Homotopy Continuation Solution of the Covariance Extension Equation. (with Fanizza, Giovanna; Lindquist, Anders) *New directions and applications in control theory*, 27–42, Lecture Notes in Control and Inform. Sci., 321, Springer, Berlin, 2005.
42. Differential Forms and Dynamical Systems, *Modeling, Estimation and Control*, (A.Chiuso, A. Ferrante, S. Pinzoni, eds.), Lecture Notes in Control and Inform. Sci. Vol. 364, Springer-Verlag, Berlin, 2007, pp. 35 -44.
43. Steady-State Response, Attractors, and Periodic Response to Forced Oscillations (with D. S. Gilliam), *Analysis and Design of Nonlinear Control Systems* (A. Astolfi and L. Marconi, eds.), Springer-Verlag, Berlin 2007, pp. 415-428.

44. The Moment Problem for Rational Measures: Convexity in the Spirit of Krein (with A. Lindquist), *The Krein Centenary Volume*, 2008.
45. On the Topology of Liapunov Functions for Dissipative Periodic Processes, *Emergent Problems in Nonlinear Systems and Control*, Springer-Verlag, to appear.

Conference Proceedings

1. A Note on the Topology of Hamiltonian Transfer Functions (with T.E. Duncan), in *Algebraic and Geometric Methods in Linear System Theory*, Lectures in Applied Mathematics, Vol. 18, Amer. Math. Soc., Providence, 1980, 7-26.
2. Decompositions, Factorization, and Invertibility in a Banach*-Algebra, (with R. Saeks), *5th Int'l. Symp. on the Math. Theory of Networks and Systems*, Santa Monica, 1981, 19-21.
3. A Geometric Problem in Electrical Energy Systems, (with J. Baillieul), *5th Int'l. Symp. on the Math. Theory of Networks and Systems*, Santa Monica, 1981, 4-8, invited paper.
4. Geometric Aspects of the Convergence Analysis of Identification Algorithms, in *Nonlinear Stochastic Problems*, (R.S. Bucy and J.F. Moura, eds.), D. Reidel, Dordrecht, 1982, 163-186, invited paper.
5. Global Properties of the Root-Locus Map, (with P.K. Stevens), in *Feedback Control of Linear and Nonlinear Systems*, (D. Hinrichsen and A. Isidori, eds.), Lecture Notes in Control and Inf. Sci., Vol. 29, Springer-Verlag, Berlin, 1983, 9-29.
6. On the Existence of Globally (f,g)-Invariant Distributions, (with A.J. Krener), in *Differential Geometric Control Theory*, (R.W. Brockett, R.S. Millman, and H. J. Sussman, eds.), Birkhäuser, Boston, 1983, 209-225.
7. Control Theory, Inverse Spectral Problems, and Real Algebraic Geometry, in *Differential Geometric Control Theory*, (R.W. Brockett, R.S. Millman, and H.J. Sussmann, eds.), Birkhäuser, Boston, 1983, 192-208, invited paper.
8. Toward a Global Theory of (f,g)-Invariant Distribution with Singularities, *Proc. of 1983 MTNS Conf* - Beer Sheba, Israel, Springer-Verlag, 1984, plenary paper.
9. Symmetries and Local Controllability, (with P.E. Crouch), *Algebraic and Geometric Methods in Nonlinear Control Theory*, Math. Appl., Vol. 29, 55-75, 1986, Reidel.
10. Asymptotic Expansions, Root Loci and the Global Stability of Nonlinear Feedback Systems, (with A. Isidori), *Algebraic and Geometric Methods in Nonlinear Control Theory*, Math. Appl., Vol. 29, 159-179, 1986, Reidel.

11. An Infinite-Dimensional Variational Problem Arising in Estimation Theory, (with A. Bloch), *Algebraic and Geometric Methods in Nonlinear Control Theory*, Math. Appl., Vol. 29, 487-498, 1986, Reidel.
12. Nonlinear Output Regulation: Remarks on Robustness (with A. Isidori) *Proc. of 27th Allerton Conf. Communic., Contr., Comp.*, 150-158, 1989.
13. An Example of Output Regulation for a Distributed Parameter System with Infinite Dimensional Exosystem, (with G.S. Gilliam, J. Hood, and V. I. Shubov) *Proceedings 15th International Conference on the Mathematical Theory of Networks and Systems*, 2002 (conference CDROM and at URL:<http://http://www.nd.edu/mtns/>).

Book Reviews and Editorials:

1. "A Complex Variable Approach to the Analysis of Linear Multivariable Feedback Systems," by I. Postlethwaite and A.G.J. Mac Farlane, *IEEE Trans. on Aut. Control*, Vol. AC-26 (1981) 1302-1304.
2. "An Introduction to Linear Control Systems," by T.E. Fortmann and K.L. Hitz, *IEEE Trans. on Aut. Control*, Vol. AC-27 (1982) 516-517.
3. "Editor's Introduction to L. Euler's "An Essay on Continued Fractions" translated by B.F. and M.F. Wyman", *Math. System Theory*, 18 (1985) 292-294.
4. "Uniform Output Regulation of Nonlinear Systems," by A. Pavlov, N. van de Wouw and H. Nijmeijer, a book review in *IEEE Trans. on Aut. Control*, Oct., 2007, 2013-2014.

PATENTS:

1. Method and Apparatus for Speech Analysis and Synthesis Using Lattice Ladder Notch Filters, US Patent No. 5,940,791.
2. Method and Apparatus for Speech Analysis and Synthesis Including Speaker Recognition, US Patent No. 6,256,609.
3. Method and Apparatus for a Tunable High-resolution Spectral Estimator, US Patent No. 6,400,310.
4. Method and Apparatus for Speaker Verification Using a Tunable High-resolution Spectral Estimator, US Patent No. 7,233,898.

RESEARCH SUPPORT:

At Washington University:

- AFOSR - FA9550-07-0214, Nonlinear Control Systems, (C.I. Byrnes, PI, and A. Isidori, Co-PI), 04/01/07 - 3/3/10, \$447,000.
- AFOSR-FA9550-04-10127, Nonlinear Control Systems, (C.I. Byrnes, PI, and A. Isidori, Co-PI), 03/01/04 - 02/28/07, \$361,238.
- NSF-ECS-0314004, Tracking Control for Nonlinear Systems Distributed over Communication Networks, (A. Isidori, PI, and C.I. Byrnes, Co-PI), 09/01/03 - 08/31/06, \$185,000.
- Boeing, "Nonequilibrium Nonlinear Control," (C. I. Byrnes, PI), 7/1/2001 - 6/30/2003, \$85,000.
- AFOSR-F49620-01-1-0039, Directorate of Mathematical and Information Sciences, "Nonlinear Control Systems," (C.I. Byrnes, PI, and A. Isidori, Co-PI) 12/1/2000 - 11/30/2003, \$400,050.
- Boeing, "Bifurcation Analysis of Nonlinear Systems with Large Feedback Gains," (A. Isidori, PI and C. I. Byrnes, Co-PI), 7/1/2000 - 6/30/2003, \$120,000.
- Boeing, "Robust Output Regulation for Nonlinear Systems," (C. I. Byrnes, PI), 1/15/98 - 6/30/2000, \$119,794.
- Boeing, "Bifurcation Analysis of Nonlinear systems with Large Feedback Gains," (A. Isidori, PI and C. I. Byrnes, Co-PI), 1/15/98 - 9/15/98, \$41,739.
- Boeing, "Robust, Adaptive and Nonlinear Control of Uncertain Systems," (A. Isidori, PI, and C.I. Byrnes, Co-PI) 1/15/98 - 1/14/99, \$96,109.
- AFOSR-F49620-98-1-0170, Directorate of Mathematical and Information Sciences, "Nonlinear Control Systems", \$346,232 (C.I. Byrnes, PI, and A. Isidori, Co-PI) 12/15/97 - 11/14/00
- McDonnell-Douglas Aircraft Co., "Optimal Control of Navier-Stokes Equations," (C.I. Byrnes, PI) 3/1/97 - 2/28/00, \$30,916.
- NSF-DMS-9623435, Division of Mathematical Sciences, "Feedback Design for Nonlinear Systems," (C. I. Byrnes, PI) , 7/1/96 - 6/30/99, \$105,000.
- AFOSR-94-F49620-9510232, Directorate of Mathematical and Information Sciences, "Nonlinear Control Systems" (C.I. Byrnes, PI, and A. Isidori, Co-PI) 1/15/95 - 1/14/98, \$394,950.

- SW BELL, (C.I. Byrnes, PI), "Mathematics, Systems and Signals," 7/1/95 - 6/30/97, \$85,000.
- AFOSR - DEPSCOR - "Analytical and Computational Methods for Nonlinear Feedback Design", (C.I. Byrnes, PI, and A. Isidori, Co-PI), 9/1/94 - 8/30/97, \$232,177
- AFOSR - F49620-93-1-0526, "(DEPSCOR 92) Equipment for Computation and Visualization" (C.I. Byrnes, PI, I.N. Katz, Co-PI, and B. Szabo, Co-PI) 9/1/93 - 8/31/93, \$210,042.
- McDonnell-Douglas Aircraft Co., "Control of Nonlinear Missiles," (C.I. Byrnes, PI, A. Isidori, Co-PI and H. Schaettler, Co-PI), 11/30/93 - 11/29/95, \$50,000.
- SW BELL, (C.I. Byrnes, PI), "Mathematics, Systems and Signals," 7/1/93 - 6/30/95, \$75,000.
- NSF-CNRS, "Nonlinear Feedback Design, a joint US-France project," (C.I. Byrnes, PI, A. Isidori, Co-PI and T. J. Tarn, Co-PI) 6/1/92 - 5/31/95, \$15,177.
- NSF-ECS-92-04612, "NSF Workshop on Nonlinear Systems" (C.I. Byrnes, PI)," \$19,963.
- AFOSR-EPSCOR - F49620-92-J-0446, "Doctoral Research in Systems Science" (C.I. Byrnes, PI), 8/15/92 - 8/14/95, \$119,446.
- AFOSR-91-0266, Directorate of Mathematical and Information Sciences, "Nonlinear Control Systems" (C.I. Byrnes, PI) 8/15/91 - 10/14/94, \$288,545.
- NSF-DMS-9105272, Division of Mathematical Sciences-SCREMS, "Mathematical Sciences Computing Environment," (C.I. Byrnes, PI, and D.Elliott, Co-PI) 7/1/91 - 12/31/93 \$39,990.
- McDonnell Foundation, "Equipment Grant for a Laboratory for Computation and Control," (C.I. Byrnes, PI), 7/1/90, \$55,000.
- SW BELL, (C.I. Byrnes, PI), "Mathematics, Systems and Signals," 7/1/90 - 6/30/93, \$90,000.
- NSF-DMS-9008223, Division of Mathematical Sciences, "Geometric Methods for Nonlinear Feedback Design," (C.I. Byrnes, PI, and A. Isidori, Co-PI) 7/1/90 - 12/31/93, \$110,829.
- AFOSR-88-0309, Directorate of Mathematical and Information Sciences, "Adaptive and Nonlinear Control," (C.I. Byrnes, PI) 8/15/88 - 8/14/91, \$250,000.

At Arizona State University:

- ASU, "The Graduate College Distinguished Research Award," (C.I. Byrnes, PI) 7/1/88 - 6/30/89, \$90,000.
- NSF, System Theory and Operations Research - Expedited Award for Novel Research, "A Dynamical Systems Approach to Modeling Filter Design," (C.I. Byrnes, PI) 1/15/88 - 1/14/90, \$28,600.
- NSF-ECS-87-03615, System Theory and Operations Research/Applied Mathematics (C.I. Byrnes, PI, P.E. Crouch, Co-PI) "Feedback Design Methods for Nonlinear Systems," 9/15/87 - 2/14/90, \$139,937.
- AFOSR, Directorate of Mathematical and Information Sciences, "Dynamic Compensation Based Adaptive Control," (C.I. Byrnes, PI) 7/15/85 - 7/14/88, \$149,952.
- NSF, Systems Theory and Operations Research, "High Gain Nonlinear Feedback" (C.I. Byrnes, PI) 6/1/85 - 11/30/86, \$25,000.

At Harvard University:

- AFOSR-81-0054, "Geometric Problems in Adaptive Control," (R.W. Brockett and C.I. Byrnes, PIs) 1/1/83 - 12/31/84, \$109,216.
- NSF-ECS-81-21428, Electrical Sciences-Systems, "High Gain Linear and Nonlinear Feedback," (R.W. Brockett, PI and C.I. Byrnes, Co-PI) 4/1/84 - 3/31/86, \$101,000
- NASA/AMES Research Center, NSG-2265, "Global Methods in Nonlinear Geometric Control Theory," (C.I. Byrnes, PI) 11/1/83 - 10/31/84, \$36,500.
- NSF-ECS-83-04915, Electrical Sciences Systems, "The International Symposium on the Mathematics of Networks and Systems," (C.I. Byrnes, PI and R. E. Saeks Co-PI), 6/1/83 - 2/1/84, \$13,000.
- NSF-ECS-81-21428, Electrical Sciences Systems, "Control Theory and Dynamical Systems," (R.W. Brockett, PI and C.I. Byrnes, Co-PI) 4/1/82 - 9/30/84, \$84,595.
- NASA/AMES Research Center, NSG-2265, "A Geometric Approach to Reliability, Fault Tolerance and Stabilizability for Multimode Systems," (C.I. Byrnes, PI) 11/1/81 - 10/31/83, \$67,000.
- AFOSR-81-0054, "Adaptive Control of Linear Systems," (R.W. Brockett and C.I. Byrnes, PIs) 1/1/81 - 12/31/82, \$87,800.

- NASA-AMES Research Center, NSG-2265, "Algebraic and Geometric Methods in the Reliability Theory of Linear Control Systems," (C.I. Byrnes, PI) 9/1/80 - 8/31/81, \$32,000.
- NASA-AMES Research Center, NSG-2265, "Geometrical Methods for Linear and Non-linear Dynamics," (R.W. Brockett and C.I. Byrnes, PIs) 9/1/79 - 8/31/80, \$32,181.
- NSF-ENG-79-09459, Electrical Sciences Systems, "Linear Dynamical Systems," (R.W. Brockett, PI and C.I. Byrnes Co-PI), 7/1/79 - 12/31/81, \$77,000.
- NASA-AMES Research Center, University Affairs Office, "Seminar/Workshop on Algebraic and Geometric Methods in Linear Systems Theory," (C.I. Byrnes and C.F. Martin, PIs) 9/1/78 - 8/31/79, \$24,766.
- NATO Grant, Advanced Study Institute, Harvard University, (R.W. Brockett, C.I. Byrnes, C.F. Martin, PI's) 9/1/78 - 8/31/79, \$30,000.